

**LONGHORN ARMY
AMMUNITION PLANT
KARNACK, TEXAS**

**ADMINISTRATIVE
RECORD**

Volume 6

2020

Bate Stamp Numbers

00958708 – 00960606

Prepared for

**Department of the Army
Longhorn Army Ammunition Plant**

1976–2020

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

VOLUME 6

2020

- A. Title: (cont'd) Report – Quarterly Evaluation Report 4th Quarter (October-December) 2019 Groundwater Treatment Plant, Longhorn Army Ammunition Plant, Karnack, Texas, April 2020
Author(s): Bhate Environmental Associates, Inc.
Recipient: U.S. Army Corps of Engineers – Tulsa District
Date: April 21, 2020
Bate Stamp: 00958708 – 00958969
- B. Title: Report – Appendix F to Quarterly Evaluation Report 4th Quarter (October-December) 2019 Groundwater Treatment Plant, Longhorn Army Ammunition Plant, Karnack, Texas, April 2020
Author(s): Department of the Army
Recipient: U.S. Environmental Protection Agency and Texas Commission on Environmental Quality
Date: April 21, 2020
Bate Stamp: 00958970 – 00960606

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND12.D

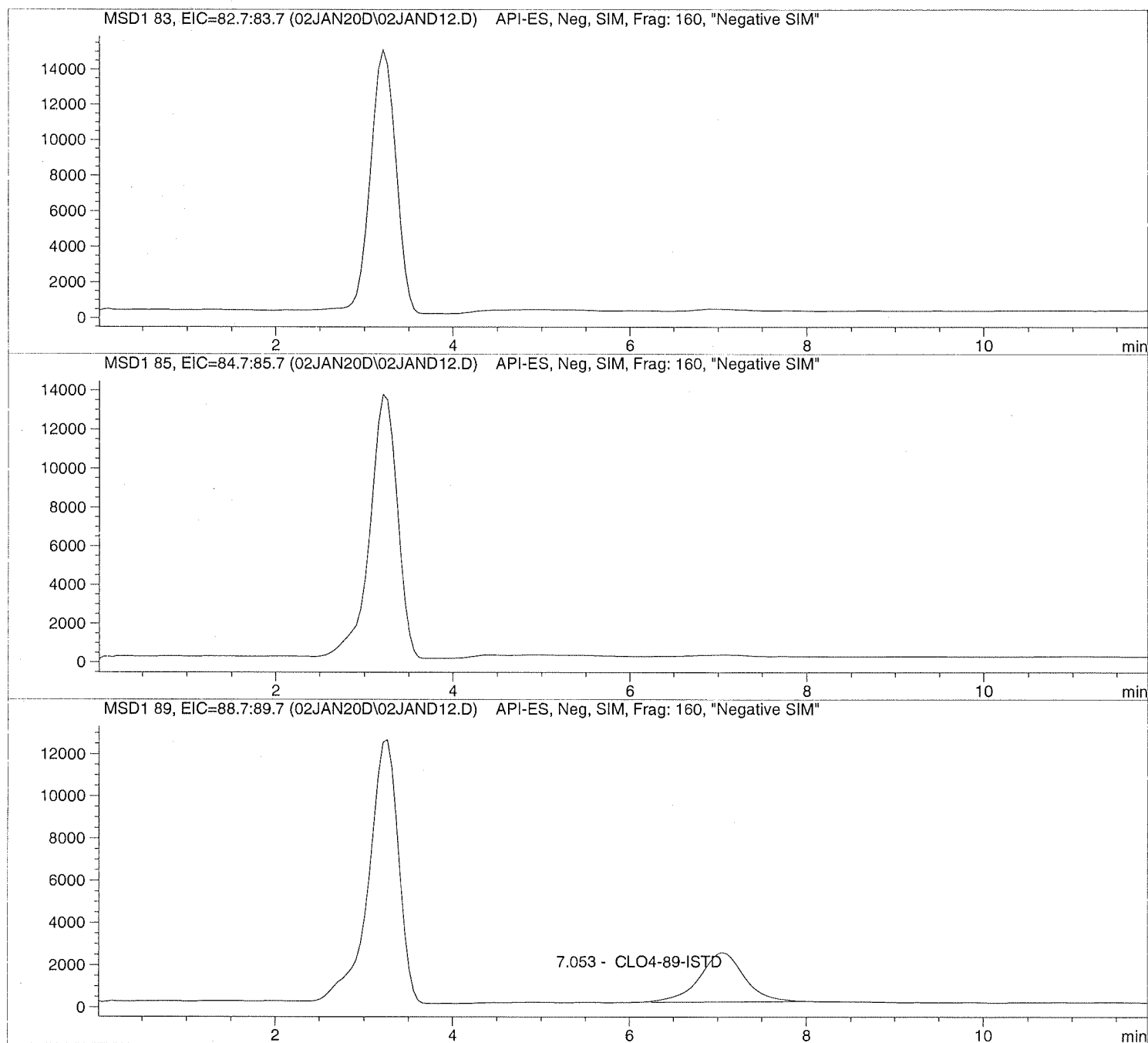
Sample Name: 1935915005

=====
Injection Date: 1/02/2020 15:45:23
Sample Name: 1935915005
Acq Operator: TNB

Seq Line: 12
Location: Vial 82
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\02JAN20D\02JAND12.D Sample Name: 1935915005

```

=====
Injection Date: 1/02/2020 15:45:23      Seq Line:          12
Sample Name:   1935915005              Location:          Vial 82
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
7.053	BBA	81637.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND13.D

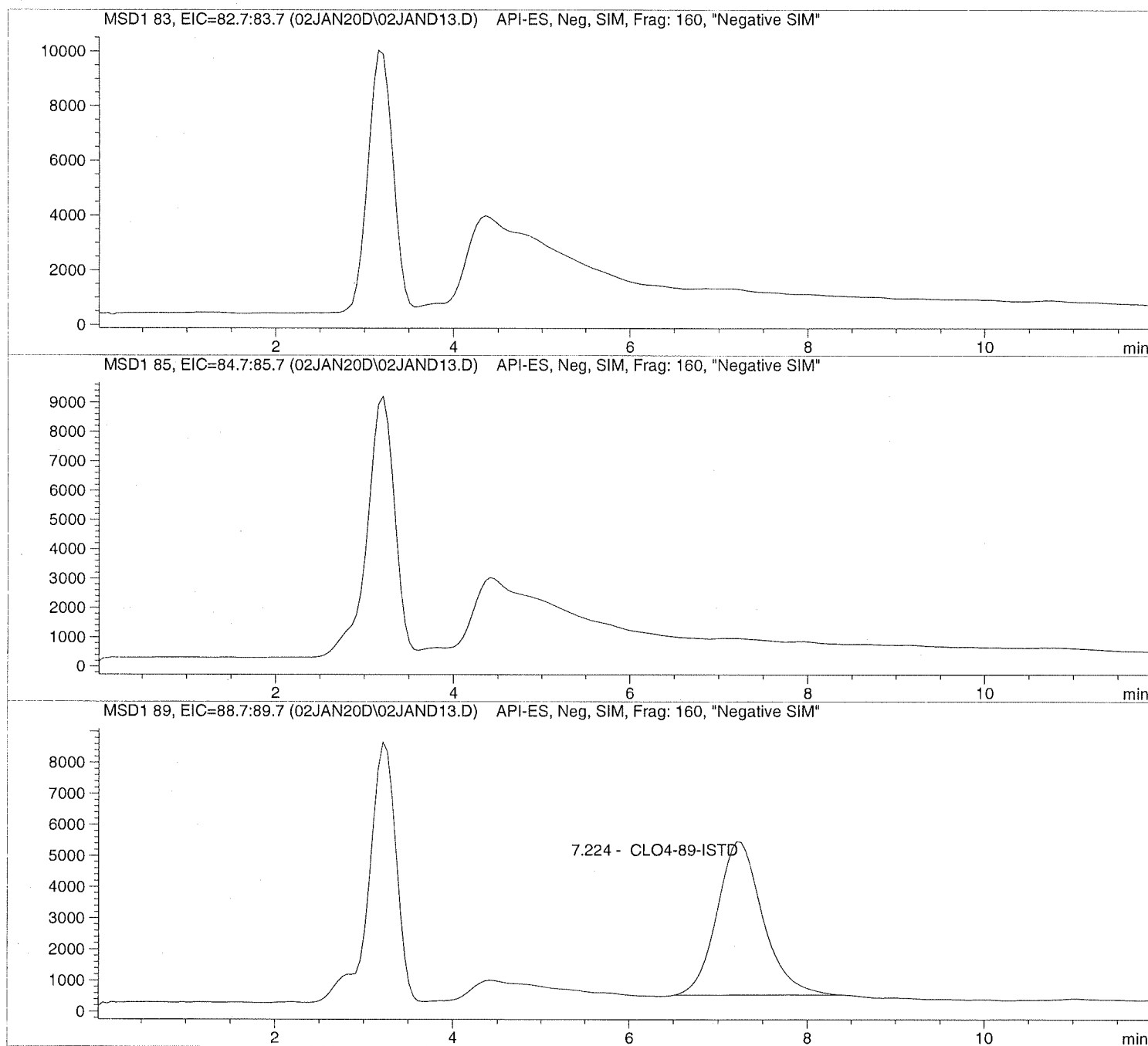
Sample Name: 1935915006

=====
Injection Date: 1/02/2020 15:59:22
Sample Name: 1935915006
Acq Operator: TNB

Seq Line: 13
Location: Vial 83
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\02JAN20D\02JAND13.D Sample Name: 1935915006

```
=====
Injection Date: 1/02/2020 15:59:22      Seq Line:      13
Sample Name:    1935915006              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:       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
7.224	PBA	175700.4	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND14.D

Sample Name: 690690 CCV@25

Injection Date: 1/02/2020 16:13:13

Seq Line: 14

Sample Name: 690690 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

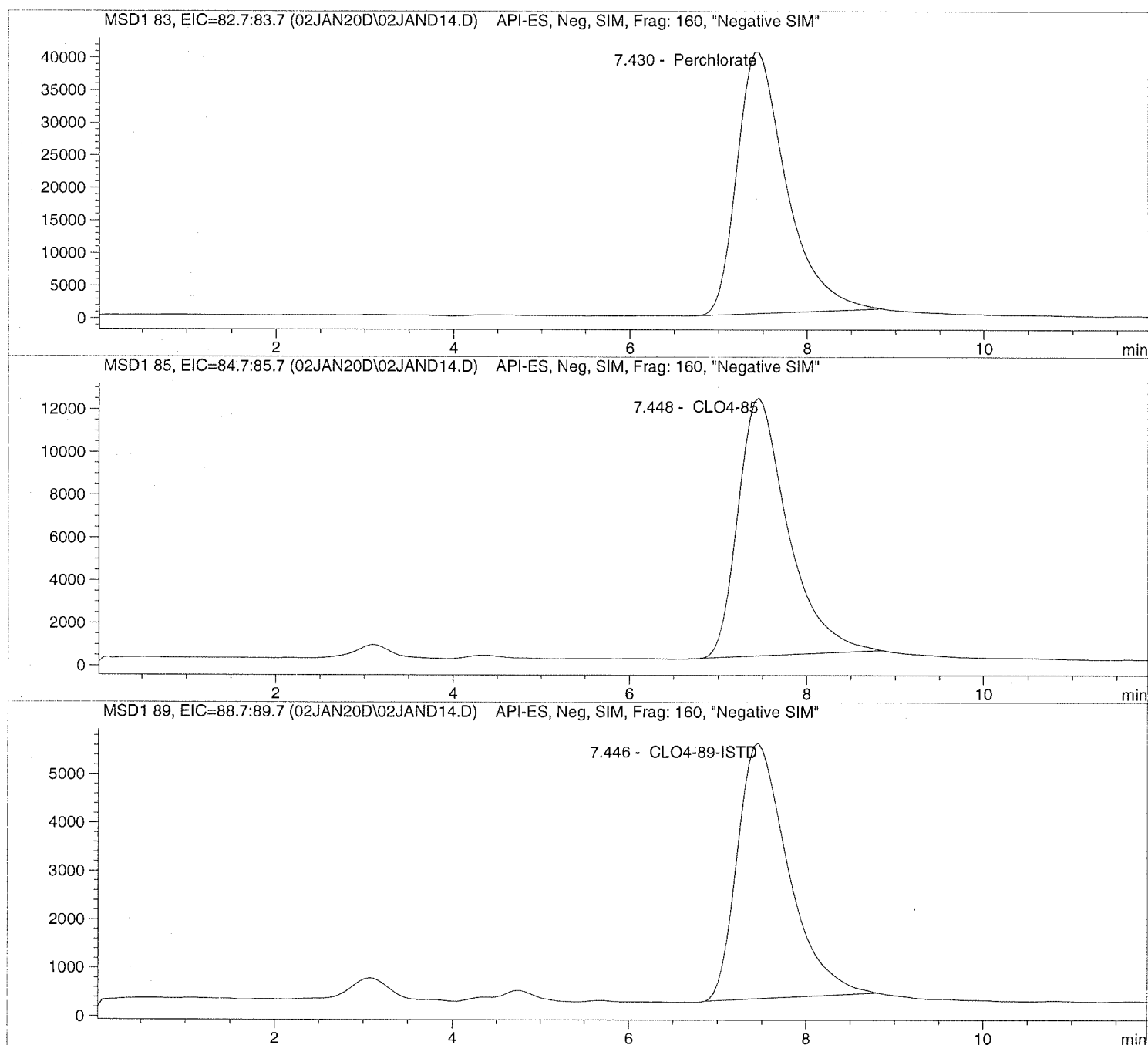
Inj. Vol.: 35 µl

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\02JAN20D\02JAND14.D Sample Name: 690690 CCV@25

```

=====
Injection Date: 1/02/2020 16:13:13          Seq Line:          14
Sample Name:   690690 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
7.430	PBA	1556973.9	25.1820	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.448	PBA	473140.5	25.1044	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.446	PBA	211105.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND15.D

Sample Name: 1935915007 MS

Injection Date: 1/02/2020 16:27:04

Seq Line: 15

Sample Name: 1935915007 MS

Location: Vial 84

Acq Operator: TNB

Inj. No.: 1

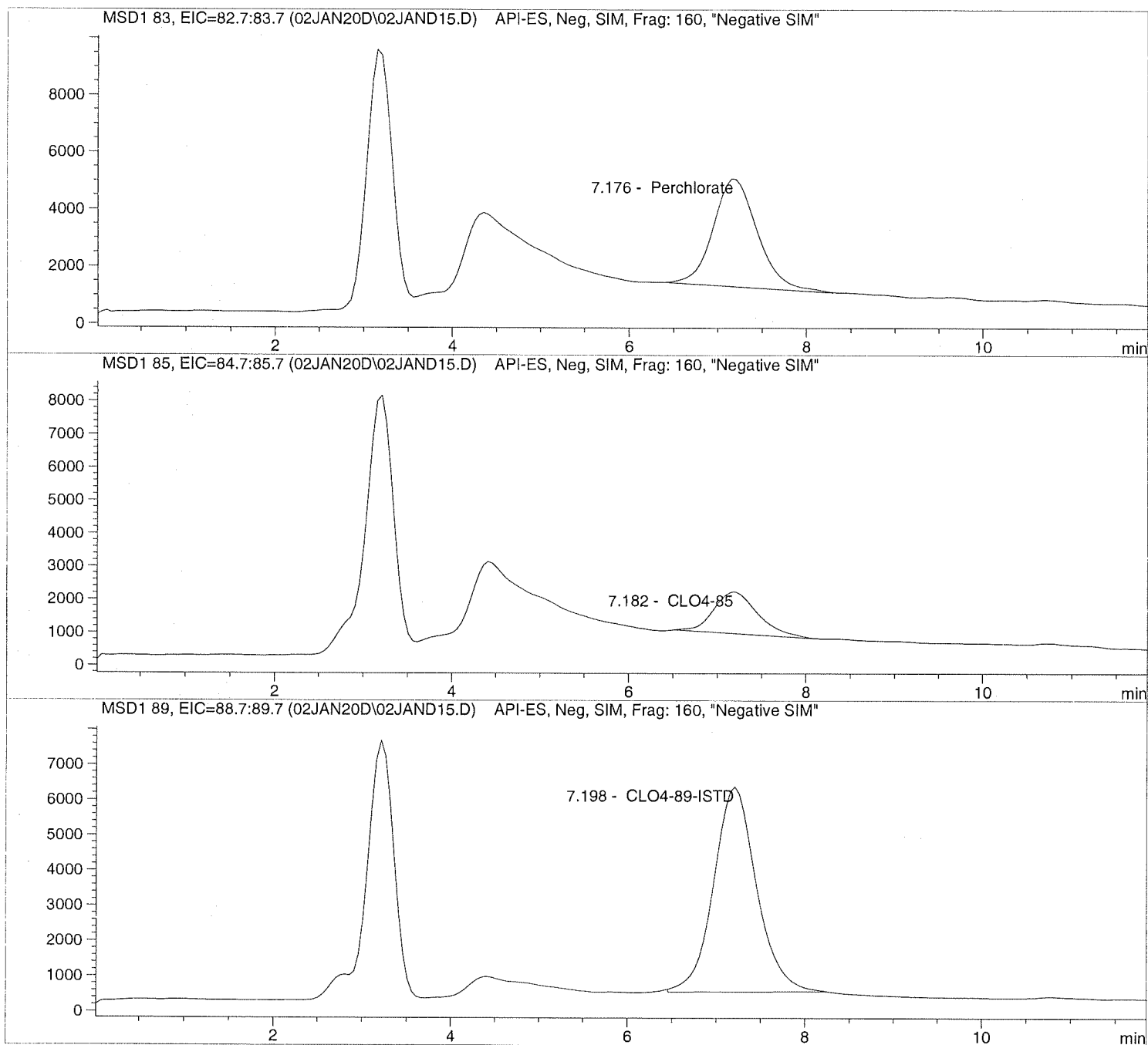
Inj. Vol.: 35 µl

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\02JAN20D\02JAND15.D Sample Name: 1935915007 MS

```

=====
Injection Date: 1/02/2020 16:27:04      Seq Line:      15
Sample Name:    1935915007 MS           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:      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
7.176	BBA	131015.0	2.4565	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.182	PBA	43555.4	2.5920	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.198	BBA	195563.0	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND16.D

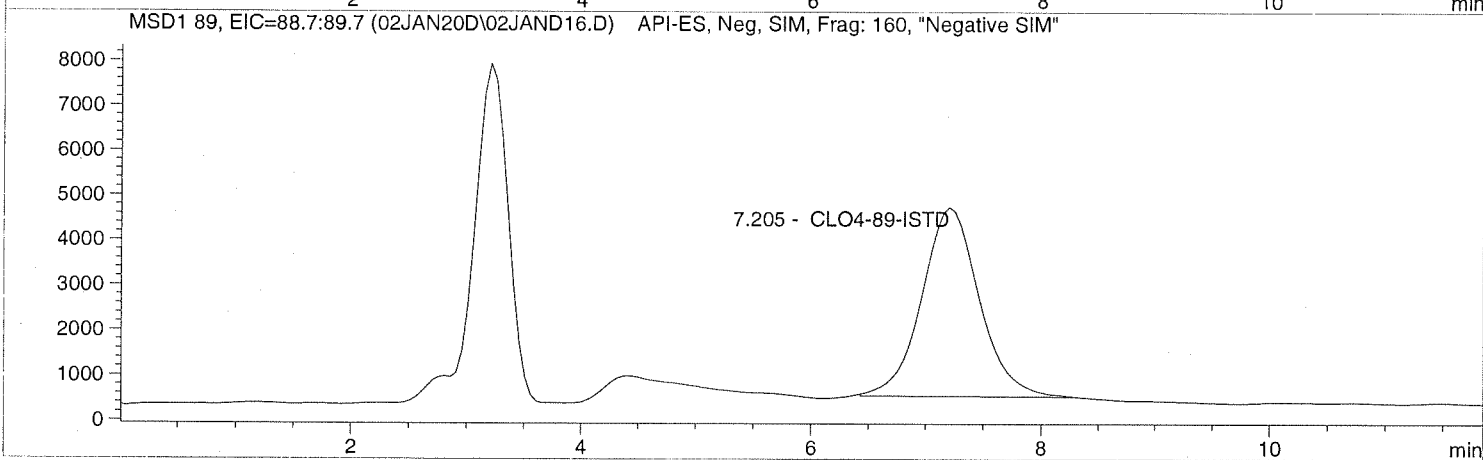
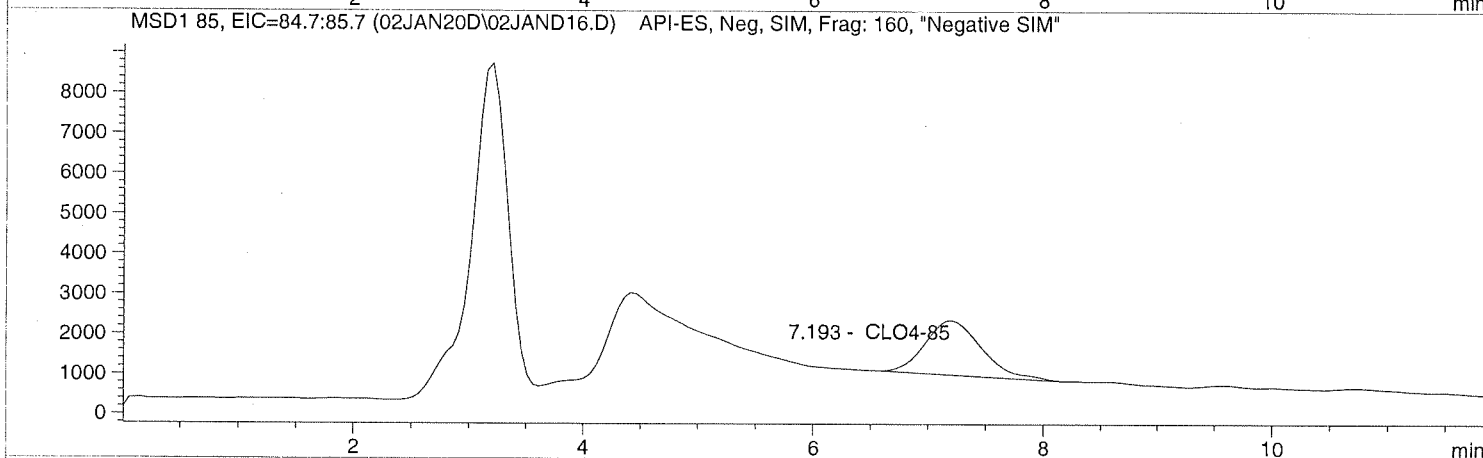
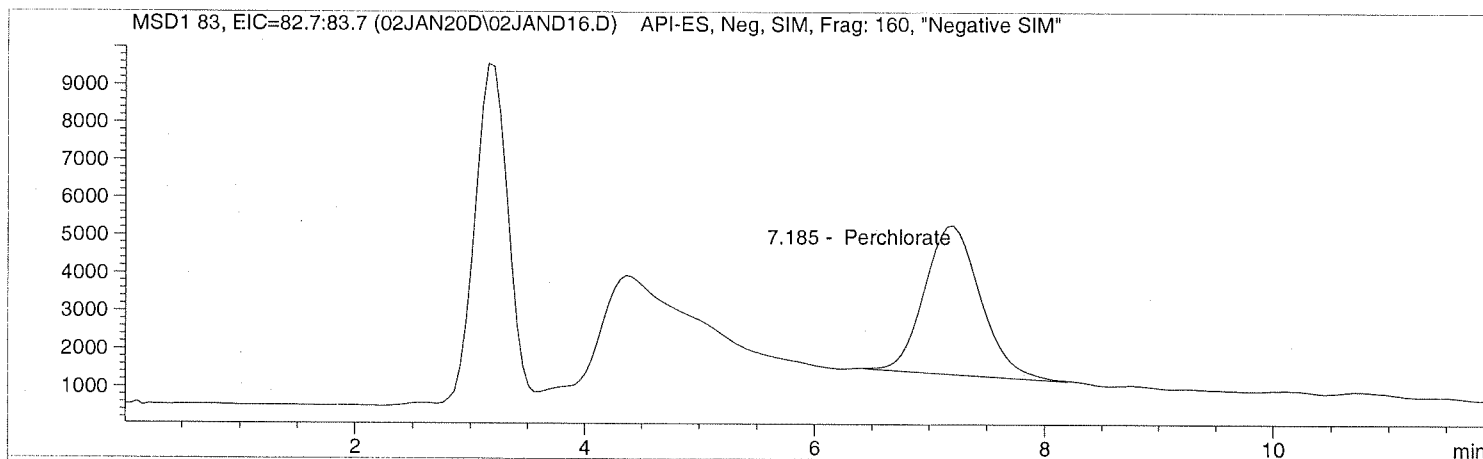
Sample Name: 1935915008 MSD

Injection Date: 1/02/2020 16:41:07
Sample Name: 1935915008 MSD
Acq Operator: TNB

Seq Line: 16
Location: Vial 85
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND16.D Sample Name: 1935915008 MSD

```

=====
Injection Date: 1/02/2020 16:41:07      Seq Line:      16
Sample Name:   1935915008 MSD           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:      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
7.185	BBA	132259.5	3.3466	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.193	PBA	46493.2	3.7688	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.205	BBA	145588.4	5.0000	CLO4-89-ISTD

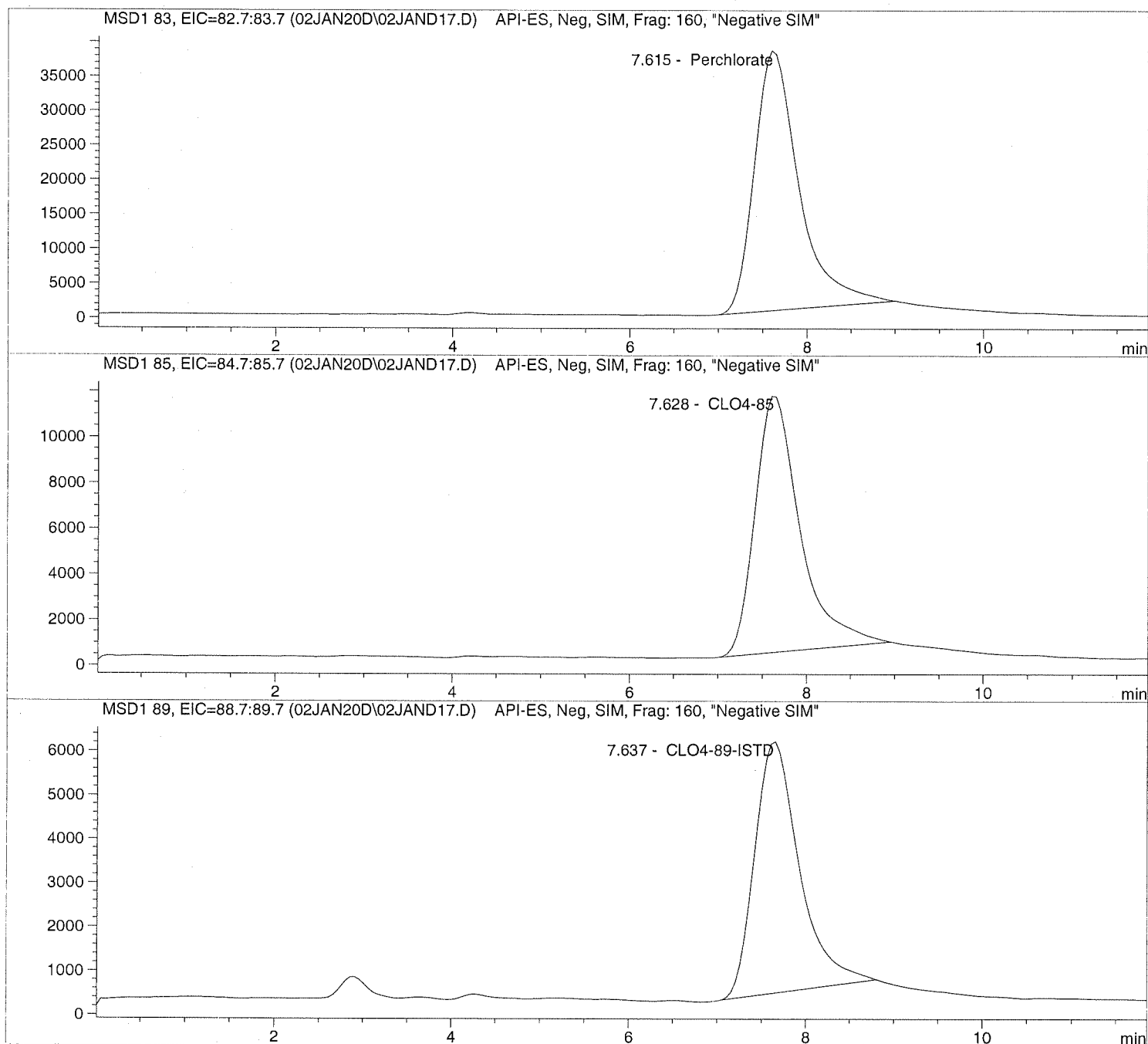
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND17.D Sample Name: 1935915009 1K

```
=====
Injection Date: 1/02/2020 16:54:59      Seq Line:      17
Sample Name:    1935915009 1K           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\02JAN20D\02JAND17.D Sample Name: 1935915009 1K

```

=====
Injection Date: 1/02/2020 16:54:59      Seq Line:          17
Sample Name:   1935915009 1K           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:     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
7.615	PBA	1320092.9	22628.1935	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.628	PBA	397733.8	22358.4905	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.637	PBA	201299.8	5000.0000	CLO4-89-ISTD

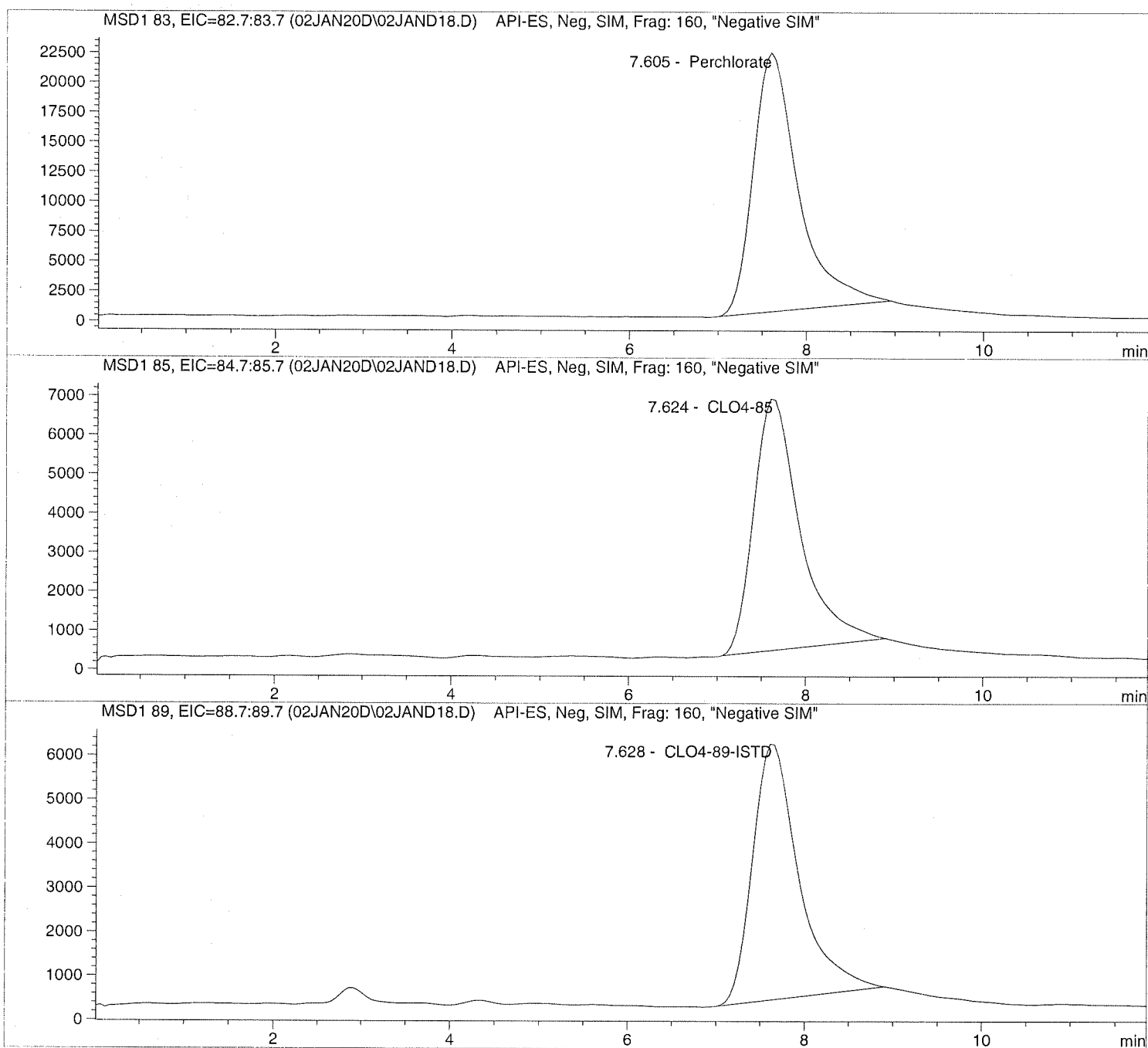
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND18.D Sample Name: 1935915010 10K

```
=====
Injection Date: 1/02/2020 17:08:52      Seq Line:      18
Sample Name:    1935915010 10K          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\02JAN20D\02JAND18.D Sample Name: 1935915010 10K

```
=====
Injection Date: 1/02/2020 17:08:52      Seq Line:          18
Sample Name:    1935915010 10K          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:       10000.000000
Sample Amount:  0.000
```

=====

LCMS Results

=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.605	PBA	768865.3	130446.8924	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.624	PBA	235180.4	130044.7637	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.628	PBA	211545.7	50000.0000	CLO4-89-ISTD

=====

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND19.D

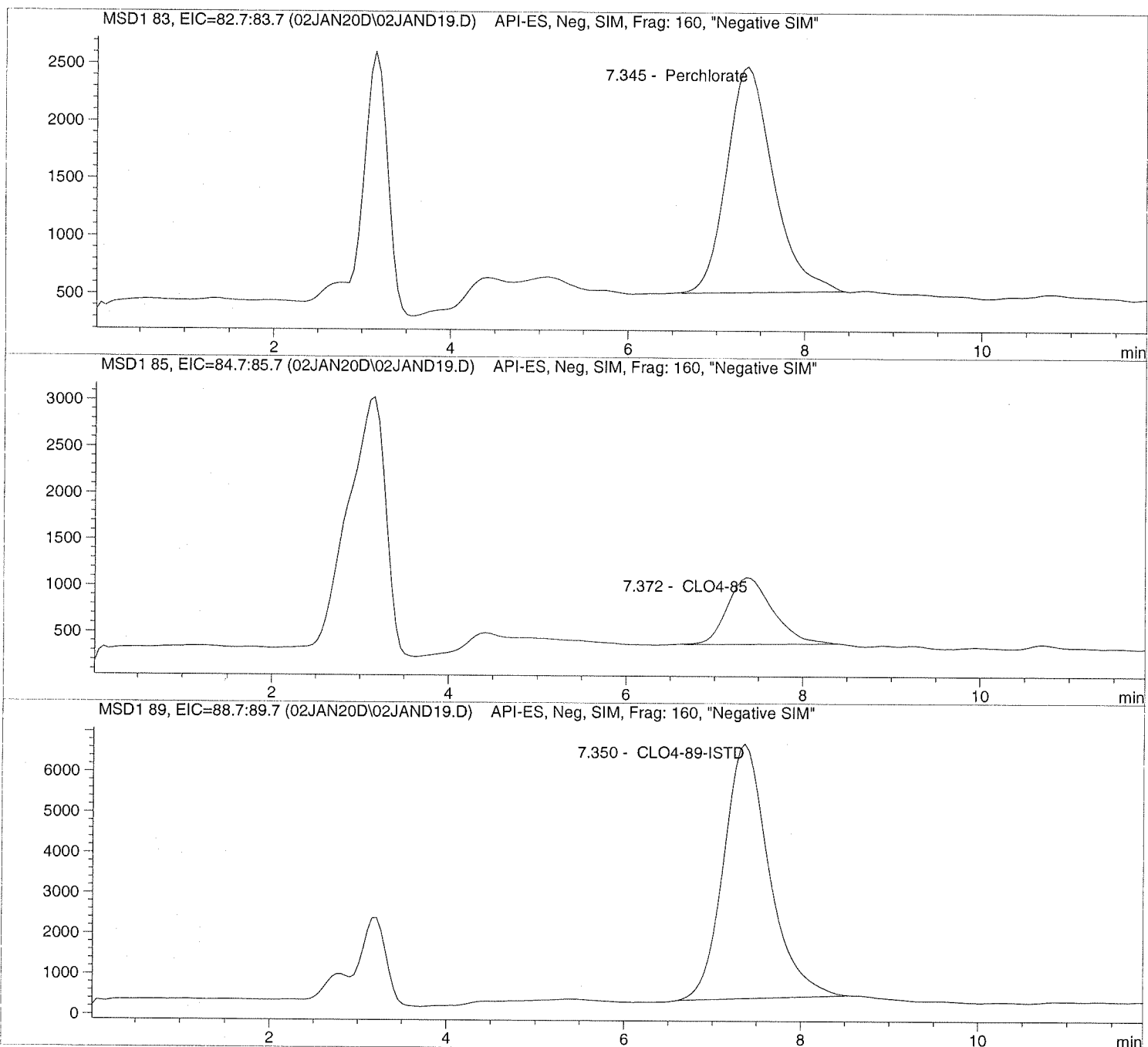
Sample Name: 1935915011

Injection Date: 1/02/2020 17:22:48
Sample Name: 1935915011
Acq Operator: TNB

Seq Line: 19
Location: Vial 88
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND19.D Sample Name: 1935915011

```

=====
Injection Date: 1/02/2020 17:22:48      Seq Line: 19
Sample Name: 1935915011      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: 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
7.345	BBA	72005.1	1.1283	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.372	BBA	25905.7	1.2573	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.350	BBA	226623.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND21.D

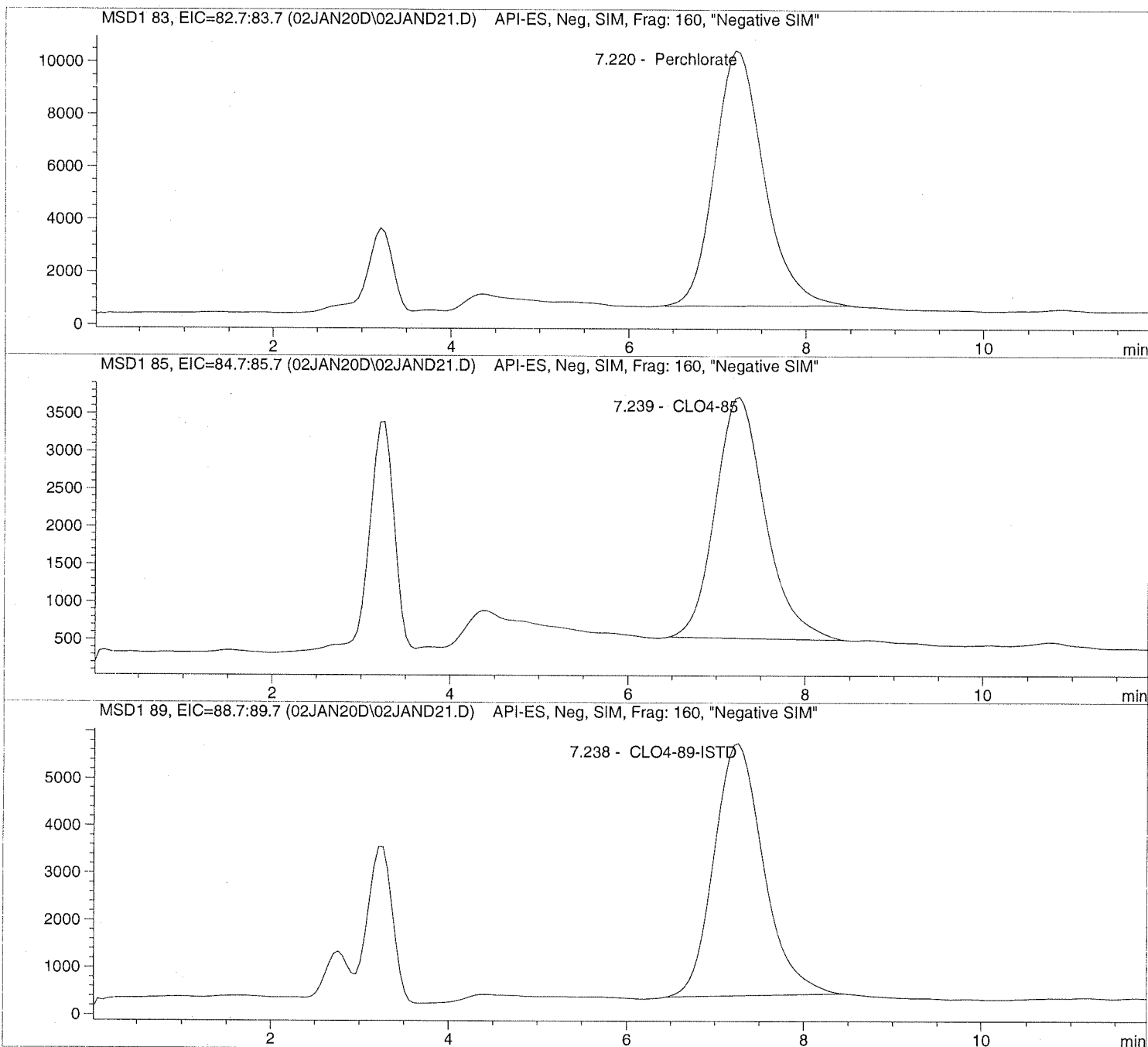
Sample Name: 1936106001

=====
Injection Date: 1/02/2020 17:50:37
Sample Name: 1936106001
Acq Operator: TNB

Seq Line: 21
Location: Vial 90
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\02JAN20D\02JAND21.D Sample Name: 1936106001

```

=====
Injection Date: 1/02/2020 17:50:37      Seq Line:          21
Sample Name:    1936106001              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
7.220	PBA	375683.7	6.6527	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.239	PBA	125368.0	7.1746	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.238	BBA	207387.2	5.0000	CLO4-89-ISTD

```

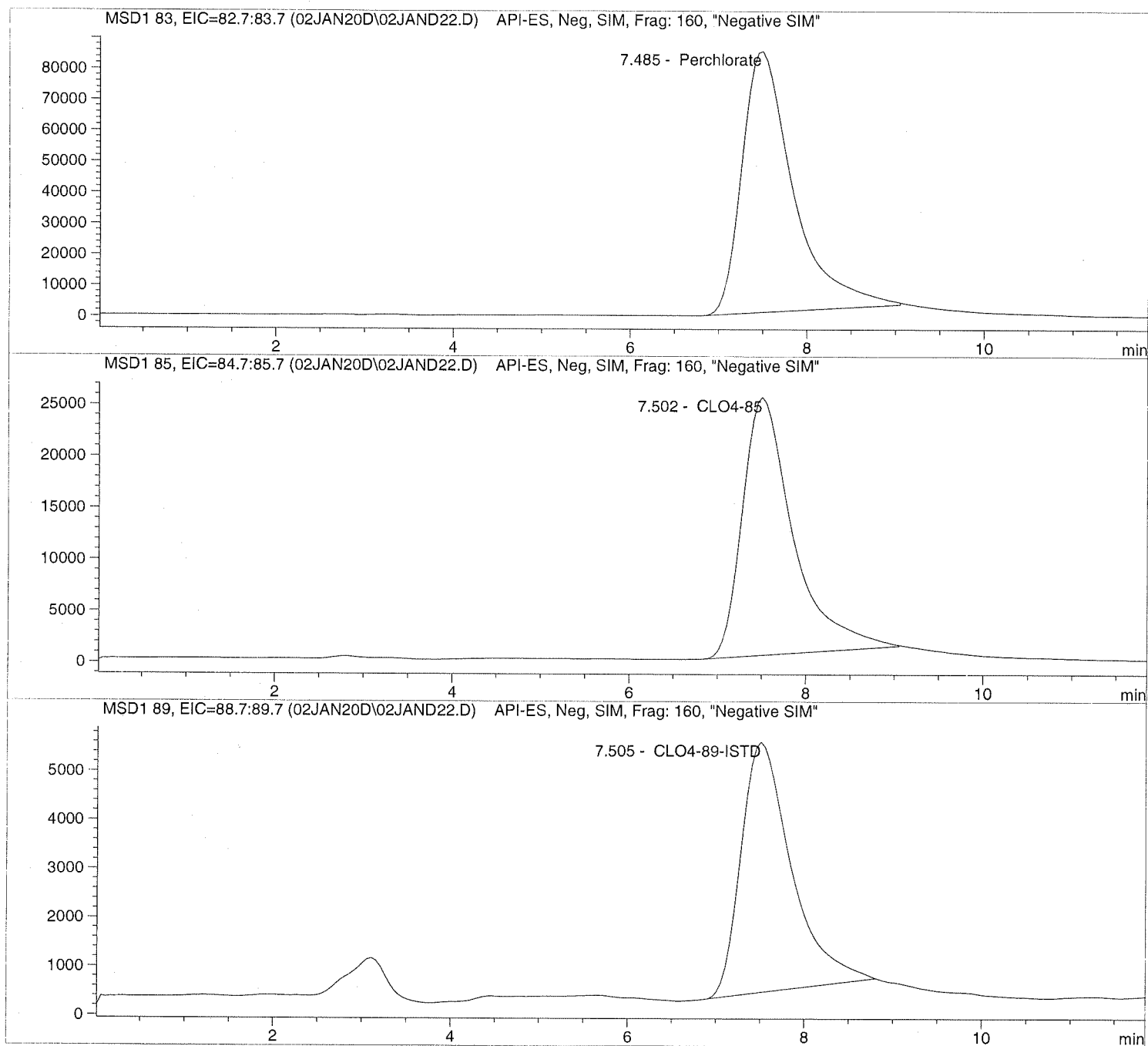
=====
*** End of Report ***

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND22.D Sample Name: 1935915012 10X

=====
Injection Date: 1/02/2020 18:04:36 Seq Line: 22
Sample Name: 1935915012 10X 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\02JAN20D\02JAND22.D Sample Name: 1935915012 10X

```

=====
Injection Date: 1/02/2020 18:04:36      Seq Line:          22
Sample Name:    1935915012 10X          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:      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
7.485	PBA	3407190.3	516.1452	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.502	PBA	999389.8	502.8506	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.505	PBA	202951.9	50.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND23.D

Sample Name: 690691 CCV@25

Injection Date: 1/02/2020 18:18:27

Seq Line: 23

Sample Name: 690691 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

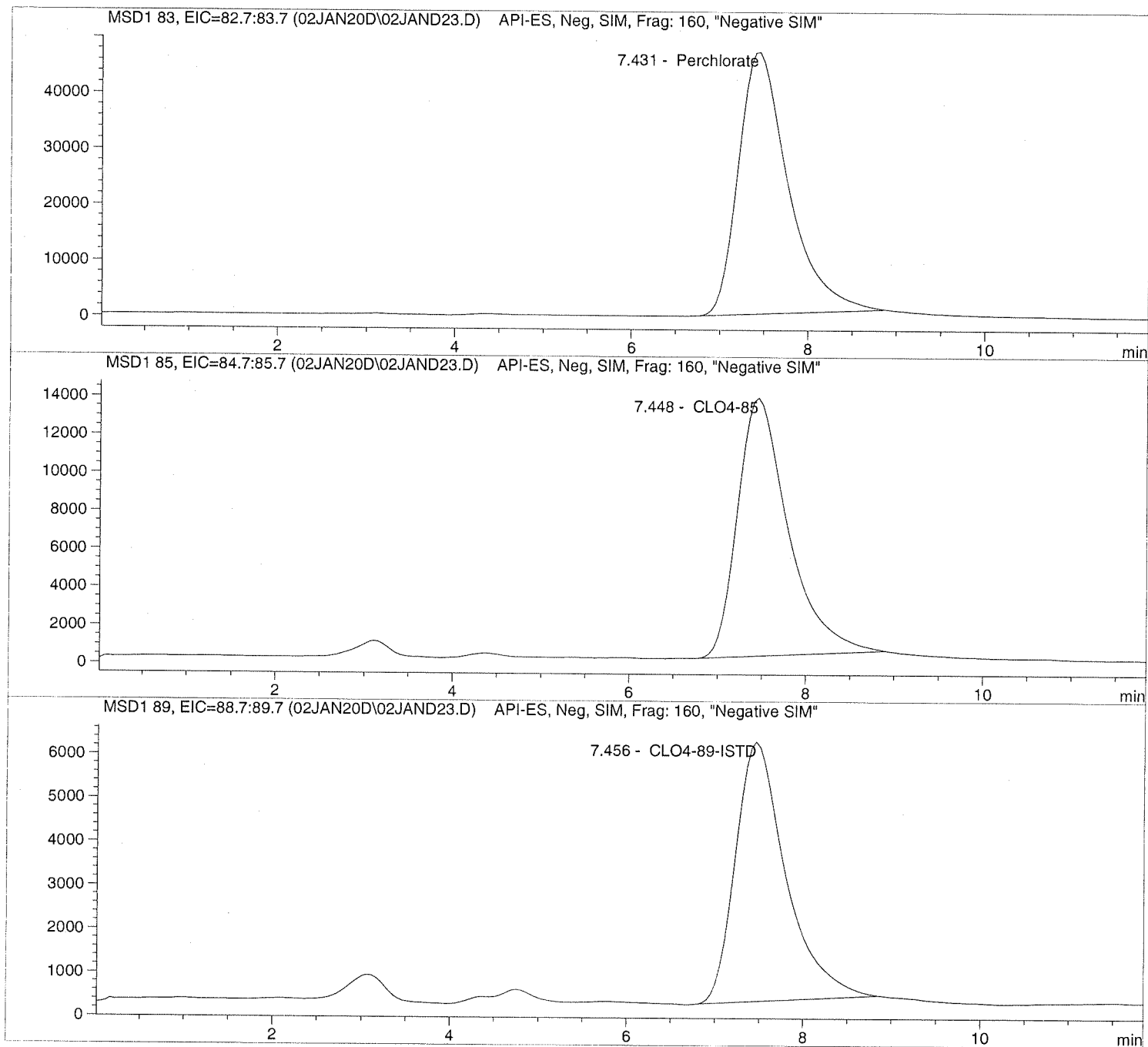
Inj. Vol.: 35 µl

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\02JAN20D\02JAND23.D Sample Name: 690691 CCV@25

```
=====
Injection Date: 1/02/2020 18:18:27      Seq Line:          23
Sample Name:    690691  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
7.431	PBA	1840917.4	26.5024	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.448	PBA	541119.1	25.6437	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.456	PBA	235883.1	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	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
[min]	Sig						
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 Sig	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

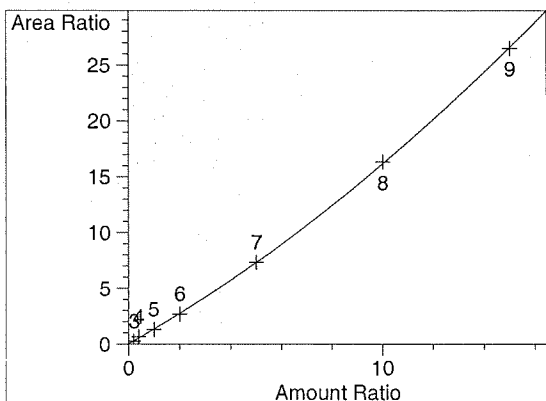
Compound: CLO4-85

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

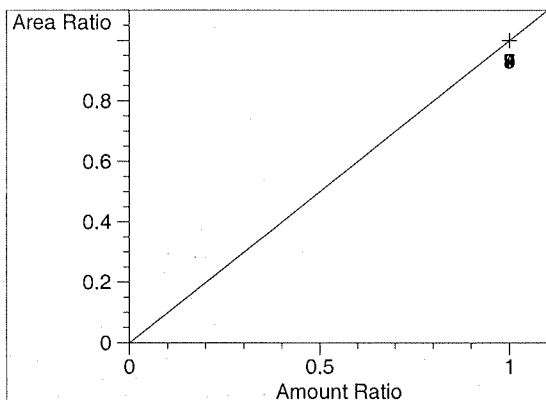
=====
 Peak Sum Table
 =====

No Entries in table

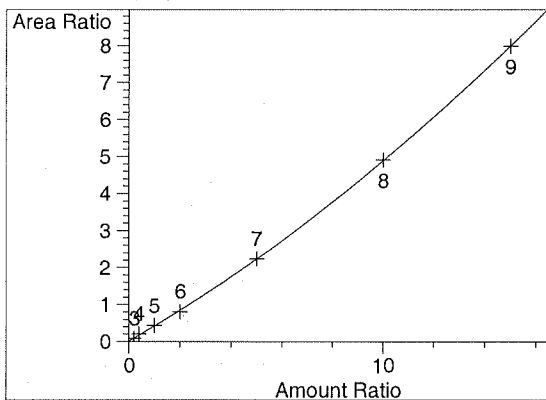
=====
 Calibration Curves
 =====



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\20SEP19\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

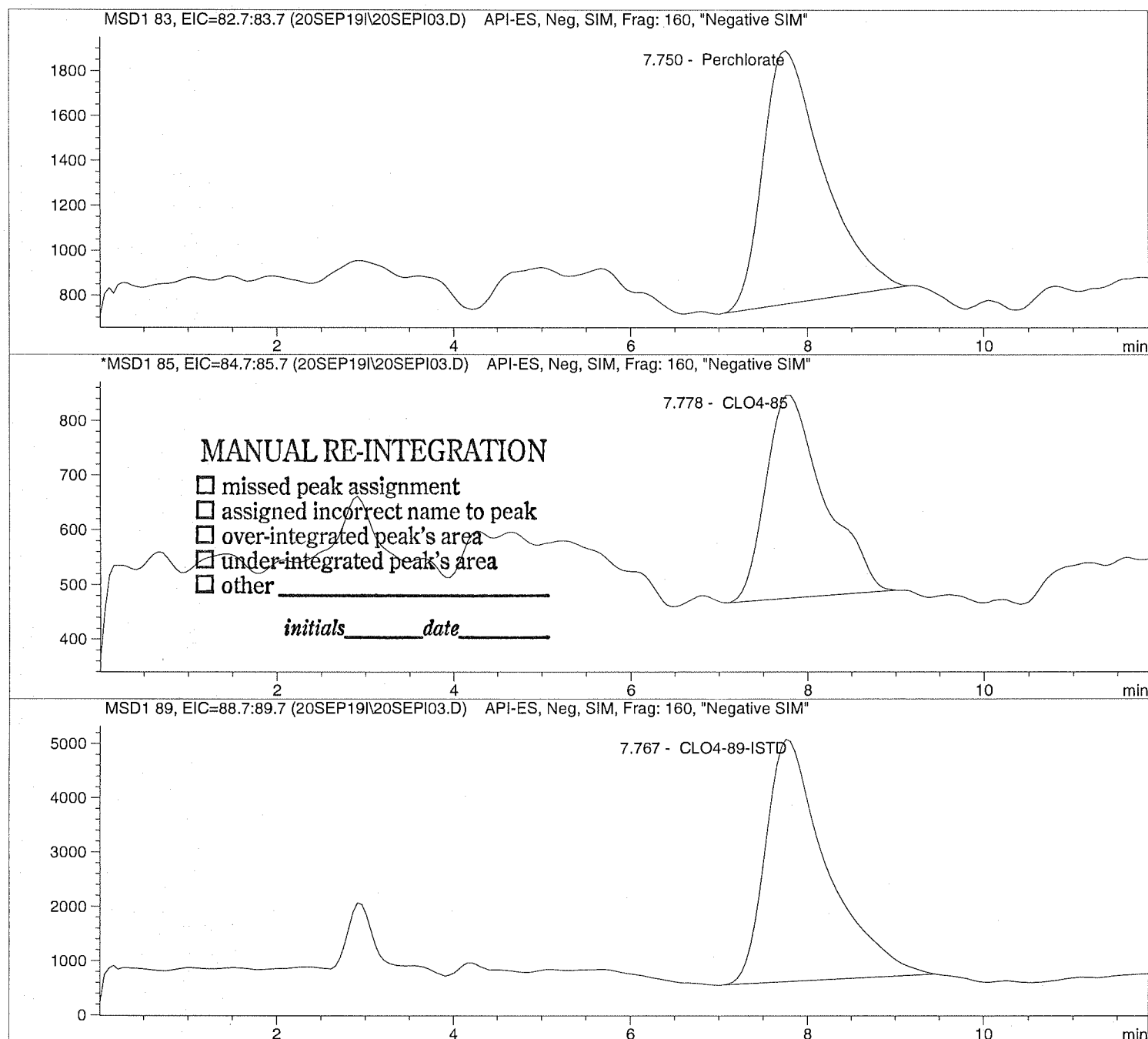
Inj. Vol.: 30 µl

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

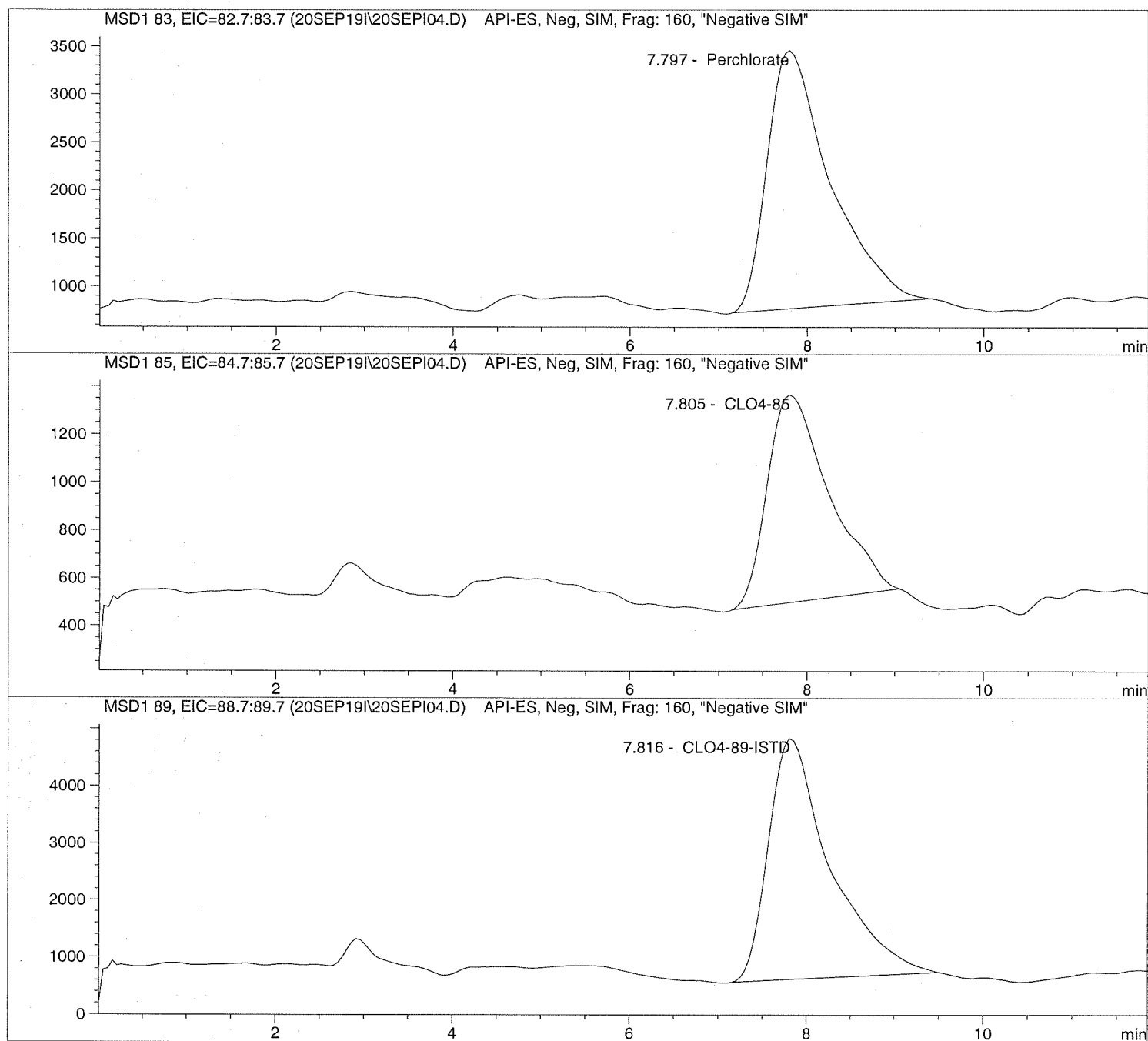
Inj. Vol.: 30 µl

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

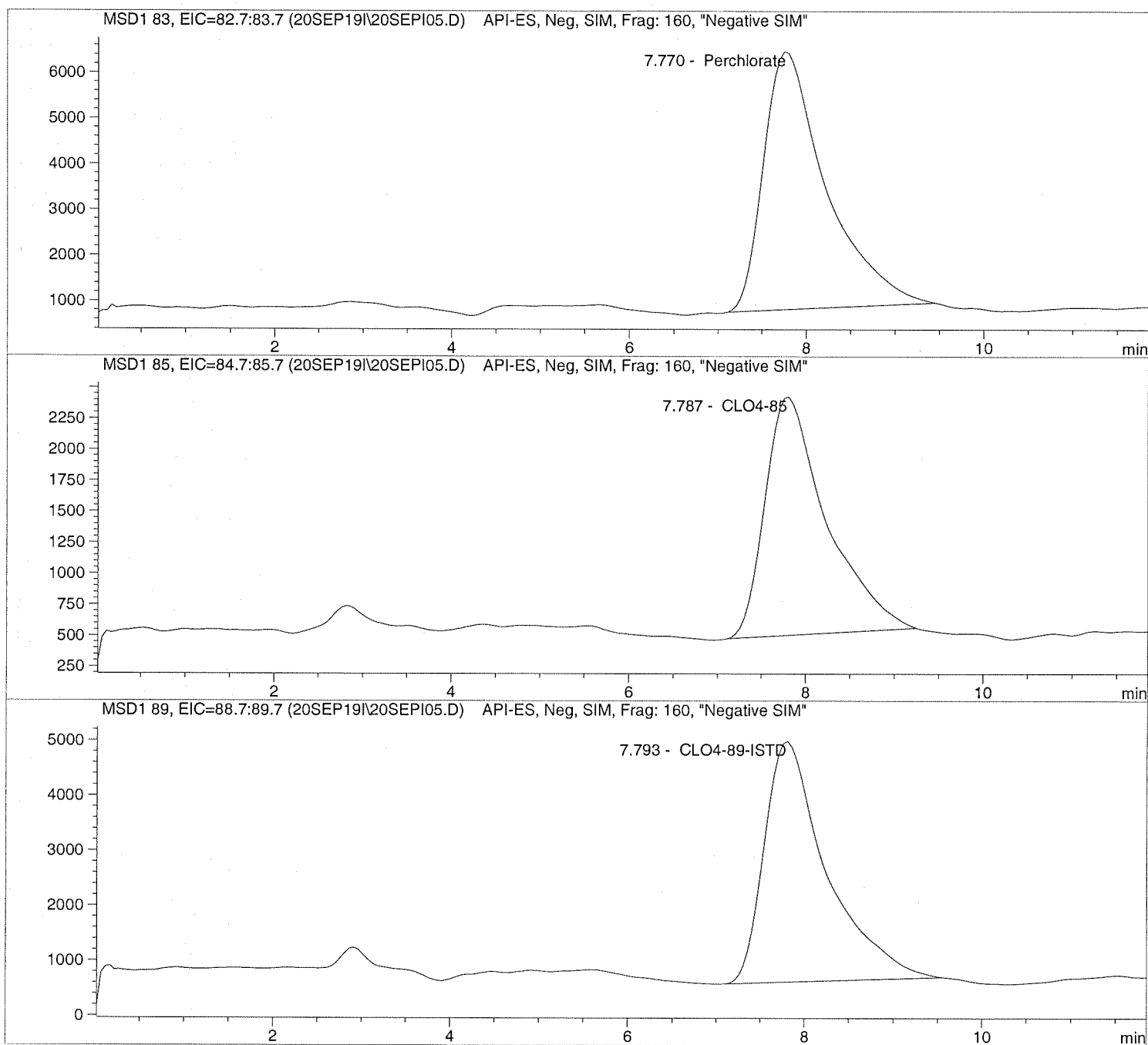
Inj. Vol.: 30 µl

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

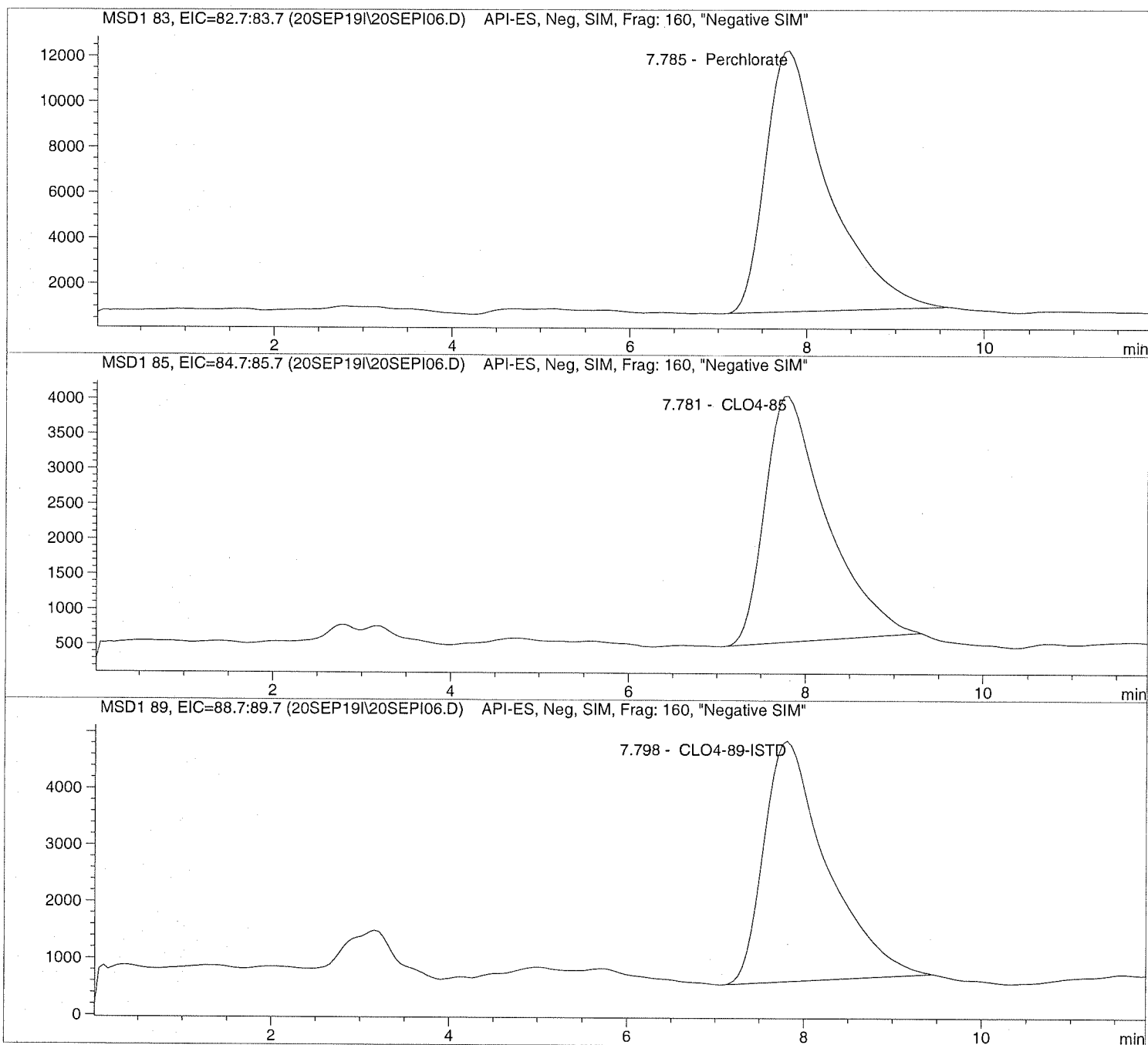
Sample Name: CLO4@ 10.ug/L

Injection Date: 9/20/2019 10:05:36
Sample Name: CLO4@ 10.ug/L
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
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\20SEP19\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

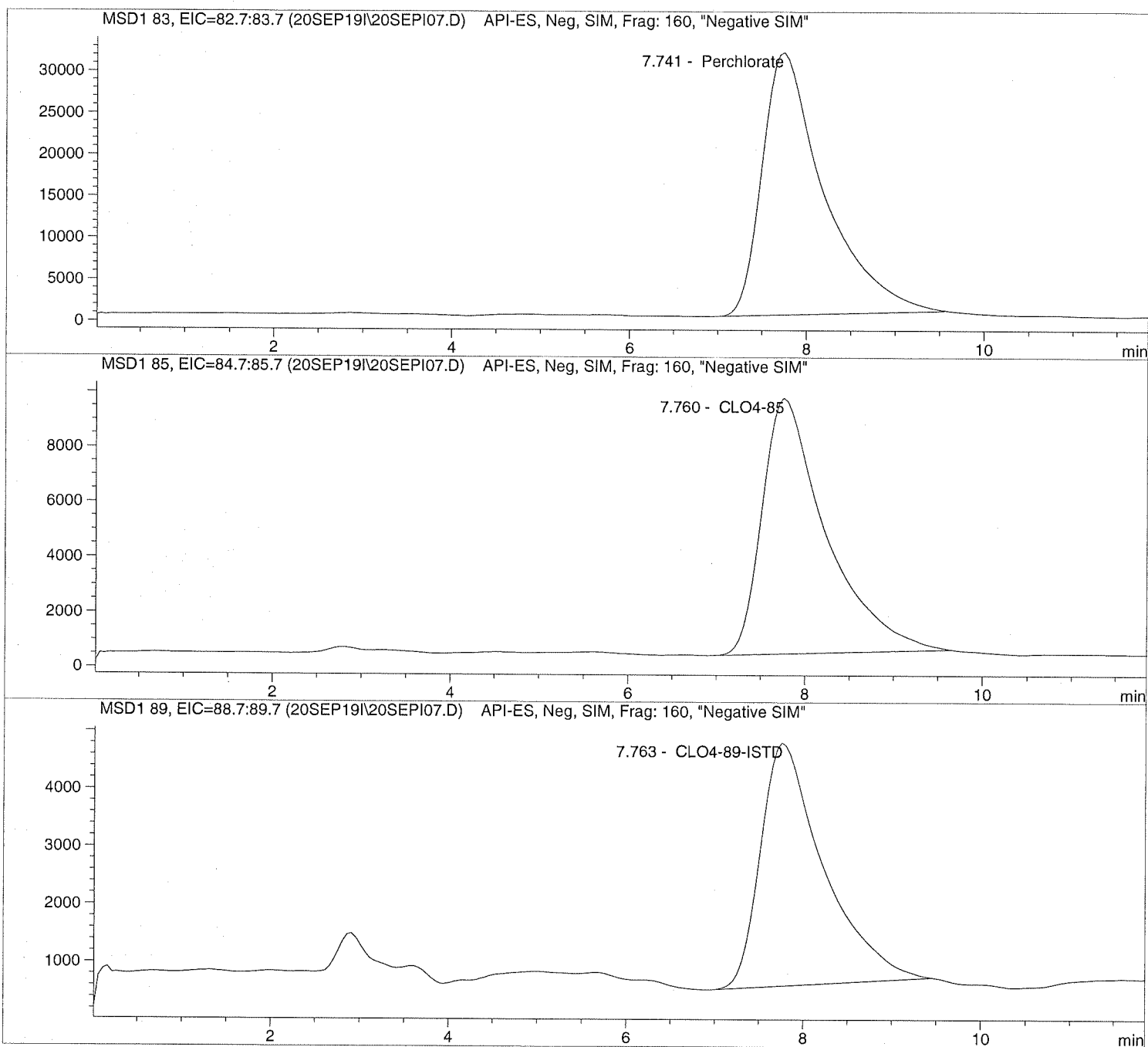
Inj. Vol.: 30 µl

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

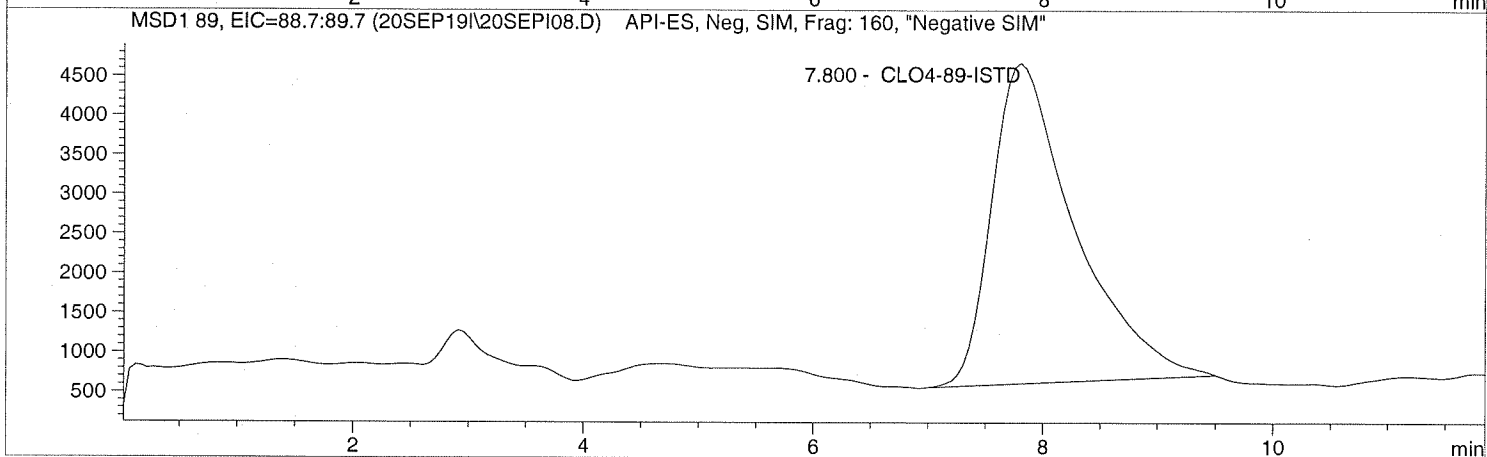
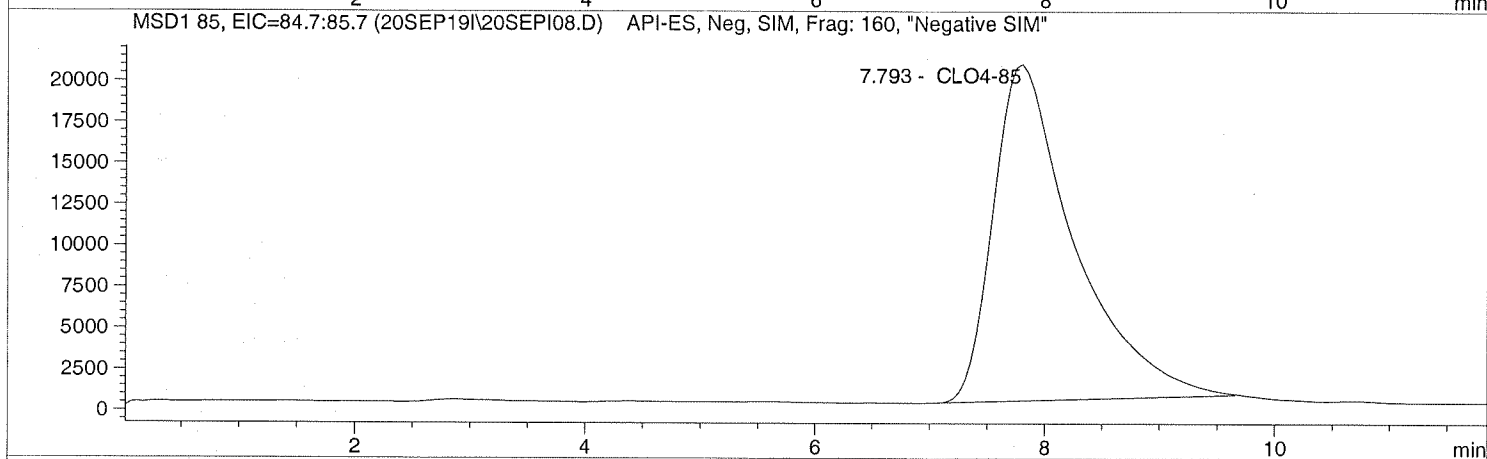
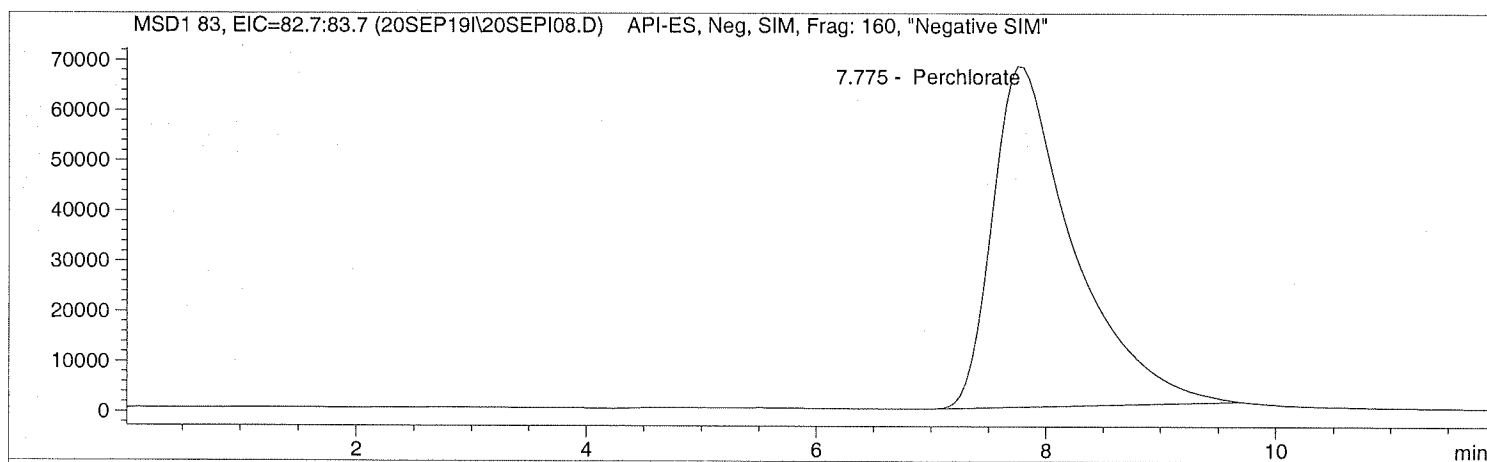
Inj. Vol.: 30 µl

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\20SEP19\20SEPI09.D

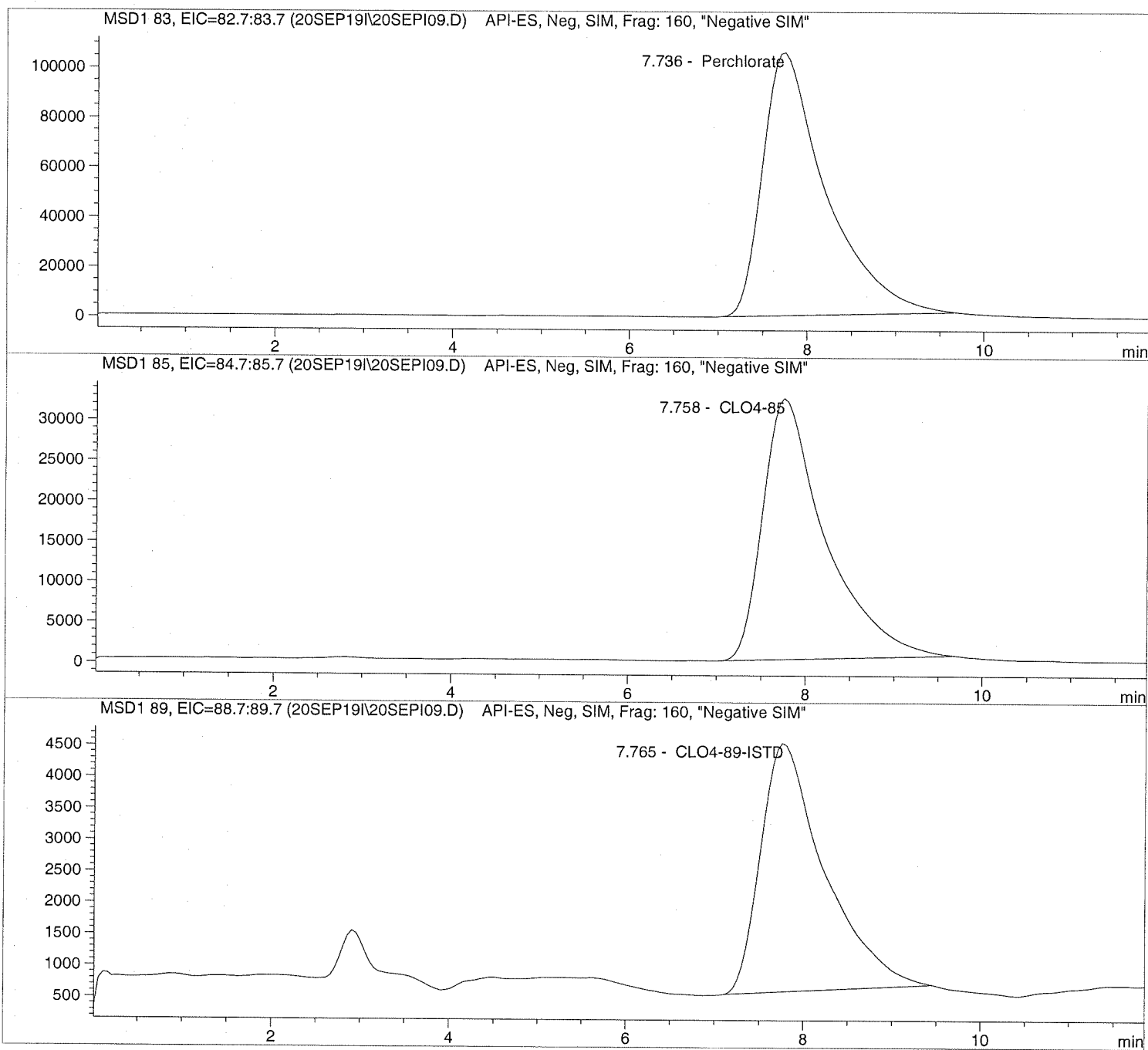
Sample Name: CLO4@ 75.ug/L

=====
Injection Date: 9/20/2019 10:47:05
Sample Name: CLO4@ 75.ug/L
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
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\20SEP19\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

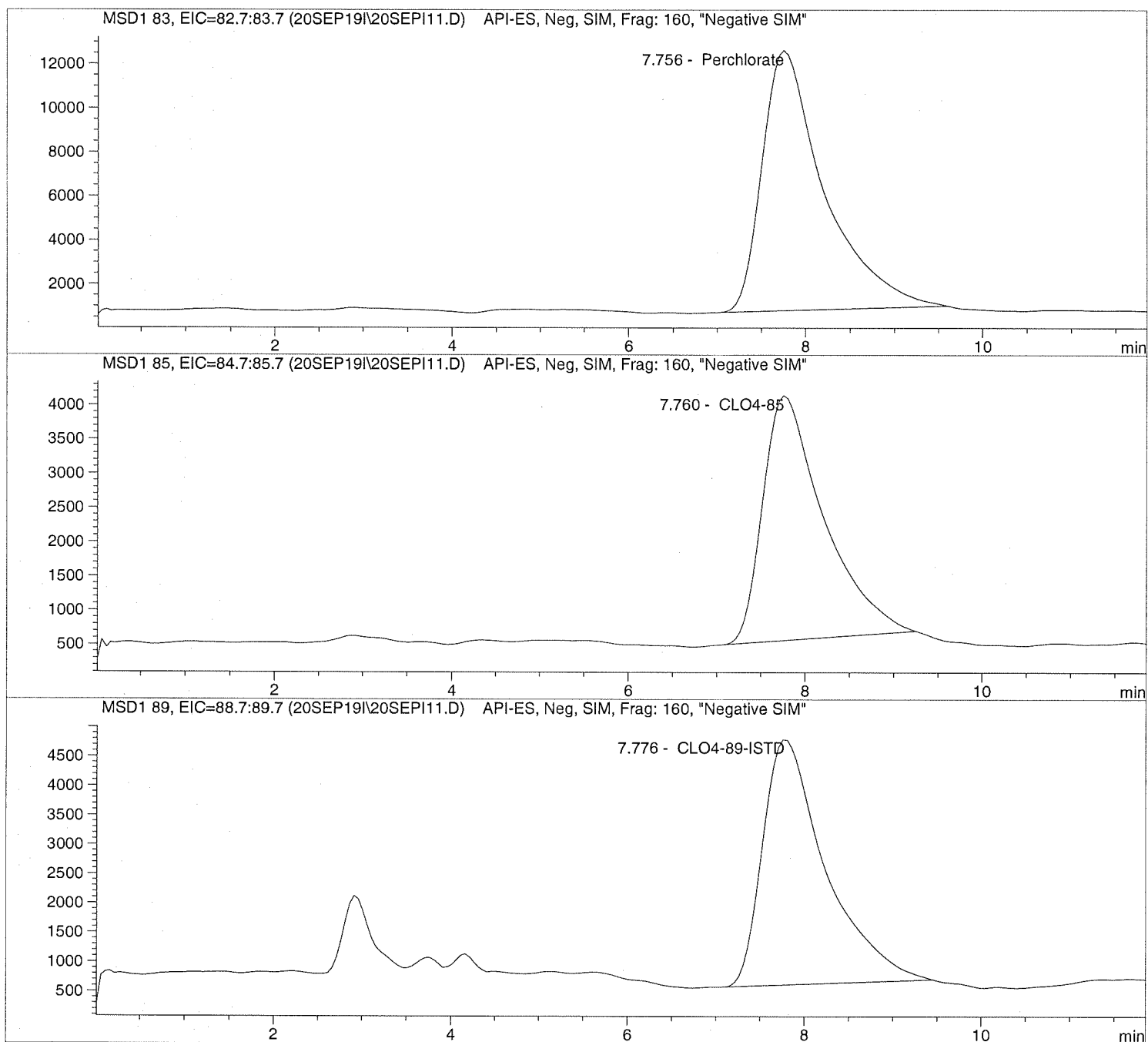
Inj. Vol.: 30 µl

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

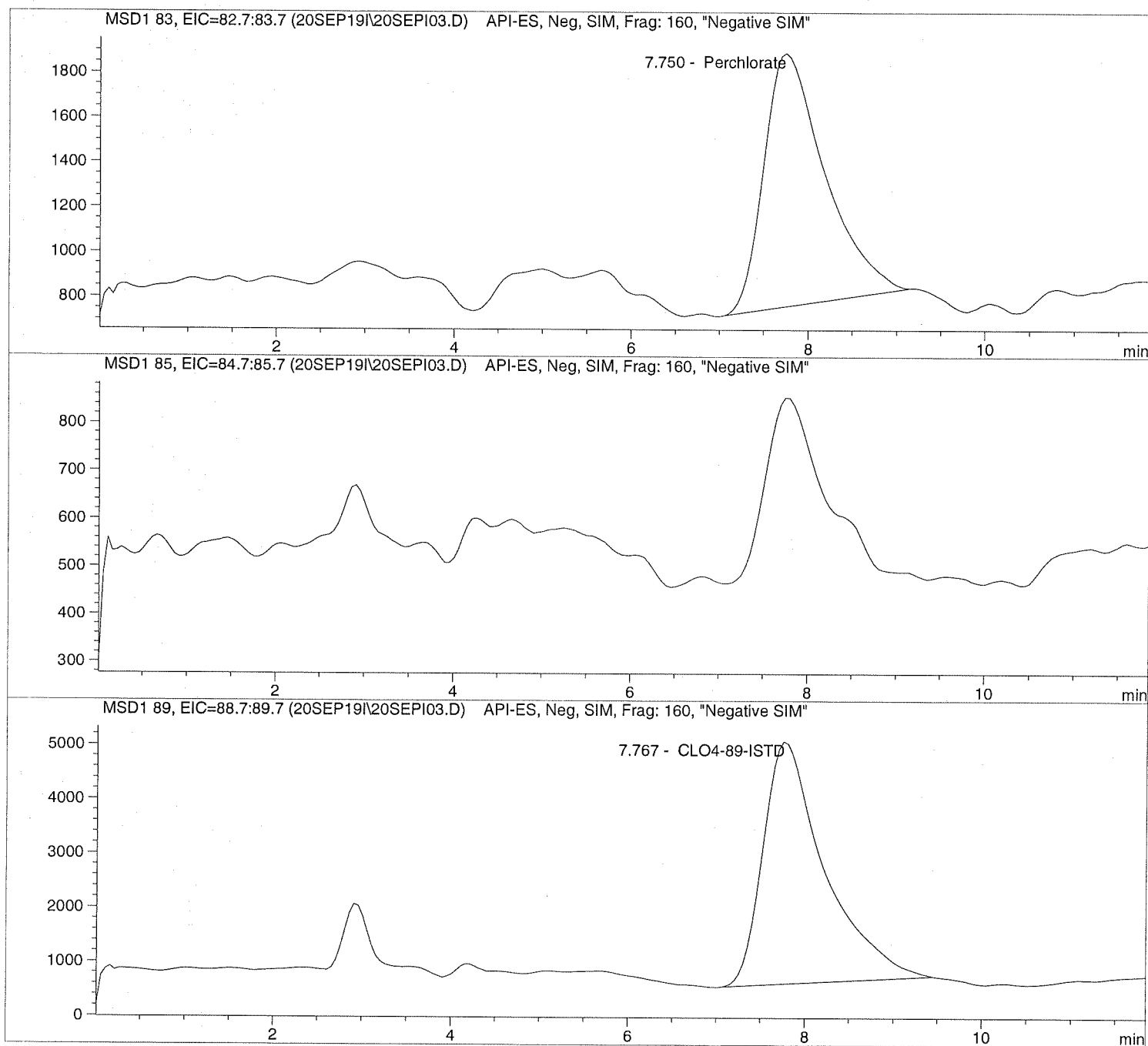
Inj. Vol.: 30 μ l

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

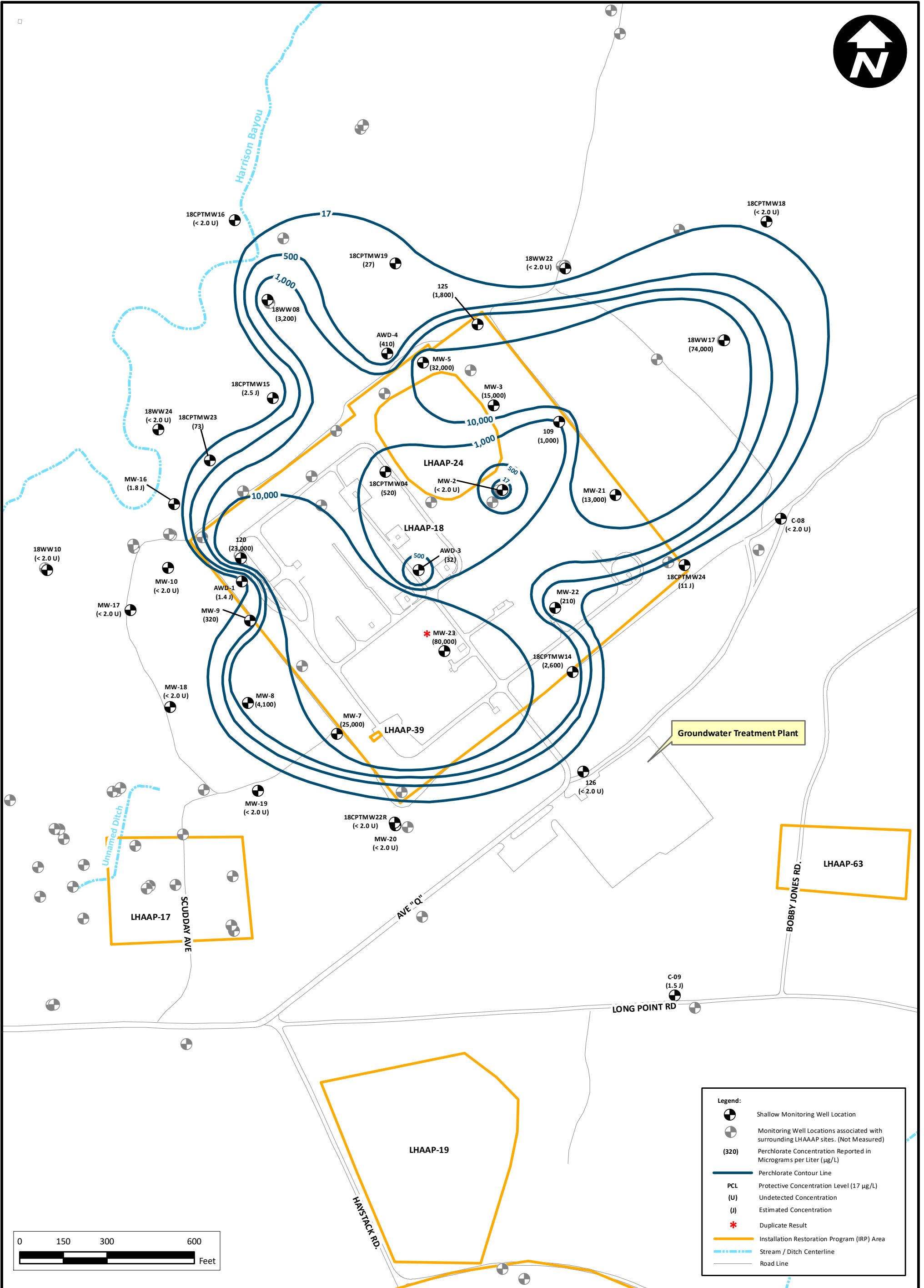
RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

*** End of Report ***

APPENDIX D
ISOPLETH CONTOUR MAPS

GWTP QUARTERLY EVALUATION REPORT —4TH QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

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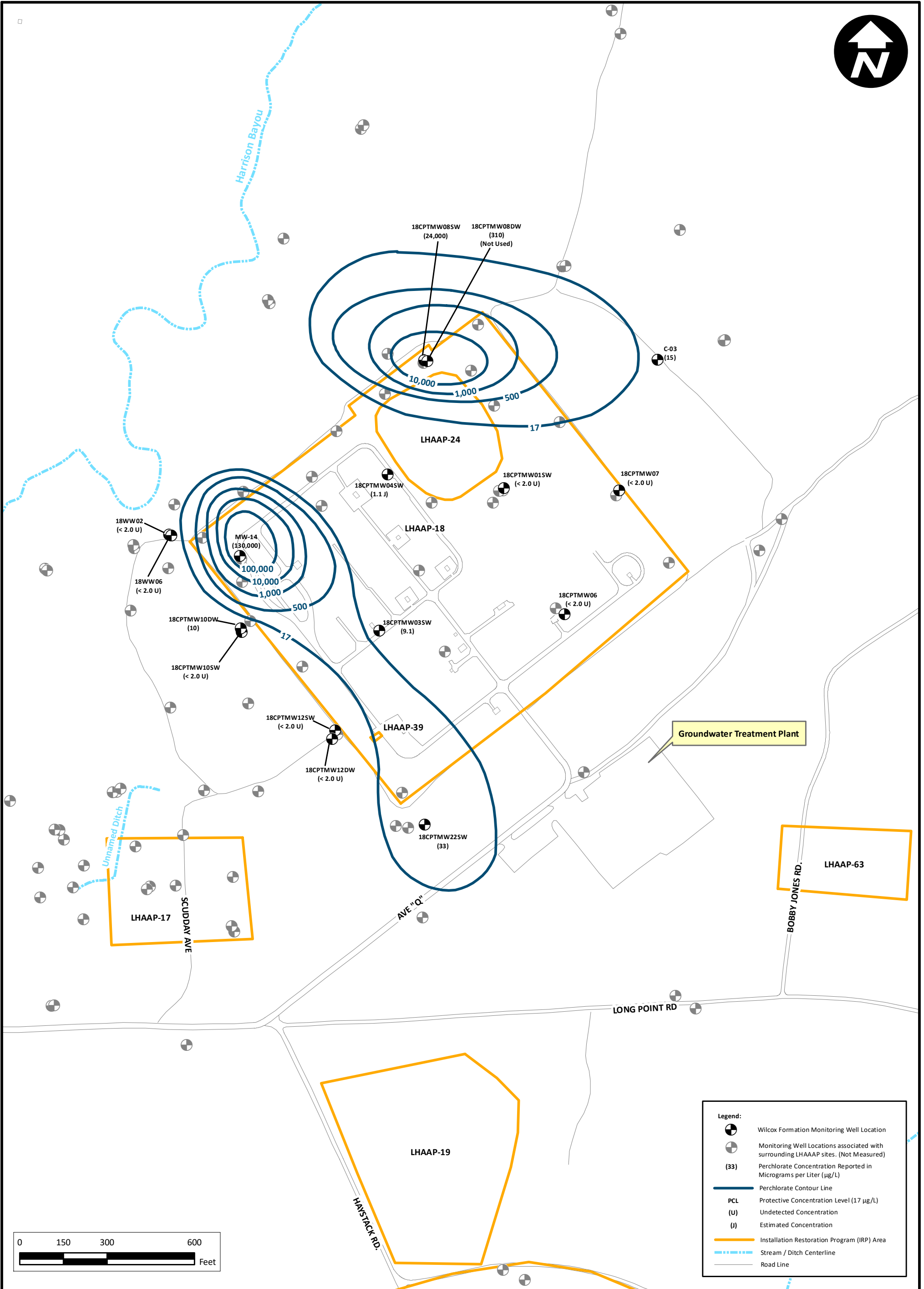
www.bhate.com

Quarterly Evaluation Report 4th Quarter (October – December) 2019
 Groundwater Treatment Plant
 Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	3/31/2020	MRM

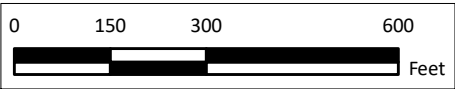
Perchlorate Isopleth Contours in Shallow Zone
 (December 2019)

Figure D-1



Legend:

- Wilcox Formation Monitoring Well Location
- Monitoring Well Locations associated with surrounding LHAAP sites. (Not Measured)
- (33)** Perchlorate Concentration Reported in Micrograms per Liter ($\mu\text{g/L}$)
- Perchlorate Contour Line
- PCL** Protective Concentration Level ($17 \mu\text{g/L}$)
- (U)** Undetected Concentration
- (J)** Estimated Concentration
- Installation Restoration Program (IRP) Area
- Stream / Ditch Centerline
- Road Line



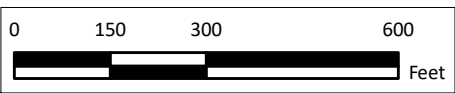
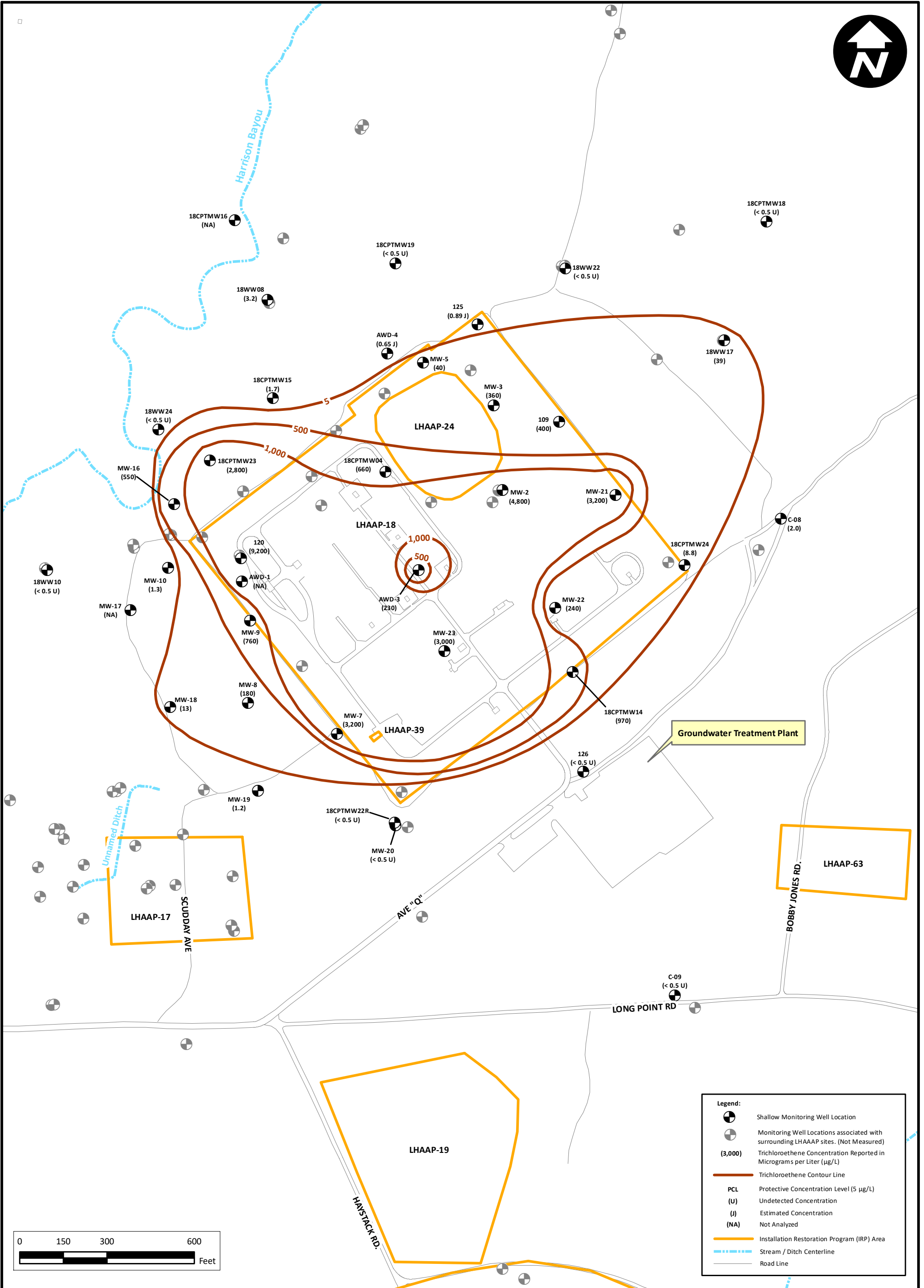
www.bhate.com

Quarterly Evaluation Report 4th Quarter (October – December) 2019
 Groundwater Treatment Plant
 Longhorn Army Ammunition Plant, Karnack, Texas

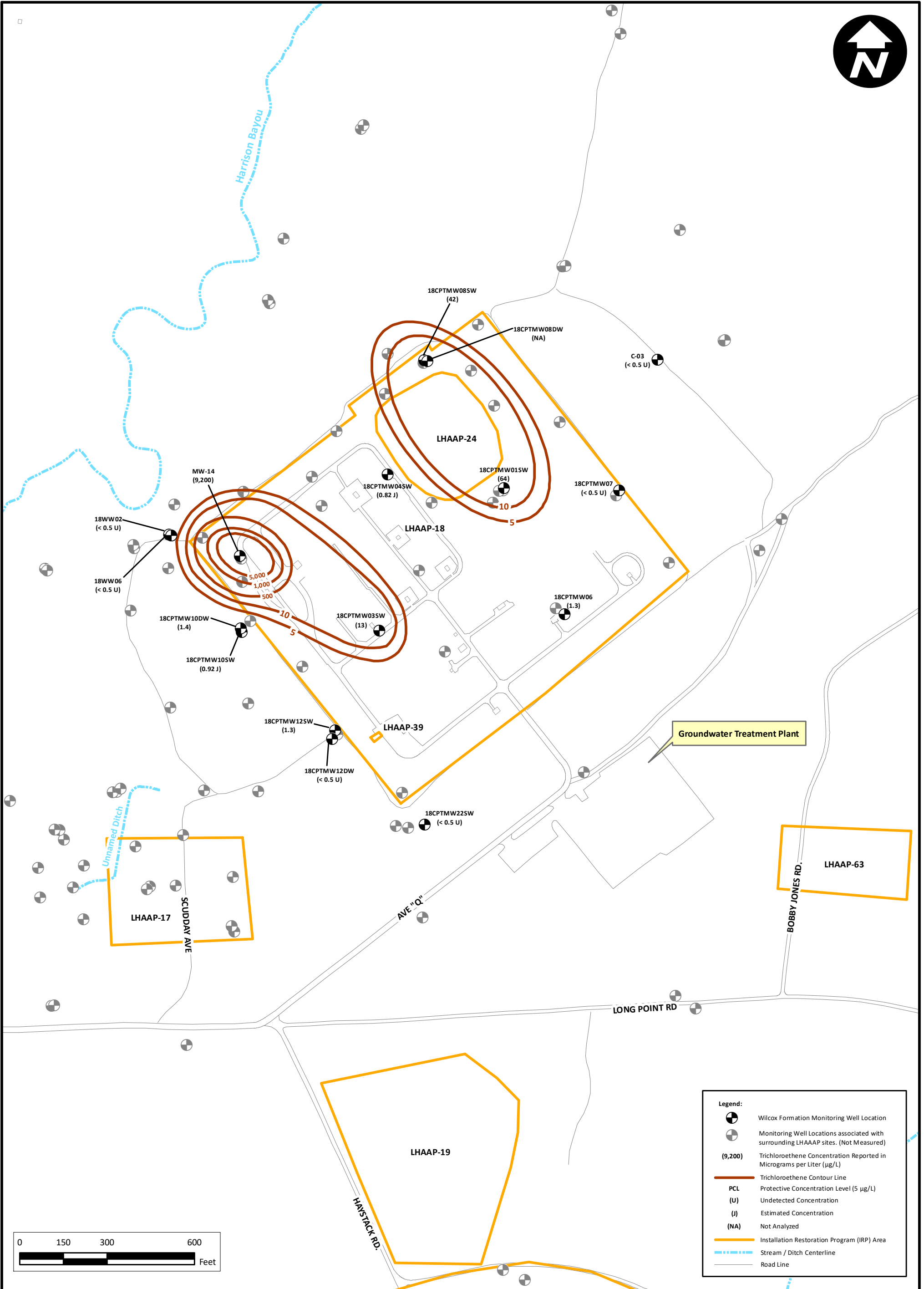
PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	3/31/2020	MRM

Perchlorate Isopleth Contours in Wilcox Formation
 (December 2019)

Figure D-2

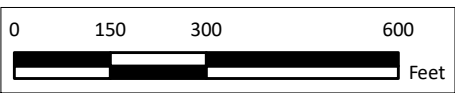
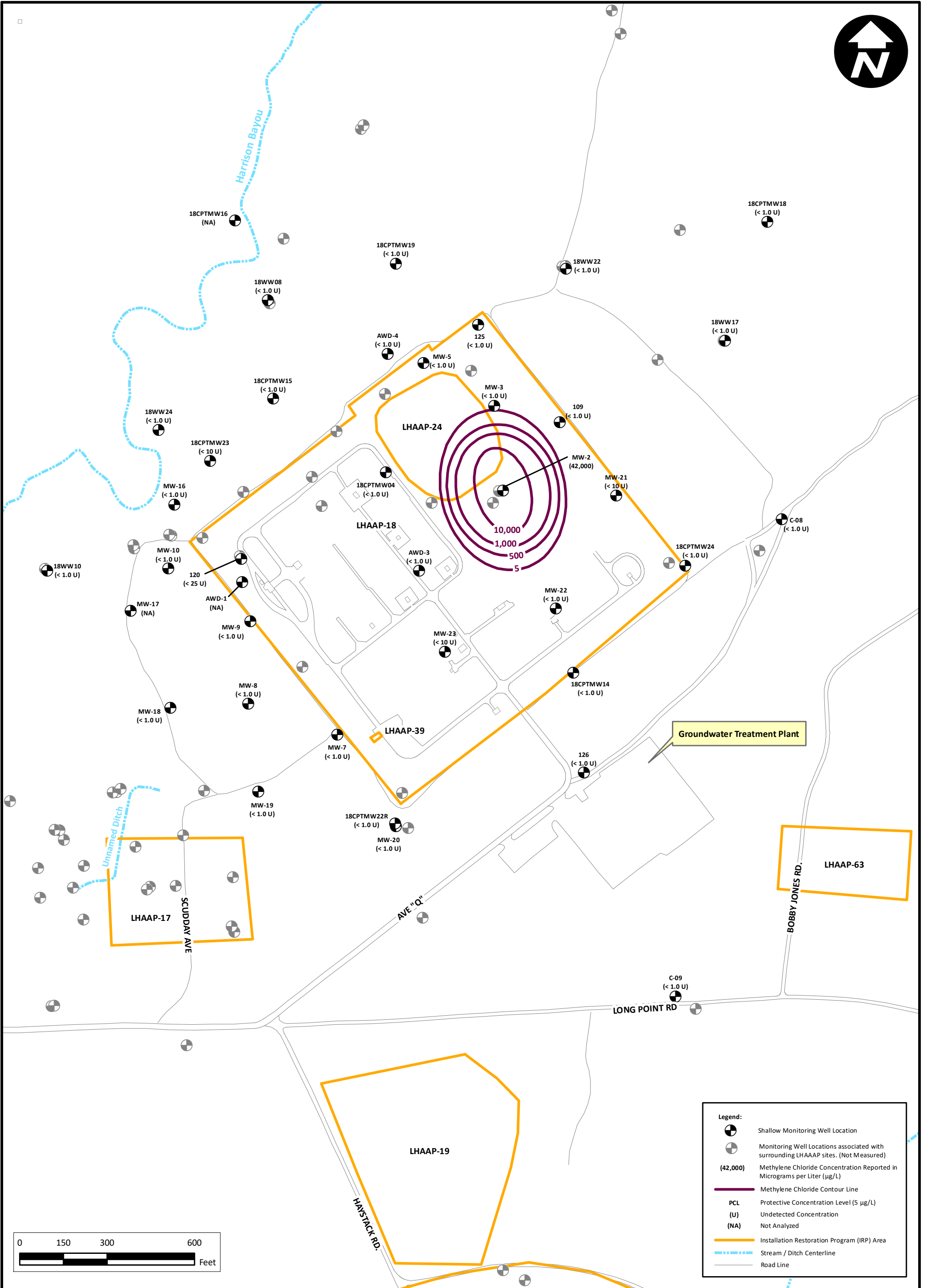


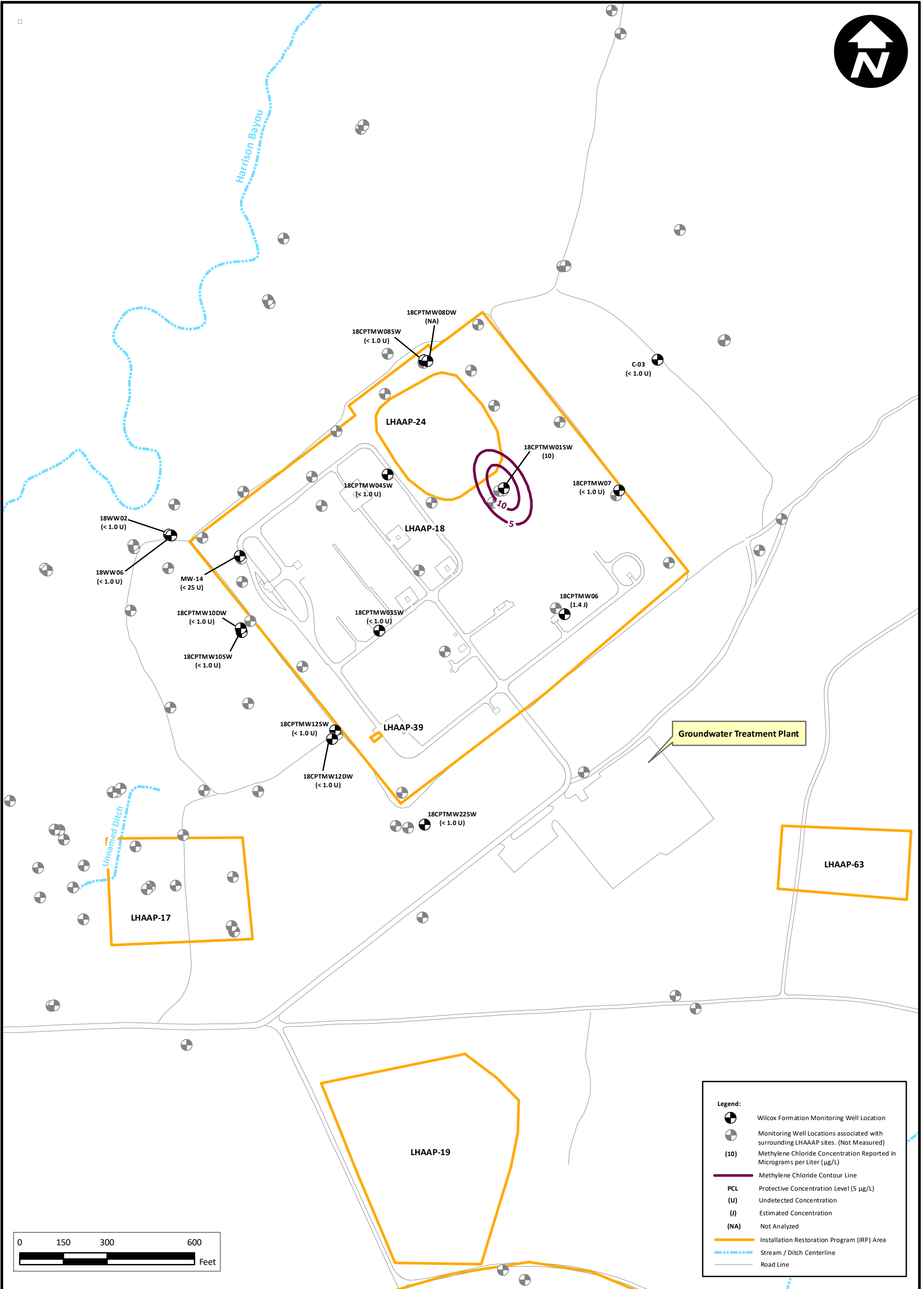
Legend:	
	Shallow Monitoring Well Location
	Monitoring Well Locations associated with surrounding LHAAP sites. (Not Measured)
(3,000)	Trichloroethene Concentration Reported in Micrograms per Liter (µg/L)
	Trichloroethene Contour Line
PCL	Protective Concentration Level (5 µg/L)
(U)	Undetected Concentration
(J)	Estimated Concentration
(NA)	Not Analyzed
	Installation Restoration Program (IRP) Area
	Stream / Ditch Centerline
	Road Line



Legend:

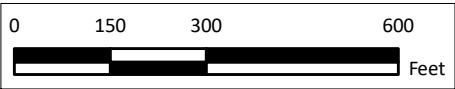
- Wilcox Formation Monitoring Well Location
- Monitoring Well Locations associated with surrounding LHAAP sites. (Not Measured)
- (9,200)** Trichloroethene Concentration Reported in Micrograms per Liter (µg/L)
- Trichloroethene Contour Line
- PCL** Protective Concentration Level (5 µg/L)
- (U)** Undetected Concentration
- (J)** Estimated Concentration
- (NA)** Not Analyzed
- Installation Restoration Program (IRP) Area
- Stream / Ditch Centerline
- Road Line





Legend:

- Wilcox Formation Monitoring Well Location
- Monitoring Well Locations associated with surrounding LHAAP sites. (Not Measured)
- (10) Methylene Chloride Concentration Reported in Micrograms per Liter (µg/L)
- Methylene Chloride Contour Line
- PCL Protective Concentration Level (5 µg/L)
- (U) Undetected Concentration
- (J) Estimated Concentration
- (NA) Not Analyzed
- Installation Restoration Program (IRP) Area
- Stream / Ditch Centerline
- Road Line

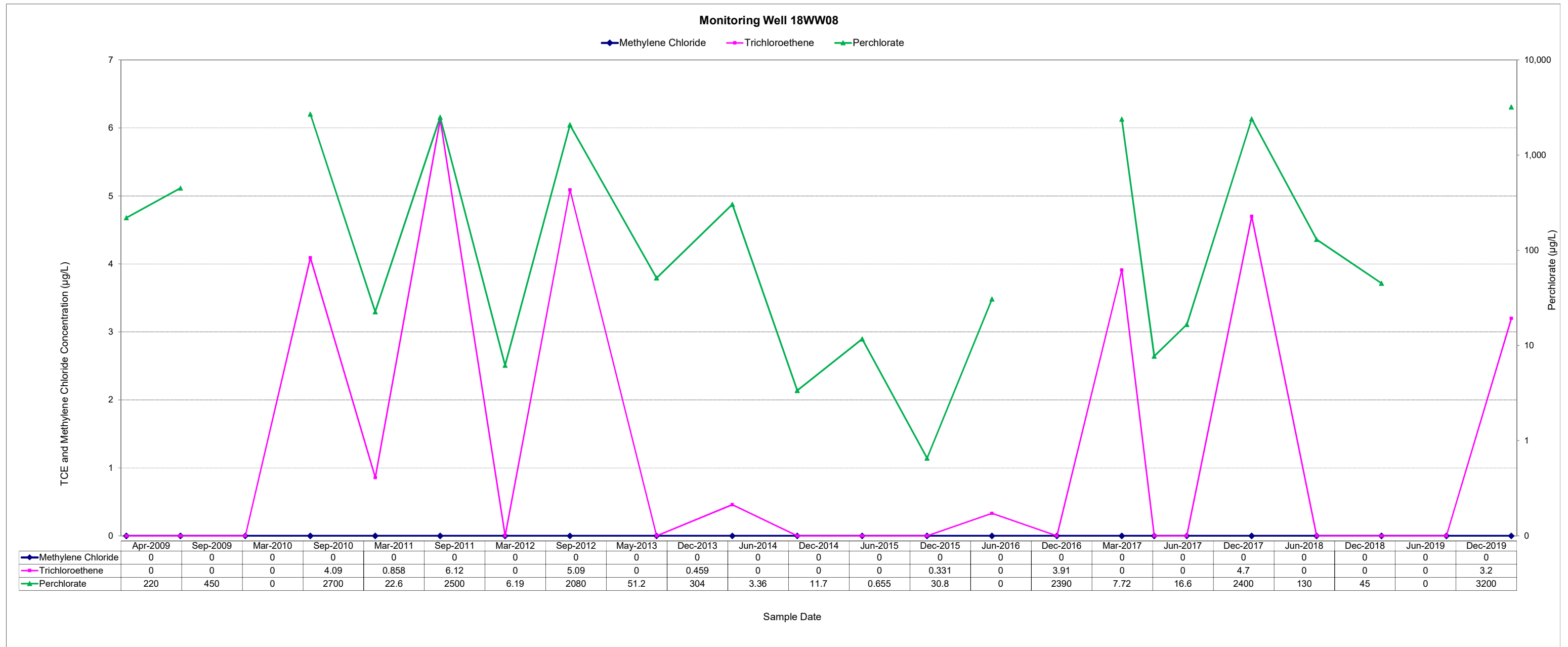


PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	3/31/2020	MRM

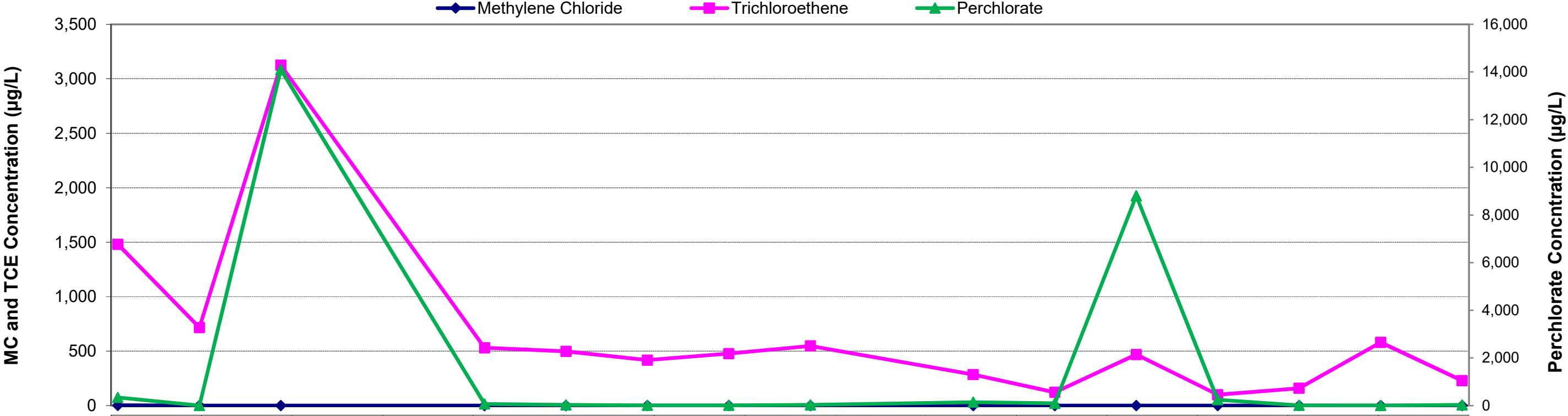
APPENDIX E
MONITORING WELL TREND CHARTS

GWTP QUARTERLY EVALUATION REPORT —4TH QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

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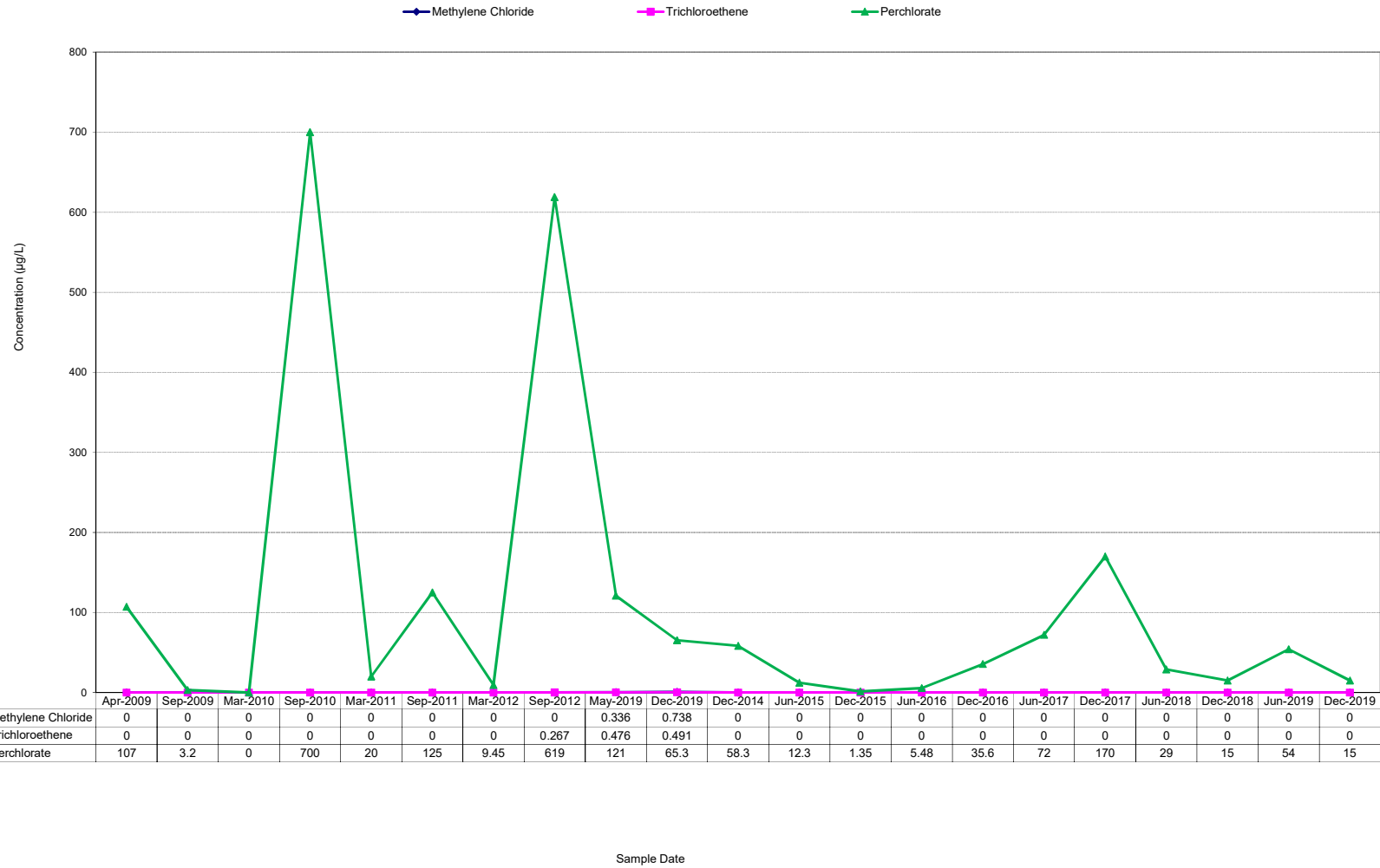
Monitoring Well AWD-3

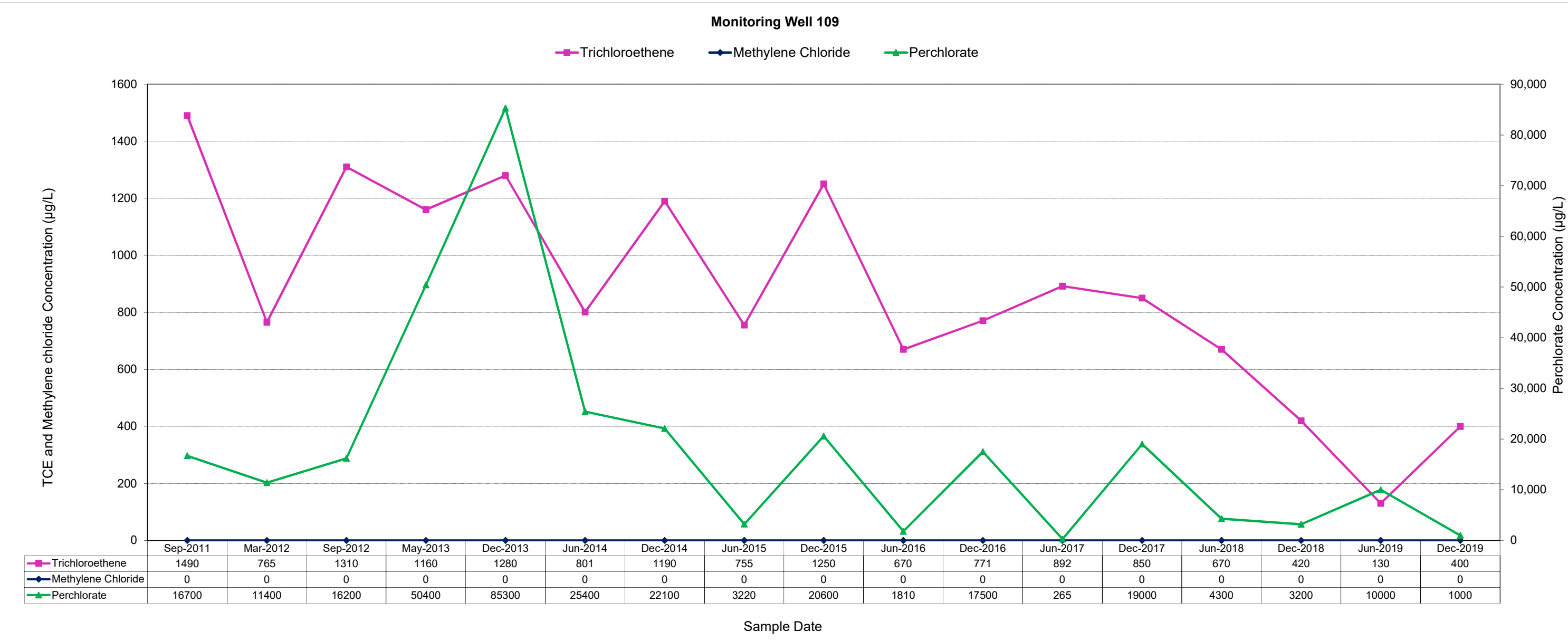


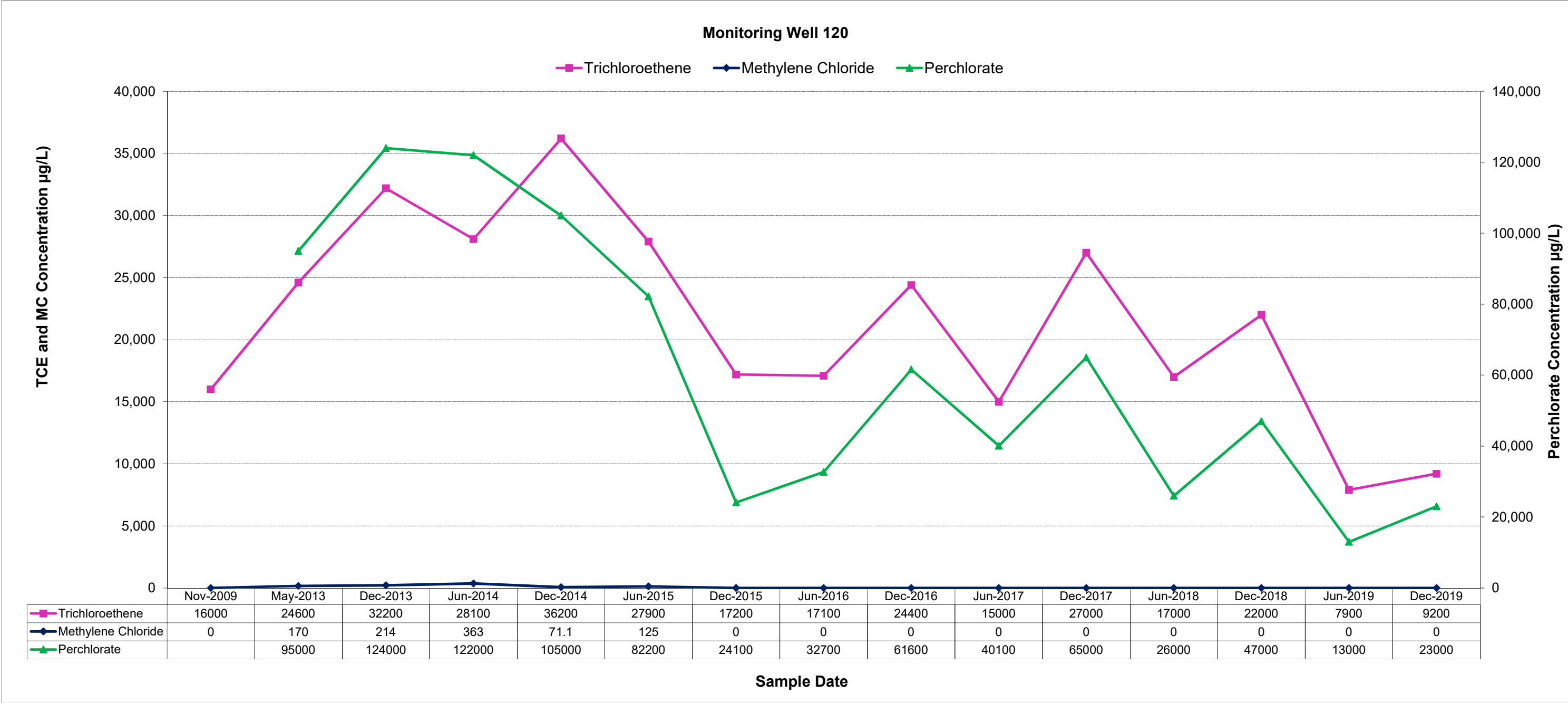
	Sep-2011	Mar-2012	Sep-2012	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019	Dec-2019
◆ Methylene Chloride	2.92J	0	0	0	0	0	0	0	0	0	0	0	0	0	0
■ Trichloroethene	1480	716	3125	530	499	417	477	547	285	122	470	100	160	580	230
▲ Perchlorate	342	3.88	14100	67.2	25	13.6	8.33	33.8	140	95.4	8800	250	6.9	1.8	32

Sample Date

Monitoring Well C-03

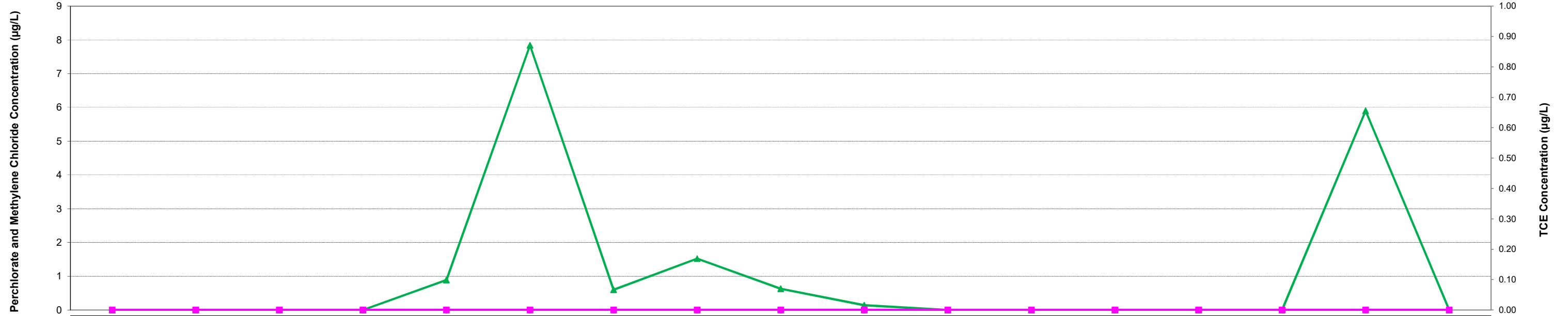






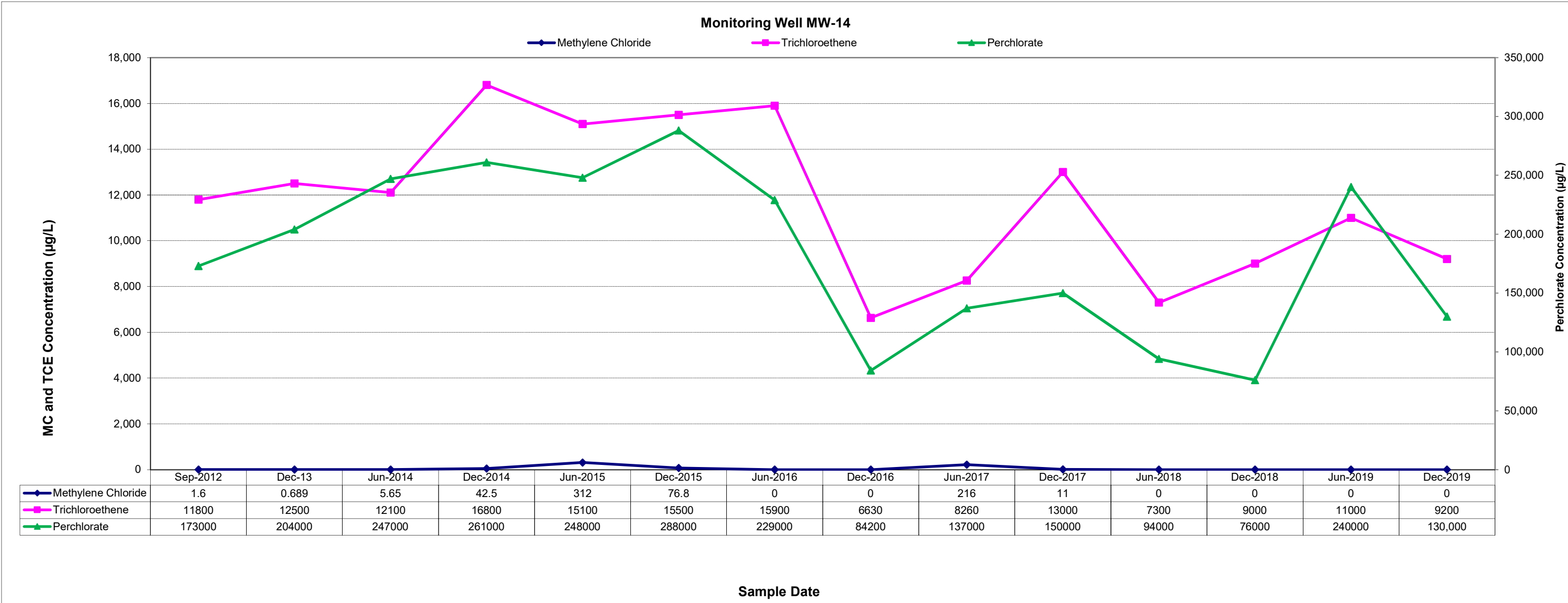
Monitoring Well 126

Methylene Chloride Perchlorate Trichloroethene

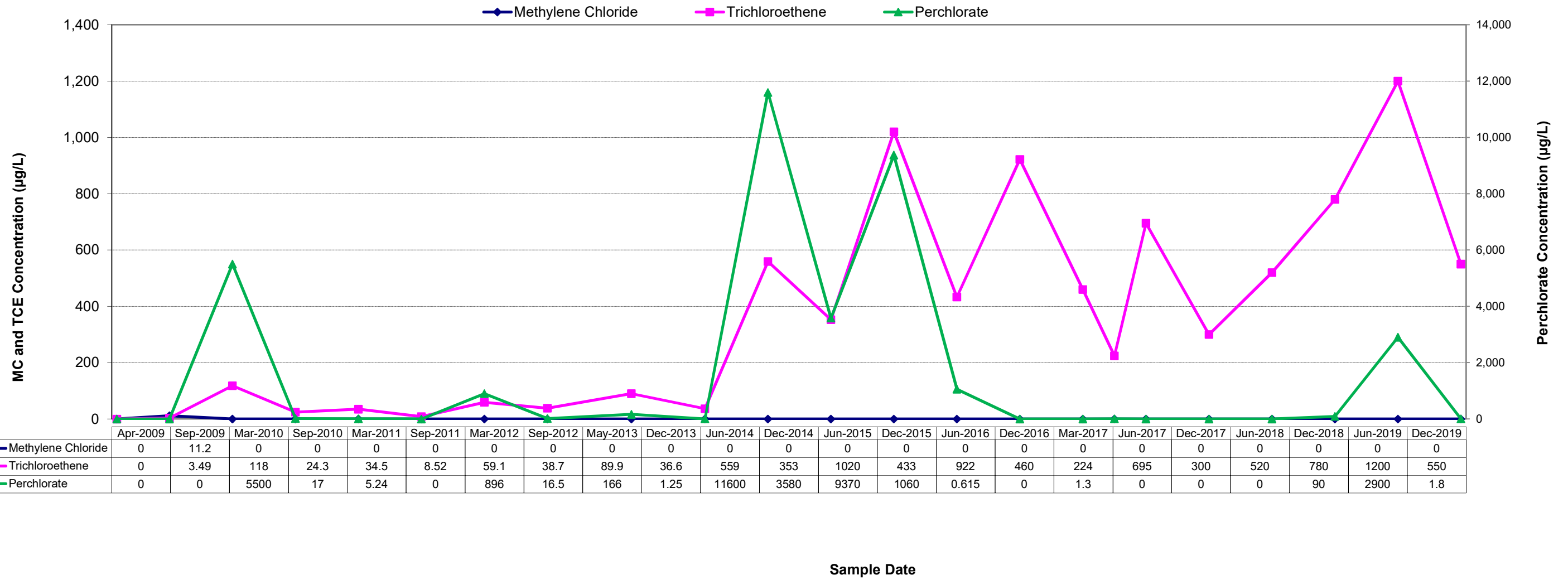


	Mar-2011	Sep-2011	Mar-2012	Sep-2012	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Mar-2017	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019	Dec-2019
Methylene Chloride	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perchlorate	0	0	0	0	0.887	7.84	0.602	1.52	0.629	0.14	0	0	0	0	0	5.9	0
Trichloroethene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

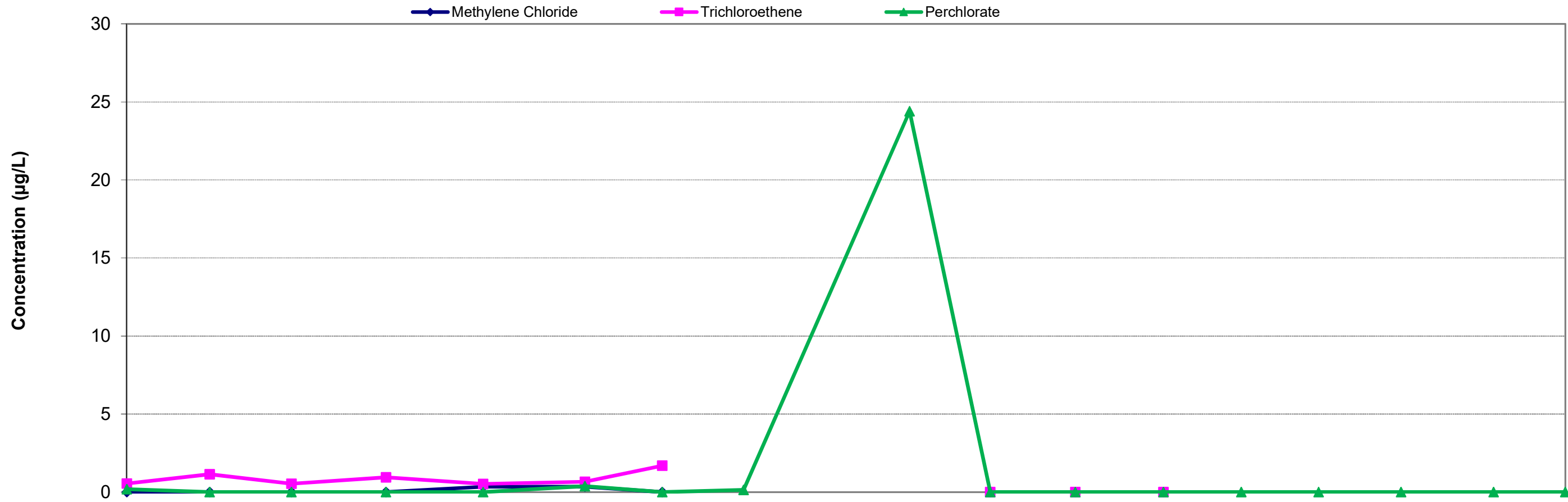
Sample Date



Monitoring Well MW-16



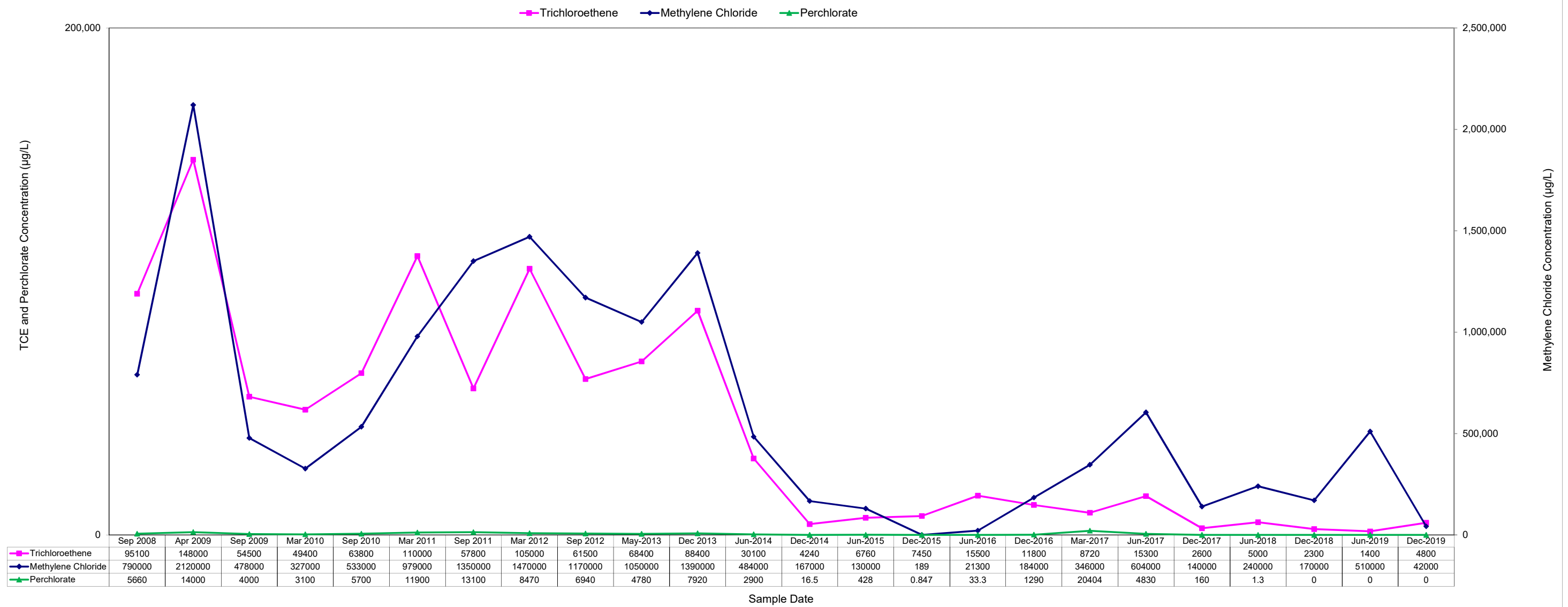
Monitoring Well MW-17



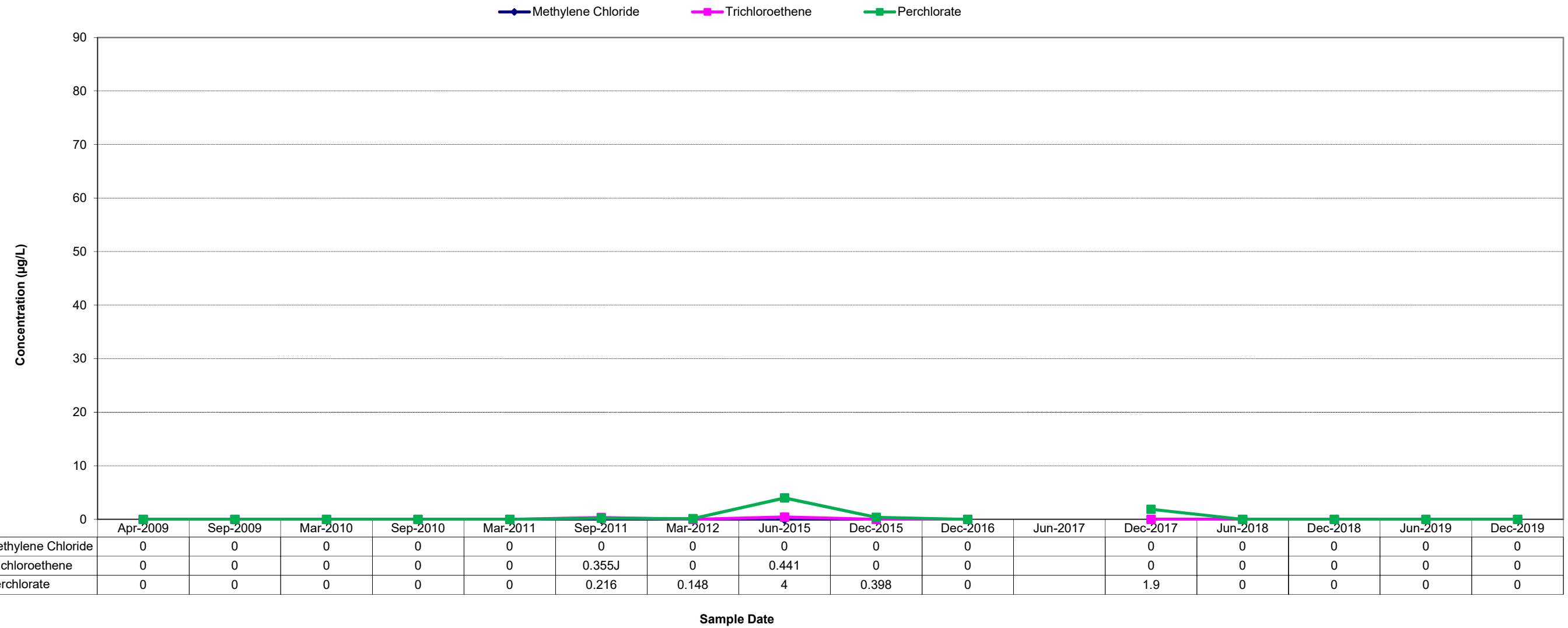
	Mar-2011	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Jun-2014	Dec-2014	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019	Dec-2019
◆ Methylene Chloride	0	0	0	0	0.335	0.346	0			0	0	0					
■ Trichloroethene	0.551	1.14	0.537	0.943	0.519	0.656	1.69			0	0	0					
▲ Perchlorate	0.179	0	0	0	0	0.376	0	0.143	24.4	0	0	0	0	0	0	0	0

Sample Date

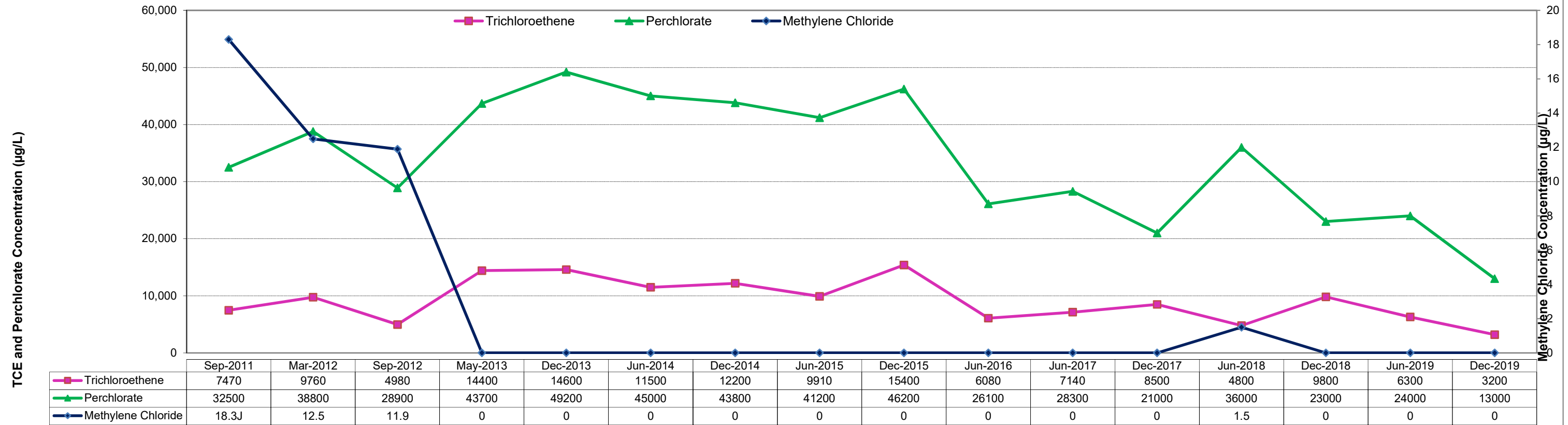
Monitoring Well MW-2



Monitoring Well MW-20

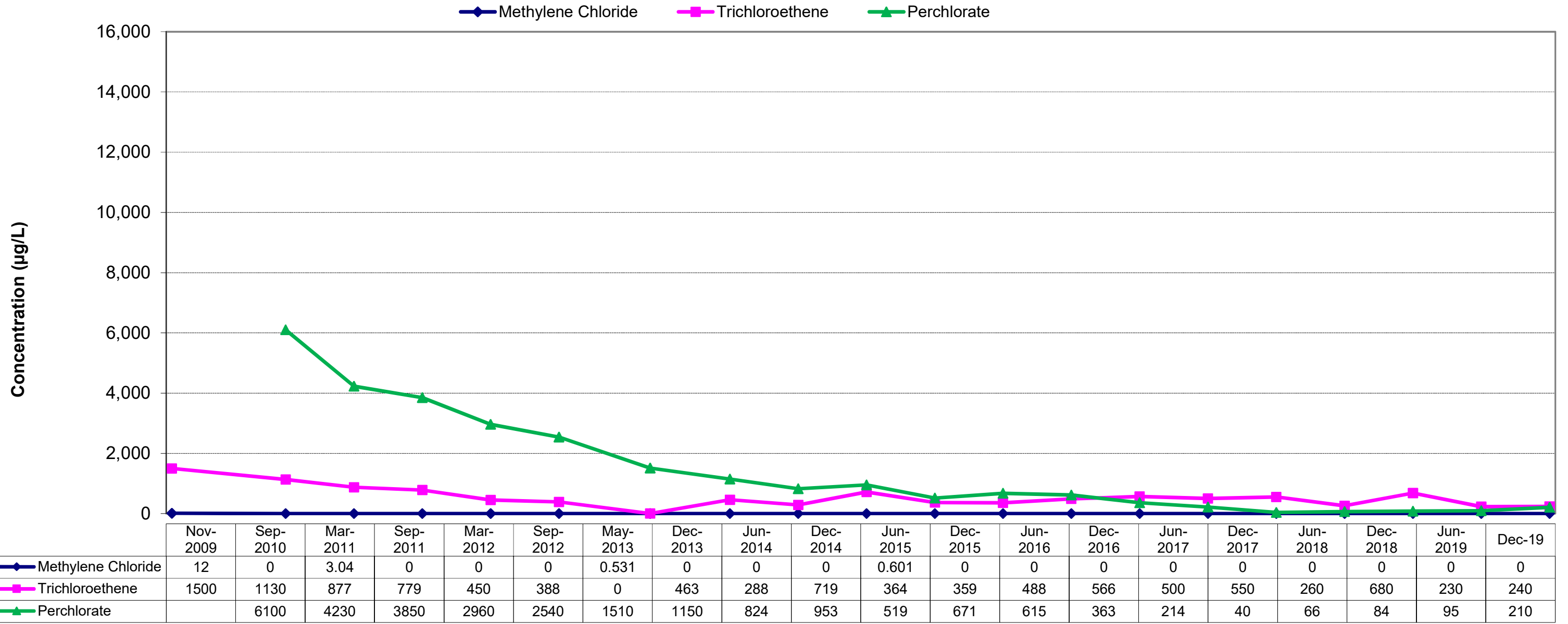


Monitoring Well MW-21



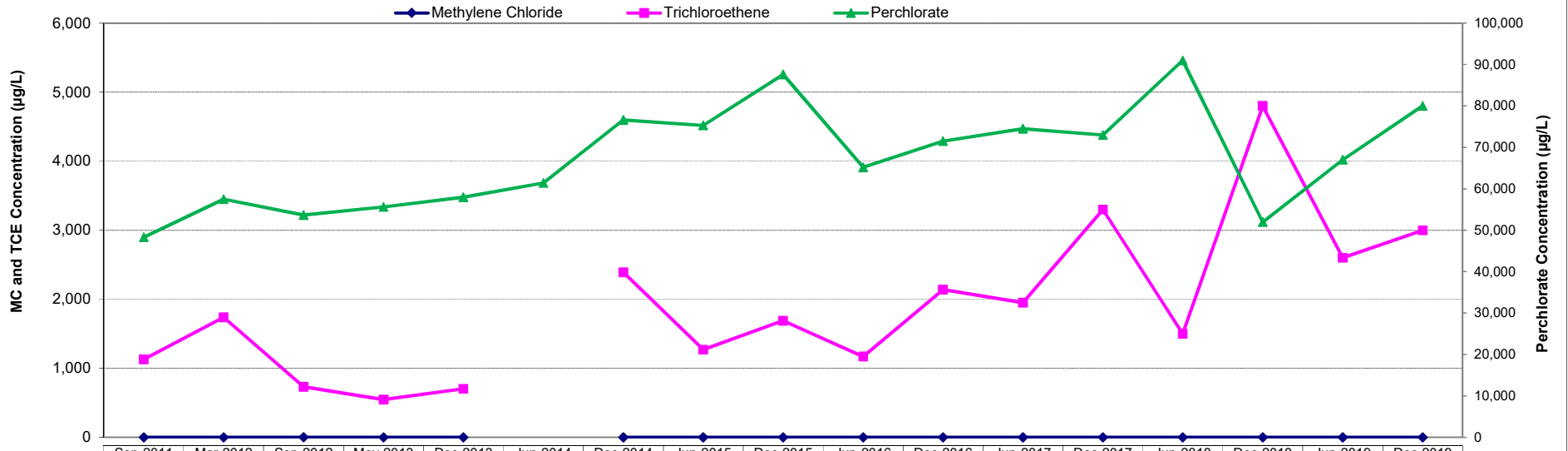
Sample Date

Monitoring Well MW-22



Sample Date

Monitoring Well MW-23

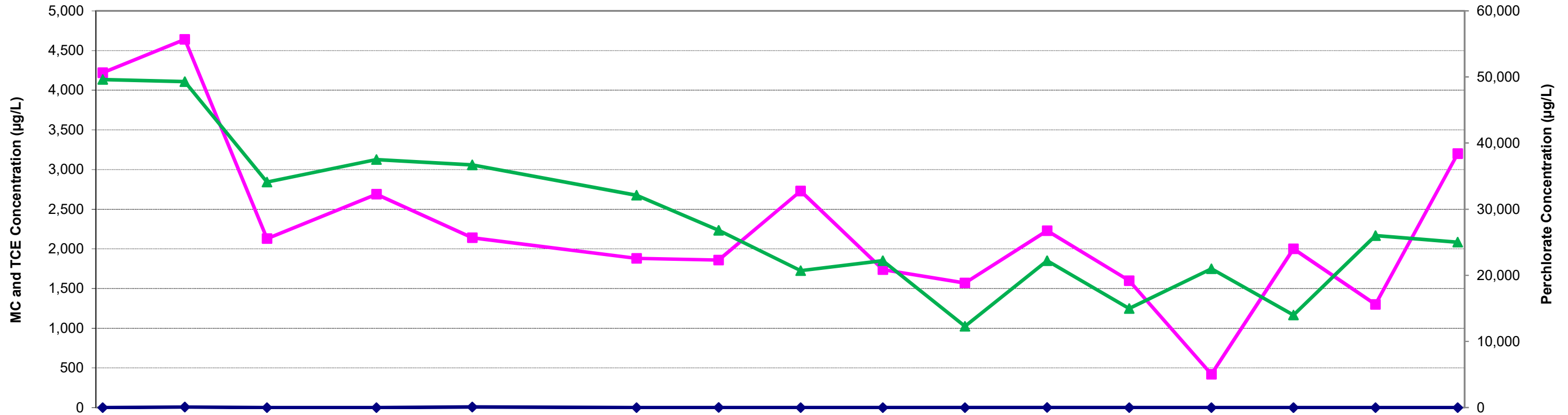


	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019	Dec-2019
◆ Methylene Chloride	0	0	1.34	0	0.338		0	0.492	0	0	0	0	0	0	0	0	0
■ Trichloroethene	1130	1740	731	547	703		2390	1270	1690	1170	2140	1950	3300	1500	4800	2600	3000
▲ Perchlorate	48300	57500	53650	55600	58000	61400	76600	75300	87600	65200	71500	74500	73000	91000	52000	67000	80000

Sample Date

Monitoring Well MW-7

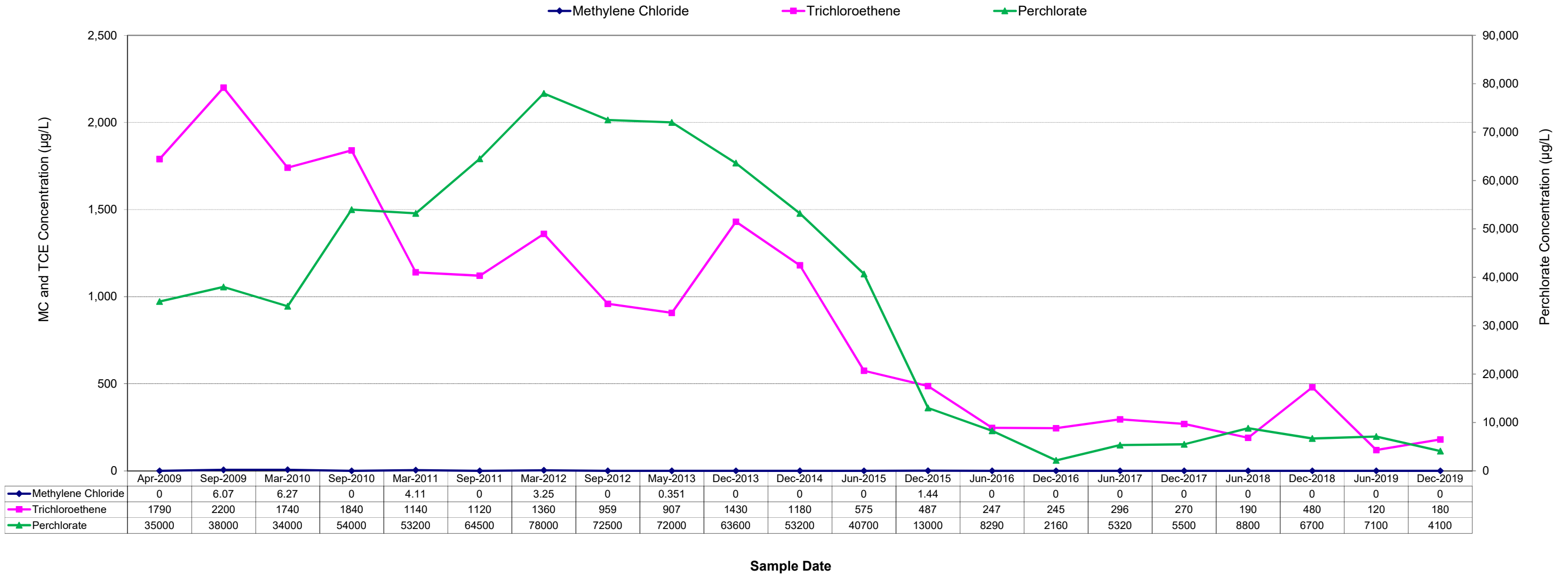
◆ Methylene Chloride ■ Trichloroethene ▲ Perchlorate



◆ Methylene Chloride	0	7.75	0	0	7.81	0	0.352	0	0	0	0.314	0	0	0	0	0
■ Trichloroethene	4220	4640	2130	2690	2140	1880	1860	2730	1740	1570	2230	1600	420	2000	1300	3200
▲ Perchlorate	49600	49300	34100	37500	36700	32100	26800	20700	22200	12300	22200	15000	21000	14000	26000	25000

Sample Date

Monitoring Well MW-8



APPENDIX F
GWTP WATER SAMPLING LABORATORY ANALYTICAL RESULTS
(PROVIDED ON CD ONLY)

GWTP QUARTERLY EVALUATION REPORT –4TH QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

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APPENDIX G
QUALITY CONTROL SUMMARY REPORT

GWTP QUARTERLY EVALUATION REPORT —4TH QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

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**QUALITY CONTROL SUMMARY REPORT
4th QUARTER (OCTOBER-DECEMBER) 2019
GROUNDWATER TREATMENT PLANT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS**

March 2020

Prepared For:



**Longhorn Army Ammunition Plant
Karnack, Texas**

Under Contract To:



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

Contract Number: W9128F-13-D-0012

Task Order Number: W912BV17F0150

Prepared By:



**1608 13th Avenue South, Suite 300
Birmingham, Alabama 35205
1-800-806-4001 • www.bhate.com**

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Table 3: Completeness by Method

1 INTRODUCTION

Bhate reviewed 47 data packages from ALS Environmental, Houston, Texas. Groundwater samples were collected from October 1, 2019, through December 30, 2019, at the Groundwater Treatment Plant (GWTP) and December 5 through 17, 2019, at Site LHAAP 18/24 at Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas. Data were reviewed for conformance to the requirements of the following guidance documents: [U.S. Environmental Protection Agency] *USEPA Contract Laboratory Program [CLP] National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA, January 2017); *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (USEPA, January 2017); and the *Final Basewide Uniform Federal Policy [UFP] – Quality Assurance Project Plan [QAPP] Longhorn Army Ammunition Plant* which is in Appendix C of the *Final Installation-Wide Work Plan for Longhorn Army Ammunition Plant Karnack, Texas* (Bhate, May 2018).

1.1 Intended Use of Data

The objective of sampling at the GWTP is to monitor effluent streams to confirm compliance with discharge limits.

Analyses performed include:

- E6850 – Perchlorate
- E350.3 – Nitrogen, Ammonia
- E365.3 – Orthophosphate
- SM5310C – Total Organic Carbon
- SW8260C - Volatile Organic Compounds (VOCs)
- SW8270D Selected Ion Monitoring (SIM) - 1,4-Dioxane
- SW6020A/7470A – Metals
- SW9056A – Chloride (Cl) and Sulfate (SO₄)
- SW7196A – Hexavalent Chromium
- E410.4 – Chemical Oxygen Demand
- E1664A – Oil and Grease
- TO-15 – Volatiles in Air

Table 1 lists the sample identification (ID) numbers and their associated laboratory package.

Table 2 lists qualified results with the qualification flag and reason code.

The following narrative is a brief synopsis of data that required qualification due to quality control discrepancies.

1.2 Preservation and Holding Times

Sample identification data were evaluated for agreement with the chain-of-custody (COC). All samples were received in appropriate containers, within the proper temperature range, in good condition, and within the required hold time.

1.3 Calibrations

All analytes reported must be present in the initial and continuing calibration. The calibrations must meet the acceptance criteria specified in Worksheet 24 (Analytical Instrument Calibration) of the QAPP. All results reported must be within the calibration range. Samples were diluted, if necessary, to bring analyte responses within the calibration range.

1.3.1 Continuing Calibration Verifications

The calibrations must meet the following criteria otherwise the compound is qualified J or UJ: The continuing calibration verification (CCV) criteria are 20 percent difference (%D) for VOCs and Semi-Volatile Organic Compounds (SVOCs) and 50% for closing CCVs. Metals and general chemistry - 10%D; perchlorate - 15%D; and volatiles in air - 30%D.

1.3.1.1 SW8260C

The CCV recovery of 1,2,3-trichlorobenzene was outside control limits for GWTP sample LH18/24-SP140_121719. This compound was flagged "UJ".

For the majority of packages related to LHAAP 18/24, 1,2,3-trichlorobenzene and/or carbon disulfide exceeded recovery limits. These non-detect compounds were flagged "UJ" in their respective packages (see Table 2).

1.4 Blanks

If the analyte result for an associated sample was less than 5X (10X for common laboratory contaminants) the analyte concentration in the blank, that result was qualified "UB" and considered an artifact of blank contamination. Where the sample result for the affected analyte was non-detect or greater than 5X the amount in the blank, no qualifier was applied.

1.4.1 SW8260C

Sample LH18/24-SP650_100119 reported a detection of acetone in the trip blank and 1,2-dichloroethane in the method blank. Both compounds were considered artifacts of blank contamination and flagged "UB".

Sample LH18/24-SP650_100819 reported a detection of acetone in the trip blank. This common laboratory contamination was flagged "UB".

1.4.2 SW6020A

The following samples reported metal results less than 5x the associated method blank concentrations:

- Zinc in sample C09_121719
- Aluminum and iron in samples MW5_121319, MW3_121219 and 18CPTMW18_121119
- Aluminum in samples 18CPTMW01SW_121319, MW21_121119, MW21-121119-a, 18CPTMW12SW_120619, 18CTPMW12DW_120619, 18CPTMW10DW_120619, 18WW17_120619, 18CPTMW24_121219 and MW9_120519

- Iron and manganese in samples 18WW22_121219 and 18WW22-121219-a
- Iron in samples 18WW24_121119, C08_121219, 125_121219 and 18CPTMW03SW_121119

These metals were all flagged “UB” and considered artifacts of blank contamination.

1.5 Surrogates

Surrogates were evaluated using limits defined by each method in the project-specific QAPP Worksheet 28.

All surrogate recoveries were within control limits.

1.6 Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

LCS/LCSD recoveries were evaluated using limits defined in the project-specific QAPP Worksheet 15.

All LCS recoveries were within control limits.

1.7 Matrix Spike (MS)/Matrix Spike Duplicate Sample (MSD)

MS/MSD recoveries were evaluated using limits defined in Worksheet 15 of the project-specific QAPP. When sample results were greater than 4X the spike amount, control limits were not applicable and require no qualification. Furthermore, if a MS/MSD analyses was performed on a batched (unrelated) sample no qualification was made to the sample data. Otherwise, only the sample used for spiking requires qualification.

1.7.1 SW8260C

The MS and/or MSD recoveries for LH18/24-SP650_101719 were below control limits for 1,1-dichloroethane, 1,2-dichloropropane, chloroform and cis-1,2-dichloroethene. The MS and/or MSD recoveries for LH18/24-SP650_121219 were below control limits for vinyl chloride and 1,1-dichloroethene. The MS and/or MSD recoveries for 1,1-dichloroethene, bromomethane, chloroethane, chloromethane, dichlorodifluoromethane, trichlorofluoromethane and vinyl chloride were below control limits in samples MW18_121719, MW5_121319 (with the exception of 1,1-dichloroethene), 18WW22_121219 and C09_121719. Sample 18CPTMW12SW_120619 reported the MSD recovery below control limits for 1,1-dichloroethene and chloroform. These compounds were flagged as estimated, “J/UJ”, due to matrix effect.

1.7.2 SW6020A

The MS and/or MSD recoveries for LH18/24-SP650_120319 were outside control limits for barium, silver and lead. These compounds were flagged “J/UJ”. The MSD recovery of silver was below control limits in sample C09_121719 and flagged “UJ”. The MS/MSD recoveries for aluminum were below control limits in sample 18CPTMW12SW_120619 and flagged “J”. Since aluminum was flagged previously due to blank contamination, the “UB” flag supersedes all others.

1.7.3 E6850

The MS/MSD recoveries for perchlorate were above control limits in sample C09_121719 and flagged as estimated, "J".

1.8 Internal Standards

If the percent recovery (%R) for an internal standard in a sample is not within the limit, the associated sample is qualified for those analytes associated with the internal standard(s) outside of the limit.

Internal standards were within acceptance criteria for the associated compounds.

1.9 Precision

Precision is the measure of variability of individual sample measurements. Evaluation of laboratory and/or field duplicates for precision was done using the relative percent difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. Field duplicate RPD limits were set at <30% for groundwater and air matrices. Laboratory duplicate RPD limits were set at <25% for air matrices.

1.9.1 Laboratory Duplicate

The RPD for analysis of Total Organic Carbon (TOC) in sample LH18/24-SP650_121219 was outside control limits. TOC has been flagged as estimated "J".

1.9.2 Field Duplicate

The RPD between AWD3_121319 and the duplicate was outside control limits for aluminum. The RPD between MW2_121319 and the duplicate was outside control limits for cadmium. The RPD between 18WW22_12129 and the duplicate was outside control limits for manganese, iron and selenium. Manganese and iron were previously flagged due to blank contamination. The remaining compounds have been flagged as estimated, "J".

2 DATA USABILITY SUMMARY

The data are usable for the intended purposes of the project (Table 3). The data quality objectives have been met for the project.

Table 1: Field Sample Identification and Laboratory Packages

Client Sample ID	Lab Package	E6850	E350.3	E365.3	SM5310C	SW8270D SIMI	SW8260C	SW6020A	SW9056A	SW7196A	E410.4	1664A	TO-15
GWTP Samples													
LH18/24-SP650_100119/AIX	HS19100171	X	X	X	X								
LH18/24-SP650_100119	HS19100181						X		X				
LH18/24-SP650_100819/AIX	HS19100471	X				X	X	X		X			
LH18/24-SP140_100819	HS19100469	X						X		X			
LH18/24-SP650_100819/AIX	HS19100472	X	X	X	X								
LH18/24-SP650_101019 (rush)	HS19100680						X						
LH18/24-SP650_101519/AIX	HS19100916	X	X	X	X								

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Client Sample ID	Lab Package	E8850	E350.3	E365.3	SMS310C	SW8270D SIM	SW8260C	SW6020A	SW9056A	SW7196A	E410.4	1664A	TO-15
LH18/24-SP650_101519 (VOCs canceled)	HS19100919								X				
LH18/24-SP650_101719 (rush)	HS19101087						X						
LH18/24-SP650_102219/AIX	HS19101325	X	X	X	X								
LH18/24-SP650_102419 (rush)	HS19101506						X						
LH18/24-SP650_102919	HS19101774						X		X				
LH18/24-SP650_102919_AIX (rush)	HS19101773	X											
LH18/24-SP650_102919	HS19101768		X	X	X								
LH18/24-SP650_BIX (rush)	HS19110215						X						
LH18/24-SP650_AIX (rush)	HS19110215						X						
LH18/24-SP650_110519_AIX	HS19110211	X				X		X		X			
LH18/24-SP650_110519	HS19110208	X	X	X	X								
LH18/24-SP140_110519	HS19110207	X						X		X			
LH18/24-SP650_111219	HS19110613						X		X				
LH18/24-SP650_111219_AIX	HS19110615	X	X	X	X								
LH18/24-SP650_112019_AIX	HS19111039	X	X	X	X								
LH18/24-SP650_112619_AIX	HS19111389	X	X	X	X								
LH18/24-SP650_112619	HS19111401						X		X				
LH18/24-SP650_120319/AIX	HS19120107	X				X	X	X		X			
LH18/24-SP140_120319	HS19120109	X						X		X			
LH18/24-SP650_120319/AIX	HS19120110	X	X	X	X								
LH18/24-SP650_120419_BIX (rush)	HS19120180						X						
LH18/24-SP650_120419_AIX (rush)	HS19120180						X						
INF Inlet_120419 (rush)	HS19120180						X						
LH18/24-SP650_121219	HS19120678						X		X				
LH18/24-SP650_121219/AIX	HS19120679	X	X	X	X								
LH18/24-SP650_121719/BIX	HS19121001	X	X	X	X								
LH18/24-SP650_121719/BIX	HS19121029	X				X	X	X	X		X	X	
LH18/24-SP140_121719	HS19121028	X				X	X	X	X		X	X	
LH18/24-SP650_122319	HS19121315	X	X	X	X								
LH18/24-SP650_122319	HS19121316						X		X				
LH18/24-SP650_122719(rush)	HS19121433						X						
LH18/24-SP650_123019	HS19121484						X						
LH18/24-SP650_123019/BIX	HS19121486	X	X	X	X								
Air Samples													
LH18/24-Air_121619_Stripper	P1907777												X
LH18/24-Air_121619_Stripper_a	P1907777												X
LH18/24-Air_121619_GWTP	P1907777												X
LH18/24-Air_121619_Downwind_North	P1907777												X
LHAAP 18/24													
AWD1_121319	HS19120844	X				X		X					
AWD3_121319	HS19120843	X					X	X					
AWD3_121319-a	HS19120843	X					X	X					
AWD4_121119	HS19120696	X				X	X	X					
18CPTMW01SW_121319	HS19120844	X				X	X	X					
18CPTMW03SW_121119	HS19120702	X				X	X	X					
18CPTMW04_121719	HS19121036	X				X	X						
18CPTMW04SW_121719	HS19121036	X				X	X	X					
18CPTMW06_121119	HS19120702	X				X	X						
18CPTMW07_121219	HS19120765	X				X	X						
18CPTMW08SW-121319	HS19120843	X				X	X						
18CPTMW08DW-121319	HS19120843	X				X							
18CPTMW10SW_120619	HS19120386	X				X	X						
18CPTMW10DW_120619	HS19120386	X					X	X					
18CPTMW12SW_120619	HS19120386	X				X	X	X					
18CPTMW12DW_120619	HS19120386	X				X	X	X					

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Client Sample ID	Lab Package	E8850	E350.3	E365.3	SMS310C	SW8270D SIM	SW8260C	SW6020A	SW9056A	SW7196A	E410.4	1664A	TO-15
18CPTMW14_120919	HS19120544	X				X	X	X					
18CPTMW15_121119	HS19120696	X				X	X						
18CPTMW16_121319	HS19120843	X				X							
18CPTMW18_121119	HS19120696	X				X	X	X					
18CPTMW19_121119	HS19120696	X				X	X						
18CPTMW22R_120519	HS19120354	X				X	X	X					
18CPTMW22SW_120519	HS19120354	X				X	X	X					
18CPTMW23-120919	HS19120544	X				X	X						
18CPTMW24_121219	HS19120765	X				X	X	X					
18WW02_120919	HS19120544	X				X	X	X					
18WW06_120919	HS19120544	X				X	X						
18WW08_121119	HS19120696	X				X	X						
18WW10_120919	HS19120544	X				X	X						
18WW17_120619	HS19120386	X					X	X					
18WW22_121219	HS19120765	X				X	X	X					
18WW22_121219-a	HS19120765	X				X	X	X					
18WW24_121119	HS19120696	X					X	X					
C03_121119	HS19120696	X				X	X						
C08_121219	HS19120765	X				X	X	X					
C09_121719	HS19121036	X					X	X					
MW2_121319	HS19120844	X				X	X	X					
MW2_121319-a	HS19120844	X				X	X	X					
MW3_121219	HS19120765	X					X	X					
MW5_121319	HS19120843	X				X	X	X					
MW7_120619	HS19120386	X				X	X						
MW8_120519	HS19120354	X				X	X						
MW9_120519	HS19120354	X				X	X	X					
MW10_120519	HS19120354	X				X	X						
MW14_121719	HS19121036	X				X	X	X					
MW16_120919	HS19120544	X				X	X						
MW17_120519	HS19120354	X				X							
MW18_121719	HS19121036	X					X						
MW19_120919	HS19120544	X					X	X					
MW20_120519	HS19120354	X					X						
MW20_120519-a	HS19120354	X					X						
MW21-121119	HS19120702	X				X	X	X					
MW21-121119-a	HS19120702	X				X	X	X					
MW22_121119	HS19120702	X					X	X					
MW23_121219	HS19120765	X					X						
MW23_121219-a	HS19120765	X					X						
109_121219	HS19120765	X				X	X						
120_121719	HS19121036	X				X	X						
125_121219	HS19120765	X					X	X					
126_121719	HS19121036	X				X	X	X					
126_121719-a	HS19121036	X				X	X	X					
Notes: GWTP – Groundwater Treatment Plant MW – Monitoring Well SM – Standard Method SW-846 - Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. E – U.S. Environmental Protection Agency Method HS – Houston AIX/BIX – after/before ion exchange													

Table 2: Qualified Analytical Data

Client Sample ID Laboratory	Laboratory Package	Analyte Name	Data Validation Qualifier (volatiles in µg/L; metals/TOC in mg/L)	Reason for Qualification
GWTP				
LH18/24-SP650_100119	HS19100181	Acetone 1,2-Dichloroethane	5.1 UB 0.37 UB	TB MB
LH18/24-SP650_100819	HS19100471	Acetone	44 UB	TB
LH18/24-SP650_101719	HS19101087	1,1-Dichloroethane 1,2-Dichloropropane Chloroform cis-1,2-Dichloroethene	0.5 UJ 0.5 UJ 0.5 UJ 12 J	MS/MSD < MS/MSD < MS/MSD < MS <
LH18/24-SP650_120319	HS19120107	Barium Lead Silver	0.117 J 0.00100 UJ 0.000500 UJ	MS > MS/MSD < MSD <
LH18/24-SP650_121219	HS19120678	1,1-Dichloroethene Vinyl chloride	0.50 UJ 0.49 J	MSD < MS/MSD <
LH18/24-SP650_121219	HS19120679	Total Organic Carbon (TOC)	0.99 J	Duplicate RPD
LH18/24-SP140_121719	HS19121028	1,2,3-Trichlorobenzene	10 UJ	CCV
LHAAP 18/24				
C09_121719	HS19121036	1,2,3-Trichlorobenzene 1,1-Dichloroethene Bromomethane Chloroethane Chloromethane Dichlorodifluoromethane Trichlorofluoromethane Vinyl chloride Silver Perchlorate Zinc	0.5 UJ 0.5 UJ 0.5 UJ 0.5 UJ 0.5 UJ 0.5 UJ 0.5 UJ 0.5 UJ 0.5 UJ 0.000500 UJ 1.5 J 0.00734 UB	CCV MS/MSD < MS/MSD < MS/MSD < MS/MSD < MS/MSD < MS/MSD < MS/MSD < MS/MSD < MSD < MS/MSD > MB
126_121719	HS19121036	1,2,3-Trichlorobenzene	0.5 UJ	CCV
126_121719-a	HS19121036	1,2,3-Trichlorobenzene	0.5 UJ	CCV
MW18_121719	HS19121036	1,2,3-Trichlorobenzene 1,1-Dichloroethene Bromomethane Chloroethane Chloromethane Dichlorodifluoromethane Trichlorofluoromethane Vinyl chloride	0.5 UJ 0.5 UJ 0.5 UJ 0.5 UJ 0.5 UJ 0.5 UJ 0.5 UJ 0.5 UJ	CCV MS/MSD < MS/MSD < MS/MSD < MS/MSD < MS/MSD < MS/MSD < MS/MSD <
120_121719	HS19121036	1,2,3-Trichlorobenzene	12 UJ	CCV
MW14_121719	HS19121036	1,2,3-Trichlorobenzene	12 UJ	CCV
18CPTMW04SW_121719	HS19121036	1,2,3-Trichlorobenzene	0.5 UJ	CCV
18CPTMW04_121719	HS19121036	1,2,3-Trichlorobenzene	0.5 UJ	CCV
AWD3_121319	HS19120843	1,2,3-Trichlorobenzene Carbon disulfide Aluminum	0.5 UJ 1.0 UJ 0.164 J	CCV CCV FD RPD
AWD3_121319-a	HS19120843	1,2,3-Trichlorobenzene Carbon disulfide Aluminum	0.5 UJ 1.0 UJ 0.105 J	CCV CCV FD RPD
MW5_121319	HS19120843	1,2,3-Trichlorobenzene Carbon disulfide Bromomethane Chloroethane Chloromethane Dichlorodifluoromethane Trichlorofluoromethane Vinyl chloride Aluminum Iron	0.5 UJ 1.0 UJ 0.5 UJ 0.5 UJ 0.5 UJ 0.5 UJ 0.5 UJ 3.0 J 0.00447 UB 0.127 UB	CCV CCV MS/MSD < MS/MSD < MS/MSD < MS/MSD < MS/MSD < MS/MSD < MS/MSD < MB MB

Client Sample ID Laboratory	Laboratory Package	Analyte Name	Data Validation Qualifier (volatiles in µg/L; metals/TOC in mg/L)	Reason for Qualification
18CPTMW08SW_121319	HS19120843	1,2,3-Trichlorobenzene Carbon disulfide	0.5 UJ 1.0 UJ	CCV CCV
MW2_121319	HS19120844	1,2,3-Trichlorobenzene Carbon disulfide Cadmium	25 UJ 50 UJ 0.000329 J	CCV CCV FD RPD
MW2_121319-a	HS19120844	1,2,3-Trichlorobenzene Carbon disulfide Cadmium	25 UJ 50 UJ 0.000495 J	CCV CCV FD RPD
18CPTMW01SW_121319	HS19120844	1,2,3-Trichlorobenzene Carbon disulfide Aluminum	0.5 UJ 1.0 UJ 0.0105 UB	CCV CCV MB
18WW22_121219	HS19120765	1,1-Dichloroethene Bromomethane Chloroethane Chloromethane Dichlorodifluoromethane Trichlorofluoromethane Vinyl chloride Manganese Iron Selenium	0.5 UJ 0.5 UJ 0.5 UJ 0.5 UJ 0.5 UJ 0.5 UJ 0.5 UJ 0.00292 UB* 0.241 UB* 0.00124 J	MSD < MS/MSD < MSD < MS/MSD < MS/MSD < MS/MSD < MS/MSD < MB/FD RPD MB/FD RPD FD RPD
18WW22_121219-a	HS19120765	Manganese Iron Selenium	0.00125 UB* 0.0233 UB* 0.00184 J	MB/FD RPD MB/FD RPD FD RPD
18CPTMW24_12129	HS19120765	Aluminum	0.00631 UB	MB
MW3_121219	HS19120765	Aluminum Iron	0.00215 UB 0.343 UB	MB MB
C08_12129	HS19120765	Iron	0.558 UB	MB
125_121219	HS19120765	Iron	0.617 UB	MB
18WW24_121119	HS19120696	Carbon disulfide Iron	1.0 UJ 0.0979 UB	CCV MB
18CPTMW15_121119	HS19120696	Carbon disulfide	1.0 UJ	CCV
AWD4_121119	HS19120696	Carbon disulfide	1.0 UJ	CCV
18WW08_121119	HS19120696	Carbon disulfide	1.0 UJ	CCV
18CPTMW19_121119	HS19120696	Carbon disulfide	1.0 UJ	CCV
18CPTMW18-121119	HS19120696	Carbon disulfide Aluminum Iron	1.0 UJ 0.0128 UB 0.802 UB	CCV MB MB
C03_121119	HS19120696	Carbon disulfide	1.0 UJ	CCV
MW21_121119	HS19120702	Carbon disulfide Aluminum	10 UJ 0.00790 UB	CCV MB
MW21_121119-a	HS19120702	Carbon disulfide Aluminum	10 UJ 0.00780 UB	CCV MB
MW22_121119	HS19120702	Carbon disulfide	1.0 UJ	CCV
18CPTMW06_121119	HS19120702	Carbon disulfide	1.0 UJ	CCV
18CPTMW03SW_121119	HS19120702	Carbon disulfide Iron	1.0 UJ 0.477 UB	CCV MB
18CPTMW12SW_120619	HS19120386	1,2,3-Trichlorobenzene Aluminum 1,1-Dichloroethene Chloroform	0.5 UJ 0.0145 UB* 0.5 UJ 0.5 UJ	CCV MS/MSD </MB MSD < MSD <
18CPTMW12DW_120619	HS19120386	1,2,3-Trichlorobenzene Aluminum	0.5 UJ 0.0121 UB	CCV MB
18CPTMW10SW_120619	HS19120386	1,2,3-Trichlorobenzene	0.5 UJ	CCV
18CPTMW10DW_120619	HS19120386	1,2,3-Trichlorobenzene Aluminum	0.5 UJ 0.0297 UB	CCV MB
MW7_120619	HS19120386	1,2,3-Trichlorobenzene	0.5 UJ	CCV

Client Sample ID Laboratory	Laboratory Package	Analyte Name	Data Validation Qualifier (volatiles in µg/L; metals/TOC in mg/L)	Reason for Qualification
18WW17_120619	HS19120386	1,2,3-Trichlorobenzene	0.5 UJ	CCV
		Aluminum	0.00775 UB	MB
MW9_120519	HS19120354	Aluminum	0.0208 UB	MB
Notes: mg/L – milligrams per liter µg/L – micrograms per liter J – Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. UJ – Estimated not detected due to discrepancies in meeting certain analyte specific quality control criteria and reported to the limit of detection. UB – considered an artifact of blank contamination TB – trip blank contamination MB – method blank contamination MS/MSD <> - matrix spike/matrix spike duplicate recovery below/above control limits CCV – continuing calibration verification outside control limits FD RPD – field duplicate relative percent difference outside control limits *-UB flag supersedes all others				

Table 3: Completeness by Method

Method	No. of Rejected Results	% Completeness
E6850	0	100
E350.3	0	100
E365.3	0	100
SM5310C	0	100
SW8270D	0	100
SW8260C	0	100
SW6020A/SW7470A	0	100
SW9056A	0	100
SW7196A	0	100
E410.4	0	100
E1664A	0	100
TO-15	0	100

APPENDIX H
AIR MONITORING ANALYTICAL LABORATORY REPORT
(PROVIDED ON CD ONLY)

GWTP QUARTERLY EVALUATION REPORT —4TH QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

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Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

LABORATORY REPORT

January 14, 2020

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

RE: LHAAP GWTP / NW01312.0150

Dear Marcia:

Enclosed are the results of the samples submitted to our laboratory on December 20, 2019. For your reference, these analyses have been assigned our service request number P1907777.

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 3:16 pm, Jan 14, 2020

For Sue Anderson
Project Manager



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 Simi Valley, CA 93065
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Client: Bhate Environmental Associates, Inc.
 Project: LHAAP GWTP / NW01312.0150

Service Request No: P1907777

CASE NARRATIVE

The samples were received intact under chain of custody on December 20, 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.

Volatile Organic Compound Analysis

The samples were analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. 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 NELAP or DoD-ELAP accreditation.

The upper control criterion was exceeded for hexachlorobutadiene in the Continuing Calibration Verification (CCV) analyzed on January 3, 2020. Since the apparent problem equates to a potential high bias and the field sample analyzed in this sequence did not contain the analyte in question, the data quality has not been affected. No corrective action was required.

The containers were cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. For projects requiring DoD QSM 5.1 compliance canisters were cleaned to <1/2 the MRL. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

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.



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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	1776326
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	CA01627201 9-10
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: Bhate Environmental Associates, Inc.
 Project ID: LHAAP GWTP / NW01312.0150

Service Request: P1907777

Date Received: 12/20/2019
 Time Received: 12:45

TO-15 - VOC Cans

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
LH18/24-Air_121619_Stripper	P1907777-001	Air	12/16/2019	14:00	AC01178	0.35	3.82	X
LH18/24-Air_121619_Stripper_a	P1907777-002	Air	12/16/2019	14:00	AC02048	0.35	4.14	X
LH18/24-Air_121619_GWTP	P1907777-003	Air	12/16/2019	14:15	AS01170	0.93	3.86	X
LH18/24-Air_121619_Downwind_North	P1907777-004	Air	12/17/2019	06:30	AC02125	-0.01	4.59	X

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: **Bhate Environmental Associates, Inc.**Client Sample ID: **LH18/24-Air_121619_Stripper**Client Project ID: **LHAAP GWTP / NW01312.0150**

ALS Project ID: P1907777

ALS Sample ID: P1907777-001

Test Code: EPA TO-15

Date Collected: 12/16/19

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: 12/20/19

Analyst: Topacio De Leon

Date Analyzed: 1/3/20

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 0.0050 Liter(s)

Test Notes:

Container ID: AC01178

Initial Pressure (psig): 0.35 Final Pressure (psig): 3.82

Canister Dilution Factor: 1.23

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m ³	µg/m ³	ppbV	ppbV	
115-07-1	Propene	ND	130	ND	76	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	130	ND	26	
74-87-3	Chloromethane	ND	130	ND	63	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	130	ND	19	
75-01-4	Vinyl Chloride	650	130	260	52	
106-99-0	1,3-Butadiene	ND	130	ND	59	
74-83-9	Bromomethane	ND	130	ND	34	
75-00-3	Chloroethane	ND	130	ND	50	
64-17-5	Ethanol	ND	1,300	ND	680	
75-05-8	Acetonitrile	ND	130	ND	78	
107-02-8	Acrolein	ND	250	ND	110	
67-64-1	Acetone	1,700	1,300	730	550	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	130	ND	23	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	520	ND	210	
107-13-1	Acrylonitrile	ND	130	ND	60	
75-35-4	1,1-Dichloroethene	320	130	80	34	
75-09-2	Methylene Chloride	3,700	130	1,100	38	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	130	ND	42	
76-13-1	Trichlorotrifluoroethane (CFC 113)	24,000	130	3,200	17	
75-15-0	Carbon Disulfide	940	270	300	87	
156-60-5	trans-1,2-Dichloroethene	ND	130	ND	34	
75-34-3	1,1-Dichloroethane	ND	140	ND	33	
1634-04-4	Methyl tert-Butyl Ether	ND	130	ND	37	
108-05-4	Vinyl Acetate	ND	1,300	ND	380	
78-93-3	2-Butanone (MEK)	ND	270	ND	92	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 2 of 3

Client: **Bhate Environmental Associates, Inc.**Client Sample ID: **LH18/24-Air_121619_Stripper**Client Project ID: **LHAAP GWTP / NW01312.0150**

ALS Project ID: P1907777

ALS Sample ID: P1907777-001

Test Code: EPA TO-15

Date Collected: 12/16/19

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: 12/20/19

Analyst: Topacio De Leon

Date Analyzed: 1/3/20

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 0.0050 Liter(s)

Test Notes:

Container ID: AC01178

Initial Pressure (psig): 0.35 Final Pressure (psig): 3.82

Canister Dilution Factor: 1.23

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	17,000	130	4,200	33	
141-78-6	Ethyl Acetate	ND	270	ND	75	
110-54-3	n-Hexane	ND	130	ND	38	
67-66-3	Chloroform	ND	130	ND	27	
109-99-9	Tetrahydrofuran (THF)	210	140	71	46	
107-06-2	1,2-Dichloroethane	190	130	48	33	
71-55-6	1,1,1-Trichloroethane	ND	130	ND	24	
71-43-2	Benzene	ND	130	ND	41	
56-23-5	Carbon Tetrachloride	ND	130	ND	21	
110-82-7	Cyclohexane	ND	270	ND	79	
78-87-5	1,2-Dichloropropane	ND	130	ND	29	
75-27-4	Bromodichloromethane	ND	130	ND	20	
79-01-6	Trichloroethene	25,000	130	4,600	25	
123-91-1	1,4-Dioxane	ND	130	ND	37	
80-62-6	Methyl Methacrylate	ND	270	ND	66	
142-82-5	n-Heptane	ND	130	ND	32	
10061-01-5	cis-1,3-Dichloropropene	ND	130	ND	28	
108-10-1	4-Methyl-2-pentanone	ND	130	ND	32	
10061-02-6	trans-1,3-Dichloropropene	ND	130	ND	29	
79-00-5	1,1,2-Trichloroethane	ND	130	ND	24	
108-88-3	Toluene	ND	130	ND	35	
591-78-6	2-Hexanone	ND	130	ND	32	
124-48-1	Dibromochloromethane	ND	130	ND	16	
106-93-4	1,2-Dibromoethane	ND	130	ND	17	
123-86-4	n-Butyl Acetate	ND	140	ND	28	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 3 of 3

Client: **Bhate Environmental Associates, Inc.**Client Sample ID: **LH18/24-Air_121619_Stripper**Client Project ID: **LHAAP GWTP / NW01312.0150**

ALS Project ID: P1907777

ALS Sample ID: P1907777-001

Test Code: EPA TO-15

Date Collected: 12/16/19

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: 12/20/19

Analyst: Topacio De Leon

Date Analyzed: 1/3/20

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 0.0050 Liter(s)

Test Notes:

Container ID: AC01178

Initial Pressure (psig): 0.35 Final Pressure (psig): 3.82

Canister Dilution Factor: 1.23

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	130	ND	28	
127-18-4	Tetrachloroethene	240	130	36	19	
108-90-7	Chlorobenzene	ND	130	ND	29	
100-41-4	Ethylbenzene	ND	130	ND	31	
179601-23-1	m,p-Xylenes	ND	270	ND	62	
75-25-2	Bromoform	ND	130	ND	13	
100-42-5	Styrene	ND	130	ND	31	
95-47-6	o-Xylene	ND	130	ND	31	
111-84-2	n-Nonane	ND	130	ND	25	
79-34-5	1,1,2,2-Tetrachloroethane	ND	130	ND	19	
98-82-8	Cumene	ND	130	ND	27	
80-56-8	alpha-Pinene	ND	130	ND	24	
103-65-1	n-Propylbenzene	ND	130	ND	27	
622-96-8	4-Ethyltoluene	ND	130	ND	27	
108-67-8	1,3,5-Trimethylbenzene	ND	130	ND	27	
95-63-6	1,2,4-Trimethylbenzene	ND	130	ND	27	
100-44-7	Benzyl Chloride	ND	270	ND	52	
541-73-1	1,3-Dichlorobenzene	ND	130	ND	22	
106-46-7	1,4-Dichlorobenzene	ND	130	ND	22	
95-50-1	1,2-Dichlorobenzene	ND	130	ND	22	
5989-27-5	d-Limonene	ND	130	ND	24	
96-12-8	1,2-Dibromo-3-chloropropane	ND	130	ND	13	
120-82-1	1,2,4-Trichlorobenzene	ND	130	ND	18	
91-20-3	Naphthalene	ND	130	ND	24	
87-68-3	Hexachlorobutadiene	ND	130	ND	12	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: **Bhate Environmental Associates, Inc.**Client Sample ID: **LH18/24-Air_121619_Stripper_a**Client Project ID: **LHAAP GWTP / NW01312.0150**

ALS Project ID: P1907777

ALS Sample ID: P1907777-002

Test Code: EPA TO-15

Date Collected: 12/16/19

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: 12/20/19

Analyst: Topacio De Leon

Date Analyzed: 1/3/20

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 0.0050 Liter(s)

Test Notes:

Container ID: AC02048

Initial Pressure (psig): 0.35 Final Pressure (psig): 4.14

Canister Dilution Factor: 1.25

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	ppbV	ppbV	
115-07-1	Propene	ND	130	ND	77	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	130	ND	27	
74-87-3	Chloromethane	ND	130	ND	64	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	130	ND	19	
75-01-4	Vinyl Chloride	560	140	220	53	
106-99-0	1,3-Butadiene	ND	130	ND	60	
74-83-9	Bromomethane	ND	140	ND	35	
75-00-3	Chloroethane	ND	140	ND	51	
64-17-5	Ethanol	ND	1,300	ND	690	
75-05-8	Acetonitrile	ND	130	ND	79	
107-02-8	Acrolein	ND	250	ND	110	
67-64-1	Acetone	ND	1,300	ND	560	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	130	ND	24	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	530	ND	210	
107-13-1	Acrylonitrile	ND	130	ND	61	
75-35-4	1,1-Dichloroethene	250	140	62	34	
75-09-2	Methylene Chloride	3,100	130	900	38	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	140	ND	43	
76-13-1	Trichlorotrifluoroethane (CFC 113)	20,000	140	2,600	18	
75-15-0	Carbon Disulfide	ND	280	ND	88	
156-60-5	trans-1,2-Dichloroethene	ND	140	ND	34	
75-34-3	1,1-Dichloroethane	ND	140	ND	34	
1634-04-4	Methyl tert-Butyl Ether	ND	140	ND	37	
108-05-4	Vinyl Acetate	ND	1,400	ND	380	
78-93-3	2-Butanone (MEK)	ND	280	ND	93	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 2 of 3

Client: **Bhate Environmental Associates, Inc.**Client Sample ID: **LH18/24-Air_121619_Stripper_a**Client Project ID: **LHAAP GWTP / NW01312.0150**

ALS Project ID: P1907777

ALS Sample ID: P1907777-002

Test Code: EPA TO-15

Date Collected: 12/16/19

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: 12/20/19

Analyst: Topacio De Leon

Date Analyzed: 1/3/20

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 0.0050 Liter(s)

Test Notes:

Container ID: AC02048

Initial Pressure (psig): 0.35 Final Pressure (psig): 4.14

Canister Dilution Factor: 1.25

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	14,000	130	3,600	33	
141-78-6	Ethyl Acetate	ND	280	ND	76	
110-54-3	n-Hexane	ND	140	ND	38	
67-66-3	Chloroform	ND	140	ND	28	
109-99-9	Tetrahydrofuran (THF)	ND	140	ND	47	
107-06-2	1,2-Dichloroethane	170	140	41	33	
71-55-6	1,1,1-Trichloroethane	ND	140	ND	25	
71-43-2	Benzene	ND	130	ND	41	
56-23-5	Carbon Tetrachloride	ND	130	ND	21	
110-82-7	Cyclohexane	ND	280	ND	80	
78-87-5	1,2-Dichloropropane	ND	140	ND	29	
75-27-4	Bromodichloromethane	ND	140	ND	20	
79-01-6	Trichloroethene	21,000	140	3,900	25	
123-91-1	1,4-Dioxane	ND	140	ND	37	
80-62-6	Methyl Methacrylate	ND	280	ND	67	
142-82-5	n-Heptane	ND	140	ND	33	
10061-01-5	cis-1,3-Dichloropropene	ND	130	ND	29	
108-10-1	4-Methyl-2-pentanone	ND	130	ND	32	
10061-02-6	trans-1,3-Dichloropropene	ND	130	ND	29	
79-00-5	1,1,2-Trichloroethane	ND	140	ND	25	
108-88-3	Toluene	ND	140	ND	36	
591-78-6	2-Hexanone	ND	140	ND	33	
124-48-1	Dibromochloromethane	ND	140	ND	16	
106-93-4	1,2-Dibromoethane	ND	140	ND	18	
123-86-4	n-Butyl Acetate	ND	140	ND	29	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

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ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 3 of 3

Client: **Bhate Environmental Associates, Inc.**Client Sample ID: **LH18/24-Air_121619_Stripper_a**Client Project ID: **LHAAP GWTP / NW01312.0150**

ALS Project ID: P1907777

ALS Sample ID: P1907777-002

Test Code: EPA TO-15

Date Collected: 12/16/19

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: 12/20/19

Analyst: Topacio De Leon

Date Analyzed: 1/3/20

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 0.0050 Liter(s)

Test Notes:

Container ID: AC02048

Initial Pressure (psig): 0.35 Final Pressure (psig): 4.14

Canister Dilution Factor: 1.25

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	140	ND	29	
127-18-4	Tetrachloroethene	210	130	30	19	
108-90-7	Chlorobenzene	ND	140	ND	29	
100-41-4	Ethylbenzene	ND	140	ND	31	
179601-23-1	m,p-Xylenes	ND	280	ND	63	
75-25-2	Bromoform	ND	140	ND	13	
100-42-5	Styrene	ND	130	ND	31	
95-47-6	o-Xylene	ND	140	ND	31	
111-84-2	n-Nonane	ND	140	ND	26	
79-34-5	1,1,2,2-Tetrachloroethane	ND	140	ND	20	
98-82-8	Cumene	ND	140	ND	27	
80-56-8	alpha-Pinene	ND	140	ND	24	
103-65-1	n-Propylbenzene	ND	140	ND	27	
622-96-8	4-Ethyltoluene	ND	140	ND	27	
108-67-8	1,3,5-Trimethylbenzene	ND	130	ND	27	
95-63-6	1,2,4-Trimethylbenzene	ND	140	ND	27	
100-44-7	Benzyl Chloride	ND	280	ND	53	
541-73-1	1,3-Dichlorobenzene	ND	140	ND	22	
106-46-7	1,4-Dichlorobenzene	ND	140	ND	22	
95-50-1	1,2-Dichlorobenzene	ND	140	ND	22	
5989-27-5	d-Limonene	ND	140	ND	24	
96-12-8	1,2-Dibromo-3-chloropropane	ND	130	ND	14	
120-82-1	1,2,4-Trichlorobenzene	ND	140	ND	18	
91-20-3	Naphthalene	ND	130	ND	25	
87-68-3	Hexachlorobutadiene	ND	130	ND	12	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: **Bhate Environmental Associates, Inc.**Client Sample ID: **LH18/24-Air_121619_GWTP**Client Project ID: **LHAAP GWTP / NW01312.0150**

ALS Project ID: P1907777

ALS Sample ID: P1907777-003

Test Code: EPA TO-15

Date Collected: 12/16/19

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: 12/20/19

Analyst: Topacio De Leon

Date Analyzed: 1/3/20

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: AS01170

Initial Pressure (psig): 0.93 Final Pressure (psig): 3.86

Canister Dilution Factor: 1.19

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	ppbV	ppbV	
115-07-1	Propene	8.9	0.63	5.2	0.37	
75-71-8	Dichlorodifluoromethane (CFC 12)	2.3	0.63	0.47	0.13	
74-87-3	Chloromethane	ND	0.63	ND	0.31	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.63	ND	0.090	
75-01-4	Vinyl Chloride	ND	0.64	ND	0.25	
106-99-0	1,3-Butadiene	ND	0.63	ND	0.29	
74-83-9	Bromomethane	ND	0.64	ND	0.17	
75-00-3	Chloroethane	ND	0.64	ND	0.24	
64-17-5	Ethanol	15	6.2	7.8	3.3	
75-05-8	Acetonitrile	ND	0.63	ND	0.38	
107-02-8	Acrolein	ND	1.2	ND	0.52	
67-64-1	Acetone	12	6.3	4.9	2.7	
75-69-4	Trichlorofluoromethane (CFC 11)	1.4	0.63	0.25	0.11	
67-63-0	2-Propanol (Isopropyl Alcohol)	53	2.5	22	1.0	
107-13-1	Acrylonitrile	ND	0.63	ND	0.29	
75-35-4	1,1-Dichloroethene	ND	0.64	ND	0.16	
75-09-2	Methylene Chloride	0.89	0.63	0.26	0.18	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.64	ND	0.21	
76-13-1	Trichlorotrifluoroethane (CFC 113)	13	0.64	1.7	0.084	
75-15-0	Carbon Disulfide	ND	1.3	ND	0.42	
156-60-5	trans-1,2-Dichloroethene	ND	0.64	ND	0.16	
75-34-3	1,1-Dichloroethane	ND	0.65	ND	0.16	
1634-04-4	Methyl tert-Butyl Ether	ND	0.64	ND	0.18	
108-05-4	Vinyl Acetate	ND	6.4	ND	1.8	
78-93-3	2-Butanone (MEK)	1.6	1.3	0.54	0.44	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: **Bhate Environmental Associates, Inc.**Client Sample ID: **LH18/24-Air_121619_GWTP**Client Project ID: **LHAAP GWTP / NW01312.0150**

ALS Project ID: P1907777

ALS Sample ID: P1907777-003

Test Code: EPA TO-15

Date Collected: 12/16/19

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: 12/20/19

Analyst: Topacio De Leon

Date Analyzed: 1/3/20

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: AS01170

Initial Pressure (psig): 0.93 Final Pressure (psig): 3.86

Canister Dilution Factor: 1.19

CAS #	Compound	Result $\mu\text{g}/\text{m}^3$	MRL $\mu\text{g}/\text{m}^3$	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	5.4	0.63	1.4	0.16	
141-78-6	Ethyl Acetate	ND	1.3	ND	0.36	
110-54-3	n-Hexane	2.4	0.64	0.68	0.18	
67-66-3	Chloroform	ND	0.64	ND	0.13	
109-99-9	Tetrahydrofuran (THF)	3.2	0.65	1.1	0.22	
107-06-2	1,2-Dichloroethane	ND	0.64	ND	0.16	
71-55-6	1,1,1-Trichloroethane	ND	0.64	ND	0.12	
71-43-2	Benzene	1.1	0.63	0.34	0.20	
56-23-5	Carbon Tetrachloride	ND	0.63	ND	0.10	
110-82-7	Cyclohexane	ND	1.3	ND	0.38	
78-87-5	1,2-Dichloropropane	ND	0.64	ND	0.14	
75-27-4	Bromodichloromethane	ND	0.64	ND	0.096	
79-01-6	Trichloroethene	8.1	0.64	1.5	0.12	
123-91-1	1,4-Dioxane	ND	0.64	ND	0.18	
80-62-6	Methyl Methacrylate	ND	1.3	ND	0.32	
142-82-5	n-Heptane	0.95	0.64	0.23	0.16	
10061-01-5	cis-1,3-Dichloropropene	ND	0.62	ND	0.14	
108-10-1	4-Methyl-2-pentanone	ND	0.63	ND	0.15	
10061-02-6	trans-1,3-Dichloropropene	ND	0.63	ND	0.14	
79-00-5	1,1,2-Trichloroethane	ND	0.64	ND	0.12	
108-88-3	Toluene	1.8	0.64	0.47	0.17	
591-78-6	2-Hexanone	ND	0.64	ND	0.16	
124-48-1	Dibromochloromethane	ND	0.64	ND	0.075	
106-93-4	1,2-Dibromoethane	ND	0.64	ND	0.084	
123-86-4	n-Butyl Acetate	ND	0.65	ND	0.14	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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RESULTS OF ANALYSIS

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Client: **Bhate Environmental Associates, Inc.**Client Sample ID: **LH18/24-Air_121619_GWTP**Client Project ID: **LHAAP GWTP / NW01312.0150**

ALS Project ID: P1907777

ALS Sample ID: P1907777-003

Test Code: EPA TO-15

Date Collected: 12/16/19

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: 12/20/19

Analyst: Topacio De Leon

Date Analyzed: 1/3/20

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: AS01170

Initial Pressure (psig): 0.93 Final Pressure (psig): 3.86

Canister Dilution Factor: 1.19

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.64	ND	0.14	
127-18-4	Tetrachloroethene	ND	0.62	ND	0.091	
108-90-7	Chlorobenzene	ND	0.64	ND	0.14	
100-41-4	Ethylbenzene	ND	0.64	ND	0.15	
179601-23-1	m,p-Xylenes	ND	1.3	ND	0.30	
75-25-2	Bromoform	ND	0.64	ND	0.062	
100-42-5	Styrene	ND	0.63	ND	0.15	
95-47-6	o-Xylene	ND	0.64	ND	0.15	
111-84-2	n-Nonane	ND	0.64	ND	0.12	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.64	ND	0.094	
98-82-8	Cumene	ND	0.64	ND	0.13	
80-56-8	alpha-Pinene	2.4	0.64	0.44	0.12	
103-65-1	n-Propylbenzene	ND	0.64	ND	0.13	
622-96-8	4-Ethyltoluene	ND	0.64	ND	0.13	
108-67-8	1,3,5-Trimethylbenzene	ND	0.63	ND	0.13	
95-63-6	1,2,4-Trimethylbenzene	ND	0.64	ND	0.13	
100-44-7	Benzyl Chloride	ND	1.3	ND	0.25	
541-73-1	1,3-Dichlorobenzene	ND	0.64	ND	0.11	
106-46-7	1,4-Dichlorobenzene	ND	0.64	ND	0.11	
95-50-1	1,2-Dichlorobenzene	ND	0.64	ND	0.11	
5989-27-5	d-Limonene	ND	0.64	ND	0.12	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.63	ND	0.065	
120-82-1	1,2,4-Trichlorobenzene	ND	0.64	ND	0.087	
91-20-3	Naphthalene	ND	0.62	ND	0.12	
87-68-3	Hexachlorobutadiene	ND	0.63	ND	0.059	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

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RESULTS OF ANALYSIS

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Client: **Bhate Environmental Associates, Inc.**Client Sample ID: **LH18/24-Air_121619_Downwind_North**Client Project ID: **LHAAP GWTP / NW01312.0150**

ALS Project ID: P1907777

ALS Sample ID: P1907777-004

Test Code: EPA TO-15

Date Collected: 12/17/19

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: 12/20/19

Analyst: Topacio De Leon

Date Analyzed: 1/3/20

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

0.10 Liter(s)

Container ID: AC02125

Initial Pressure (psig): -0.01 Final Pressure (psig): 4.59

Canister Dilution Factor: 1.31

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	ppbV	ppbV	
115-07-1	Propene	110	0.69	64	0.40	
75-71-8	Dichlorodifluoromethane (CFC 12)	2.5	0.69	0.51	0.14	
74-87-3	Chloromethane	ND	0.69	ND	0.34	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.69	ND	0.099	
75-01-4	Vinyl Chloride	ND	0.71	ND	0.28	
106-99-0	1,3-Butadiene	ND	0.69	ND	0.31	
74-83-9	Bromomethane	ND	0.71	ND	0.18	
75-00-3	Chloroethane	ND	0.71	ND	0.27	
64-17-5	Ethanol	180	6.8	96	3.6	
75-05-8	Acetonitrile	2.2	0.69	1.3	0.41	
107-02-8	Acrolein	2.1	1.3	0.94	0.57	
67-64-1	Acetone	150	6.9	61	2.9	
75-69-4	Trichlorofluoromethane (CFC 11)	3.0	0.69	0.53	0.12	
67-63-0	2-Propanol (Isopropyl Alcohol)	820	28	330	11	D
107-13-1	Acrylonitrile	ND	0.69	ND	0.32	
75-35-4	1,1-Dichloroethene	ND	0.71	ND	0.18	
75-09-2	Methylene Chloride	0.85	0.69	0.24	0.20	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.71	ND	0.23	
76-13-1	Trichlorotrifluoroethane (CFC 113)	8.5	0.71	1.1	0.092	
75-15-0	Carbon Disulfide	ND	1.4	ND	0.46	
156-60-5	trans-1,2-Dichloroethene	ND	0.71	ND	0.18	
75-34-3	1,1-Dichloroethane	ND	0.72	ND	0.18	
1634-04-4	Methyl tert-Butyl Ether	ND	0.71	ND	0.20	
108-05-4	Vinyl Acetate	ND	7.1	ND	2.0	
78-93-3	2-Butanone (MEK)	18	1.4	6.0	0.49	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

D = The reported result is from a dilution.

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RESULTS OF ANALYSIS

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Client: **Bhate Environmental Associates, Inc.**Client Sample ID: **LH18/24-Air_121619_Downwind_North**Client Project ID: **LHAAP GWTP / NW01312.0150**

ALS Project ID: P1907777

ALS Sample ID: P1907777-004

Test Code: EPA TO-15

Date Collected: 12/17/19

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: 12/20/19

Analyst: Topacio De Leon

Date Analyzed: 1/3/20

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

0.10 Liter(s)

Container ID: AC02125

Initial Pressure (psig): -0.01 Final Pressure (psig): 4.59

Canister Dilution Factor: 1.31

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	ppbV	ppbV	
156-59-2	cis-1,2-Dichloroethene	3.9	0.69	0.99	0.18	
141-78-6	Ethyl Acetate	3.6	1.4	0.99	0.40	
110-54-3	n-Hexane	14	0.71	4.0	0.20	
67-66-3	Chloroform	ND	0.71	ND	0.14	
109-99-9	Tetrahydrofuran (THF)	53	0.72	18	0.24	
107-06-2	1,2-Dichloroethane	ND	0.71	ND	0.17	
71-55-6	1,1,1-Trichloroethane	ND	0.71	ND	0.13	
71-43-2	Benzene	3.6	0.69	1.1	0.22	
56-23-5	Carbon Tetrachloride	ND	0.69	ND	0.11	
110-82-7	Cyclohexane	2.2	1.4	0.64	0.42	
78-87-5	1,2-Dichloropropane	ND	0.71	ND	0.15	
75-27-4	Bromodichloromethane	ND	0.71	ND	0.11	
79-01-6	Trichloroethene	5.7	0.71	1.1	0.13	
123-91-1	1,4-Dioxane	ND	0.71	ND	0.20	
80-62-6	Methyl Methacrylate	ND	1.4	ND	0.35	
142-82-5	n-Heptane	5.2	0.71	1.3	0.17	
10061-01-5	cis-1,3-Dichloropropene	ND	0.68	ND	0.15	
108-10-1	4-Methyl-2-pentanone	1.3	0.69	0.31	0.17	
10061-02-6	trans-1,3-Dichloropropene	ND	0.69	ND	0.15	
79-00-5	1,1,2-Trichloroethane	ND	0.71	ND	0.13	
108-88-3	Toluene	18	0.71	4.9	0.19	
591-78-6	2-Hexanone	ND	0.71	ND	0.17	
124-48-1	Dibromochloromethane	ND	0.71	ND	0.083	
106-93-4	1,2-Dibromoethane	ND	0.71	ND	0.092	
123-86-4	n-Butyl Acetate	ND	0.72	ND	0.15	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

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Client: **Bhate Environmental Associates, Inc.**Client Sample ID: **LH18/24-Air_121619_Downwind_North**Client Project ID: **LHAAP GWTP / NW01312.0150**

ALS Project ID: P1907777

ALS Sample ID: P1907777-004

Test Code: EPA TO-15

Date Collected: 12/17/19

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: 12/20/19

Analyst: Topacio De Leon

Date Analyzed: 1/3/20

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

0.10 Liter(s)

Container ID: AC02125

Initial Pressure (psig): -0.01 Final Pressure (psig): 4.59

Canister Dilution Factor: 1.31

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	1.4	0.71	0.31	0.15	
127-18-4	Tetrachloroethene	ND	0.68	ND	0.10	
108-90-7	Chlorobenzene	ND	0.71	ND	0.15	
100-41-4	Ethylbenzene	2.8	0.71	0.65	0.16	
179601-23-1	m,p-Xylenes	9.0	1.4	2.1	0.33	
75-25-2	Bromoform	ND	0.71	ND	0.068	
100-42-5	Styrene	0.77	0.69	0.18	0.16	
95-47-6	o-Xylene	3.1	0.71	0.71	0.16	
111-84-2	n-Nonane	1.3	0.71	0.24	0.13	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.71	ND	0.10	
98-82-8	Cumene	ND	0.71	ND	0.14	
80-56-8	alpha-Pinene	2.4	0.71	0.44	0.13	
103-65-1	n-Propylbenzene	ND	0.71	ND	0.14	
622-96-8	4-Ethyltoluene	0.80	0.71	0.16	0.14	
108-67-8	1,3,5-Trimethylbenzene	ND	0.69	ND	0.14	
95-63-6	1,2,4-Trimethylbenzene	2.4	0.71	0.50	0.14	
100-44-7	Benzyl Chloride	ND	1.4	ND	0.28	
541-73-1	1,3-Dichlorobenzene	ND	0.71	ND	0.12	
106-46-7	1,4-Dichlorobenzene	ND	0.71	ND	0.12	
95-50-1	1,2-Dichlorobenzene	ND	0.71	ND	0.12	
5989-27-5	d-Limonene	1.5	0.71	0.27	0.13	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.69	ND	0.072	
120-82-1	1,2,4-Trichlorobenzene	ND	0.71	ND	0.095	
91-20-3	Naphthalene	ND	0.68	ND	0.13	
87-68-3	Hexachlorobutadiene	ND	0.69	ND	0.065	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: Bhate Environmental Associates, Inc.**Client Sample ID:** Method Blank**Client Project ID:** LHAAP GWTP / NW01312.0150

ALS Project ID: P1907777

ALS Sample ID: P200103-MB

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: NA

Analyst: Topacio De Leon

Date Analyzed: 1/3/20

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result	MRL	Result	MRL	Data Qualifier
		µg/m ³	µg/m ³	ppbV	ppbV	
115-07-1	Propene	ND	0.53	ND	0.31	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.53	ND	0.11	
74-87-3	Chloromethane	ND	0.53	ND	0.26	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.53	ND	0.076	
75-01-4	Vinyl Chloride	ND	0.54	ND	0.21	
106-99-0	1,3-Butadiene	ND	0.53	ND	0.24	
74-83-9	Bromomethane	ND	0.54	ND	0.14	
75-00-3	Chloroethane	ND	0.54	ND	0.20	
64-17-5	Ethanol	ND	5.2	ND	2.8	
75-05-8	Acetonitrile	ND	0.53	ND	0.32	
107-02-8	Acrolein	ND	1.0	ND	0.44	
67-64-1	Acetone	ND	5.3	ND	2.2	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	0.53	ND	0.094	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	2.1	ND	0.85	
107-13-1	Acrylonitrile	ND	0.53	ND	0.24	
75-35-4	1,1-Dichloroethene	ND	0.54	ND	0.14	
75-09-2	Methylene Chloride	ND	0.53	ND	0.15	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.54	ND	0.17	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	0.54	ND	0.070	
75-15-0	Carbon Disulfide	ND	1.1	ND	0.35	
156-60-5	trans-1,2-Dichloroethene	ND	0.54	ND	0.14	
75-34-3	1,1-Dichloroethane	ND	0.55	ND	0.14	
1634-04-4	Methyl tert-Butyl Ether	ND	0.54	ND	0.15	
108-05-4	Vinyl Acetate	ND	5.4	ND	1.5	
78-93-3	2-Butanone (MEK)	ND	1.1	ND	0.37	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: Bhate Environmental Associates, Inc.**Client Sample ID:** Method Blank**Client Project ID:** LHAAP GWTP / NW01312.0150

ALS Project ID: P1907777

ALS Sample ID: P200103-MB

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: NA

Analyst: Topacio De Leon

Date Analyzed: 1/3/20

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.53	ND	0.13	
141-78-6	Ethyl Acetate	ND	1.1	ND	0.31	
110-54-3	n-Hexane	ND	0.54	ND	0.15	
67-66-3	Chloroform	ND	0.54	ND	0.11	
109-99-9	Tetrahydrofuran (THF)	ND	0.55	ND	0.19	
107-06-2	1,2-Dichloroethane	ND	0.54	ND	0.13	
71-55-6	1,1,1-Trichloroethane	ND	0.54	ND	0.099	
71-43-2	Benzene	ND	0.53	ND	0.17	
56-23-5	Carbon Tetrachloride	ND	0.53	ND	0.084	
110-82-7	Cyclohexane	ND	1.1	ND	0.32	
78-87-5	1,2-Dichloropropane	ND	0.54	ND	0.12	
75-27-4	Bromodichloromethane	ND	0.54	ND	0.081	
79-01-6	Trichloroethene	ND	0.54	ND	0.10	
123-91-1	1,4-Dioxane	ND	0.54	ND	0.15	
80-62-6	Methyl Methacrylate	ND	1.1	ND	0.27	
142-82-5	n-Heptane	ND	0.54	ND	0.13	
10061-01-5	cis-1,3-Dichloropropene	ND	0.52	ND	0.11	
108-10-1	4-Methyl-2-pentanone	ND	0.53	ND	0.13	
10061-02-6	trans-1,3-Dichloropropene	ND	0.53	ND	0.12	
79-00-5	1,1,2-Trichloroethane	ND	0.54	ND	0.099	
108-88-3	Toluene	ND	0.54	ND	0.14	
591-78-6	2-Hexanone	ND	0.54	ND	0.13	
124-48-1	Dibromochloromethane	ND	0.54	ND	0.063	
106-93-4	1,2-Dibromoethane	ND	0.54	ND	0.070	
123-86-4	n-Butyl Acetate	ND	0.55	ND	0.12	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: Bhate Environmental Associates, Inc.**Client Sample ID:** Method Blank**Client Project ID:** LHAAP GWTP / NW01312.0150

ALS Project ID: P1907777

ALS Sample ID: P200103-MB

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: NA

Analyst: Topacio De Leon

Date Analyzed: 1/3/20

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.54	ND	0.12	
127-18-4	Tetrachloroethene	ND	0.52	ND	0.077	
108-90-7	Chlorobenzene	ND	0.54	ND	0.12	
100-41-4	Ethylbenzene	ND	0.54	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.1	ND	0.25	
75-25-2	Bromoform	ND	0.54	ND	0.052	
100-42-5	Styrene	ND	0.53	ND	0.12	
95-47-6	o-Xylene	ND	0.54	ND	0.12	
111-84-2	n-Nonane	ND	0.54	ND	0.10	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.54	ND	0.079	
98-82-8	Cumene	ND	0.54	ND	0.11	
80-56-8	alpha-Pinene	ND	0.54	ND	0.097	
103-65-1	n-Propylbenzene	ND	0.54	ND	0.11	
622-96-8	4-Ethyltoluene	ND	0.54	ND	0.11	
108-67-8	1,3,5-Trimethylbenzene	ND	0.53	ND	0.11	
95-63-6	1,2,4-Trimethylbenzene	ND	0.54	ND	0.11	
100-44-7	Benzyl Chloride	ND	1.1	ND	0.21	
541-73-1	1,3-Dichlorobenzene	ND	0.54	ND	0.090	
106-46-7	1,4-Dichlorobenzene	ND	0.54	ND	0.090	
95-50-1	1,2-Dichlorobenzene	ND	0.54	ND	0.090	
5989-27-5	d-Limonene	ND	0.54	ND	0.097	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.53	ND	0.055	
120-82-1	1,2,4-Trichlorobenzene	ND	0.54	ND	0.073	
91-20-3	Naphthalene	ND	0.52	ND	0.099	
87-68-3	Hexachlorobutadiene	ND	0.53	ND	0.050	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

SURROGATE SPIKE RECOVERY RESULTS

Page 1 of 1

Client: Bhate Environmental Associates, Inc.
Client Project ID: LHAAP GWTP / NW01312.0150

ALS Project ID: P1907777

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Topacio De Leon
Sample Type: 6.0 L Summa Canister(s) / 6.0 L Silonite Canister(s)
Test Notes:

Date(s) Collected: 12/16 - 12/17/19

Date(s) Received: 12/20/19

Date(s) Analyzed: 1/3/20

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4	Toluene-d8	Bromofluorobenzene	Acceptance Limits	Data Qualifier
		Percent Recovered	Percent Recovered	Percent Recovered		
Method Blank	P200103-MB	89	99	112	70-130	
Lab Control Sample	P200103-LCS	86	99	116	70-130	
LH18/24-Air_121619_Stripper	P1907777-001	85	97	111	70-130	
LH18/24-Air_121619_Stripper_a	P1907777-002	85	97	111	70-130	
LH18/24-Air_121619_GWTP	P1907777-003	92	97	110	70-130	
LH18/24-Air_121619_Downwind_North	P1907777-004	91	98	111	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 3

Client: Bhate Environmental Associates, Inc.**Client Sample ID:** Lab Control Sample**Client Project ID:** LHAAP GWTP / NW01312.0150

ALS Project ID: P1907777

ALS Sample ID: P200103-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: NA

Analyst: Topacio De Leon

Date Analyzed: 1/3/20

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount µg/m ³	Result µg/m ³	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
115-07-1	Propene	210	194	92	51-133	
75-71-8	Dichlorodifluoromethane (CFC 12)	210	167	80	64-115	
74-87-3	Chloromethane	212	135	64	49-127	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	206	152	74	65-114	
75-01-4	Vinyl Chloride	212	174	82	61-129	
106-99-0	1,3-Butadiene	212	203	96	54-140	
74-83-9	Bromomethane	212	182	86	68-120	
75-00-3	Chloroethane	214	199	93	63-123	
64-17-5	Ethanol	1,060	928	88	49-134	
75-05-8	Acetonitrile	214	208	97	50-137	
107-02-8	Acrolein	206	200	97	62-128	
67-64-1	Acetone	1,070	879	82	56-125	
75-69-4	Trichlorofluoromethane (CFC 11)	212	164	77	64-115	
67-63-0	2-Propanol (Isopropyl Alcohol)	422	402	95	57-133	
107-13-1	Acrylonitrile	212	211	100	64-136	
75-35-4	1,1-Dichloroethene	214	192	90	67-115	
75-09-2	Methylene Chloride	210	184	88	68-114	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	214	202	94	55-139	
76-13-1	Trichlorotrifluoroethane (CFC 113)	216	202	94	65-115	
75-15-0	Carbon Disulfide	212	173	82	68-113	
156-60-5	trans-1,2-Dichloroethene	214	195	91	65-122	
75-34-3	1,1-Dichloroethane	212	185	87	63-118	
1634-04-4	Methyl tert-Butyl Ether	214	142	66	57-131	
108-05-4	Vinyl Acetate	1,070	862	81	71-128	
78-93-3	2-Butanone (MEK)	212	197	93	67-123	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result. Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 3

Client: Bhate Environmental Associates, Inc.**Client Sample ID:** Lab Control Sample**Client Project ID:** LHAAP GWTP / NW01312.0150

ALS Project ID: P1907777

ALS Sample ID: P200103-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: NA

Analyst: Topacio De Leon

Date Analyzed: 1/3/20

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount µg/m ³	Result µg/m ³	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
156-59-2	cis-1,2-Dichloroethene	212	185	87	64-120	
141-78-6	Ethyl Acetate	432	383	89	64-131	
110-54-3	n-Hexane	216	186	86	58-125	
67-66-3	Chloroform	214	173	81	65-114	
109-99-9	Tetrahydrofuran (THF)	220	192	87	65-115	
107-06-2	1,2-Dichloroethane	214	163	76	59-119	
71-55-6	1,1,1-Trichloroethane	214	172	80	66-115	
71-43-2	Benzene	210	168	80	66-109	
56-23-5	Carbon Tetrachloride	208	167	80	66-119	
110-82-7	Cyclohexane	422	354	84	67-117	
78-87-5	1,2-Dichloropropane	214	190	89	66-119	
75-27-4	Bromodichloromethane	218	174	80	71-119	
79-01-6	Trichloroethene	216	184	85	70-114	
123-91-1	1,4-Dioxane	216	192	89	71-117	
80-62-6	Methyl Methacrylate	430	384	89	76-121	
142-82-5	n-Heptane	214	187	87	66-119	
10061-01-5	cis-1,3-Dichloropropene	214	203	95	72-125	
108-10-1	4-Methyl-2-pentanone	212	198	93	68-130	
10061-02-6	trans-1,3-Dichloropropene	212	201	95	71-132	
79-00-5	1,1,2-Trichloroethane	214	185	86	70-117	
108-88-3	Toluene	212	185	87	67-113	
591-78-6	2-Hexanone	216	205	95	62-135	
124-48-1	Dibromochloromethane	214	199	93	73-126	
106-93-4	1,2-Dibromoethane	214	195	91	71-122	
123-86-4	n-Butyl Acetate	218	214	98	65-134	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 3 of 3

Client: Bhate Environmental Associates, Inc.**Client Sample ID:** Lab Control Sample**Client Project ID:** LHAAP GWTP / NW01312.0150

ALS Project ID: P1907777

ALS Sample ID: P200103-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: NA

Analyst: Topacio De Leon

Date Analyzed: 1/3/20

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount µg/m ³	Result µg/m ³	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
111-65-9	n-Octane	216	202	94	63-120	
127-18-4	Tetrachloroethene	208	192	92	64-120	
108-90-7	Chlorobenzene	214	187	87	65-116	
100-41-4	Ethylbenzene	212	189	89	65-117	
179601-23-1	m,p-Xylenes	426	372	87	64-121	
75-25-2	Bromoform	214	193	90	72-130	
100-42-5	Styrene	212	208	98	72-126	
95-47-6	o-Xylene	214	184	86	64-120	
111-84-2	n-Nonane	214	201	94	56-132	
79-34-5	1,1,2,2-Tetrachloroethane	214	181	85	66-122	
98-82-8	Cumene	214	190	89	64-121	
80-56-8	alpha-Pinene	212	194	92	62-136	
103-65-1	n-Propylbenzene	214	192	90	65-123	
622-96-8	4-Ethyltoluene	210	189	90	71-126	
108-67-8	1,3,5-Trimethylbenzene	212	193	91	65-120	
95-63-6	1,2,4-Trimethylbenzene	212	181	85	63-129	
100-44-7	Benzyl Chloride	214	176	82	66-138	
541-73-1	1,3-Dichlorobenzene	214	199	93	65-127	
106-46-7	1,4-Dichlorobenzene	214	204	95	65-125	
95-50-1	1,2-Dichlorobenzene	214	186	87	67-128	
5989-27-5	d-Limonene	212	193	91	65-136	
96-12-8	1,2-Dibromo-3-chloropropane	214	196	92	73-133	
120-82-1	1,2,4-Trichlorobenzene	216	201	93	62-140	
91-20-3	Naphthalene	212	186	88	57-149	
87-68-3	Hexachlorobutadiene	214	235	110	57-129	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: Bhate Environmental Associates, Inc.
Client Project ID: LHAAP GWTP / NW01312.0150

ALS Project ID: P1907777

Internal Standard Area and RT Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Topacio De Leon
Sample Type: 6.0 L Summa Canister(s)
Test Notes:

Lab File ID: 01032002.D
Date Analyzed: 1/3/20
Time Analyzed: 02:04

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
24 Hour Standard	173945	11.24	802852	13.36	379243	17.67
Upper Limit	243523	11.57	1123993	13.69	530940	18.00
Lower Limit	104367	10.91	481711	13.03	227546	17.34

Client Sample ID		IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
01	Method Blank	164627	11.22	781429	13.35	371381	17.67
02	Lab Control Sample	178581	11.24	815742	13.36	382586	17.67
03	LH18/24-Air_121619_Stripper	185501	11.23	823968	13.35	398240	17.67
04	LH18/24-Air_121619_Stripper_a	182521	11.23	812199	13.35	394801	17.67
05	LH18/24-Air_121619_GWTP	156419	11.22	746752	13.35	368015	17.67
06	LH18/24-Air_121619_Downwind_North	158138	11.23	749267	13.36	366433	17.67
07	LH18/24-Air_121619_Downwind_North (Dilutio	160451	11.22	743299	13.35	360165	17.67
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS1 (BCM) = Bromochloromethane

IS2 (DFB) = 1,4-Difluorobenzene

IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = 140% of internal standard area

AREA LOWER LIMIT = 60% of internal standard area

RT UPPER LIMIT = 0.33 minutes of internal standard RT

RT LOWER LIMIT = 0.33 minutes of internal standard RT

Column used to flag values outside QC limits with an I.

I = Internal standard not within the specified limits.

Data File : I:\MS13\DATA\2020 01\03\01032013.D
 Acq On : 3 Jan 2020 12:32
 Sample : P1907777-001 (5.0mL)
 Misc : S31-10251901

Vial: 3
 Operator: TD
 Inst : MS13

TD 1/7/20

Quant Time: Jan 07 09:39:20 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	185501	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.35	114	823968	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.67	82	398240	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	291967	10.569	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	84.56%	
57) Toluene-d8 (SS2)	15.80	98	954313	12.176	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.44%	
73) Bromofluorobenzene (SS3)	19.05	174	232243	13.856	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	110.88%	

Target Compounds

						Qvalue
2) Propene	0.00	42	0	N.D.	d	
3) Dichlorodifluoromethan...	4.32	85	2870	N.D.		
4) Chloromethane	0.00	50	0	N.D.	d	
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	5.01	62	95486	2.651	ng	99
7) 1,3-Butadiene	5.39	54	171	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.60	45	108	N.D.		
11) Acetonitrile	6.72	41	6248	N.D.		
12) Acrolein	6.92	56	1321	N.D.		
13) Acetone	7.10	58	127433	7.023	ng	94
14) Trichlorofluoromethane	7.33	101	1197	N.D.		
15) 2-Propanol (Isopropanol)	7.60	45	78637	1.393	ng	100
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	8.29	96	24612	1.291	ng	96
18) 2-Methyl-2-Propanol (t...	8.56	59	2047	N.D.		
19) Methylene Chloride	8.49	84	315129	15.096	ng	99
20) 3-Chloro-1-propene (Al...	8.59	41	322	N.D.		
21) Trichlorotrifluoroethane	8.94	151	1493144	99.006	ng	93
22) Carbon Disulfide	8.77	76	307837	3.804	ng	99
23) trans-1,2-Dichloroethene	9.78	61	6552	N.D.		
24) 1,1-Dichloroethane	10.04	63	7038	N.D.		
25) Methyl tert-Butyl Ether	10.18	73	334	N.D.		
26) Vinyl Acetate	10.29	86	1446	N.D.		
27) 2-Butanone (MEK)	10.58	72	9624	0.658	ng	93
28) cis-1,2-Dichloroethene	11.05	61	2053583	67.963	ng	99
29) Diisopropyl Ether	11.39	87	901	N.D.		
30) Ethyl Acetate	11.41	61	4330m	0.513	ng	
31) n-Hexane	11.34	57	2984	N.D.		
32) Chloroform	11.39	83	9110	N.D.		
34) Tetrahydrofuran (THF)	11.85	72	12485	0.854	ng	# 85
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.20	62	23684	0.791	ng	99
38) 1,1,1-Trichloroethane	12.49	97	907	N.D.		
39) Isopropyl Acetate	12.82	61	426	N.D.		
40) 1-Butanol	12.98	56	8969	N.D.		
41) Benzene	12.96	78	12494	N.D.		
42) Carbon Tetrachloride	13.12	117	2072	N.D.		
43) Cyclohexane	13.25	84	3425	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.	d	
47) Trichloroethene	14.06	130	2207311	101.166	ng	99
48) 1,4-Dioxane	14.14	88	106	N.D.		
49) 2,2,4-Trimethylpentane...	14.13	57	13690	N.D.		
50) Methyl Methacrylate	0.00	100	0	N.D.	d	

Data File : I:\MS13\DATA\2020 01\03\01032013.D
 Acq On : 3 Jan 2020 12:32
 Sample : P1907777-001 (5.0mL)
 Misc : S31-10251901

Vial: 3
 Operator: TD
 Inst : MS13

Quant Time: Jan 07 09:39:20 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

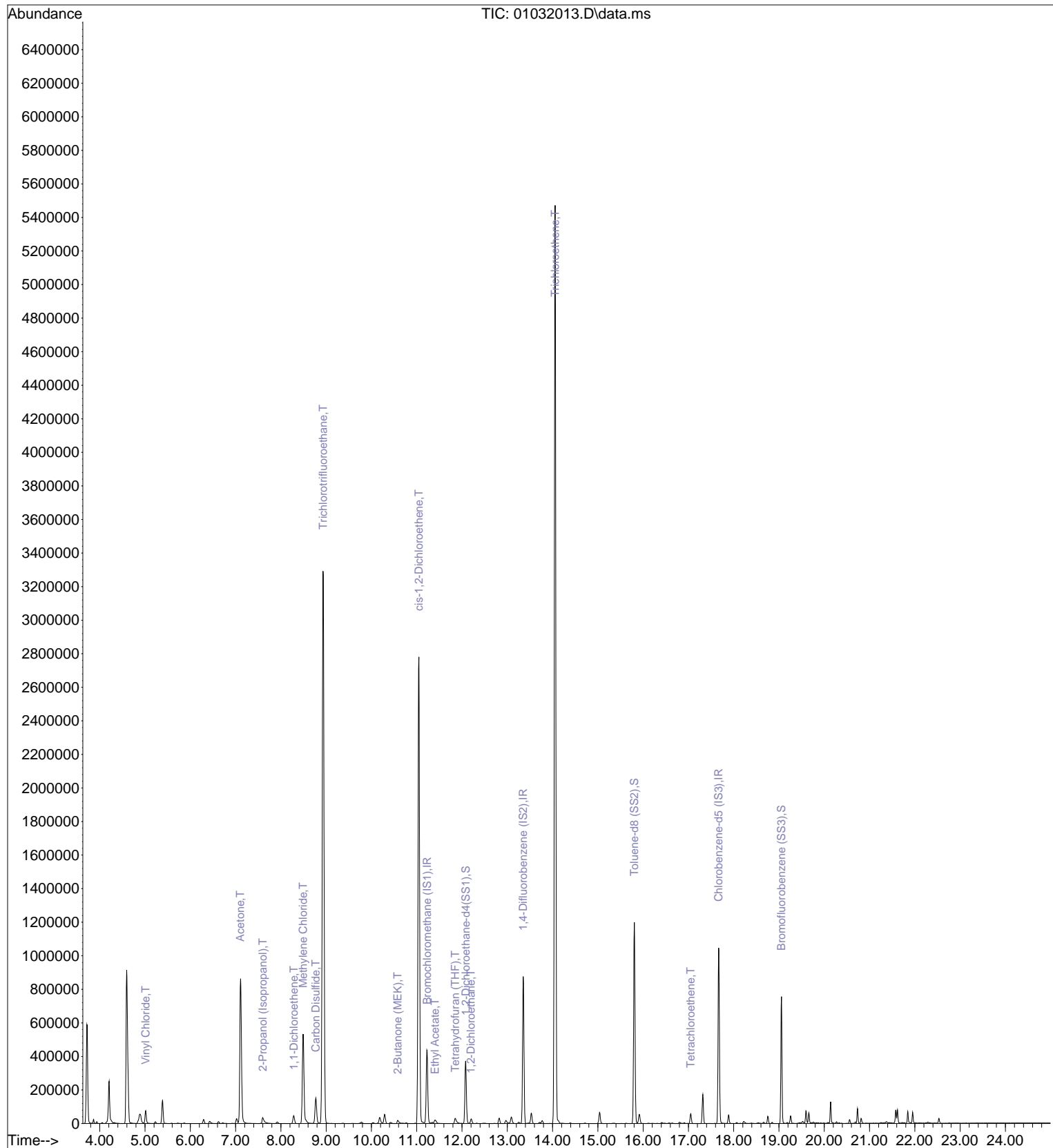
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	900	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	15.02	58	367	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	15.62	97	919	N.D.		
58) Toluene	15.91	91	27674	N.D.		
59) 2-Hexanone	16.11	43	2417	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.81	43	9183	N.D.		
63) n-Octane	16.91	57	829	N.D.		
64) Tetrachloroethene	17.05	166	21334	0.981 ng		99
65) Chlorobenzene	17.71	112	473	N.D.		
66) Ethylbenzene	18.07	91	5576	N.D.		
67) m- & p-Xylenes	18.22	91	11084	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.57	104	626	N.D.		
70) o-Xylene	18.66	91	3029	N.D.		
71) n-Nonane	18.84	43	3115	N.D.		
72) 1,1,2,2-Tetrachloroethane	18.76	83	484	N.D.		
74) Cumene	19.19	105	3843	N.D.		
75) alpha-Pinene	19.53	93	3124	N.D.		
76) n-Propylbenzene	19.66	91	41275	N.D.		
77) 3-Ethyltoluene	19.72	105	1863	N.D.		
78) 4-Ethyltoluene	19.76	105	1156	N.D.		
79) 1,3,5-Trimethylbenzene	19.83	105	1161	N.D.		
80) alpha-Methylstyrene	19.96	118	110	N.D.		
81) 2-Ethyltoluene	20.00	105	951	N.D.		
82) 1,2,4-Trimethylbenzene	20.19	105	2246	N.D.		
83) n-Decane	20.27	57	3291	N.D.		
84) Benzyl Chloride	20.31	91	570	N.D.		
85) 1,3-Dichlorobenzene	20.32	146	242	N.D.		
86) 1,4-Dichlorobenzene	20.38	146	975	N.D.		
87) sec-Butylbenzene	20.42	105	194	N.D.		
88) 4-Isopropyltoluene (p-...	20.56	119	13243	N.D.		
89) 1,2,3-Trimethylbenzene	20.56	105	1281	N.D.		
90) 1,2-Dichlorobenzene	20.69	146	192	N.D.		
91) d-Limonene	20.68	68	2236	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	21.37	57	5382	N.D.		
94) 1,2,4-Trichlorobenzene	22.20	180	356	N.D.		
95) Naphthalene	22.31	128	3156	N.D.		
96) n-Dodecane	22.29	57	1805	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	18.39	55	729	N.D.		
99) tert-Butylbenzene	20.14	119	3423	N.D.		
100) n-Butylbenzene	20.92	91	742	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2020 01\03\01032013.D
 Acq On : 3 Jan 2020 12:32
 Sample : P1907777-001 (5.0mL)
 Misc : S31-10251901

Vial: 3
 Operator: TD
 Inst : MS13

Quant Time: Jan 07 09:39:20 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2020 01\03\01032013.D
 Acq On : 3 Jan 2020 12:32
 Sample : P1907777-001 (5.0mL)
 Misc : S31-10251901

Vial: 3
 Operator: TD
 Inst : MS13

TD 1/7/20

Quant Time: Jan 07 09:39:20 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	185501	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.35	114	823968	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.67	82	398240	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	291967	10.569	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery =	84.56%		
57) Toluene-d8 (SS2)	15.80	98	954313	12.176	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery =	97.44%		
73) Bromofluorobenzene (SS3)	19.05	174	232243	13.856	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery =	110.88%		

Target Compounds

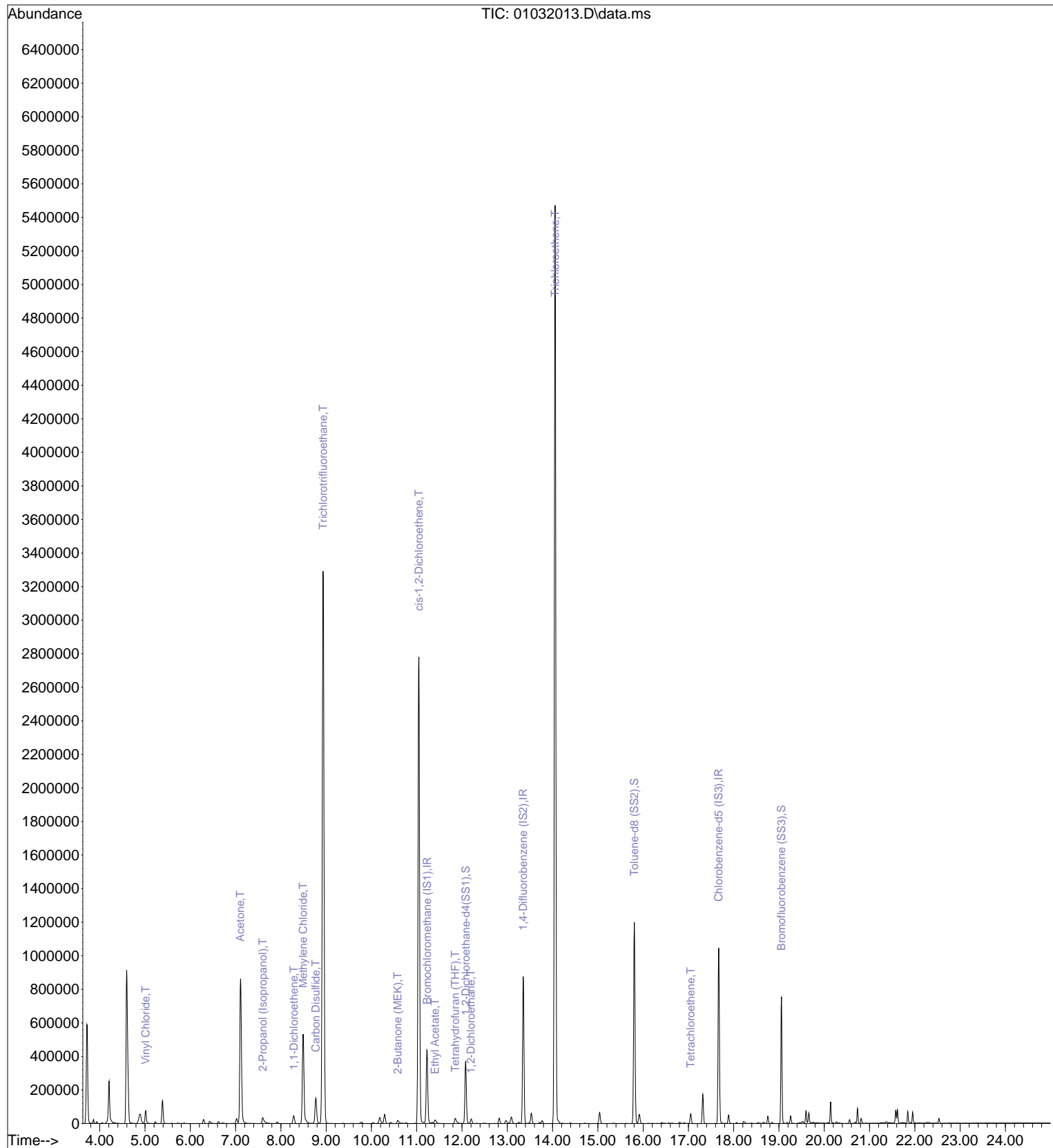
	R.T.	QIon	Response	Conc	Units	Qvalue
6) Vinyl Chloride	5.01	62	95486	2.651	ng	99
13) Acetone	7.10	58	127433	7.023	ng	94
15) 2-Propanol (Isopropanol)	7.60	45	78637	1.393	ng	100
17) 1,1-Dichloroethene	8.29	96	24612	1.291	ng	96
19) Methylene Chloride	8.49	84	315129	15.096	ng	99
21) Trichlorotrifluoroethane	8.94	151	1493144	99.006	ng	93
22) Carbon Disulfide	8.77	76	307837	3.804	ng	99
27) 2-Butanone (MEK)	10.58	72	9624	0.658	ng	93
28) cis-1,2-Dichloroethene	11.05	61	2053583	67.963	ng	99
30) Ethyl Acetate	11.41	61	4330m	0.513	ng	
34) Tetrahydrofuran (THF)	11.85	72	12485	0.854	ng	# 85
36) 1,2-Dichloroethane	12.20	62	23684	0.791	ng	99
47) Trichloroethene	14.06	130	2207311	101.166	ng	99
64) Tetrachloroethene	17.05	166	21334	0.981	ng	99

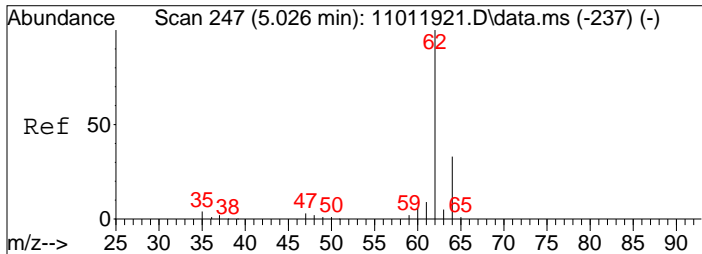
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2020 01\03\01032013.D
 Acq On : 3 Jan 2020 12:32
 Sample : P1907777-001 (5.0mL)
 Misc : S31-10251901

Vial: 3
 Operator: TD
 Inst : MS13

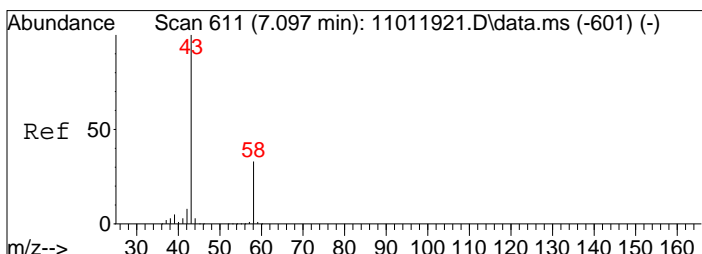
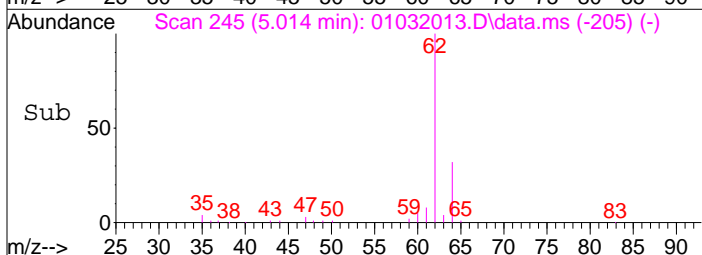
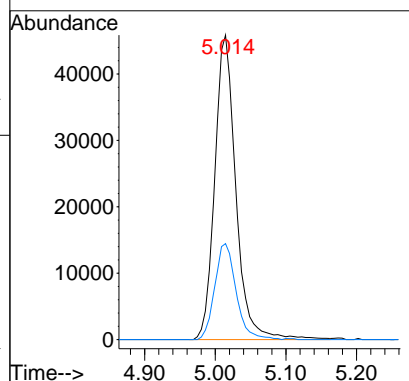
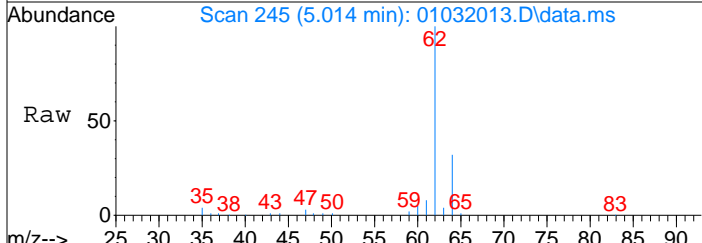
Quant Time: Jan 07 09:39:20 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M





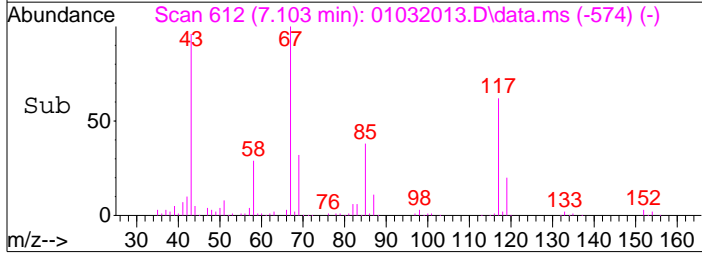
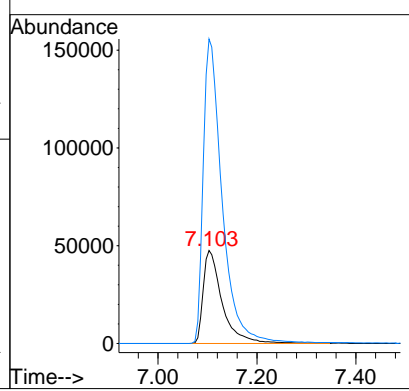
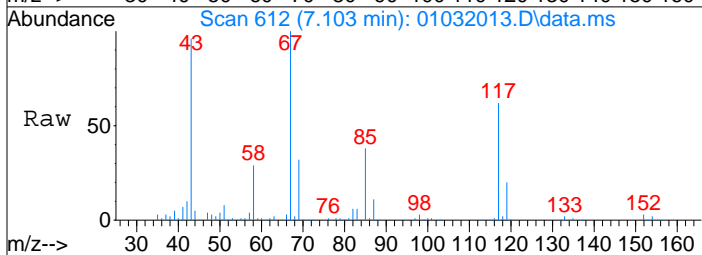
#6
 Vinyl Chloride
 Concen: 2.65 ng
 RT: 5.01 min Scan# 245
 Delta R.T. -0.023 min
 Lab File: 01032013.D
 Acq: 3 Jan 2020 12:32

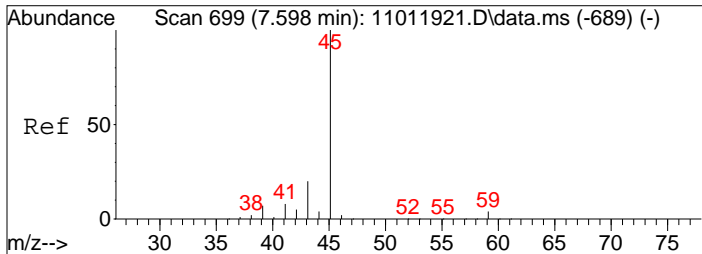
Tgt Ion	Resp	Lower	Upper
62	100		
64	31.8	12.4	52.4



#13
 Acetone
 Concen: 7.02 ng
 RT: 7.10 min Scan# 612
 Delta R.T. -0.034 min
 Lab File: 01032013.D
 Acq: 3 Jan 2020 12:32

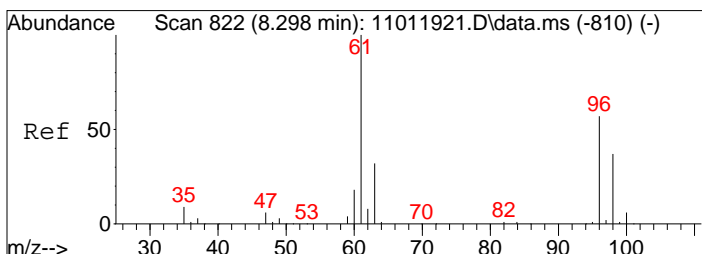
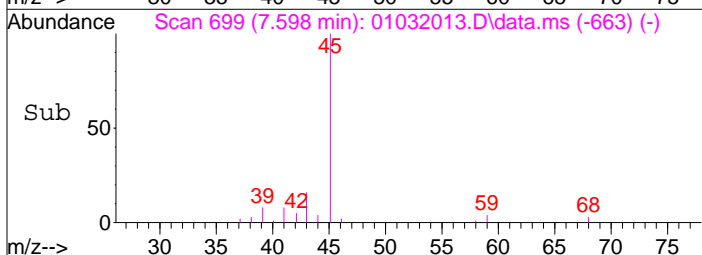
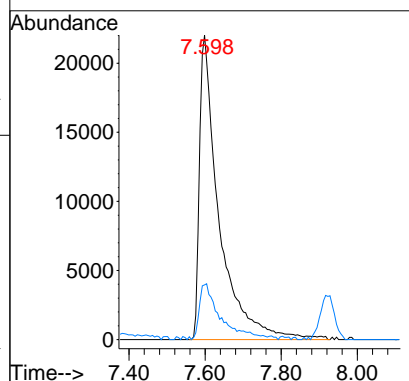
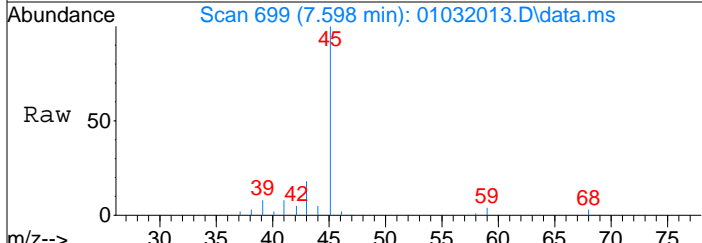
Tgt Ion	Resp	Lower	Upper
58	100		
43	326.1	284.6	344.6





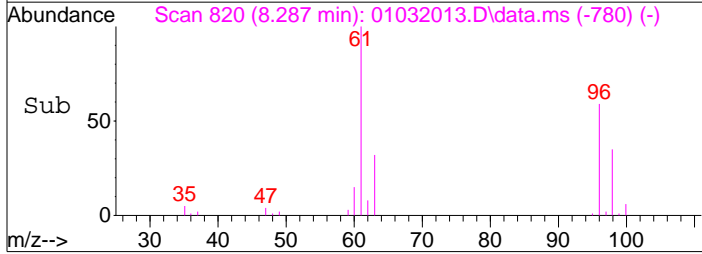
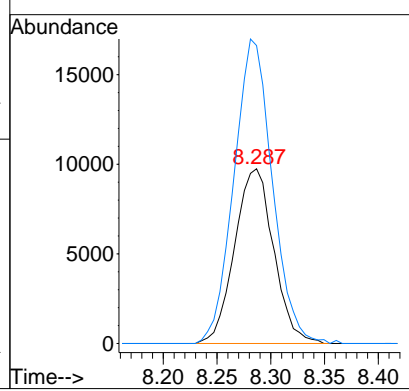
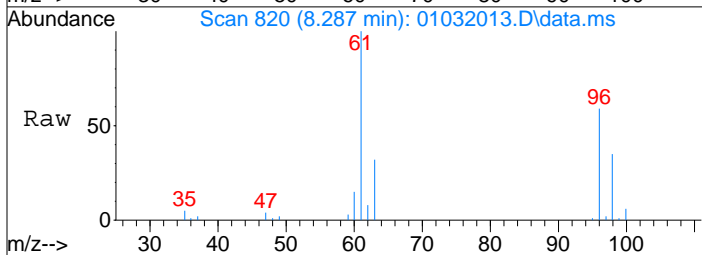
#15
 2-Propanol (Isopropanol)
 Concen: 1.39 ng
 RT: 7.60 min Scan# 699
 Delta R.T. -0.046 min
 Lab File: 01032013.D
 Acq: 3 Jan 2020 12:32

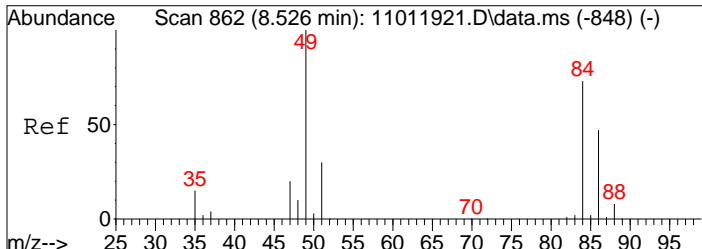
Tgt Ion	Resp	Lower	Upper
45	100		
43	20.2	0.2	40.2



#17
 1,1-Dichloroethene
 Concen: 1.29 ng
 RT: 8.29 min Scan# 820
 Delta R.T. -0.023 min
 Lab File: 01032013.D
 Acq: 3 Jan 2020 12:32

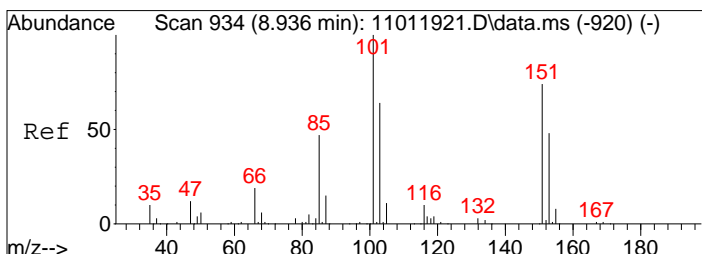
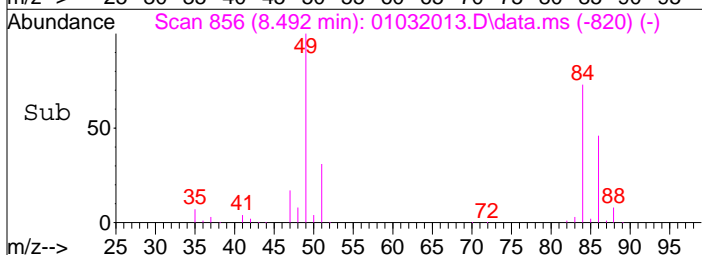
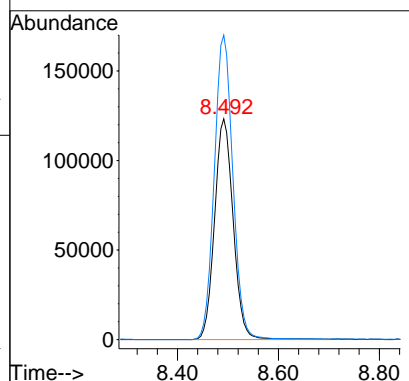
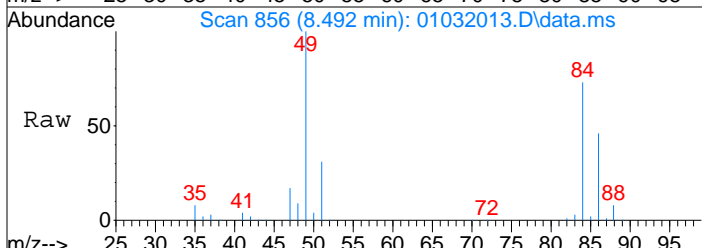
Tgt Ion	Resp	Lower	Upper
96	100		
61	171.6	156.7	196.7





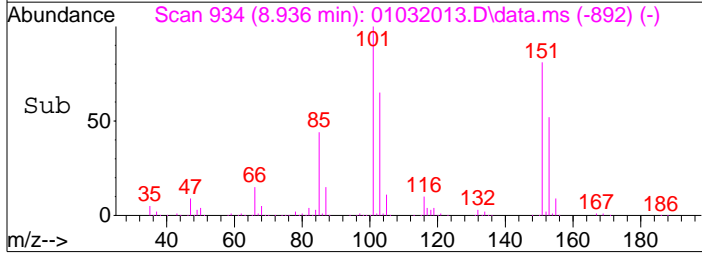
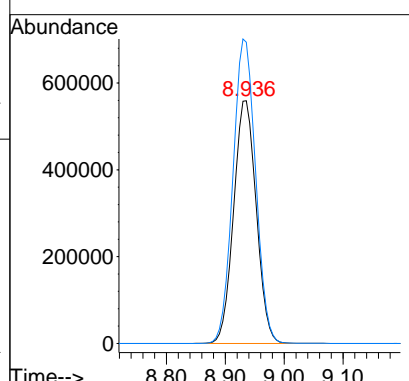
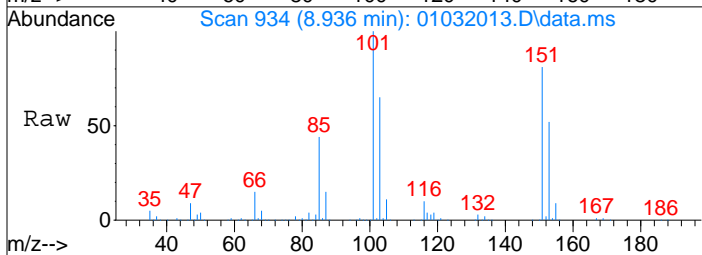
#19
 Methylene Chloride
 Concen: 15.10 ng
 RT: 8.49 min Scan# 856
 Delta R.T. -0.046 min
 Lab File: 01032013.D
 Acq: 3 Jan 2020 12:32

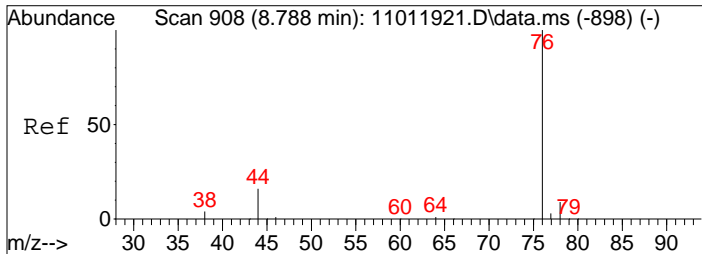
Tgt Ion	Resp	Lower	Upper
84	315129		
84	100		
49	138.3	114.0	164.0



#21
 Trichlorotrifluoroethane
 Concen: 99.01 ng
 RT: 8.94 min Scan# 934
 Delta R.T. -0.012 min
 Lab File: 01032013.D
 Acq: 3 Jan 2020 12:32

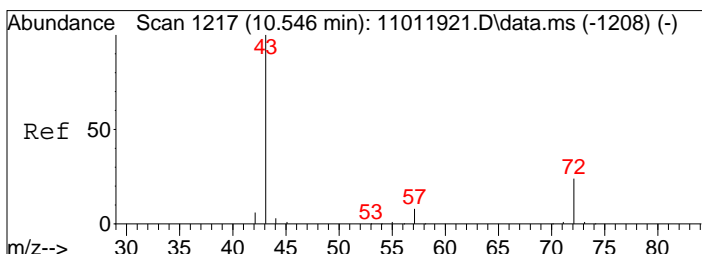
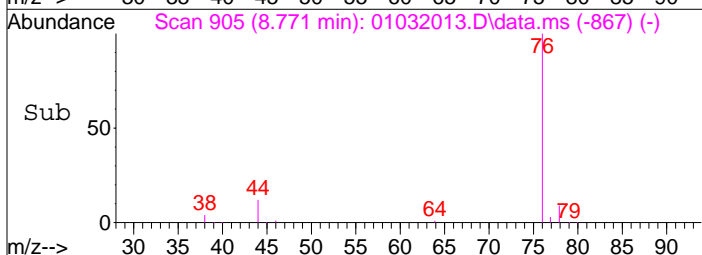
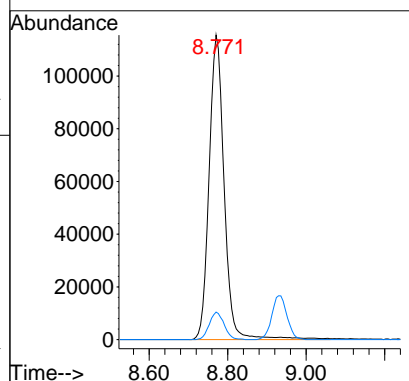
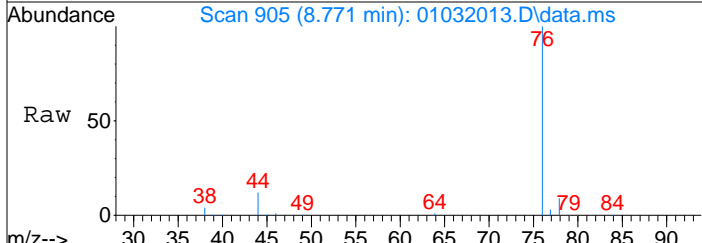
Tgt Ion	Resp	Lower	Upper
151	1493144		
151	100		
101	125.7	114.4	154.4





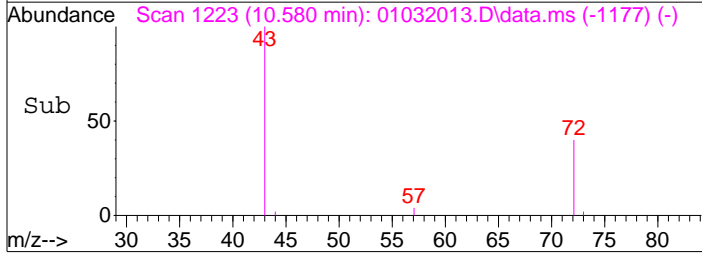
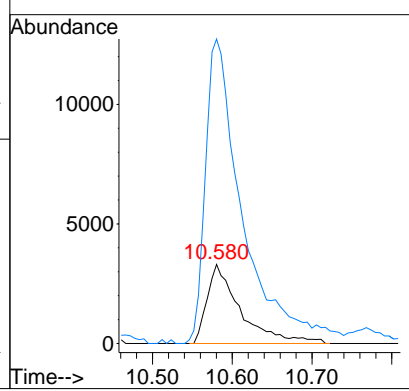
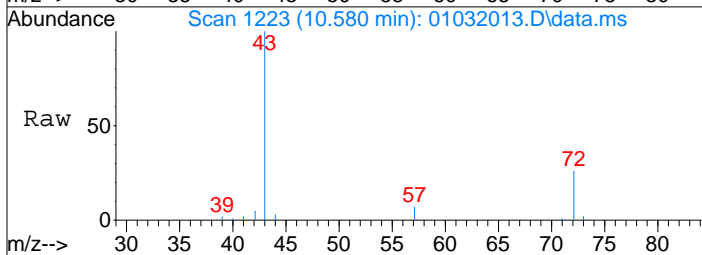
#22
 Carbon Disulfide
 Concen: 3.80 ng
 RT: 8.77 min Scan# 905
 Delta R.T. -0.034 min
 Lab File: 01032013.D
 Acq: 3 Jan 2020 12:32

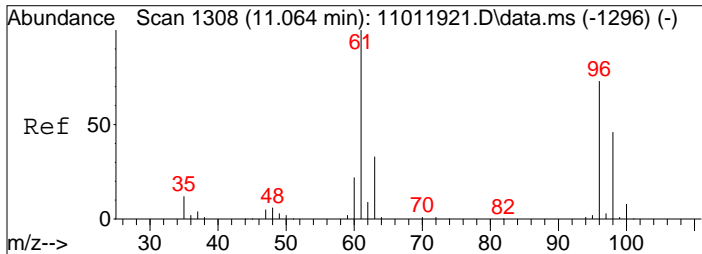
Tgt Ion	Resp	Lower	Upper
76	100		
78	8.9	0.0	29.2



#27
 2-Butanone (MEK)
 Concen: 0.66 ng
 RT: 10.58 min Scan# 1223
 Delta R.T. 0.011 min
 Lab File: 01032013.D
 Acq: 3 Jan 2020 12:32

Tgt Ion	Resp	Lower	Upper
72	100		
43	429.8	392.5	432.5

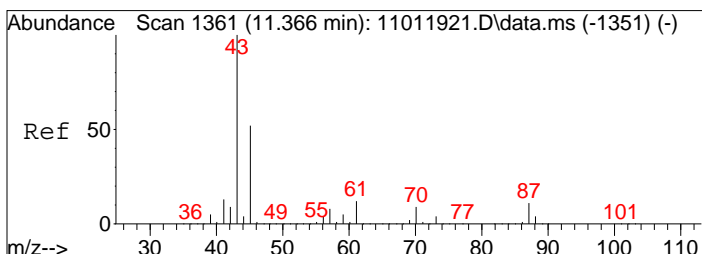
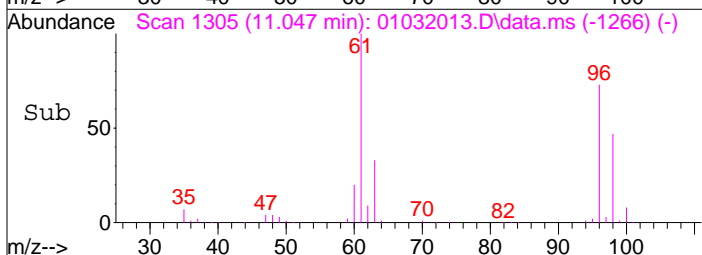
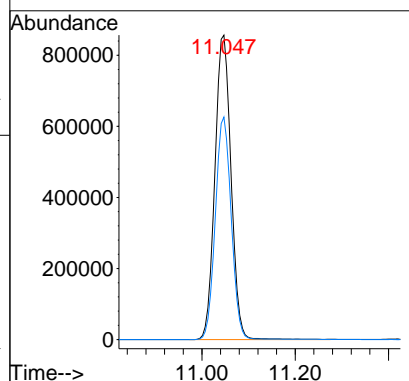
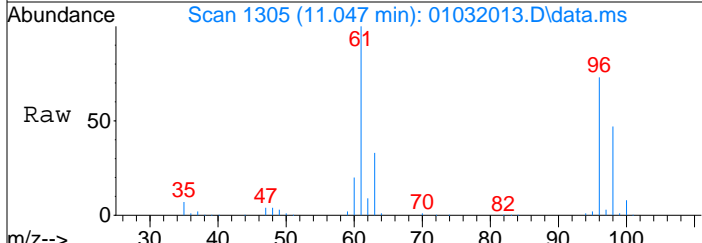




#28
 cis-1,2-Dichloroethene
 Concen: 67.96 ng
 RT: 11.05 min Scan# 1305
 Delta R.T. -0.029 min
 Lab File: 01032013.D
 Acq: 3 Jan 2020 12:32

Tgt Ion: 61 Resp: 2053583

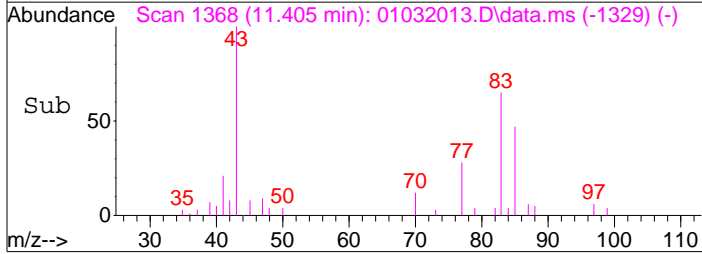
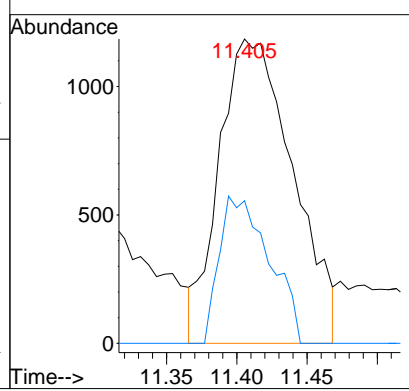
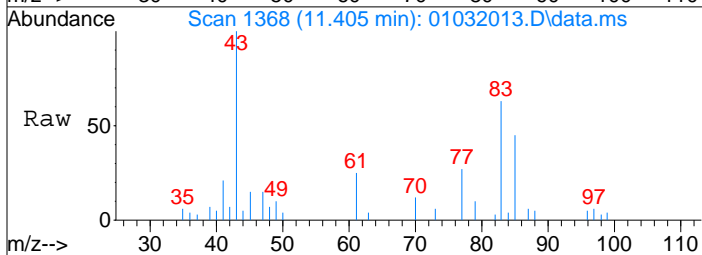
Ion	Ratio	Lower	Upper
61	100		
96	72.3	51.9	91.9

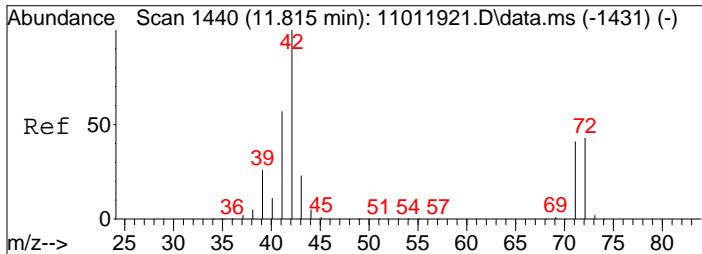


#30
 Ethyl Acetate
 Concen: 0.51 ng m
 RT: 11.41 min Scan# 1368
 Delta R.T. 0.023 min
 Lab File: 01032013.D
 Acq: 3 Jan 2020 12:32

Tgt Ion: 61 Resp: 4330

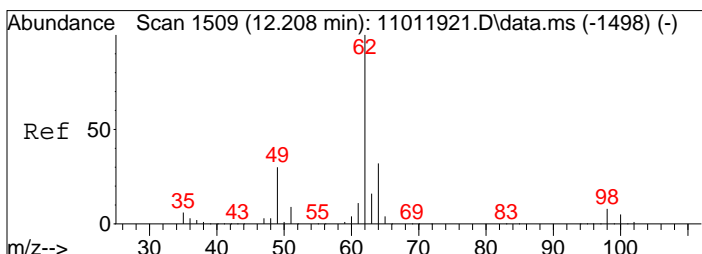
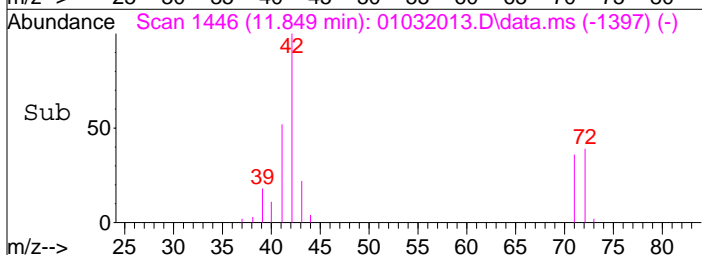
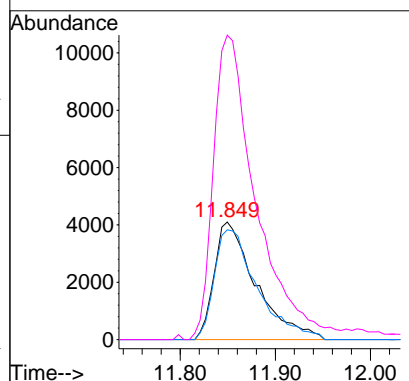
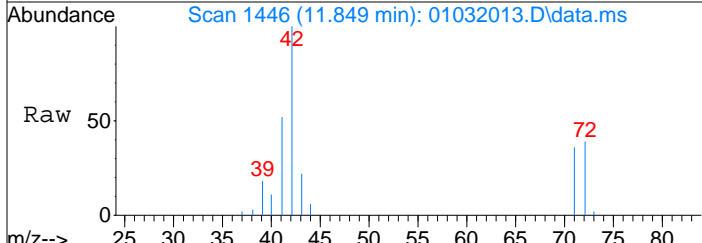
Ion	Ratio	Lower	Upper
61	100		
70	32.7	60.0	100.0#





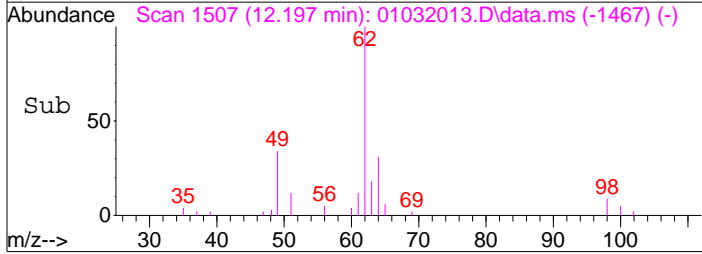
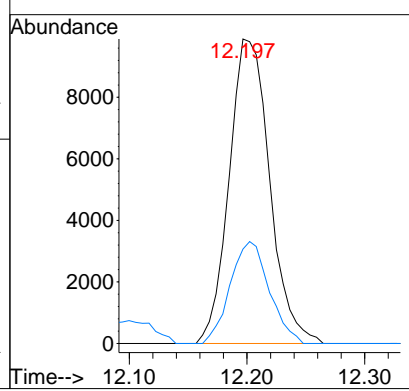
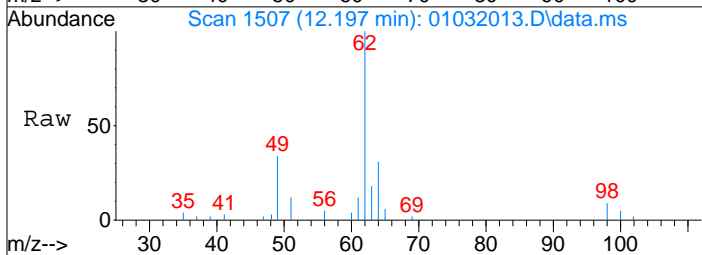
#34
 Tetrahydrofuran (THF)
 Concen: 0.85 ng
 RT: 11.85 min Scan# 1446
 Delta R.T. 0.028 min
 Lab File: 01032013.D
 Acq: 3 Jan 2020 12:32

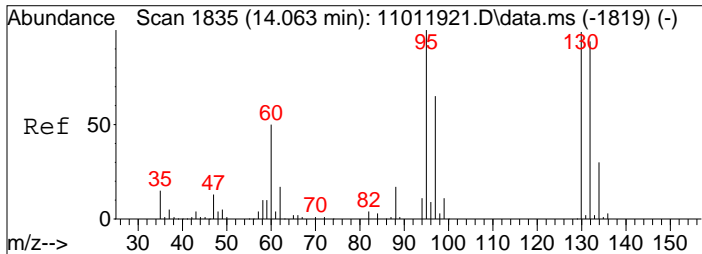
Tgt Ion	Resp	Lower	Upper
72	12485		
71	96.1	76.0	116.0
42	272.5	216.3	256.3#



#36
 1,2-Dichloroethane
 Concen: 0.79 ng
 RT: 12.20 min Scan# 1507
 Delta R.T. -0.023 min
 Lab File: 01032013.D
 Acq: 3 Jan 2020 12:32

Tgt Ion	Resp	Lower	Upper
62	23684		
64	32.2	12.6	52.6

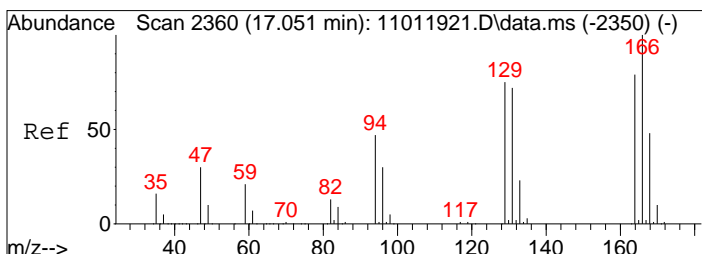
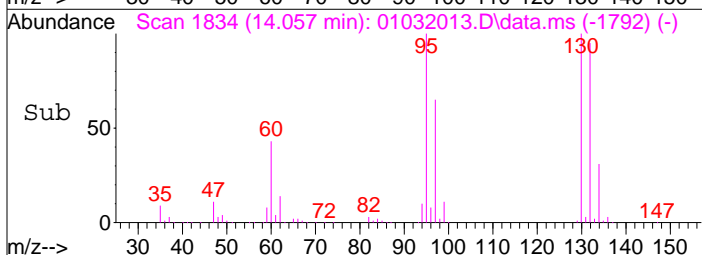
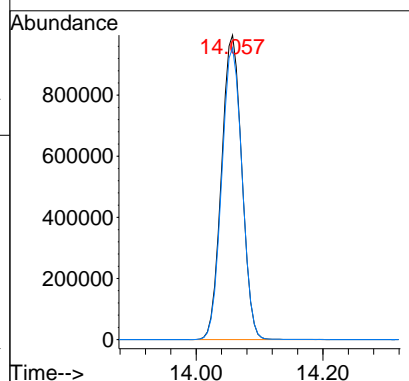
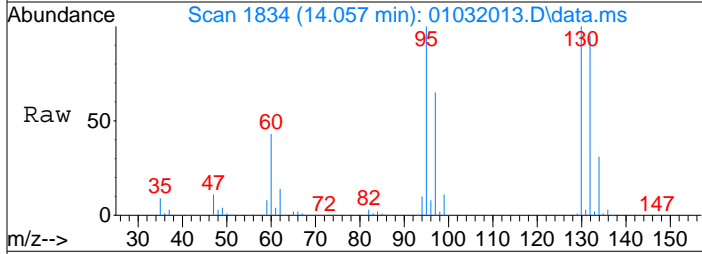




#47
 Trichloroethene
 Concen: 101.17 ng
 RT: 14.06 min Scan# 1834
 Delta R.T. -0.012 min
 Lab File: 01032013.D
 Acq: 3 Jan 2020 12:32

Tgt Ion:130 Resp: 2207311

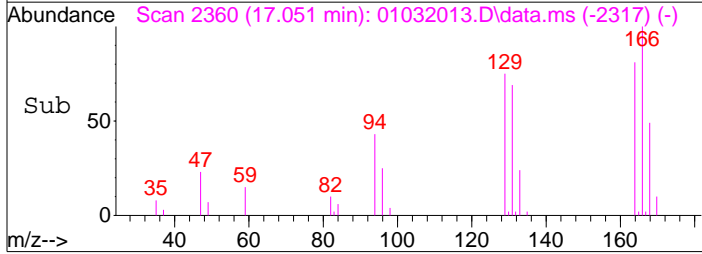
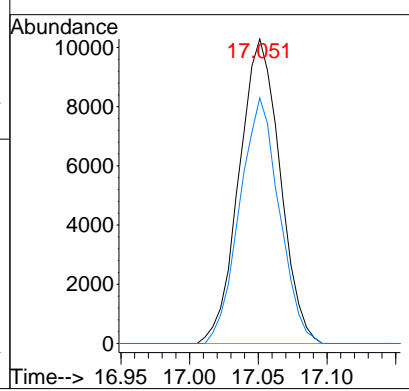
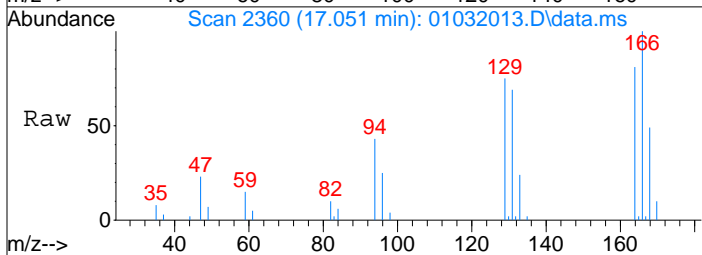
Ion	Ratio	Lower	Upper
130	100		
132	96.3	75.4	115.4



#64
 Tetrachloroethene
 Concen: 0.98 ng
 RT: 17.05 min Scan# 2360
 Delta R.T. -0.006 min
 Lab File: 01032013.D
 Acq: 3 Jan 2020 12:32

Tgt Ion:166 Resp: 21334

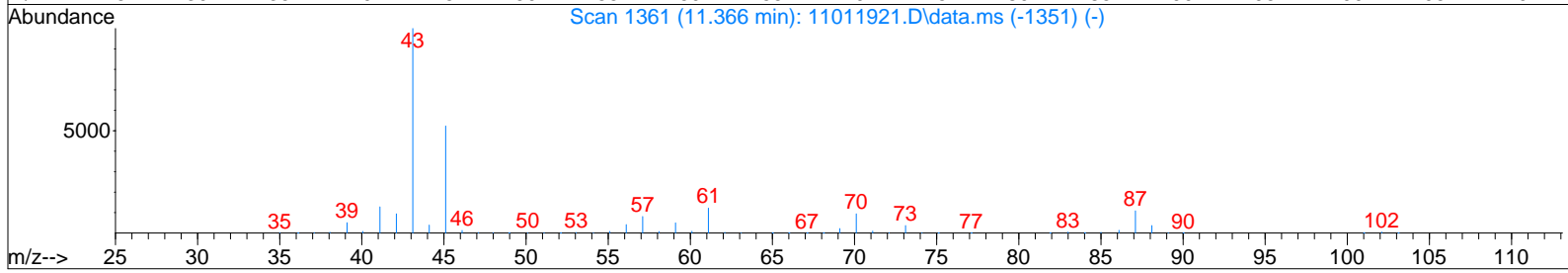
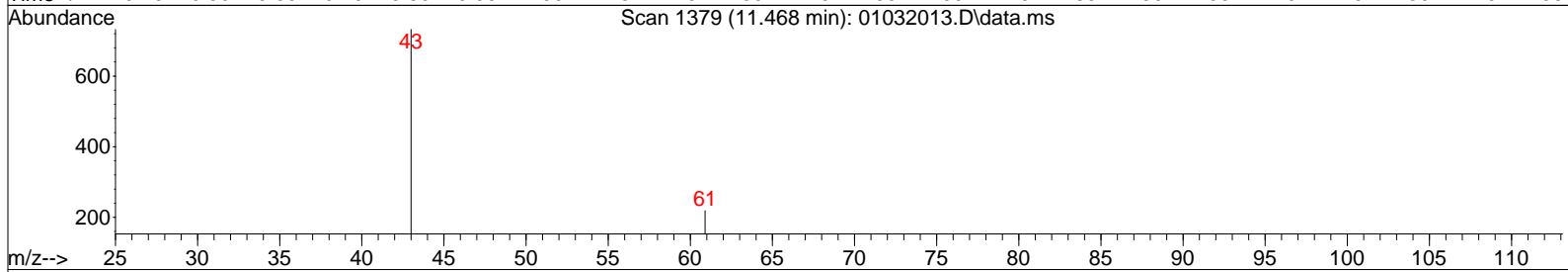
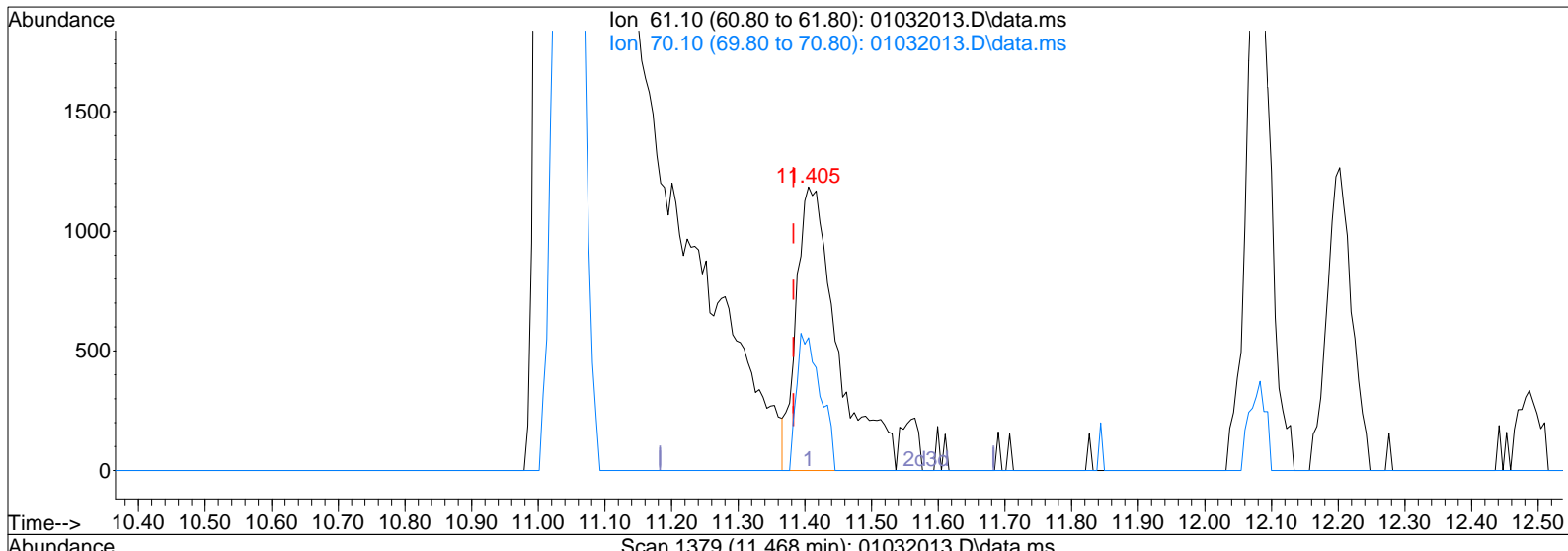
Ion	Ratio	Lower	Upper
166	100		
164	77.9	58.9	98.9



Data File : I:\MS13\DATA\2020 01\03\01032013.D
 Acq On : 3 Jan 2020 12:32
 Sample : P1907777-001 (5.0mL)
 Misc : S31-10251901

Vial: 3
 Operator: TD
 Inst : MS13

Quant Time: Jan 03 13:29:16 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



TIC: 01032013.D\data.ms

(30) Ethyl Acetate (T)

11.405min (+0.023) 0.60ng

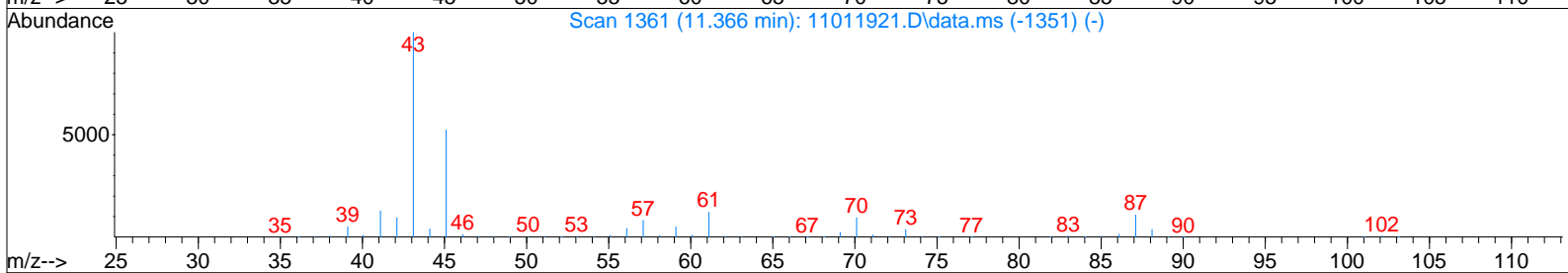
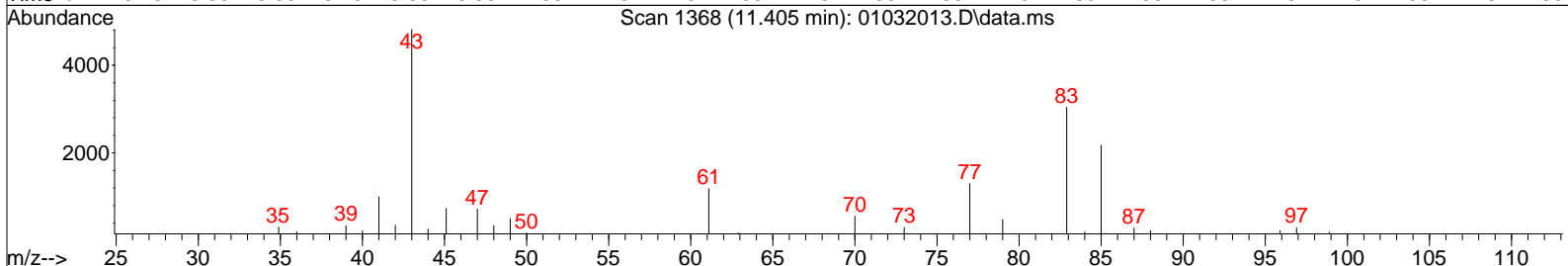
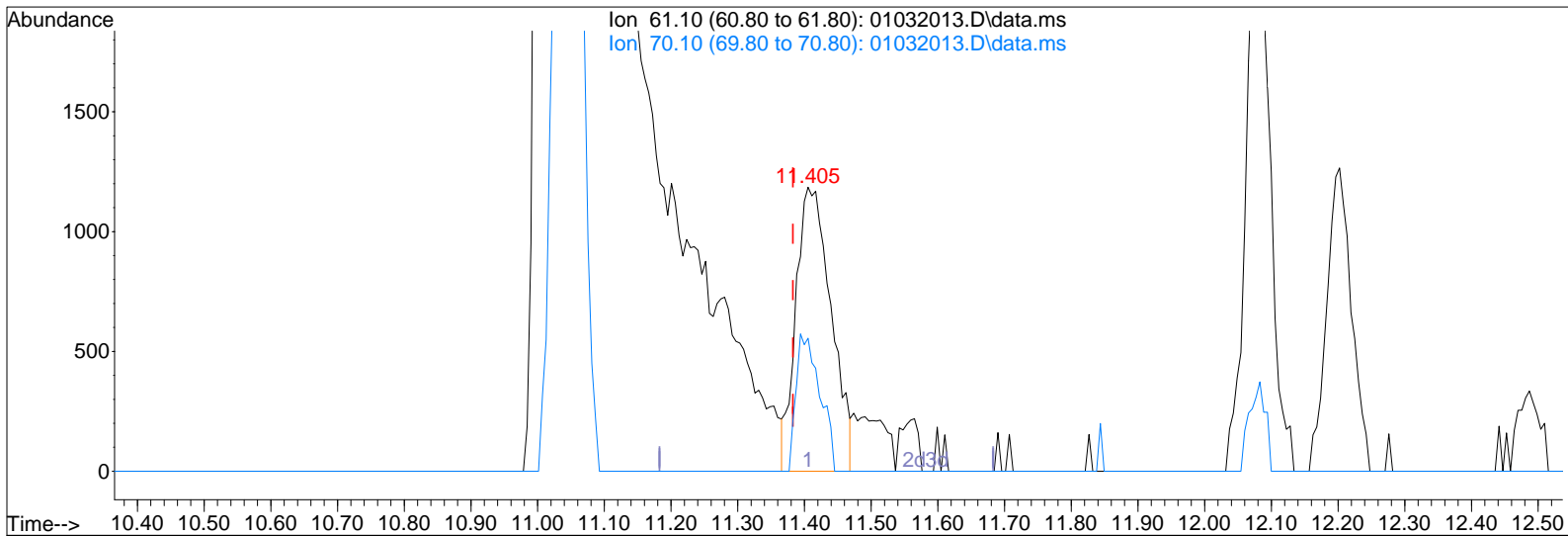
response 5099

Ion	Exp%	Act%
61.10	100	100
70.10	80.00	27.79#
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2020 01\03\01032013.D
Acq On : 3 Jan 2020 12:32
Sample : P1907777-001 (5.0mL)
Misc : S31-10251901

Vial: 3
Operator: TD
Inst : MS13

Quant Time: Jan 03 13:29:16 2020
Quant Method : I:\MS13\METHODS\R13110119.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Nov 02 09:55:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 01032013.D\data.ms

(30) Ethyl Acetate (T)

11.405min (+0.023) 0.51ng m

response 4330

Ion	Exp%	Act%
61.10	100	100
70.10	80.00	32.73#
0.00	0.00	0.00
0.00	0.00	0.00

BLC

TD 1/7/20

1/7/20

Data File : I:\MS13\DATA\2020 01\03\01032014.D
 Acq On : 3 Jan 2020 13:05
 Sample : P1907777-002 (5.0mL)
 Misc : S31-10251901

Vial: 3
 Operator: TD
 Inst : MS13

TD 1/7/20

Quant Time: Jan 07 09:41:05 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.23	130	182521	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.35	114	812199	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.67	82	394801	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	289303	10.644	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	85.12%	
57) Toluene-d8 (SS2)	15.80	98	945259	12.166	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.36%	
73) Bromofluorobenzene (SS3)	19.05	174	231394	13.925	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	111.44%	

Target Compounds

						Qvalue
2) Propene	4.22	42	10126	N.D.		
3) Dichlorodifluoromethan...	4.34	85	216	N.D.		
4) Chloromethane	0.00	50	0	N.D.	d	
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	5.03	62	79149	2.233	ng	99
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.48	45	825	N.D.		
11) Acetonitrile	6.77	41	59	N.D.		
12) Acrolein	6.94	56	109	N.D.		
13) Acetone	7.14	58	17827	0.999	ng	99
14) Trichlorofluoromethane	7.11	101	1538	N.D.		
15) 2-Propanol (Isopropanol)	7.76	45	713	N.D.		
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	8.29	96	18549	0.989	ng	96
18) 2-Methyl-2-Propanol (t...	8.29	59	946	N.D.		
19) Methylene Chloride	8.50	84	255708	12.450	ng	100
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.		
21) Trichlorotrifluoroethane	8.94	151	1196941	80.661	ng	93
22) Carbon Disulfide	8.79	76	3352	N.D.		
23) trans-1,2-Dichloroethene	9.78	61	5365	N.D.		
24) 1,1-Dichloroethane	10.04	63	5555	N.D.		
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.		
27) 2-Butanone (MEK)	10.47	72	106	N.D.		
28) cis-1,2-Dichloroethene	11.05	61	1710942	57.548	ng	100
29) Diisopropyl Ether	11.41	87	575	N.D.		
30) Ethyl Acetate	11.41	61	1133	N.D.		
31) n-Hexane	11.34	57	716	N.D.		
32) Chloroform	11.40	83	7137	N.D.		
34) Tetrahydrofuran (THF)	11.92	72	471	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.20	62	19657	0.667	ng	97
38) 1,1,1-Trichloroethane	12.48	97	618	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.		
41) Benzene	12.97	78	5369	N.D.		
42) Carbon Tetrachloride	13.11	117	1530	N.D.		
43) Cyclohexane	13.26	84	2362	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.	d	
47) Trichloroethene	14.06	130	1816433	84.458	ng	99
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	14.12	57	13049	N.D.		
50) Methyl Methacrylate	0.00	100	0	N.D.	d	

Data File : I:\MS13\DATA\2020 01\03\01032014.D
 Acq On : 3 Jan 2020 13:05
 Sample : P1907777-002 (5.0mL)
 Misc : S31-10251901

Vial: 3
 Operator: TD
 Inst : MS13

Quant Time: Jan 07 09:41:05 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

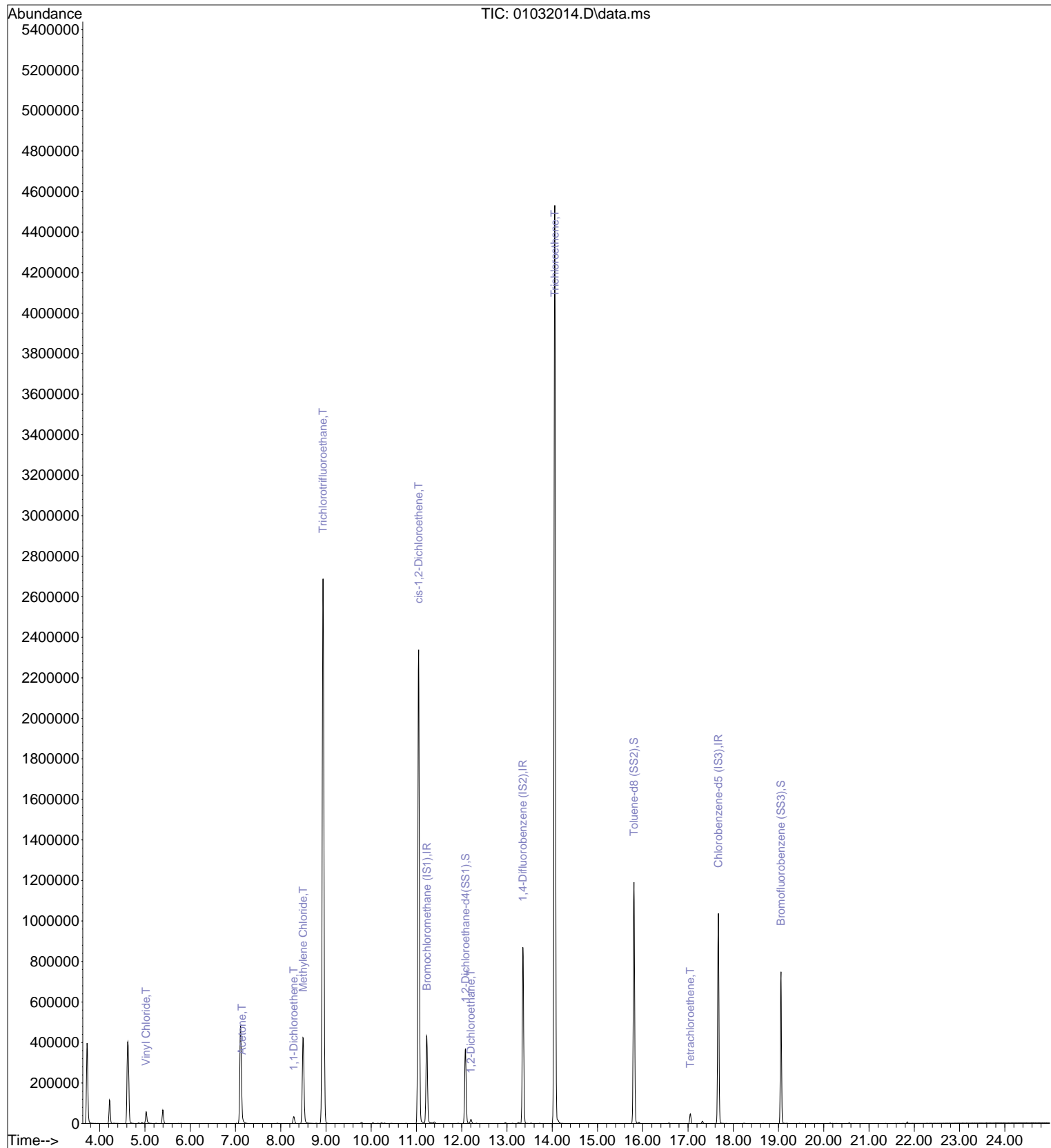
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	15.63	97	486	N.D.		
58) Toluene	15.92	91	2943	N.D.		
59) 2-Hexanone	16.12	43	342	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.86	43	170	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	17.05	166	17805	0.826	ng	100
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	18.08	91	928	N.D.		
67) m- & p-Xylenes	18.23	91	2029	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	0.00	104	0	N.D.		
70) o-Xylene	18.67	91	811	N.D.		
71) n-Nonane	18.85	43	354	N.D.		
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	19.19	105	1283	N.D.		
75) alpha-Pinene	19.53	93	461	N.D.		
76) n-Propylbenzene	19.64	91	221	N.D.		
77) 3-Ethyltoluene	19.72	105	642	N.D.		
78) 4-Ethyltoluene	19.75	105	375	N.D.		
79) 1,3,5-Trimethylbenzene	19.83	105	358	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	20.00	105	321	N.D.		
82) 1,2,4-Trimethylbenzene	20.19	105	711	N.D.		
83) n-Decane	20.27	57	341	N.D.		
84) Benzyl Chloride	0.00	91	0	N.D.		
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.		
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.		
87) sec-Butylbenzene	20.56	105	206	N.D.		
88) 4-Isopropyltoluene (p-...	20.56	119	2902	N.D.		
89) 1,2,3-Trimethylbenzene	20.56	105	206	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	20.69	68	237	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	21.38	57	367	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	22.34	128	122	N.D.		
96) n-Dodecane	22.29	57	162	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.		
99) tert-Butylbenzene	20.18	119	241	N.D.		
100) n-Butylbenzene	0.00	91	0	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2020 01\03\01032014.D
Acq On : 3 Jan 2020 13:05
Sample : P1907777-002 (5.0mL)
Misc : S31-10251901

Vial: 3
Operator: TD
Inst : MS13

Quant Time: Jan 07 09:41:05 2020
Quant Method : I:\MS13\METHODS\R13110119.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Nov 02 09:55:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2020 01\03\01032014.D
 Acq On : 3 Jan 2020 13:05
 Sample : P1907777-002 (5.0mL)
 Misc : S31-10251901

Vial: 3
 Operator: TD
 Inst : MS13

TD 1/7/20

Quant Time: Jan 07 09:41:05 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
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37) 1,4-Difluorobenzene (IS2)	13.35	114	812199	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.67	82	394801	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	289303	10.644	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	85.12%	
57) Toluene-d8 (SS2)	15.80	98	945259	12.166	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.36%	
73) Bromofluorobenzene (SS3)	19.05	174	231394	13.925	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	111.44%	

Target Compounds

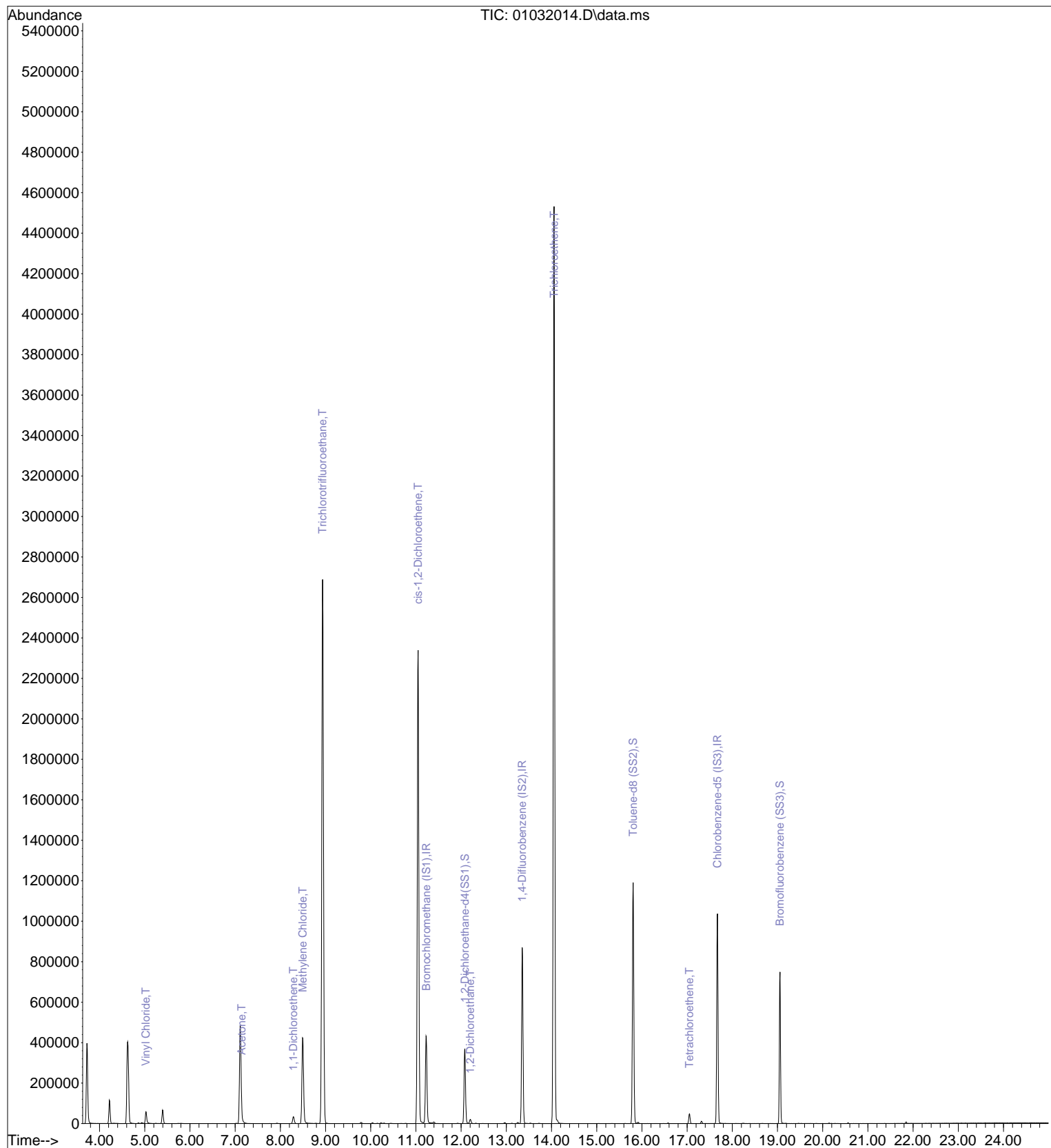
Target Compounds	R.T.	QIon	Response	Conc	Units	Qvalue
6) Vinyl Chloride	5.03	62	79149	2.233	ng	99
13) Acetone	7.14	58	17827	0.999	ng	99
17) 1,1-Dichloroethene	8.29	96	18549	0.989	ng	96
19) Methylene Chloride	8.50	84	255708	12.450	ng	100
21) Trichlorotrifluoroethane	8.94	151	1196941	80.661	ng	93
28) cis-1,2-Dichloroethene	11.05	61	1710942	57.548	ng	100
36) 1,2-Dichloroethane	12.20	62	19657	0.667	ng	97
47) Trichloroethene	14.06	130	1816433	84.458	ng	99
64) Tetrachloroethene	17.05	166	17805	0.826	ng	100

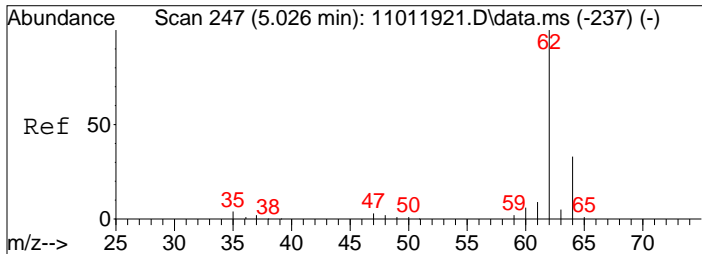
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2020 01\03\01032014.D
 Acq On : 3 Jan 2020 13:05
 Sample : P1907777-002 (5.0mL)
 Misc : S31-10251901

Vial: 3
 Operator: TD
 Inst : MS13

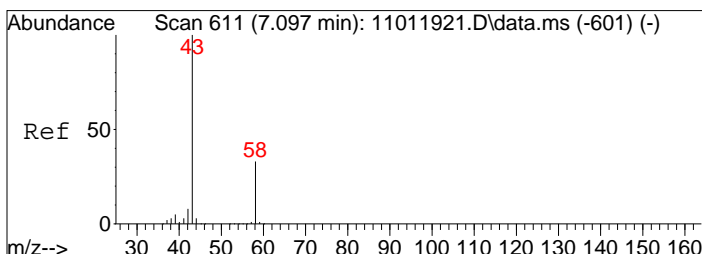
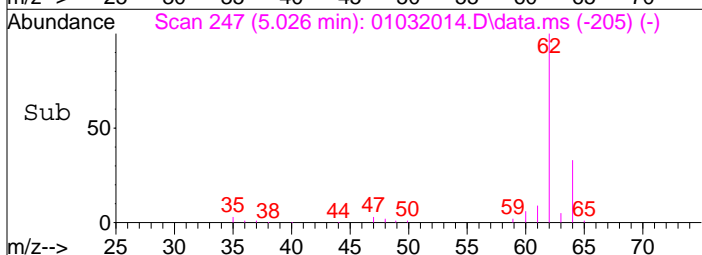
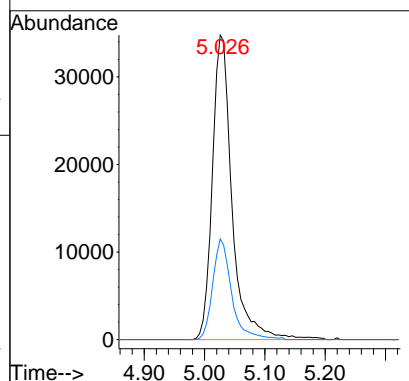
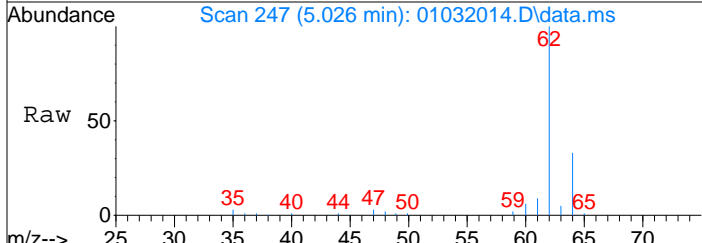
Quant Time: Jan 07 09:41:05 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M





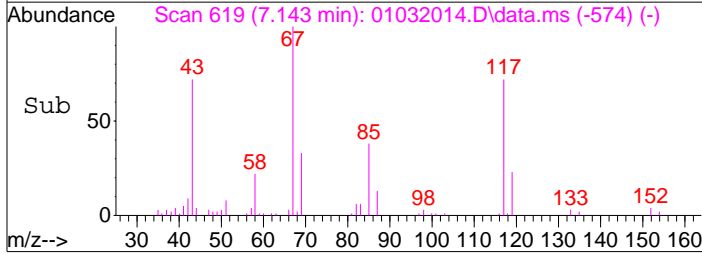
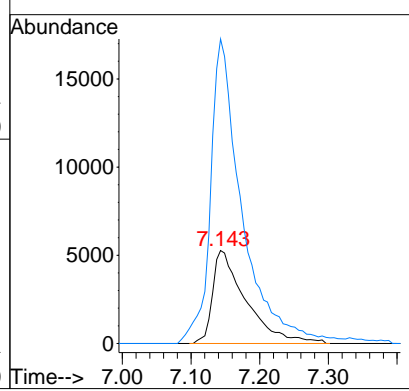
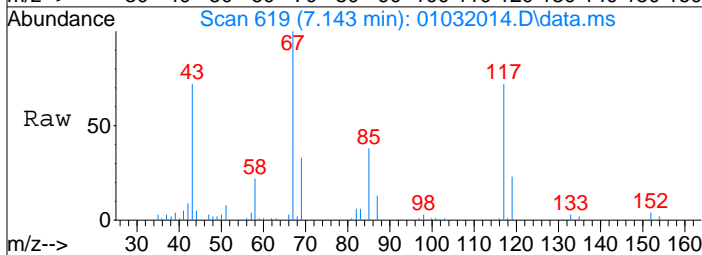
#6
 Vinyl Chloride
 Concen: 2.23 ng
 RT: 5.03 min Scan# 247
 Delta R.T. -0.011 min
 Lab File: 01032014.D
 Acq: 3 Jan 2020 13:05

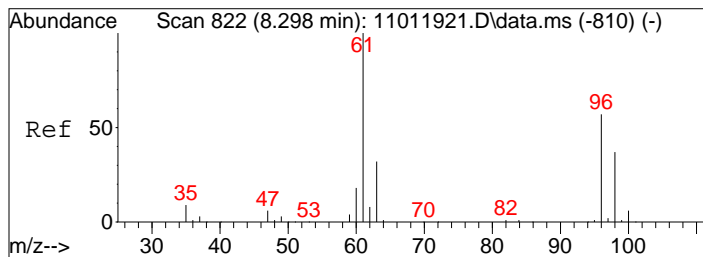
Tgt Ion	Resp	Lower	Upper
62	100		
64	31.6	12.4	52.4



#13
 Acetone
 Concen: 1.00 ng
 RT: 7.14 min Scan# 619
 Delta R.T. 0.006 min
 Lab File: 01032014.D
 Acq: 3 Jan 2020 13:05

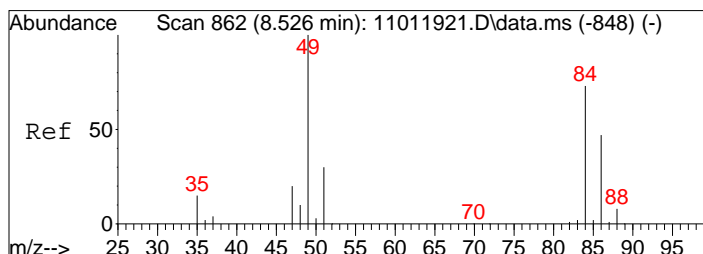
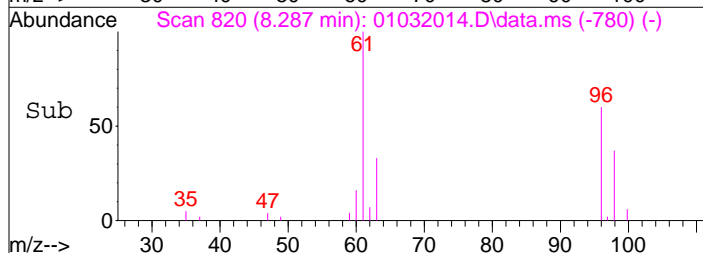
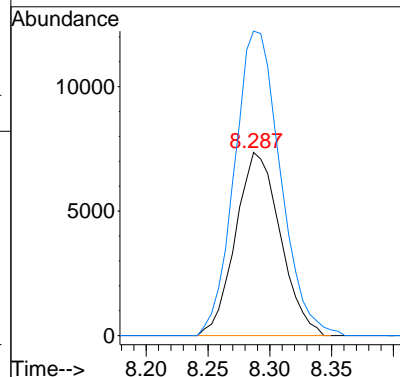
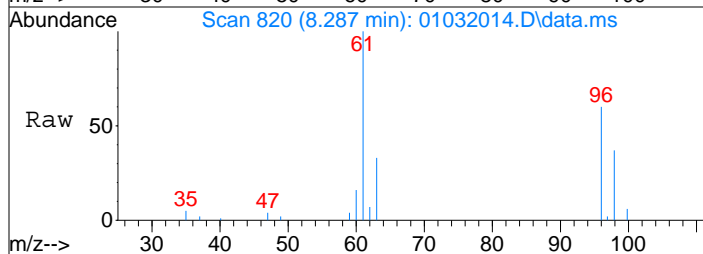
Tgt Ion	Resp	Lower	Upper
58	100		
43	311.9	284.6	344.6





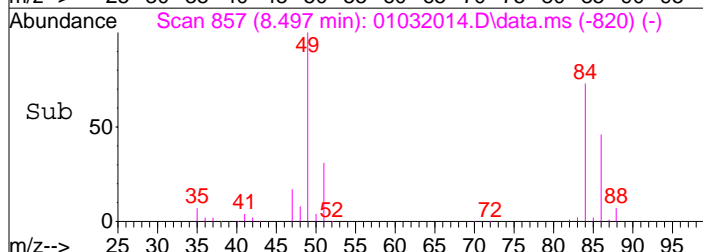
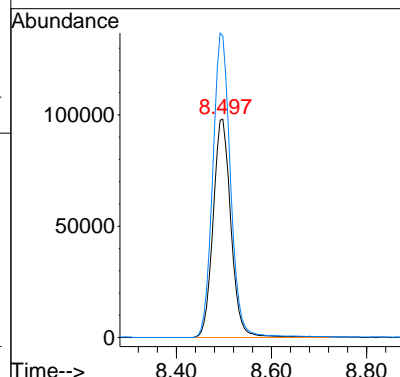
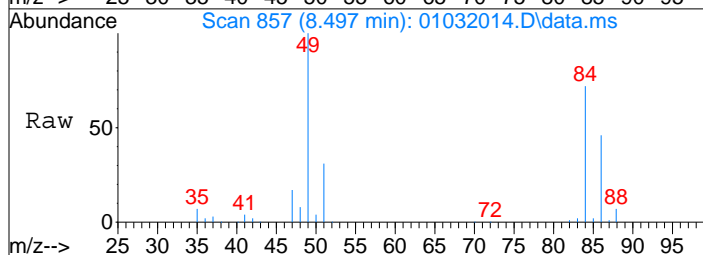
#17
 1,1-Dichloroethene
 Concen: 0.99 ng
 RT: 8.29 min Scan# 820
 Delta R.T. -0.023 min
 Lab File: 01032014.D
 Acq: 3 Jan 2020 13:05

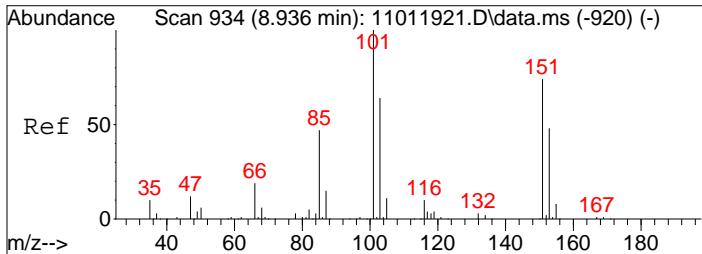
Tgt Ion	Resp	Lower	Upper
96	18549		
96	100		
61	170.6	156.7	196.7



#19
 Methylene Chloride
 Concen: 12.45 ng
 RT: 8.50 min Scan# 857
 Delta R.T. -0.040 min
 Lab File: 01032014.D
 Acq: 3 Jan 2020 13:05

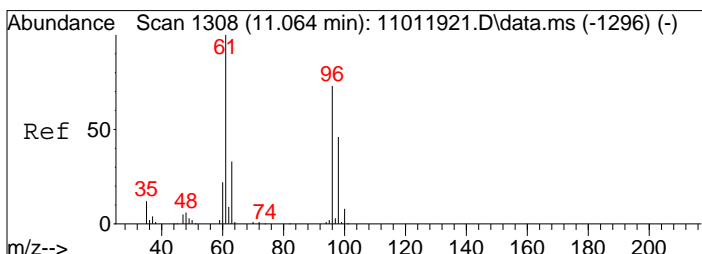
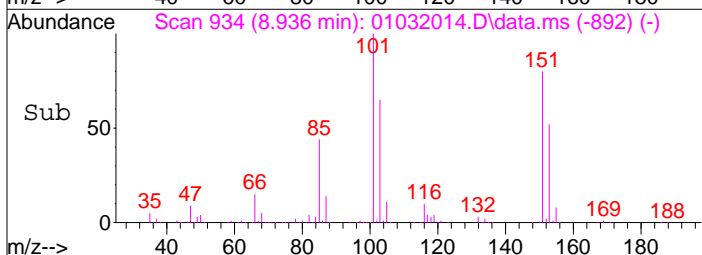
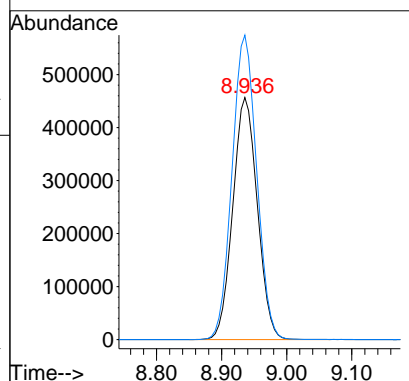
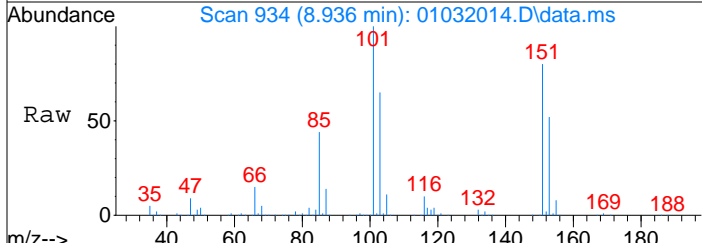
Tgt Ion	Resp	Lower	Upper
84	255708		
84	100		
49	139.4	114.0	164.0





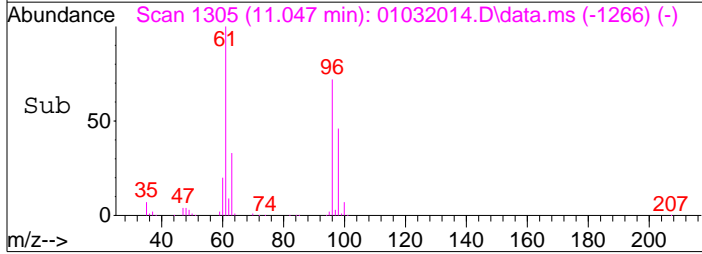
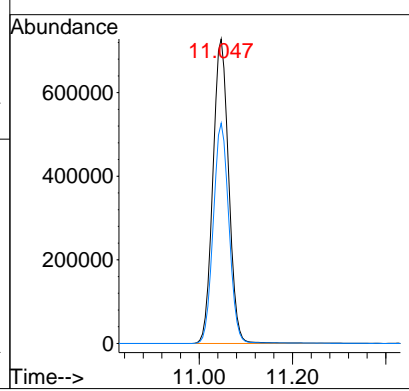
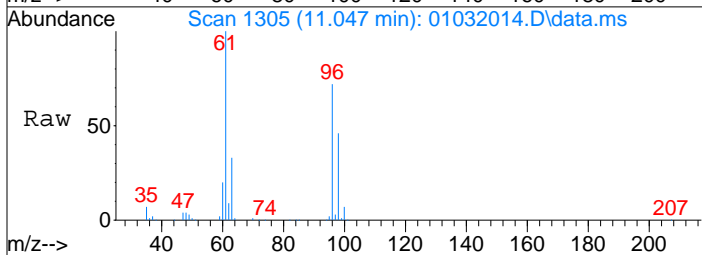
#21
 Trichlorotrifluoroethane
 Concen: 80.66 ng
 RT: 8.94 min Scan# 934
 Delta R.T. -0.011 min
 Lab File: 01032014.D
 Acq: 3 Jan 2020 13:05

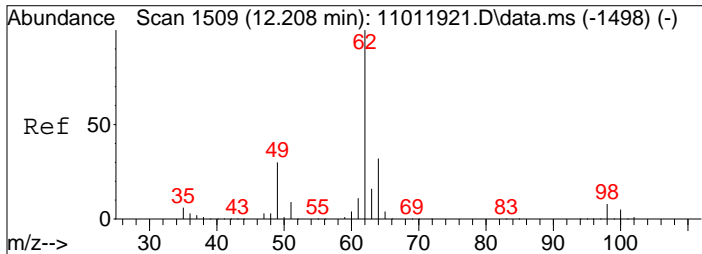
Tgt Ion: 151 Resp: 1196941
 Ion Ratio Lower Upper
 151 100
 101 126.4 114.4 154.4



#28
 cis-1,2-Dichloroethene
 Concen: 57.55 ng
 RT: 11.05 min Scan# 1305
 Delta R.T. -0.028 min
 Lab File: 01032014.D
 Acq: 3 Jan 2020 13:05

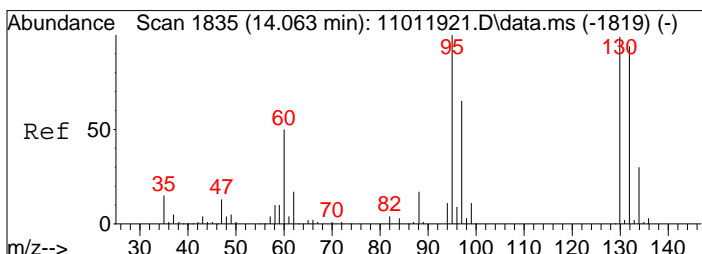
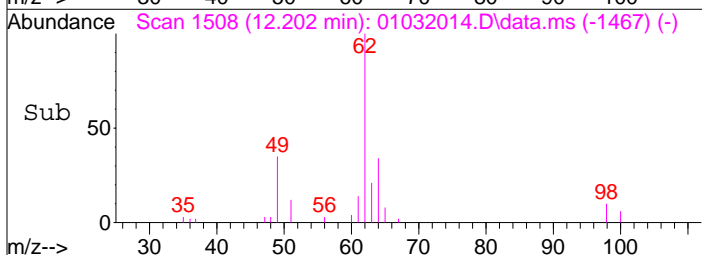
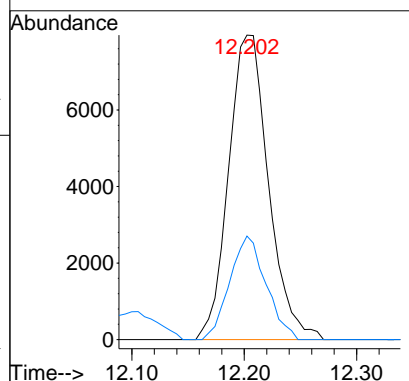
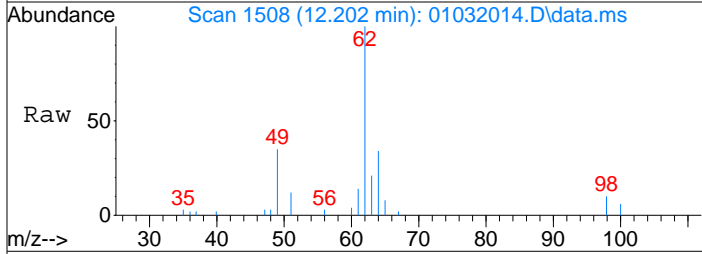
Tgt Ion: 61 Resp: 1710942
 Ion Ratio Lower Upper
 61 100
 96 71.6 51.9 91.9





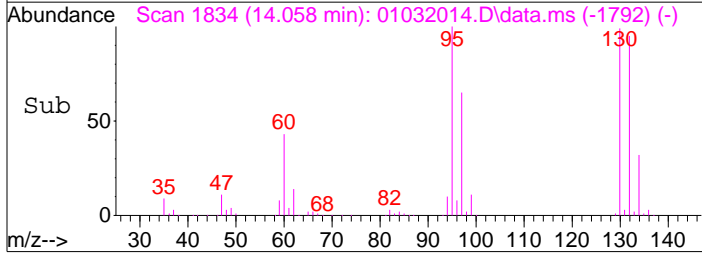
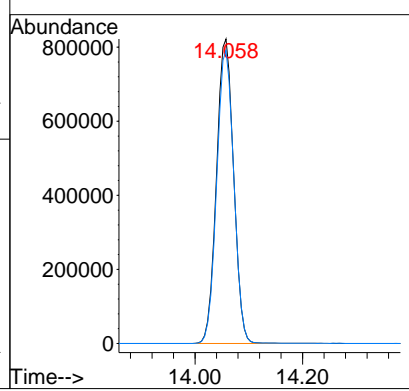
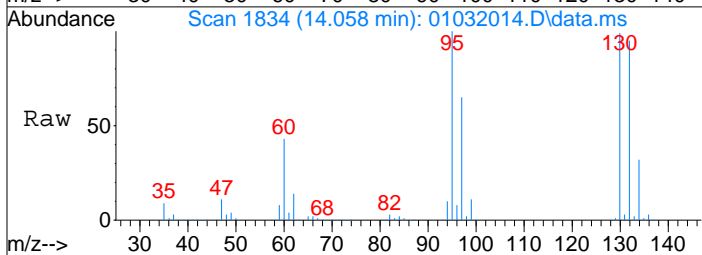
#36
 1,2-Dichloroethane
 Concen: 0.67 ng
 RT: 12.20 min Scan# 1508
 Delta R.T. -0.017 min
 Lab File: 01032014.D
 Acq: 3 Jan 2020 13:05

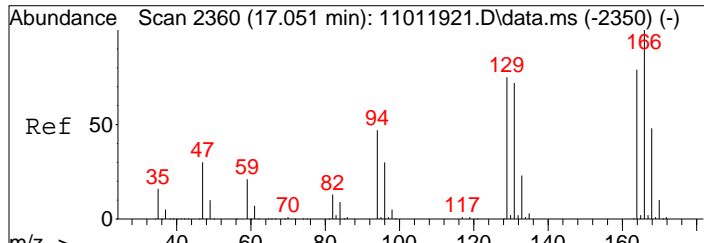
Tgt Ion:	Resp:	Lower	Upper
62	19657		
64	30.9	12.6	52.6



#47
 Trichloroethene
 Concen: 84.46 ng
 RT: 14.06 min Scan# 1834
 Delta R.T. -0.011 min
 Lab File: 01032014.D
 Acq: 3 Jan 2020 13:05

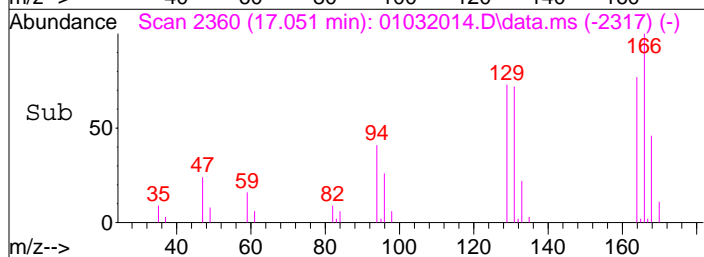
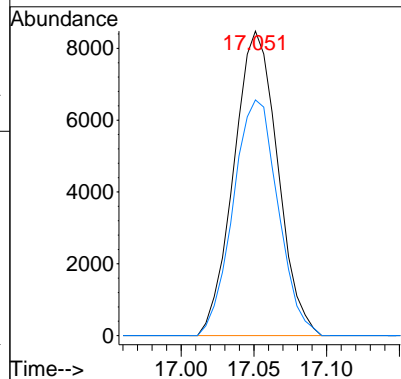
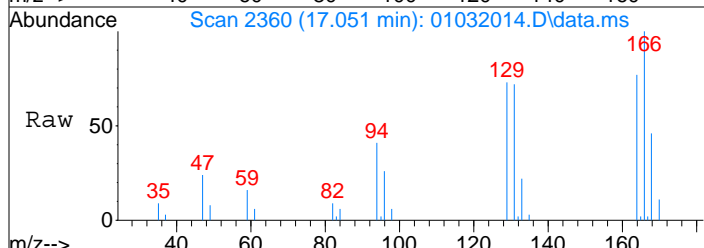
Tgt Ion:	Resp:	Lower	Upper
130	1816433		
132	96.2	75.4	115.4





#64
Tetrachloroethene
Concen: 0.83 ng
RT: 17.05 min Scan# 2360
Delta R.T. -0.006 min
Lab File: 01032014.D
Acq: 3 Jan 2020 13:05

Tgt Ion	Resp	Lower	Upper
166	17805		
166	100		
164	79.0	58.9	98.9



Data File : I:\MS13\DATA\2020 01\03\01032027.D
 Acq On : 3 Jan 2020 20:47
 Sample : P1907777-003 (1000mL)
 Misc : S31-10251901

Vial: 5
 Operator: TD
 Inst : MS13

TD 1/7/20

Quant Time: Jan 07 10:33:45 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	11.22	130	156419	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.35	114	746752	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.67	82	368015	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	268750	11.538	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	92.32%	
57) Toluene-d8 (SS2)	15.80	98	876019	12.095	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	96.80%	
73) Bromofluorobenzene (SS3)	19.05	174	212344	13.709	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	109.68%	

Target Compounds

						Qvalue
2) Propene	4.16	42	166129m	7.467	ng	
3) Dichlorodifluoromethan...	4.33	85	70685	1.970	ng	99
4) Chloromethane	4.61	50	6982	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	4.88	135	1536	N.D.		
6) Vinyl Chloride	5.03	62	7350	N.D.		
7) 1,3-Butadiene	5.30	54	344	N.D.		
8) Bromomethane	5.74	94	477	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.41	45	181437	12.301	ng	100
11) Acetonitrile	6.69	41	11072	N.D.		
12) Acrolein	6.88	56	3486	N.D.		
13) Acetone	7.09	58	148382	9.698	ng	# 55
14) Trichlorofluoromethane	7.32	101	35492	1.167	ng	99
15) 2-Propanol (Isopropanol)	7.58	45	2123596	44.603	ng	94
16) Acrylonitrile	7.85	53	119	N.D.		
17) 1,1-Dichloroethene	8.29	96	1683	N.D.		
18) 2-Methyl-2-Propanol (t...	8.57	59	2797	N.D.		
19) Methylene Chloride	8.50	84	13133	0.746	ng	99
20) 3-Chloro-1-propene (Al...	8.59	41	5198	N.D.		
21) Trichlorotrifluoroethane	8.93	151	139996	11.009	ng	95
22) Carbon Disulfide	8.77	76	30482	N.D.		
23) trans-1,2-Dichloroethene	9.78	61	319	N.D.		
24) 1,1-Dichloroethane	10.02	63	412	N.D.		
25) Methyl tert-Butyl Ether	10.18	73	2371	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	10.56	72	16543	1.342	ng	# 87
28) cis-1,2-Dichloroethene	11.05	61	115000	4.514	ng	97
29) Diisopropyl Ether	11.34	87	513	N.D.		
30) Ethyl Acetate	11.39	61	3382	0.475	ng	86
31) n-Hexane	11.34	57	66949	2.008	ng	99
32) Chloroform	11.39	83	4672	N.D.		
34) Tetrahydrofuran (THF)	11.83	72	33105	2.684	ng	# 86
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.21	62	3235	N.D.		
38) 1,1,1-Trichloroethane	12.49	97	128	N.D.		
39) Isopropyl Acetate	12.95	61	474	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	12.96	78	75509	0.910	ng	99
42) Carbon Tetrachloride	13.11	117	8140	N.D.		
43) Cyclohexane	13.25	84	10923	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	13.94	83	647	N.D.		
47) Trichloroethene	14.05	130	135346	6.845	ng	99
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	14.13	57	33045	N.D.		
50) Methyl Methacrylate	0.00	100	0	N.D.	d	

Data File : I:\MS13\DATA\2020 01\03\01032027.D
 Acq On : 3 Jan 2020 20:47
 Sample : P1907777-003 (1000mL)
 Misc : S31-10251901

Vial: 5
 Operator: TD
 Inst : MS13

Quant Time: Jan 07 10:33:45 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

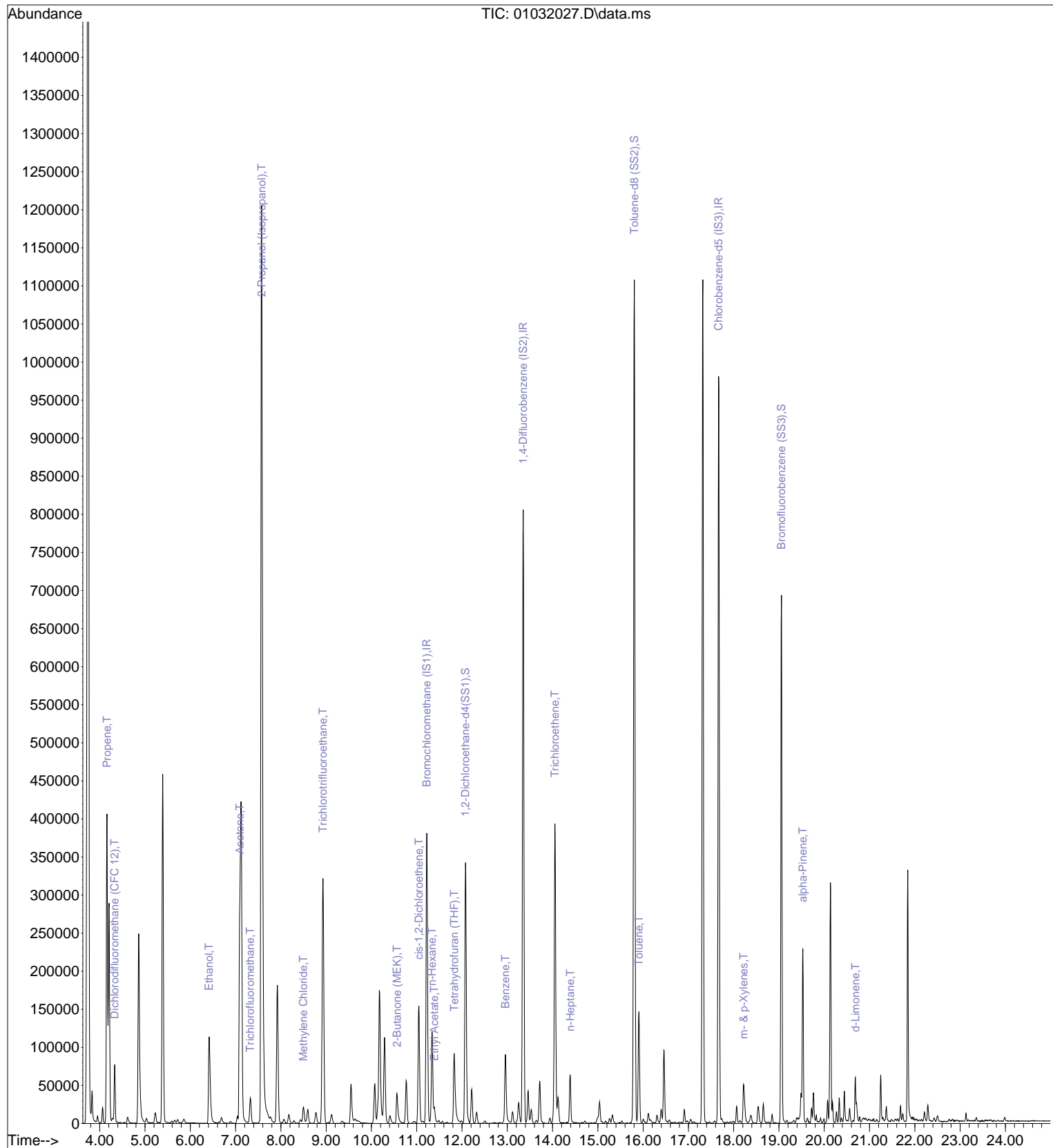
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	16295	0.796	ng	95
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	14.99	58	1663	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	15.91	91	116921	1.488	ng	100
59) 2-Hexanone	16.16	43	3412	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.81	43	1656	N.D.		
63) n-Octane	16.91	57	3621	N.D.		
64) Tetrachloroethene	17.05	166	1759	N.D.		
65) Chlorobenzene	17.74	112	736	N.D.		
66) Ethylbenzene	18.06	91	18511	N.D.		
67) m- & p-Xylenes	18.22	91	42237	0.620	ng	98
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.55	104	4327	N.D.		
70) o-Xylene	18.66	91	15588	N.D.		
71) n-Nonane	18.85	43	5126	N.D.		
72) 1,1,2,2-Tetrachloroethane	18.70	83	288	N.D.		
74) Cumene	19.18	105	1590	N.D.		
75) alpha-Pinene	19.53	93	90880	2.057	ng	99
76) n-Propylbenzene	19.63	91	5451	N.D.		
77) 3-Ethyltoluene	19.72	105	10037	N.D.		
78) 4-Ethyltoluene	19.75	105	4707	N.D.		
79) 1,3,5-Trimethylbenzene	19.82	105	3167	N.D.		
80) alpha-Methylstyrene	19.96	118	428	N.D.		
81) 2-Ethyltoluene	19.99	105	3905	N.D.		
82) 1,2,4-Trimethylbenzene	20.18	105	13031	N.D.		
83) n-Decane	20.27	57	5512	N.D.		
84) Benzyl Chloride	20.31	91	269	N.D.		
85) 1,3-Dichlorobenzene	20.38	146	1867	N.D.		
86) 1,4-Dichlorobenzene	20.38	146	1867	N.D.		
87) sec-Butylbenzene	20.42	105	506	N.D.		
88) 4-Isopropyltoluene (p-...	20.56	119	6714	N.D.		
89) 1,2,3-Trimethylbenzene	20.56	105	3659	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	20.69	68	14465	0.475	ng	98
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	21.37	57	6346	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	22.30	128	5805	N.D.		
96) n-Dodecane	22.29	57	7227	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	18.37	55	5056	N.D.		
99) tert-Butylbenzene	20.18	119	1526	N.D.		
100) n-Butylbenzene	20.92	91	1852	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2020 01\03\01032027.D
 Acq On : 3 Jan 2020 20:47
 Sample : P1907777-003 (1000mL)
 Misc : S31-10251901

Vial: 5
 Operator: TD
 Inst : MS13

Quant Time: Jan 07 10:33:45 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2020 01\03\01032027.D
 Acq On : 3 Jan 2020 20:47
 Sample : P1907777-003 (1000mL)
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TD 1/7/20

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 Quant Method : I:\MS13\METHODS\R13110119.M
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Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
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56) Chlorobenzene-d5 (IS3)	17.67	82	368015	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	268750	11.538	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	92.32%	
57) Toluene-d8 (SS2)	15.80	98	876019	12.095	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	96.80%	
73) Bromofluorobenzene (SS3)	19.05	174	212344	13.709	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	109.68%	

Target Compounds

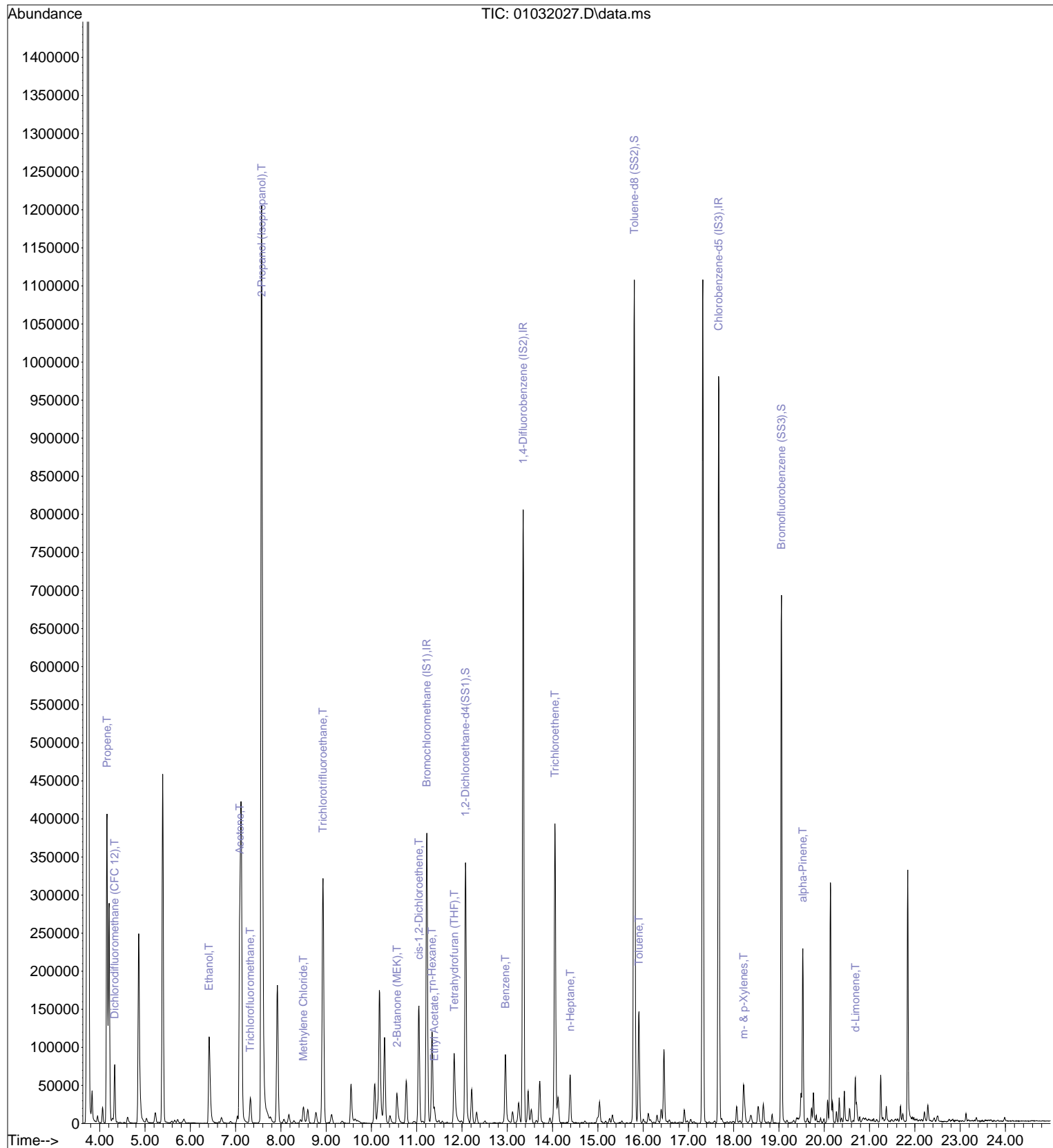
						Qvalue
2) Propene	4.16	42	166129m	7.467	ng	
3) Dichlorodifluoromethan...	4.33	85	70685	1.970	ng	99
10) Ethanol	6.41	45	181437	12.301	ng	100
13) Acetone	7.09	58	148382	9.698	ng	# 55
14) Trichlorofluoromethane	7.32	101	35492	1.167	ng	99
15) 2-Propanol (Isopropanol)	7.58	45	2123596	44.603	ng	94
19) Methylene Chloride	8.50	84	13133	0.746	ng	99
21) Trichlorotrifluoroethane	8.93	151	139996	11.009	ng	95
27) 2-Butanone (MEK)	10.56	72	16543	1.342	ng	# 87
28) cis-1,2-Dichloroethene	11.05	61	115000	4.514	ng	97
30) Ethyl Acetate	11.39	61	3382	0.475	ng	86
31) n-Hexane	11.34	57	66949	2.008	ng	99
34) Tetrahydrofuran (THF)	11.83	72	33105	2.684	ng	# 86
41) Benzene	12.96	78	75509	0.910	ng	99
47) Trichloroethene	14.05	130	135346	6.845	ng	99
51) n-Heptane	14.39	71	16295	0.796	ng	95
58) Toluene	15.91	91	116921	1.488	ng	100
67) m- & p-Xylenes	18.22	91	42237	0.620	ng	98
75) alpha-Pinene	19.53	93	90880	2.057	ng	99
91) d-Limonene	20.69	68	14465	0.475	ng	98

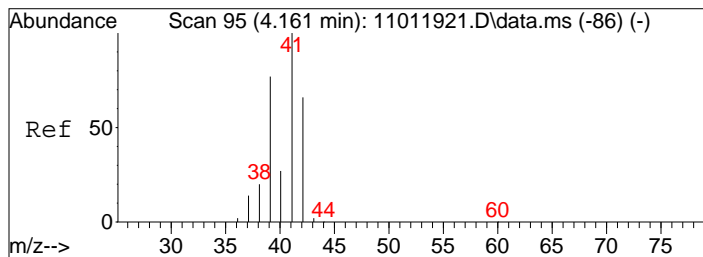
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2020 01\03\01032027.D
 Acq On : 3 Jan 2020 20:47
 Sample : P1907777-003 (1000mL)
 Misc : S31-10251901

Vial: 5
 Operator: TD
 Inst : MS13

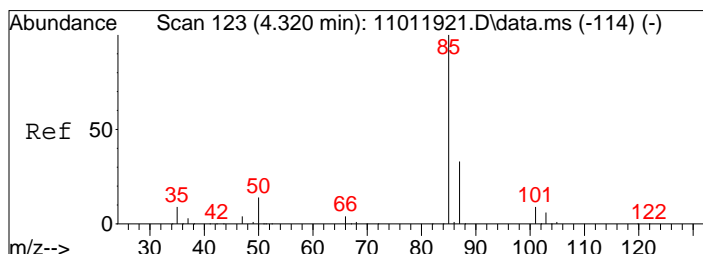
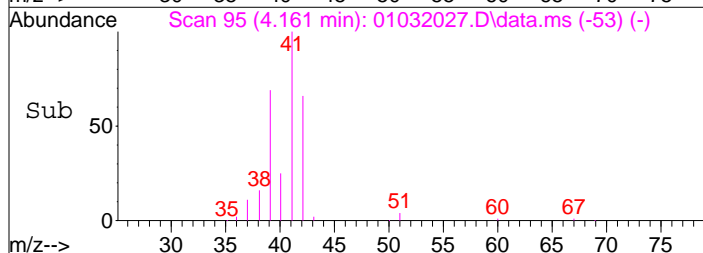
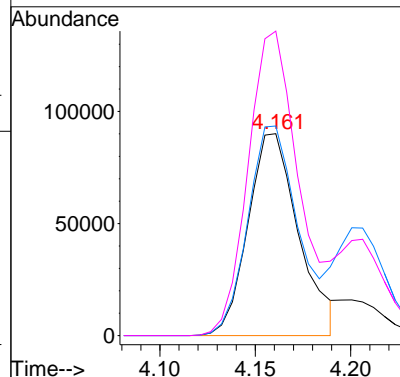
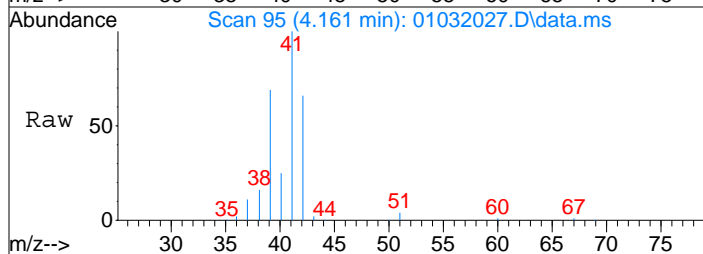
Quant Time: Jan 07 10:33:45 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M





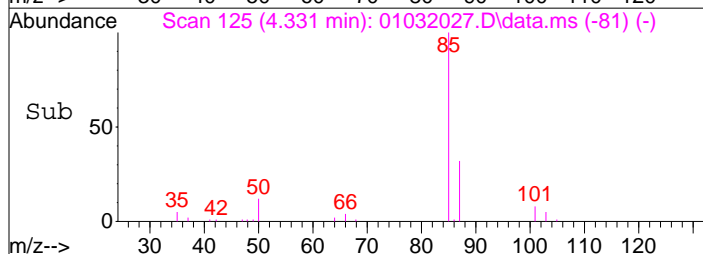
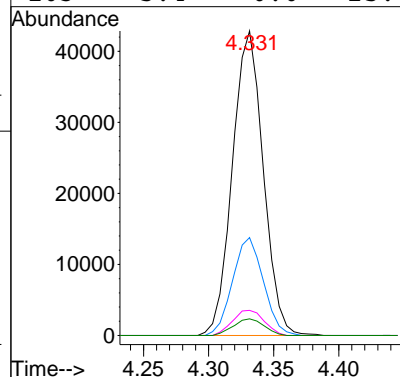
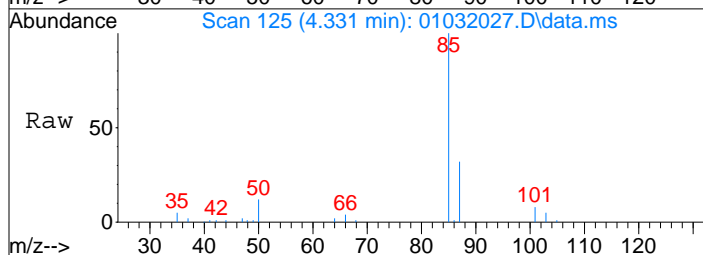
#2
 Propene
 Concen: 7.47 ng m
 RT: 4.16 min Scan# 95
 Delta R.T. -0.011 min
 Lab File: 01032027.D
 Acq: 3 Jan 2020 20:47

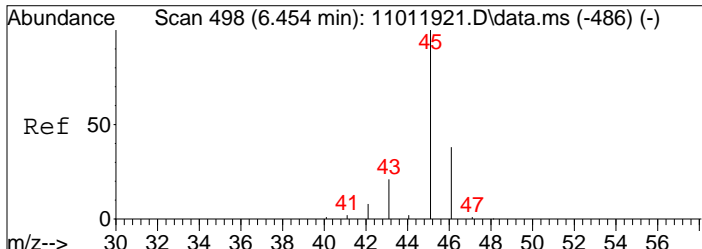
Tgt Ion:	Resp:	Lower	Upper
42	166129		
42	100		
39	102.4	94.8	134.8
41	154.0	130.9	170.9



#3
 Dichlorodifluoromethane (CFC 12)
 Concen: 1.97 ng
 RT: 4.33 min Scan# 125
 Delta R.T. -0.000 min
 Lab File: 01032027.D
 Acq: 3 Jan 2020 20:47

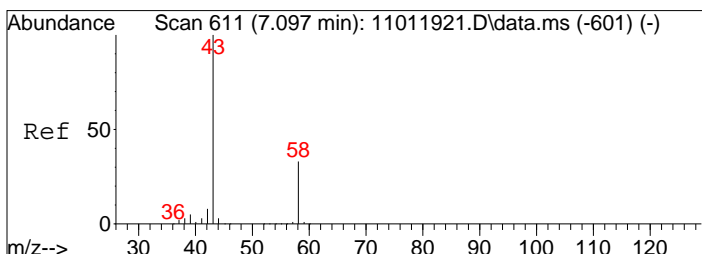
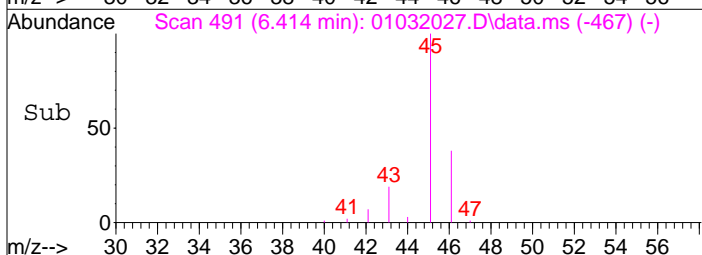
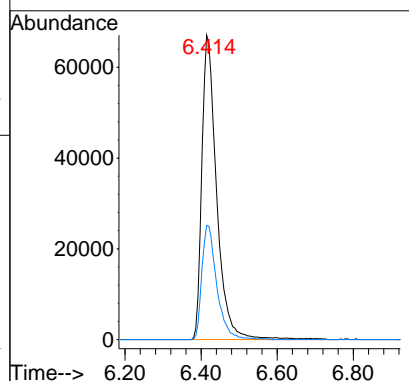
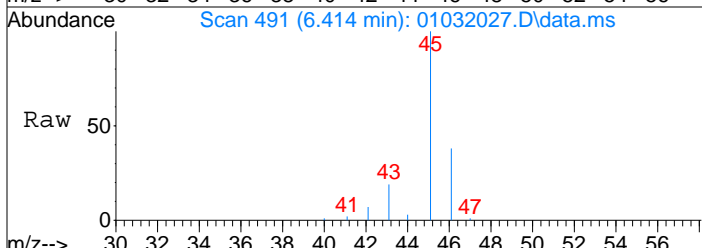
Tgt Ion:	Resp:	Lower	Upper
85	70685		
85	100		
87	32.1	12.6	52.6
101	8.5	0.0	28.8
103	5.4	0.0	25.7





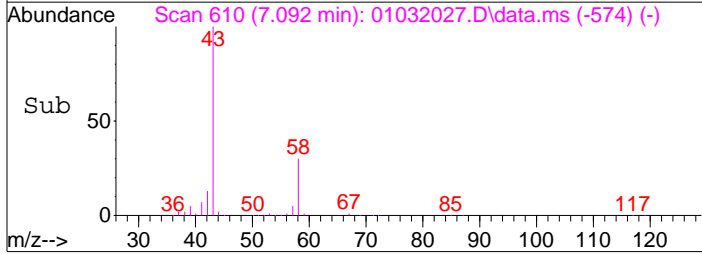
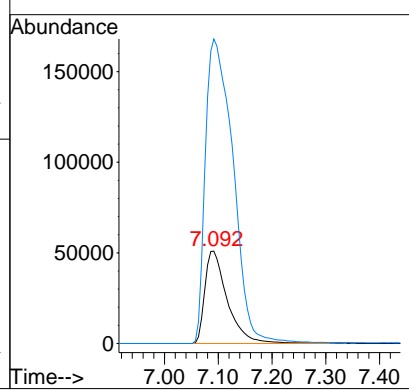
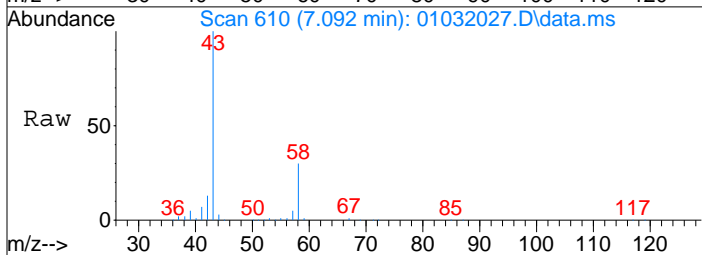
#10
 Ethanol
 Concen: 12.30 ng
 RT: 6.41 min Scan# 491
 Delta R.T. -0.114 min
 Lab File: 01032027.D
 Acq: 3 Jan 2020 20:47

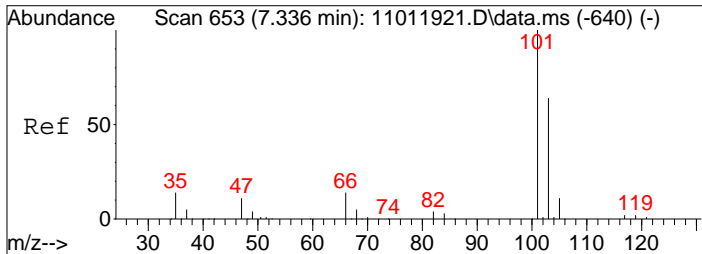
Tgt Ion	Resp	Lower	Upper
45	181437		
45	100		
46	37.9	18.1	58.1



#13
 Acetone
 Concen: 9.70 ng
 RT: 7.09 min Scan# 610
 Delta R.T. -0.045 min
 Lab File: 01032027.D
 Acq: 3 Jan 2020 20:47

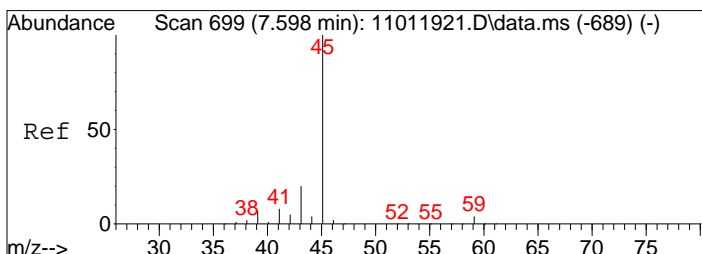
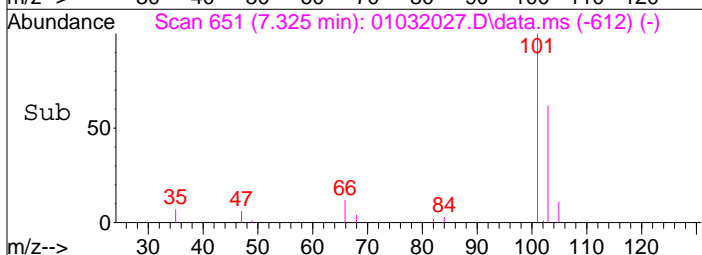
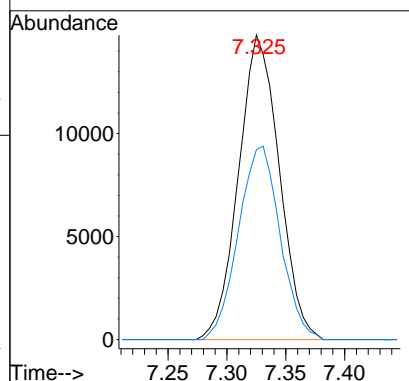
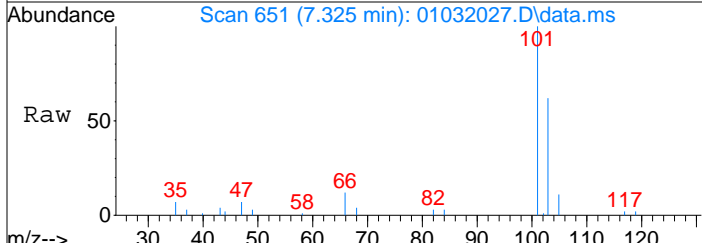
Tgt Ion	Resp	Lower	Upper
58	148382		
58	100		
43	405.5	284.6	344.6#





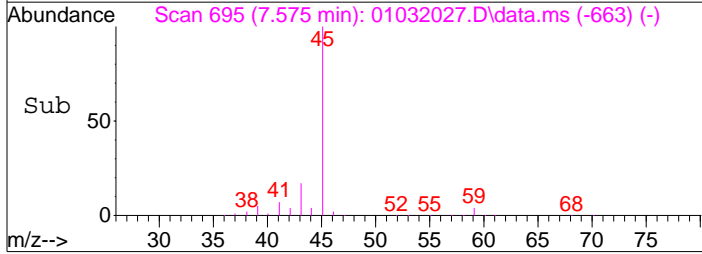
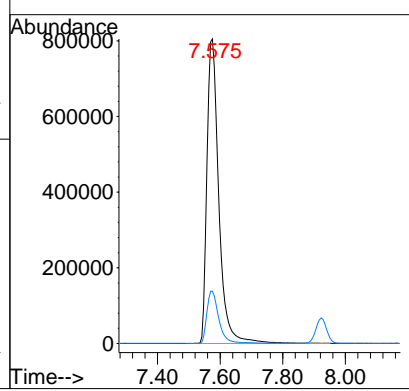
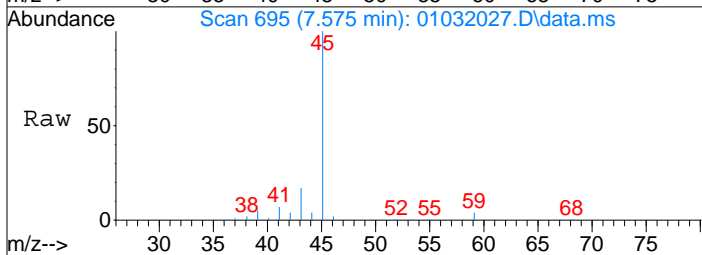
#14
 Trichlorofluoromethane
 Concen: 1.17 ng
 RT: 7.32 min Scan# 651
 Delta R.T. -0.029 min
 Lab File: 01032027.D
 Acq: 3 Jan 2020 20:47

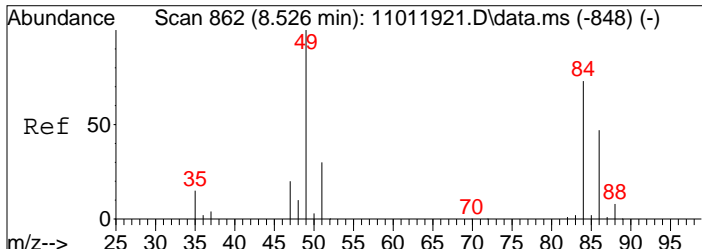
Tgt Ion	Resp	Lower	Upper
101	100		
103	65.1	44.1	84.1



#15
 2-Propanol (Isopropanol)
 Concen: 44.60 ng
 RT: 7.58 min Scan# 695
 Delta R.T. -0.069 min
 Lab File: 01032027.D
 Acq: 3 Jan 2020 20:47

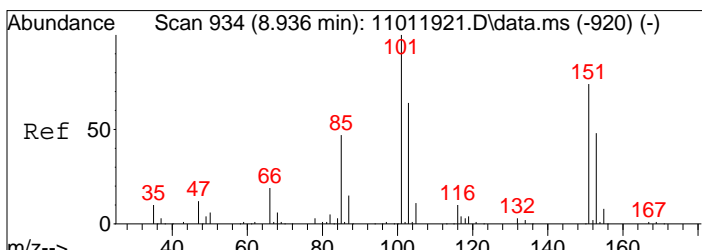
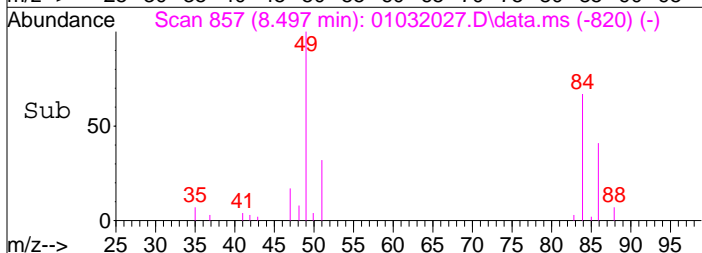
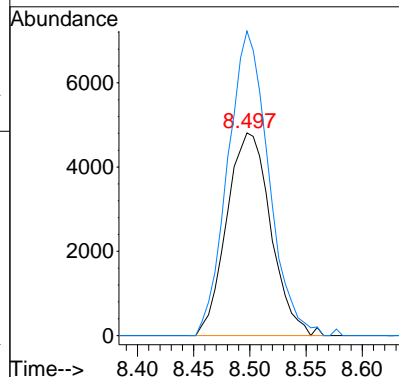
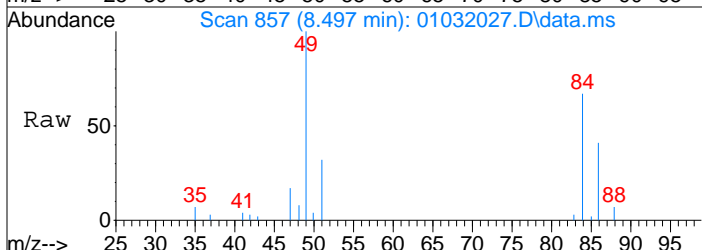
Tgt Ion	Resp	Lower	Upper
45	100		
43	17.3	0.2	40.2





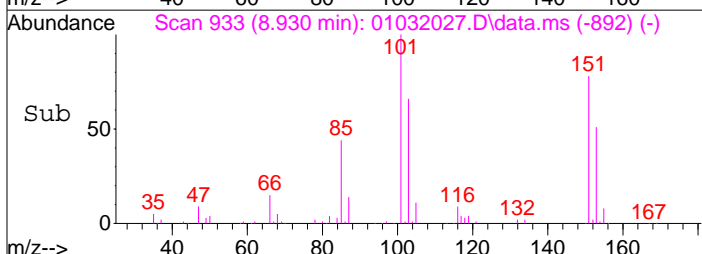
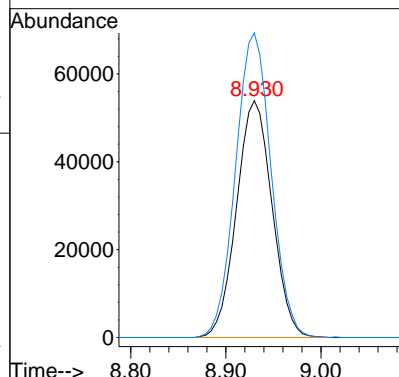
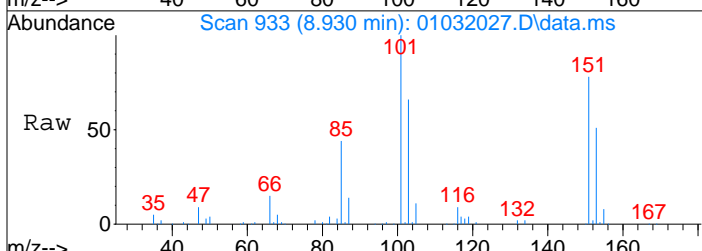
#19
 Methylene Chloride
 Concen: 0.75 ng
 RT: 8.50 min Scan# 857
 Delta R.T. -0.040 min
 Lab File: 01032027.D
 Acq: 3 Jan 2020 20:47

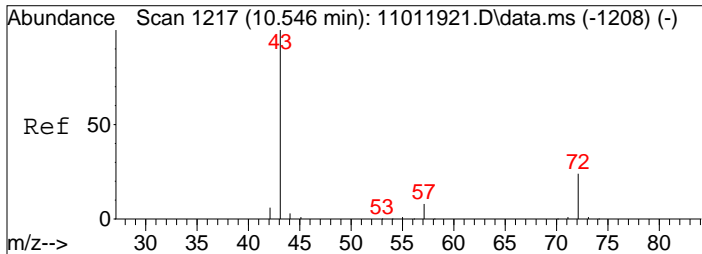
Tgt Ion	Resp	Lower	Upper
84	13133		
84	100		
49	139.9	114.0	164.0



#21
 Trichlorotrifluoroethane
 Concen: 11.01 ng
 RT: 8.93 min Scan# 933
 Delta R.T. -0.017 min
 Lab File: 01032027.D
 Acq: 3 Jan 2020 20:47

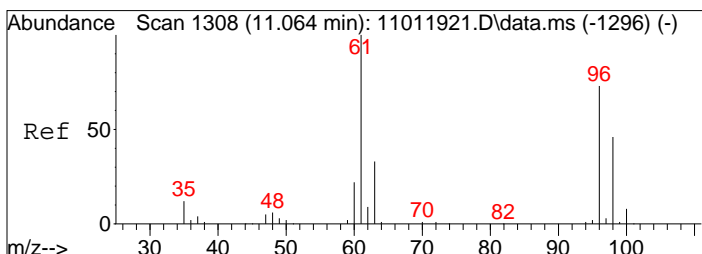
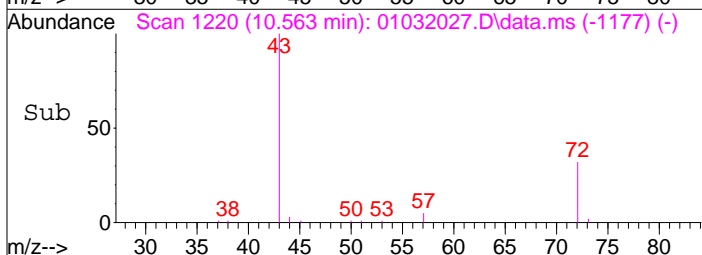
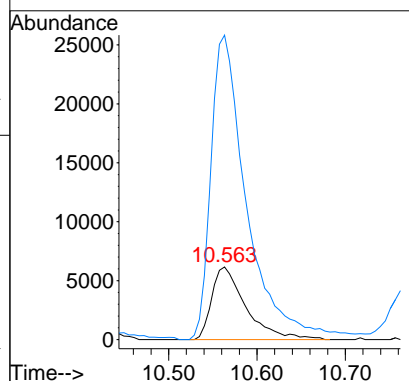
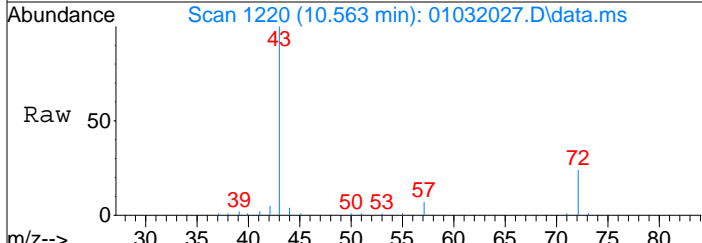
Tgt Ion	Resp	Lower	Upper
151	139996		
151	100		
101	128.9	114.4	154.4





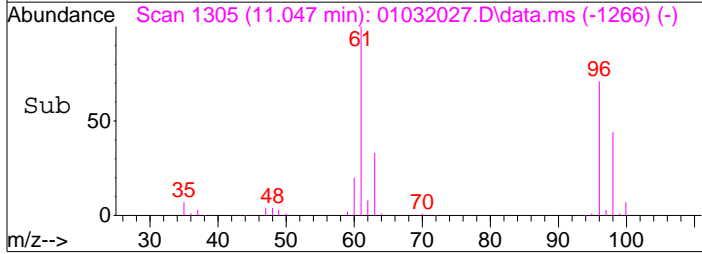
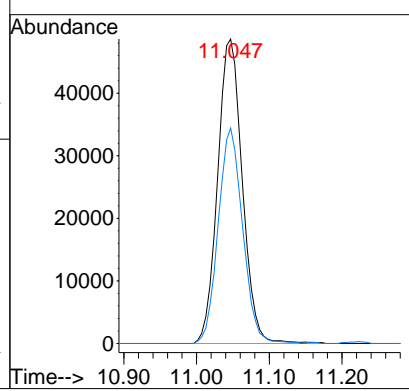
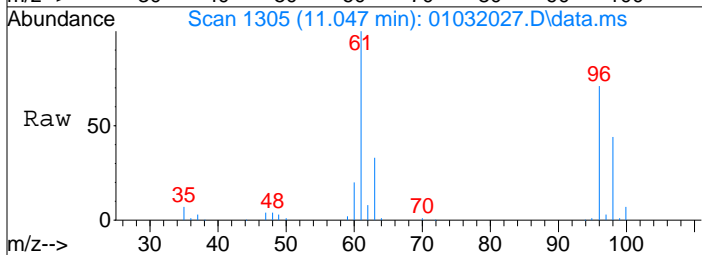
#27
 2-Butanone (MEK)
 Concen: 1.34 ng
 RT: 10.56 min Scan# 1220
 Delta R.T. -0.006 min
 Lab File: 01032027.D
 Acq: 3 Jan 2020 20:47

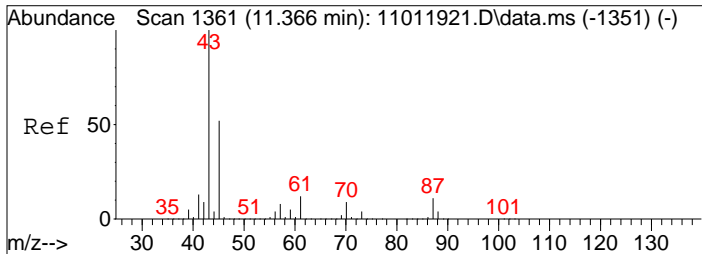
Tgt Ion	Resp	Lower	Upper
72	16543		
72	100		
43	443.8	392.5	432.5#



#28
 cis-1,2-Dichloroethene
 Concen: 4.51 ng
 RT: 11.05 min Scan# 1305
 Delta R.T. -0.029 min
 Lab File: 01032027.D
 Acq: 3 Jan 2020 20:47

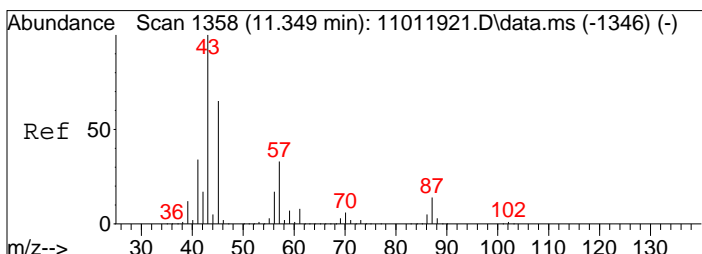
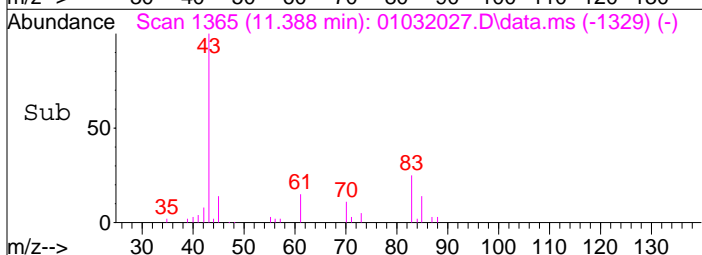
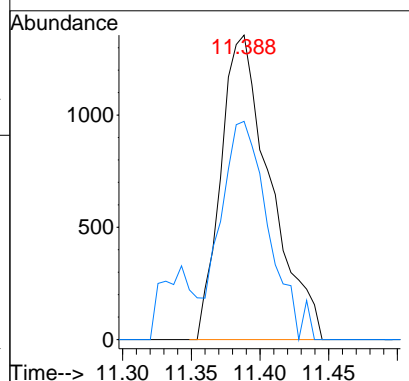
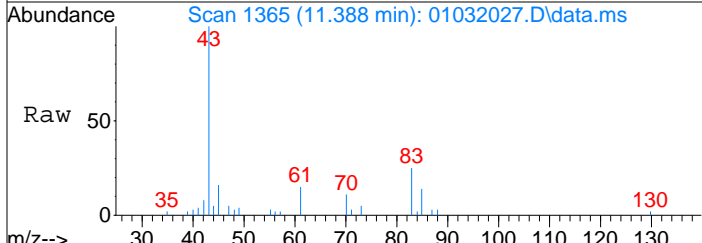
Tgt Ion	Resp	Lower	Upper
61	115000		
61	100		
96	69.7	51.9	91.9





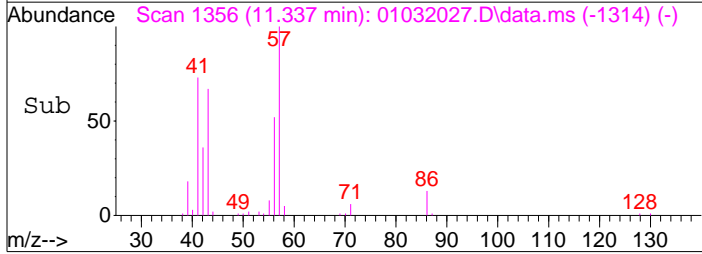
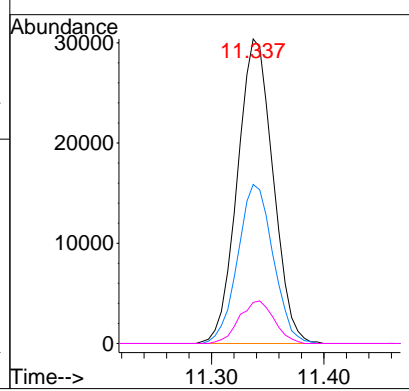
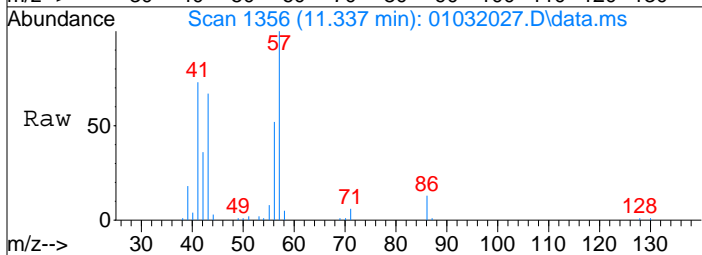
#30
Ethyl Acetate
Concen: 0.48 ng
RT: 11.39 min Scan# 1365
Delta R.T. 0.006 min
Lab File: 01032027.D
Acq: 3 Jan 2020 20:47

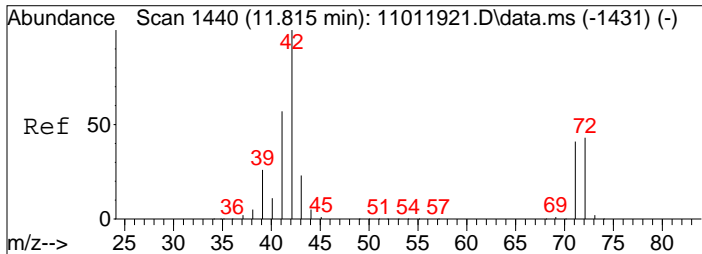
Tgt Ion	Resp	Lower	Upper
61	3382		
61	100		
70	67.9	60.0	100.0



#31
n-Hexane
Concen: 2.01 ng
RT: 11.34 min Scan# 1356
Delta R.T. -0.012 min
Lab File: 01032027.D
Acq: 3 Jan 2020 20:47

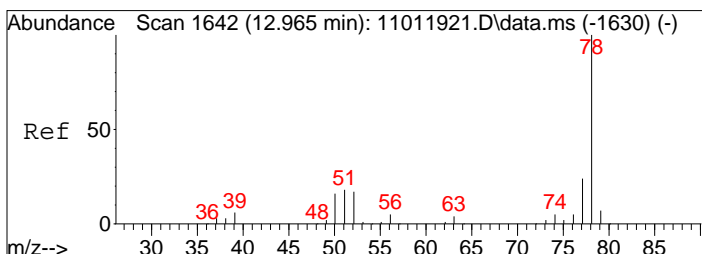
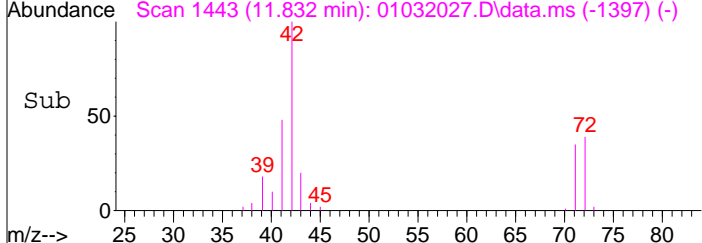
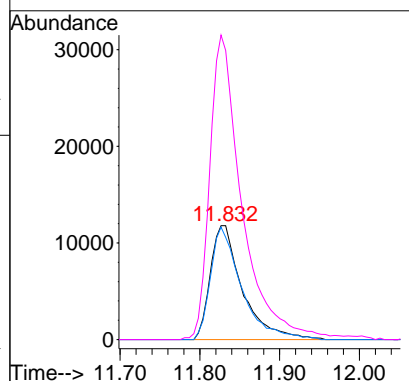
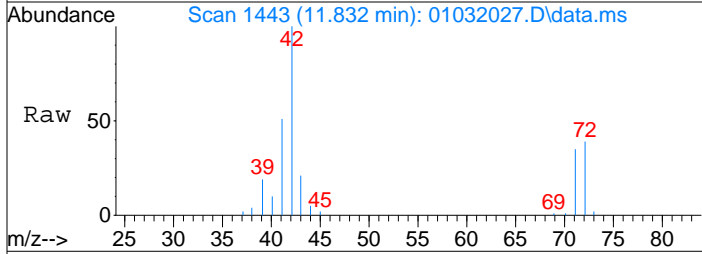
Tgt Ion	Resp	Lower	Upper
57	66949		
57	100		
56	52.0	41.4	62.0
86	13.7	11.9	17.9





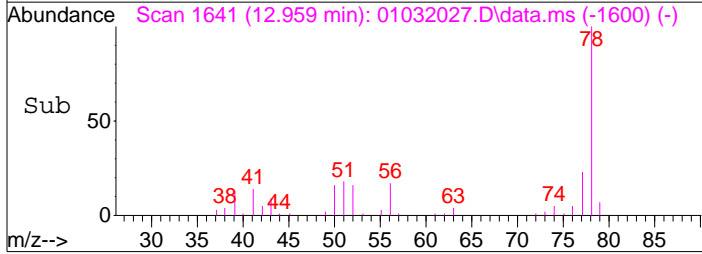
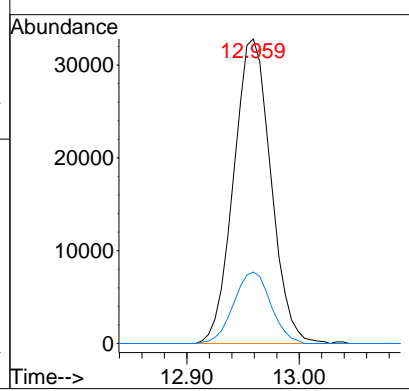
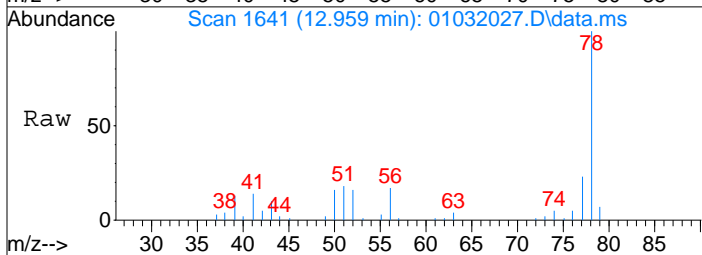
#34
 Tetrahydrofuran (THF)
 Concen: 2.68 ng
 RT: 11.83 min Scan# 1443
 Delta R.T. 0.011 min
 Lab File: 01032027.D
 Acq: 3 Jan 2020 20:47

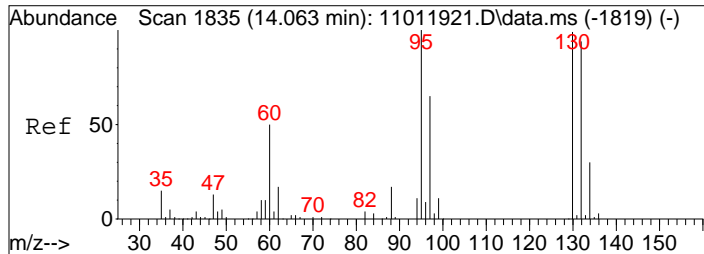
Tgt Ion:	Resp:	Lower	Upper
72	33105		
71	95.5	76.0	116.0
42	269.3	216.3	256.3#



#41
 Benzene
 Concen: 0.91 ng
 RT: 12.96 min Scan# 1641
 Delta R.T. -0.017 min
 Lab File: 01032027.D
 Acq: 3 Jan 2020 20:47

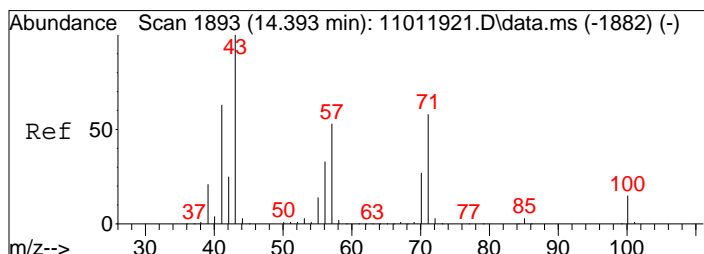
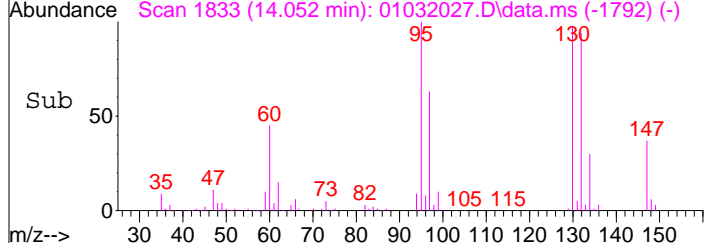
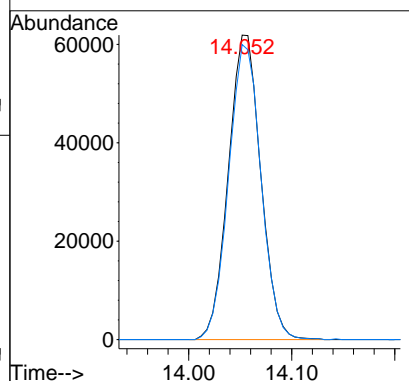
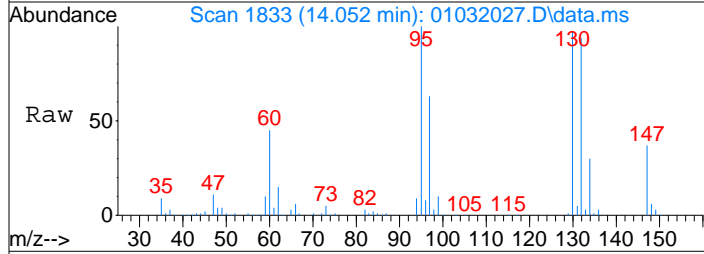
Tgt Ion:	Resp:	Lower	Upper
78	75509		
77	23.5	4.0	44.0





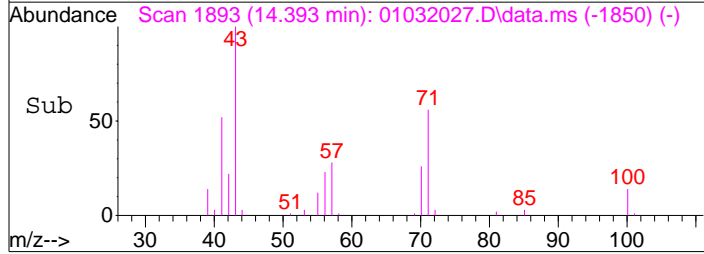
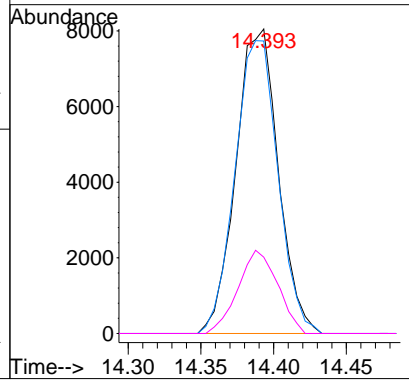
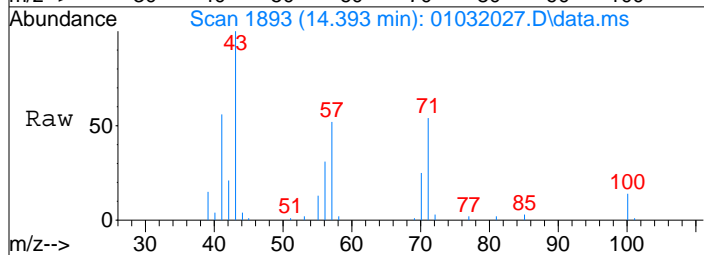
#47
 Trichloroethene
 Concen: 6.84 ng
 RT: 14.05 min Scan# 1833
 Delta R.T. -0.017 min
 Lab File: 01032027.D
 Acq: 3 Jan 2020 20:47

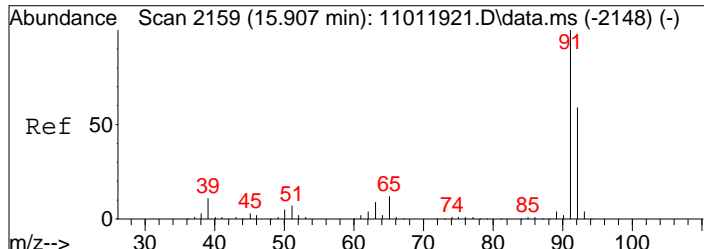
Tgt Ion: 130 Resp: 135346
 Ion Ratio Lower Upper
 130 100
 132 96.8 75.4 115.4



#51
 n-Heptane
 Concen: 0.80 ng
 RT: 14.39 min Scan# 1893
 Delta R.T. -0.006 min
 Lab File: 01032027.D
 Acq: 3 Jan 2020 20:47

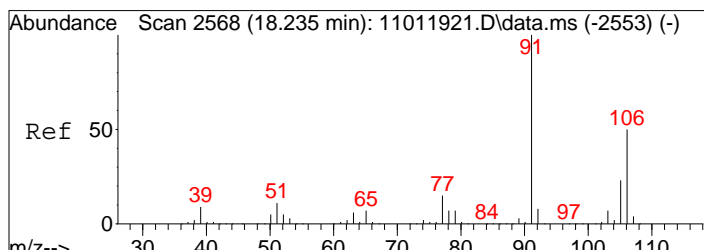
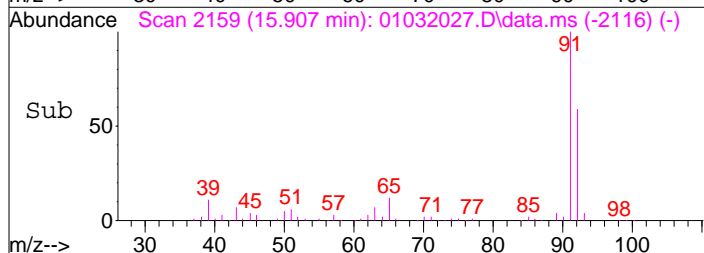
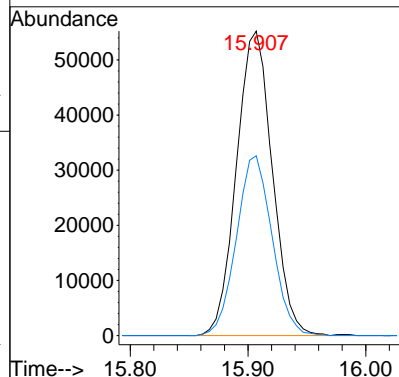
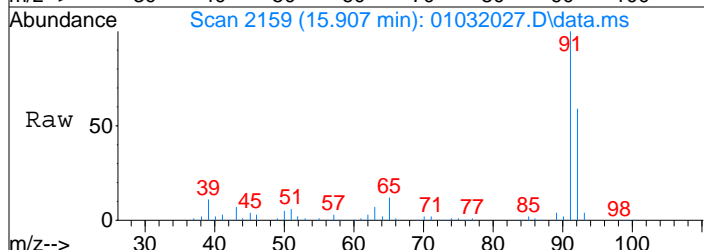
Tgt Ion: 71 Resp: 16295
 Ion Ratio Lower Upper
 71 100
 57 97.6 72.4 112.4
 100 25.6 6.6 46.6





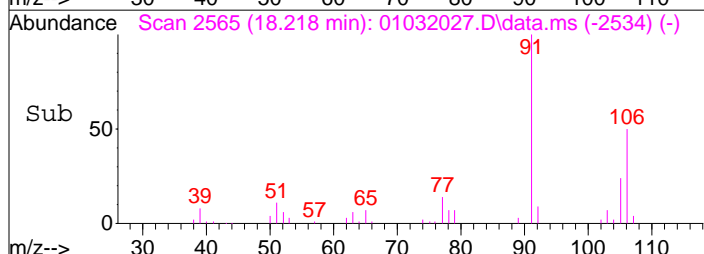
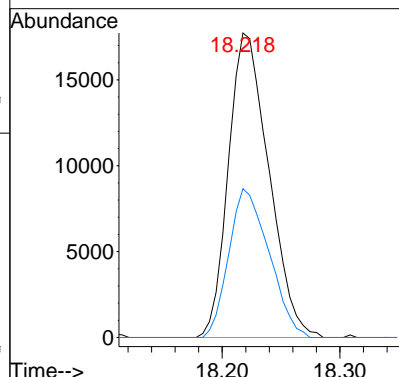
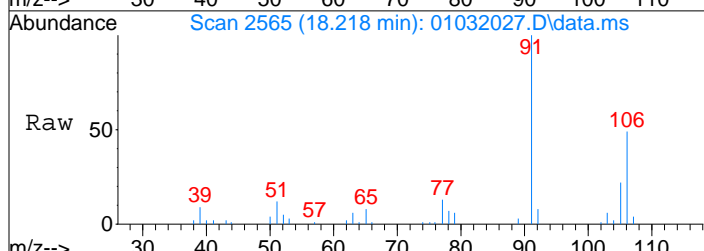
#58
 Toluene
 Concen: 1.49 ng
 RT: 15.91 min Scan# 2159
 Delta R.T. -0.006 min
 Lab File: 01032027.D
 Acq: 3 Jan 2020 20:47

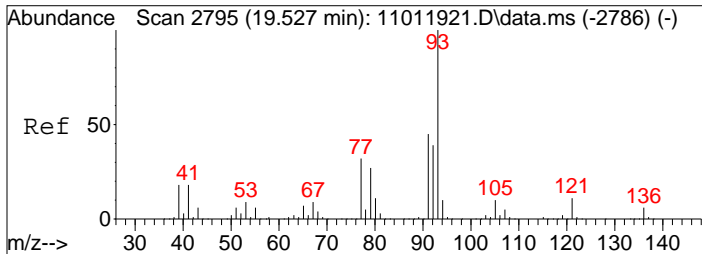
Tgt Ion	Resp	Lower	Upper
91	116921		
92	58.8	39.1	79.1



#67
 m- & p-Xylenes
 Concen: 0.62 ng
 RT: 18.22 min Scan# 2565
 Delta R.T. -0.023 min
 Lab File: 01032027.D
 Acq: 3 Jan 2020 20:47

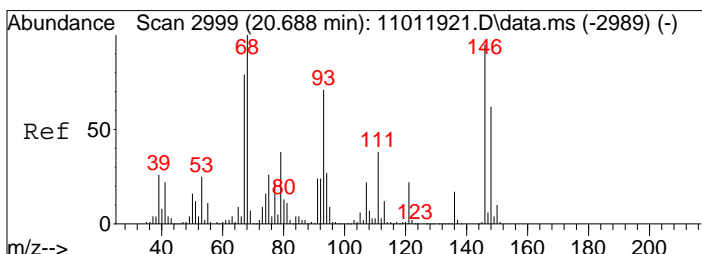
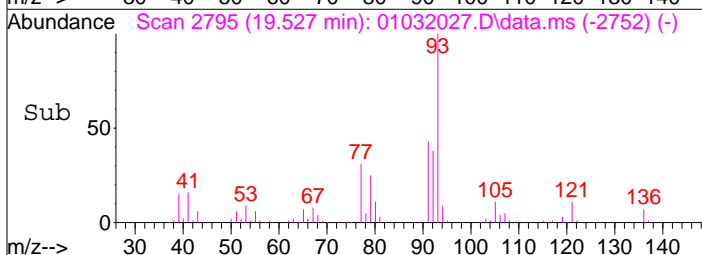
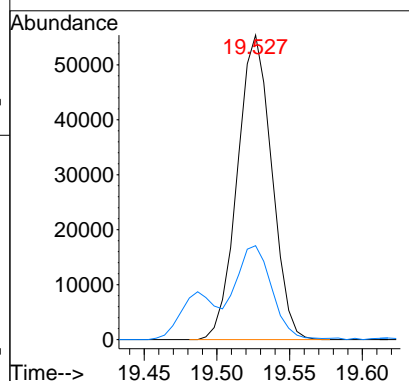
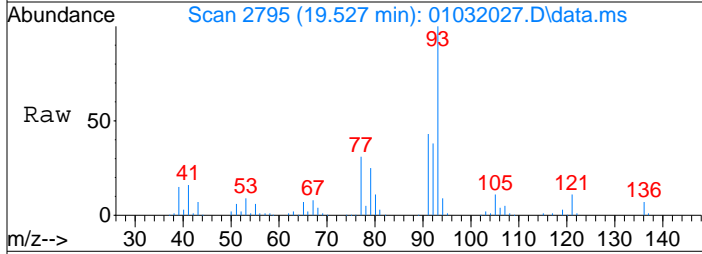
Tgt Ion	Resp	Lower	Upper
91	42237		
106	48.6	29.6	69.6





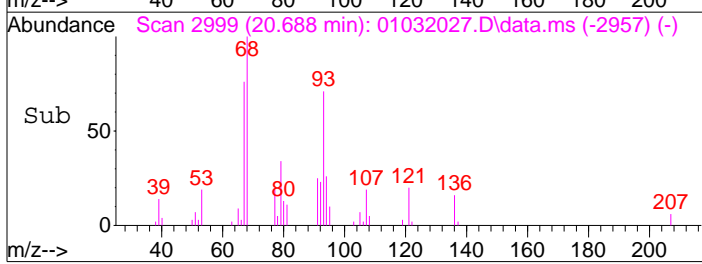
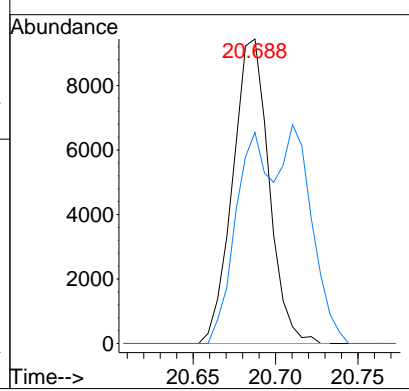
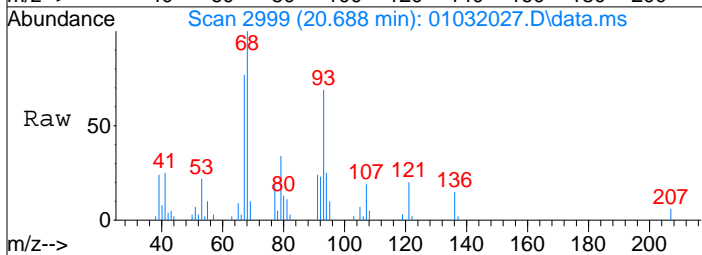
#75
 alpha-Pinene
 Concen: 2.06 ng
 RT: 19.53 min Scan# 2795
 Delta R.T. -0.006 min
 Lab File: 01032027.D
 Acq: 3 Jan 2020 20:47

Tgt Ion	Resp	Lower	Upper
93	100		
77	32.2	12.7	52.7



#91
 d-Limonene
 Concen: 0.47 ng
 RT: 20.69 min Scan# 2999
 Delta R.T. -0.012 min
 Lab File: 01032027.D
 Acq: 3 Jan 2020 20:47

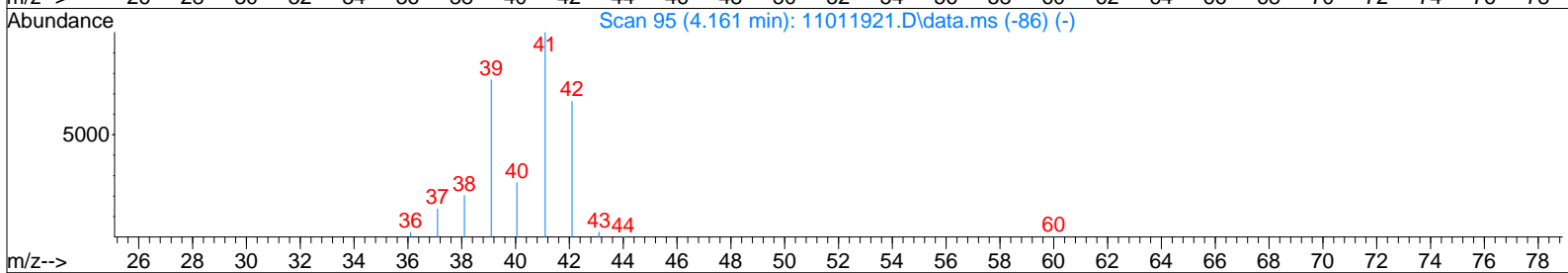
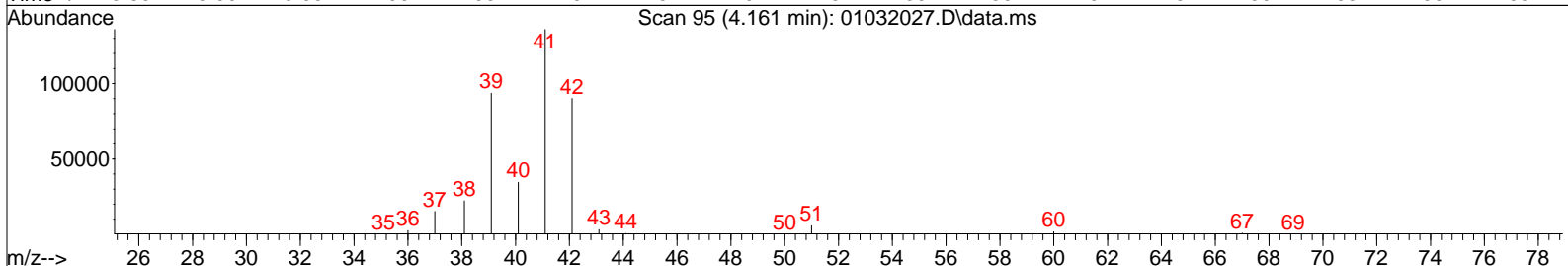
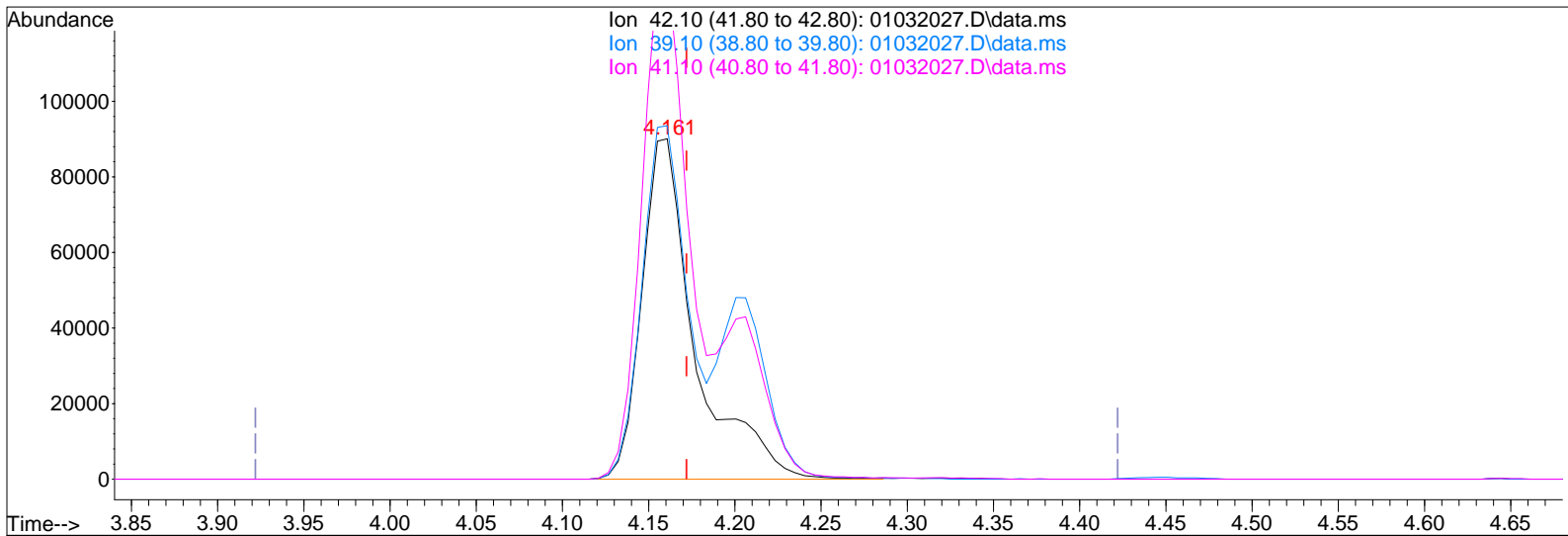
Tgt Ion	Resp	Lower	Upper
68	100		
93	69.1	50.4	90.4



Data File : I:\MS13\DATA\2020 01\03\01032027.D
 Acq On : 3 Jan 2020 20:47
 Sample : P1907777-003 (1000mL)
 Misc : S31-10251901

Vial: 5
 Operator: TD
 Inst : MS13

Quant Time: Jan 04 07:17:51 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



TIC: 01032027.D\data.ms

(2) Propene (T)

4.161min (-0.011) 8.71ng

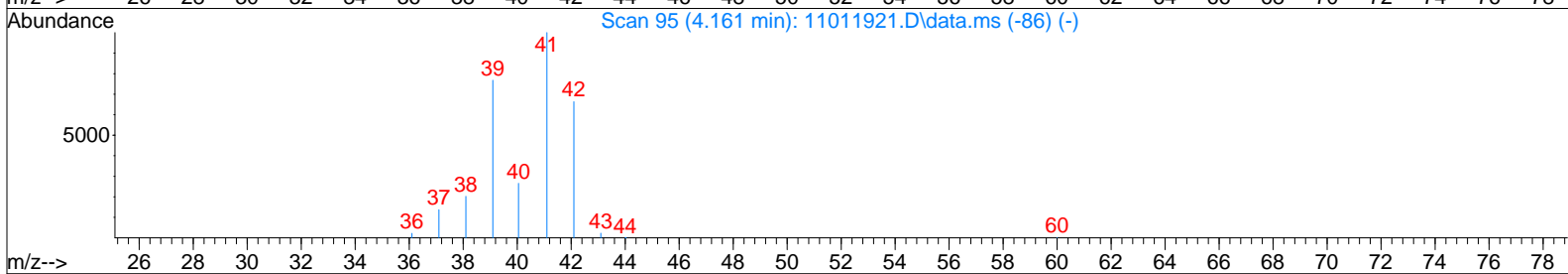
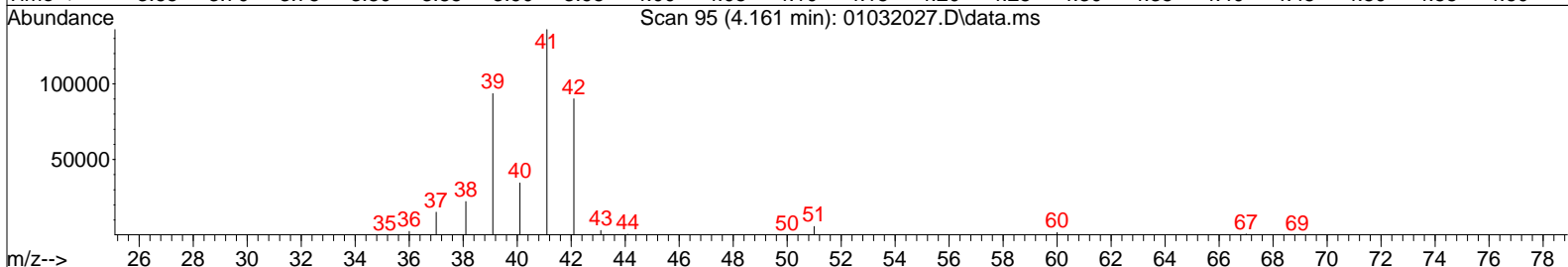
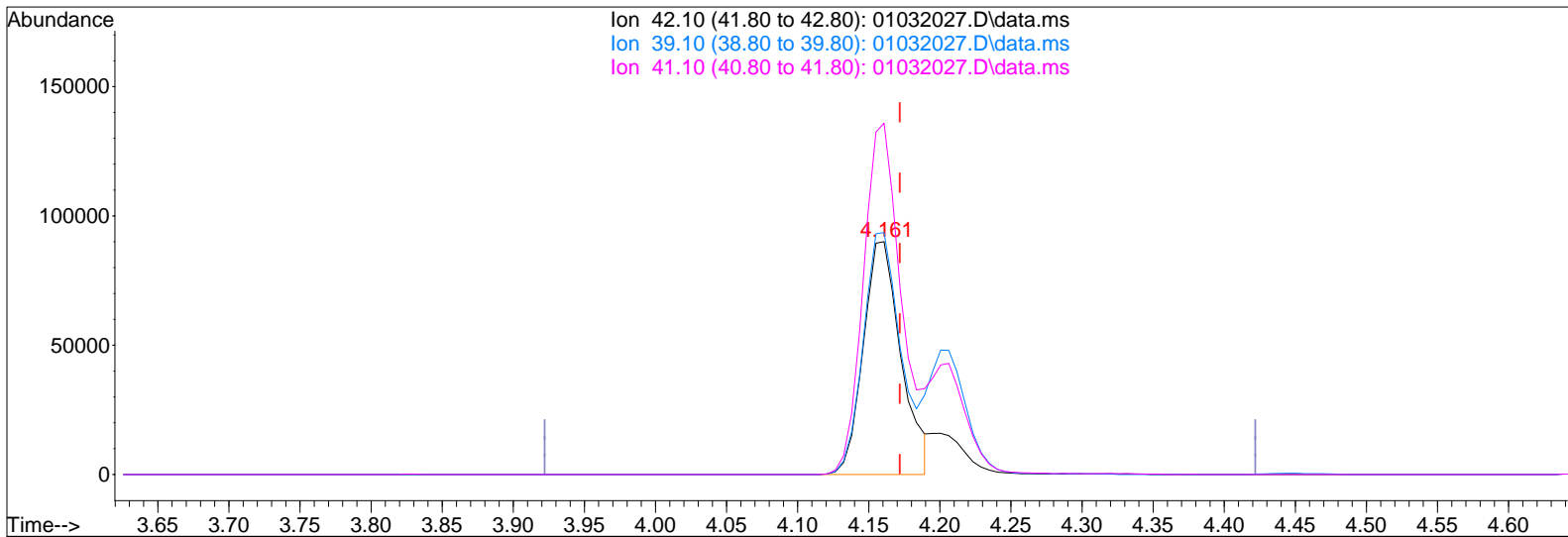
response 193803

Ion	Exp%	Act%
42.10	100	100
39.10	114.80	87.77#
41.10	150.90	132.02
0.00	0.00	0.00

Data File : I:\MS13\DATA\2020 01\03\01032027.D
 Acq On : 3 Jan 2020 20:47
 Sample : P1907777-003 (1000mL)
 Misc : S31-10251901

Vial: 5
 Operator: TD
 Inst : MS13

Quant Time: Jan 04 07:17:51 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



TIC: 01032027.D\data.ms

(2) Propene (T)

4.161min (-0.011) 7.47ng m

response 166129

Ion	Exp%	Act%
42.10	100	100
39.10	114.80	102.39
41.10	150.90	154.02
0.00	0.00	0.00

IPC TD 1/7/20

1/7/20

Data File : I:\MS13\DATA\2020 01\03\01032028.D
 Acq On : 3 Jan 2020 21:21
 Sample : P1907777-004 (1000mL)
 Misc : S31-10251901

Vial: 6
 Operator: TD
 Inst : MS13

TD 1/7/20

Quant Time: Jan 07 10:43:41 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	11.23	130	158138	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.36	114	749267	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	366433	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	267535	11.361	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	90.88%	
57) Toluene-d8 (SS2)	15.80	98	880468	12.209	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.68%	
73) Bromofluorobenzene (SS3)	19.05	174	214642	13.917	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	111.36%	

Target Compounds

						Qvalue
2) Propene	4.17	42	1880246	83.592	ng	97
3) Dichlorodifluoromethan...	4.33	85	70460	1.942	ng	99
4) Chloromethane	4.61	50	13208	0.492	ng	97
5) 1,2-Dichloro-1,1,2,2-t...	4.87	135	1489	N.D.		
6) Vinyl Chloride	5.04	62	4694	N.D.		
7) 1,3-Butadiene	5.29	54	633	N.D.		
8) Bromomethane	5.74	94	990	N.D.		
9) Chloroethane	6.07	64	287	N.D.		
10) Ethanol	6.46	45	2051409	137.567	ng	100
11) Acetonitrile	6.70	41	59774	1.683	ng	100
12) Acrolein	6.89	56	18602	1.641	ng	100
13) Acetone	7.09	58	1717135	111.015	ng	96
14) Trichlorofluoromethane	7.33	101	69296	2.254	ng	99
15) 2-Propanol (Isopropanol)	7.65	45	18775164	390.055	ng	99
16) Acrylonitrile	7.85	53	2496	N.D.		
17) 1,1-Dichloroethene	8.29	96	1157	N.D.		
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.	d	
19) Methylene Chloride	8.53	84	11500	0.646	ng	94
20) 3-Chloro-1-propene (Al...	8.76	41	234	N.D.		
21) Trichlorotrifluoroethane	8.94	151	83305	6.479	ng	95
22) Carbon Disulfide	8.78	76	58902	0.854	ng	99
23) trans-1,2-Dichloroethene	9.79	61	107	N.D.		
24) 1,1-Dichloroethane	10.08	63	3353	N.D.		
25) Methyl tert-Butyl Ether	10.20	73	615	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	10.55	72	166923	13.395	ng	92
28) cis-1,2-Dichloroethene	11.06	61	77339	3.002	ng	99
29) Diisopropyl Ether	11.35	87	3420	N.D.		
30) Ethyl Acetate	11.38	61	19517	2.714	ng	90
31) n-Hexane	11.34	57	363531	10.783	ng	99
32) Chloroform	11.40	83	16220	0.510	ng	94
34) Tetrahydrofuran (THF)	11.80	72	507974	40.739	ng	# 91
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.20	62	3971	N.D.		
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.		
39) Isopropyl Acetate	12.94	61	2973	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	12.96	78	229473	2.757	ng	99
42) Carbon Tetrachloride	13.12	117	7489	N.D.		
43) Cyclohexane	13.26	84	50191	1.668	ng	91
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	13.72	63	238	N.D.		
46) Bromodichloromethane	14.02	83	7220	N.D.		
47) Trichloroethene	14.06	130	85603	4.315	ng	98
48) 1,4-Dioxane	13.90	88	274	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	
50) Methyl Methacrylate	0.00	100	0	N.D.	d	

Data File : I:\MS13\DATA\2020 01\03\01032028.D
 Acq On : 3 Jan 2020 21:21
 Sample : P1907777-004 (1000mL)
 Misc : S31-10251901

Vial: 6
 Operator: TD
 Inst : MS13

Quant Time: Jan 07 10:43:41 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

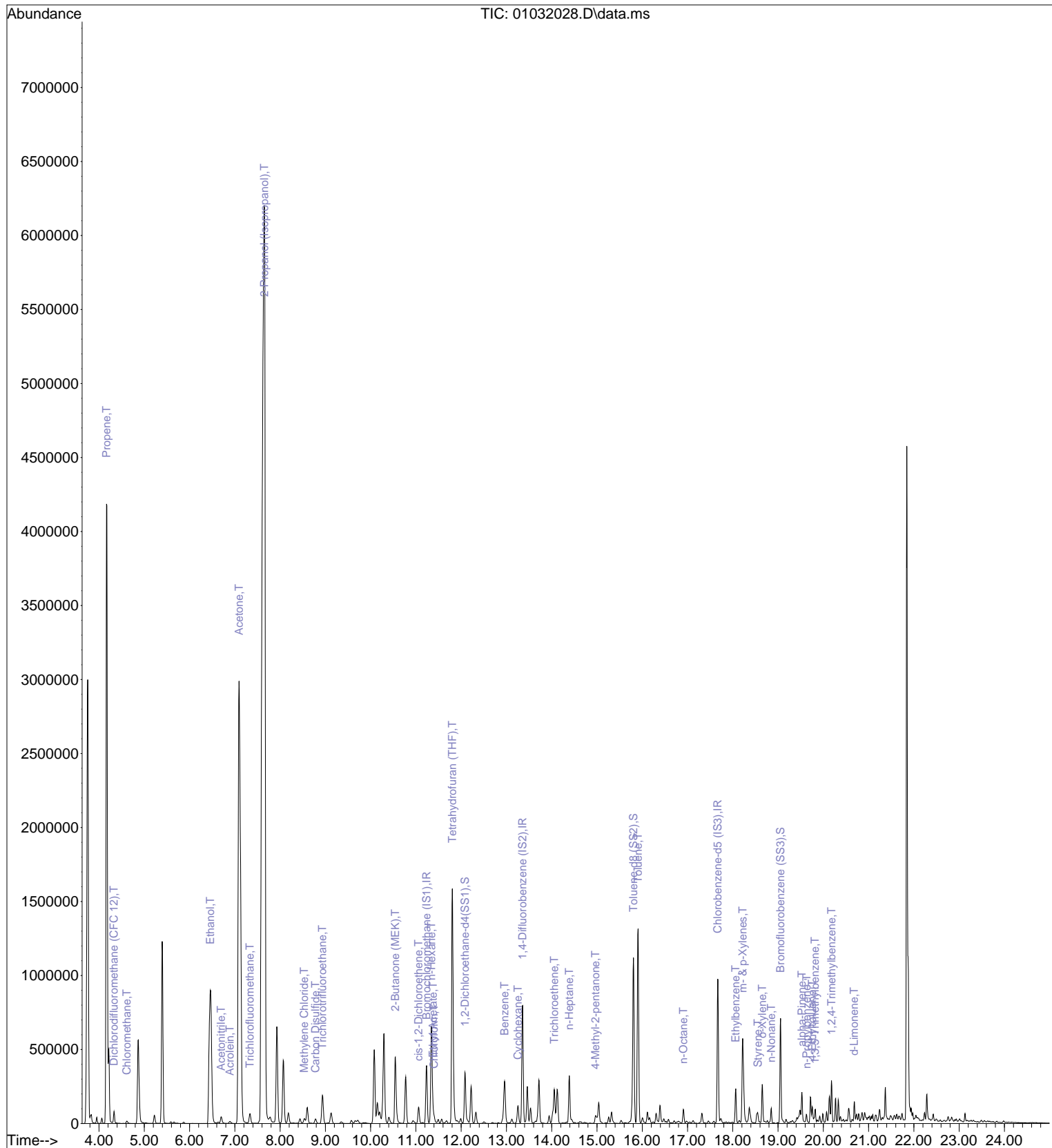
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	82304	4.005	ng	97
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	14.97	58	17939	0.967	ng	77
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	15.54	97	497	N.D.		
58) Toluene	15.91	91	1096787	14.022	ng	99
59) 2-Hexanone	0.00	43	0	N.D.	d	
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.79	43	5570	N.D.		
63) n-Octane	16.91	57	19287	1.103	ng	94
64) Tetrachloroethene	17.06	166	2573	N.D.		
65) Chlorobenzene	17.75	112	2613	N.D.		
66) Ethylbenzene	18.06	91	183825	2.143	ng	99
67) m- & p-Xylenes	18.22	91	465513	6.858	ng	100
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.55	104	29022	0.587	ng	97
70) o-Xylene	18.65	91	164683	2.356	ng	99
71) n-Nonane	18.85	43	38768	0.956	ng	94
72) 1,1,2,2-Tetrachloroethane	18.59	83	651	N.D.		
74) Cumene	19.18	105	12226	N.D.		
75) alpha-Pinene	19.53	93	81986	1.863	ng	98
76) n-Propylbenzene	19.63	91	46273	0.460	ng	97
77) 3-Ethyltoluene	0.00	105	0	N.D.	d	
78) 4-Ethyltoluene	19.75	105	47752	0.608	ng	98
79) 1,3,5-Trimethylbenzene	19.82	105	34481	0.494	ng	99
80) alpha-Methylstyrene	19.96	118	745	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D.	d	
82) 1,2,4-Trimethylbenzene	20.18	105	138575	1.861	ng	90
83) n-Decane	0.00	57	0	N.D.	d	
84) Benzyl Chloride	20.31	91	508	N.D.		
85) 1,3-Dichlorobenzene	20.37	146	11931	N.D.		
86) 1,4-Dichlorobenzene	20.37	146	11931	N.D.		
87) sec-Butylbenzene	20.42	105	4518	N.D.		
88) 4-Isopropyltoluene (p-...	20.56	119	13835	N.D.		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.	d	
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	20.68	68	34837	1.148	ng	100
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	0.00	57	0	N.D.	d	
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	22.30	128	17511	N.D.		
96) n-Dodecane	0.00	57	0	N.D.	d	
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.	d	
99) tert-Butylbenzene	20.18	119	16909	N.D.		
100) n-Butylbenzene	20.92	91	16889	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2020 01\03\01032028.D
Acq On : 3 Jan 2020 21:21
Sample : P1907777-004 (1000mL)
Misc : S31-10251901

Vial: 6
Operator: TD
Inst : MS13

Quant Time: Jan 07 10:43:41 2020
Quant Method : I:\MS13\METHODS\R13110119.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Nov 02 09:55:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



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 DataAcq Meth:TO15.M

TD 1/7/20

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	11.23	130	158138	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.36	114	749267	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	366433	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	267535	11.361	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	90.88%	
57) Toluene-d8 (SS2)	15.80	98	880468	12.209	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.68%	
73) Bromofluorobenzene (SS3)	19.05	174	214642	13.917	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	111.36%	

Target Compounds

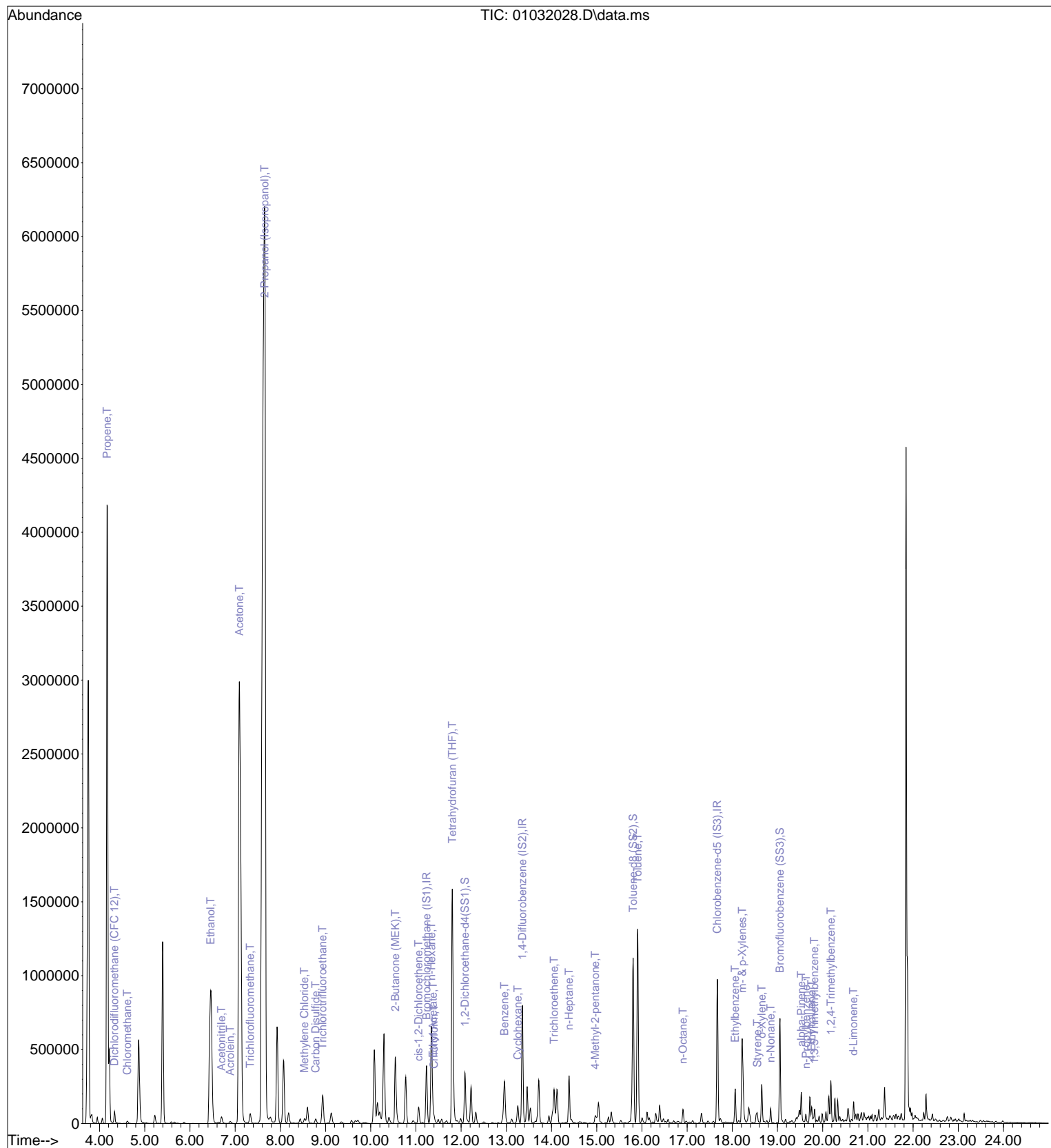
	R.T.	QIon	Response	Conc	Units	Qvalue
2) Propene	4.17	42	1880246	83.592	ng	97
3) Dichlorodifluoromethan...	4.33	85	70460	1.942	ng	99
4) Chloromethane	4.61	50	13208	0.492	ng	97
10) Ethanol	6.46	45	2051409	137.567	ng	100
11) Acetonitrile	6.70	41	59774	1.683	ng	100
12) Acrolein	6.89	56	18602	1.641	ng	100
13) Acetone	7.09	58	1717135	111.015	ng	96
14) Trichlorofluoromethane	7.33	101	69296	2.254	ng	99
15) 2-Propanol (Isopropanol)	7.65	45	18775164	390.055	ng	99
19) Methylene Chloride	8.53	84	11500	0.646	ng	94
21) Trichlorotrifluoroethane	8.94	151	83305	6.479	ng	95
22) Carbon Disulfide	8.78	76	58902	0.854	ng	99
27) 2-Butanone (MEK)	10.55	72	166923	13.395	ng	92
28) cis-1,2-Dichloroethene	11.06	61	77339	3.002	ng	99
30) Ethyl Acetate	11.38	61	19517	2.714	ng	90
31) n-Hexane	11.34	57	363531	10.783	ng	99
32) Chloroform	11.40	83	16220	0.510	ng	94
34) Tetrahydrofuran (THF)	11.80	72	507974	40.739	ng	# 91
41) Benzene	12.96	78	229473	2.757	ng	99
43) Cyclohexane	13.26	84	50191	1.668	ng	91
47) Trichloroethene	14.06	130	85603	4.315	ng	98
51) n-Heptane	14.39	71	82304	4.005	ng	97
53) 4-Methyl-2-pentanone	14.97	58	17939	0.967	ng	77
58) Toluene	15.91	91	1096787	14.022	ng	99
63) n-Octane	16.91	57	19287	1.103	ng	94
66) Ethylbenzene	18.06	91	183825	2.143	ng	99
67) m- & p-Xylenes	18.22	91	465513	6.858	ng	100
69) Styrene	18.55	104	29022	0.587	ng	97
70) o-Xylene	18.65	91	164683	2.356	ng	99
71) n-Nonane	18.85	43	38768	0.956	ng	94
75) alpha-Pinene	19.53	93	81986	1.863	ng	98
76) n-Propylbenzene	19.63	91	46273	0.460	ng	97
78) 4-Ethyltoluene	19.75	105	47752	0.608	ng	98
79) 1,3,5-Trimethylbenzene	19.82	105	34481	0.494	ng	99
82) 1,2,4-Trimethylbenzene	20.18	105	138575	1.861	ng	90
91) d-Limonene	20.68	68	34837	1.148	ng	100

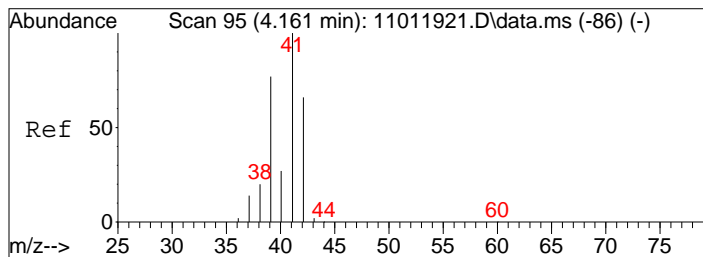
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2020 01\03\01032028.D
Acq On : 3 Jan 2020 21:21
Sample : P1907777-004 (1000mL)
Misc : S31-10251901

Vial: 6
Operator: TD
Inst : MS13

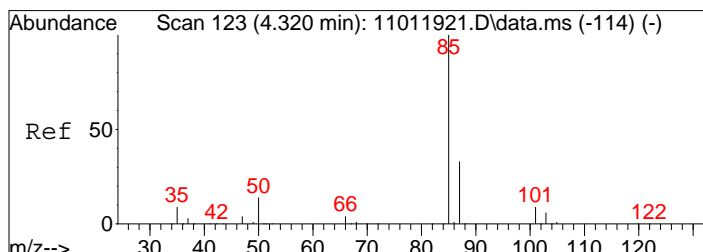
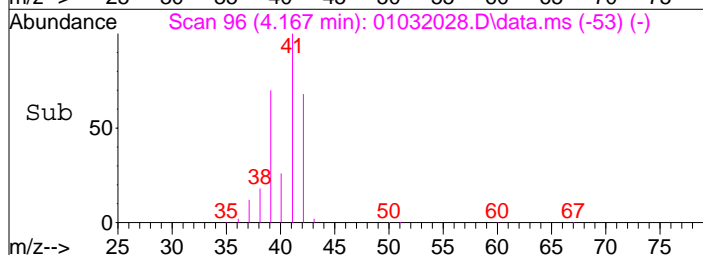
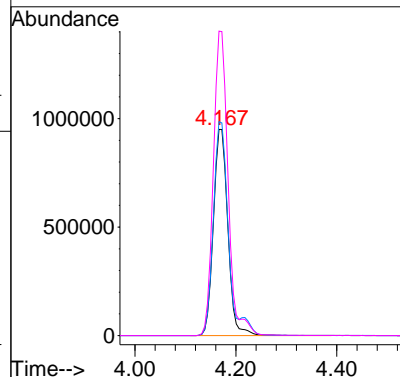
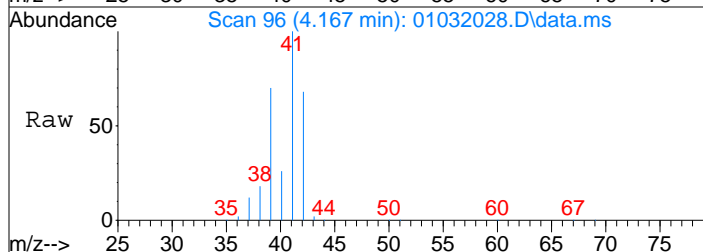
Quant Time: Jan 07 10:43:41 2020
Quant Method : I:\MS13\METHODS\R13110119.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Nov 02 09:55:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M





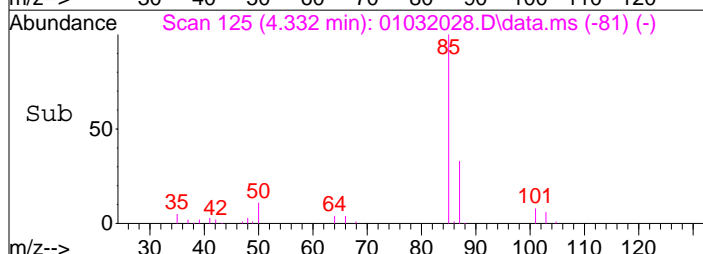
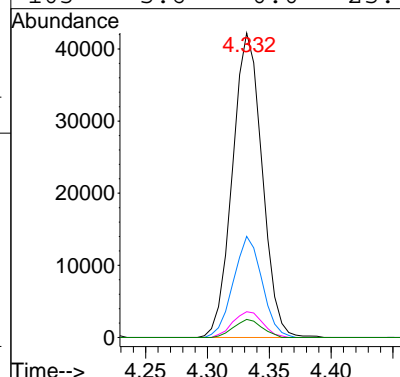
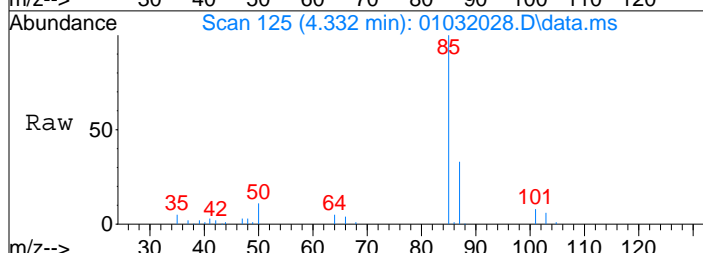
#2
 Propene
 Concen: 83.59 ng
 RT: 4.17 min Scan# 96
 Delta R.T. -0.005 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

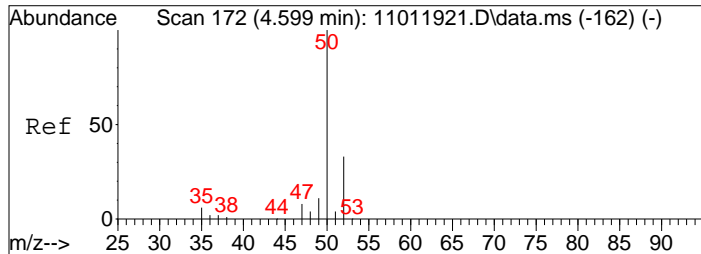
Tgt Ion:	42	Resp:	1880246
Ion Ratio	Lower	Upper	
42	100		
39	109.0	94.8	134.8
41	151.7	130.9	170.9



#3
 Dichlorodifluoromethane (CFC 12)
 Concen: 1.94 ng
 RT: 4.33 min Scan# 125
 Delta R.T. -0.000 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

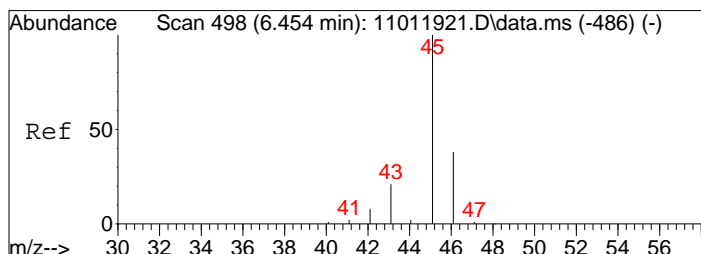
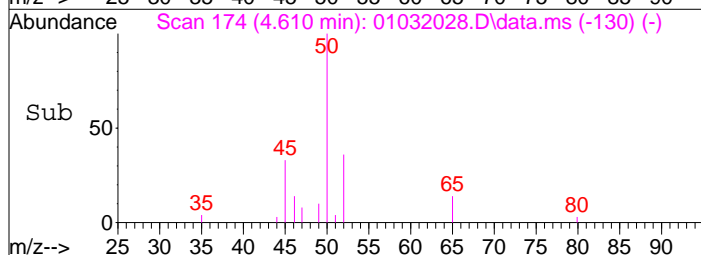
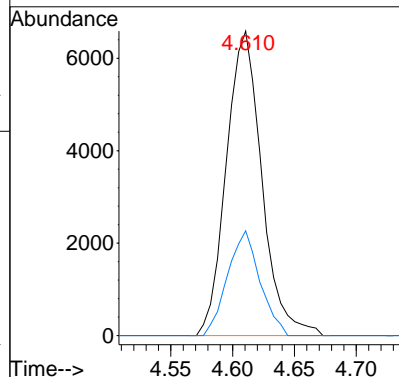
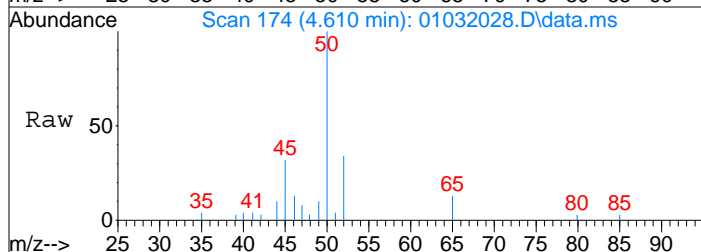
Tgt Ion:	85	Resp:	70460
Ion Ratio	Lower	Upper	
85	100		
87	32.1	12.6	52.6
101	8.6	0.0	28.8
103	5.6	0.0	25.7





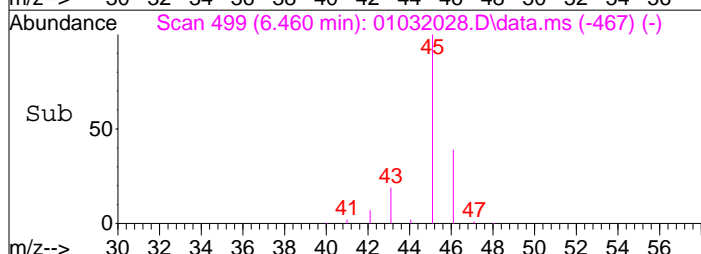
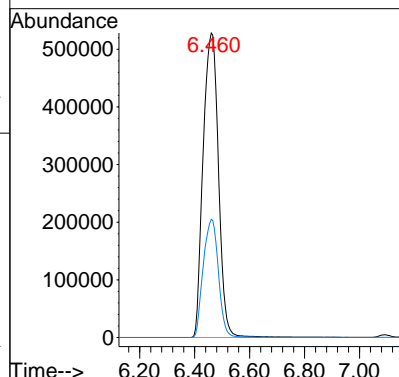
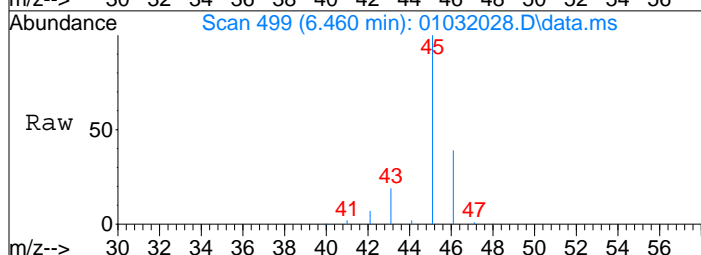
#4
 Chloromethane
 Concen: 0.49 ng
 RT: 4.61 min Scan# 174
 Delta R.T. -0.001 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

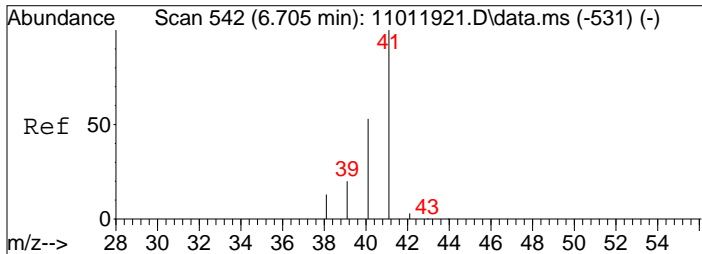
Tgt Ion	Resp	Lower	Upper
50	100		
52	31.3	12.8	52.8



#10
 Ethanol
 Concen: 137.57 ng
 RT: 6.46 min Scan# 499
 Delta R.T. -0.068 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

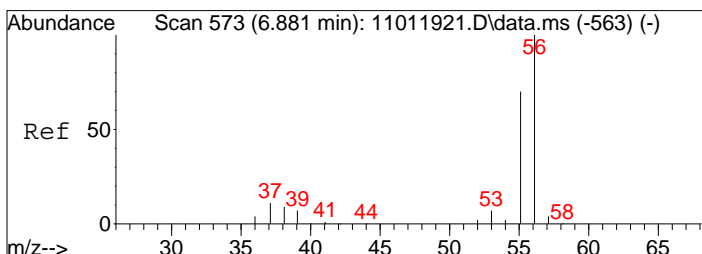
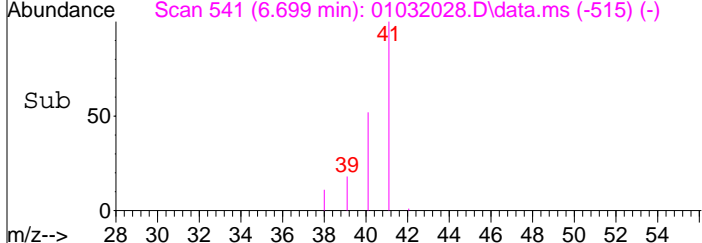
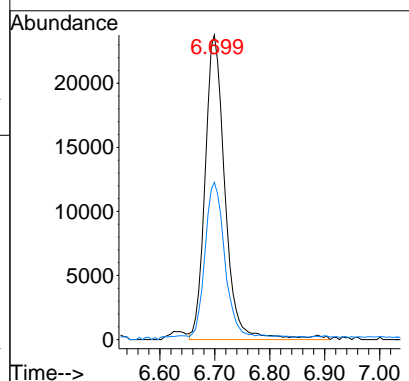
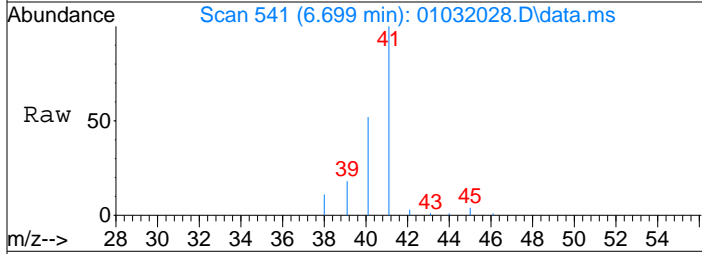
Tgt Ion	Resp	Lower	Upper
45	100		
46	38.4	18.1	58.1





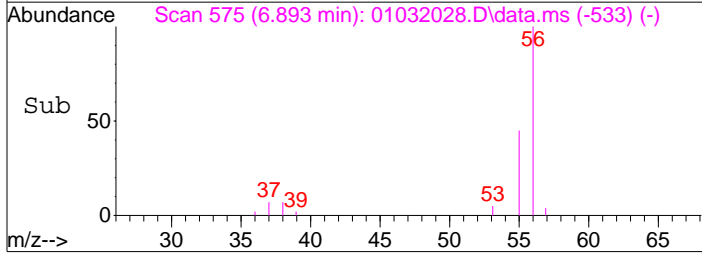
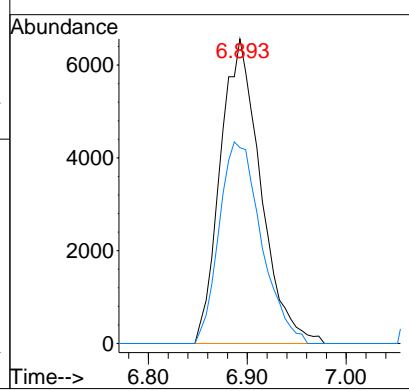
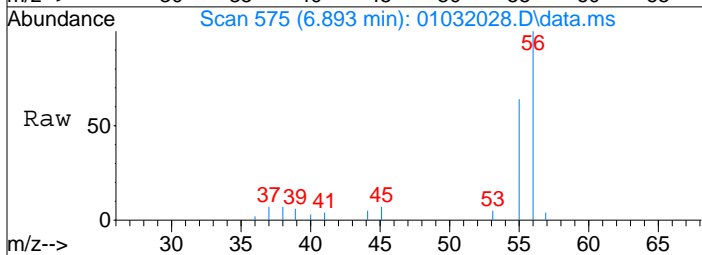
#11
 Acetonitrile
 Concen: 1.68 ng
 RT: 6.70 min Scan# 541
 Delta R.T. -0.051 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

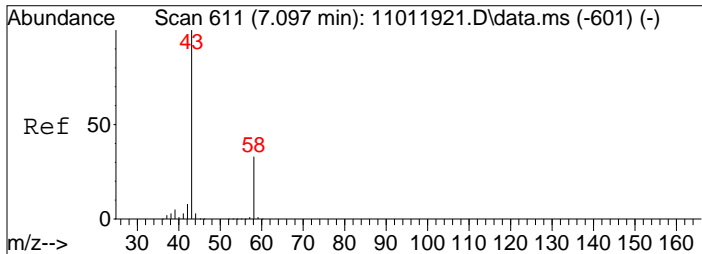
Tgt Ion	Resp	Lower	Upper
41	59774		
40	54.0	33.7	73.7



#12
 Acrolein
 Concen: 1.64 ng
 RT: 6.89 min Scan# 575
 Delta R.T. -0.011 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

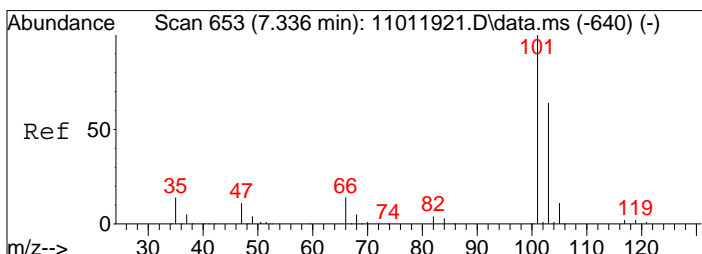
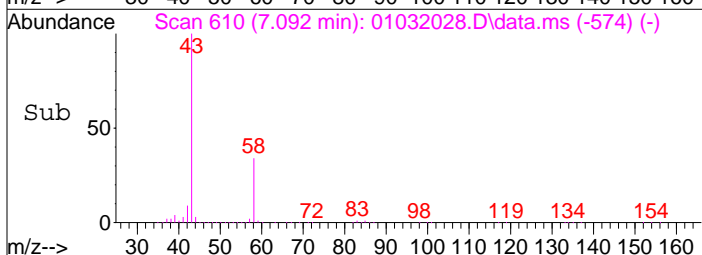
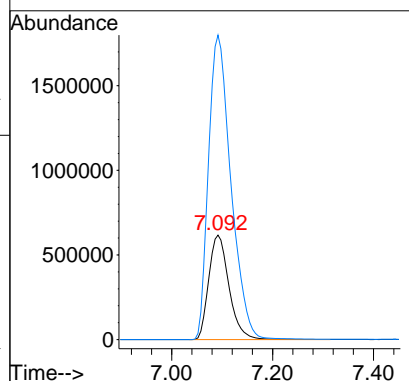
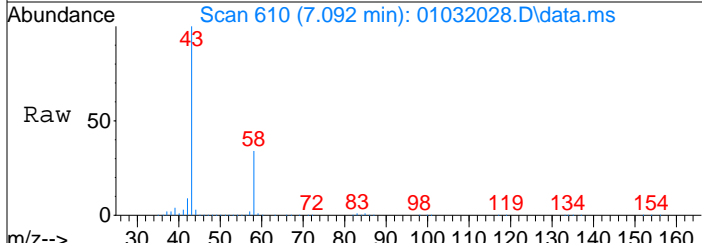
Tgt Ion	Resp	Lower	Upper
56	18602		
55	68.9	49.1	89.1





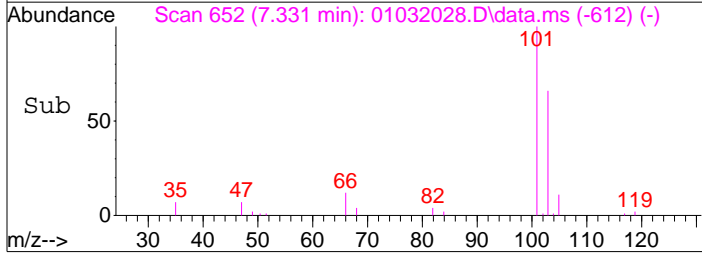
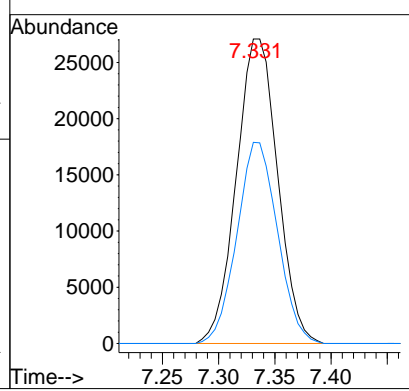
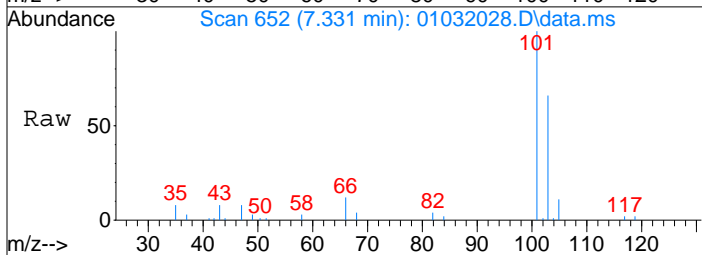
#13
 Acetone
 Concen: 111.01 ng
 RT: 7.09 min Scan# 610
 Delta R.T. -0.045 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

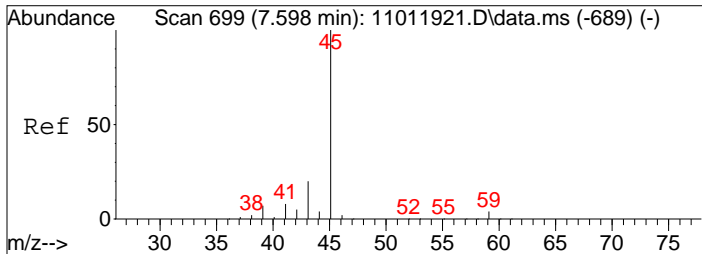
Tgt Ion:	Resp:	Lower	Upper
58	1717135		
58	100		
43	323.6	284.6	344.6



#14
 Trichlorofluoromethane
 Concen: 2.25 ng
 RT: 7.33 min Scan# 652
 Delta R.T. -0.023 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

Tgt Ion:	Resp:	Lower	Upper
101	69296		
101	100		
103	64.9	44.1	84.1

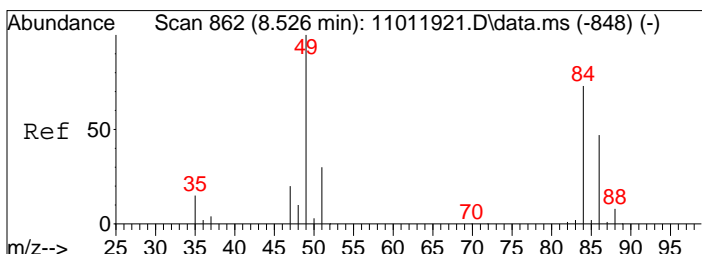
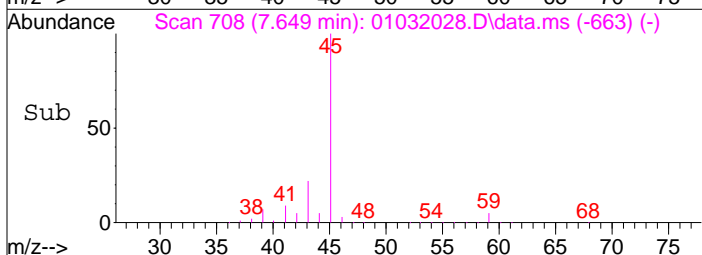
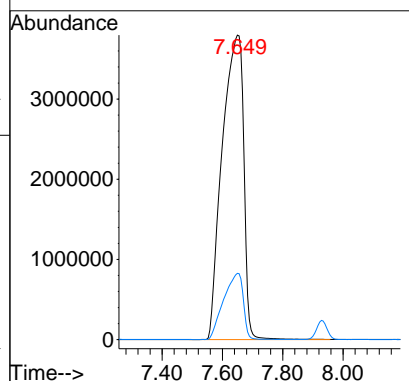
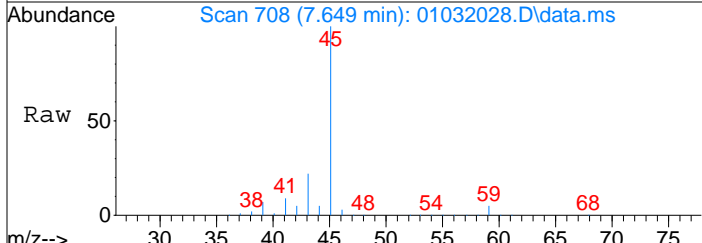




#15
 2-Propanol (Isopropanol)
 Concen: 390.06 ng
 RT: 7.65 min Scan# 708
 Delta R.T. 0.005 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

Tgt Ion: 45 Resp:18775164

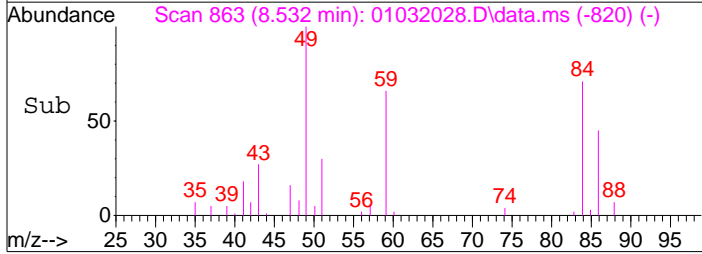
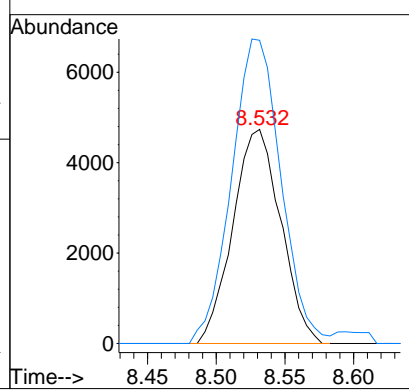
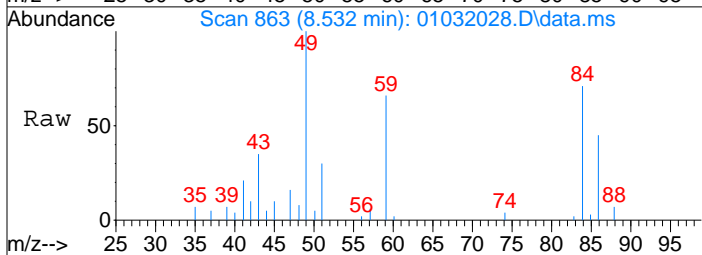
Ion	Ratio	Lower	Upper
45	100		
43	19.9	0.2	40.2

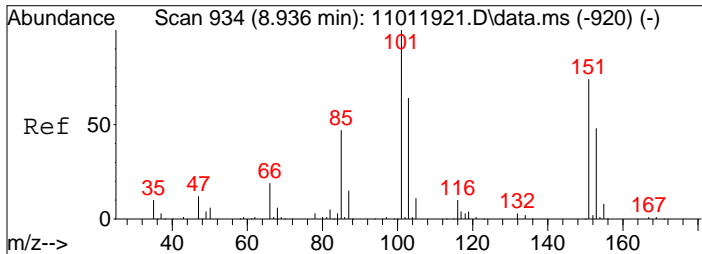


#19
 Methylene Chloride
 Concen: 0.65 ng
 RT: 8.53 min Scan# 863
 Delta R.T. -0.006 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

Tgt Ion: 84 Resp: 11500

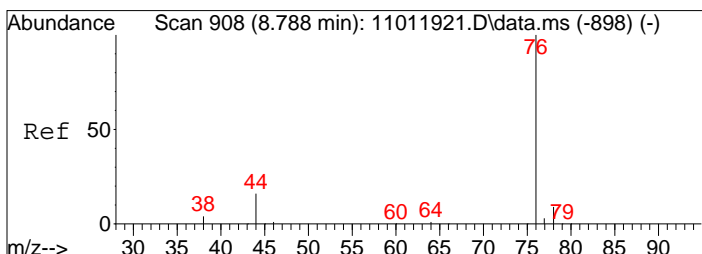
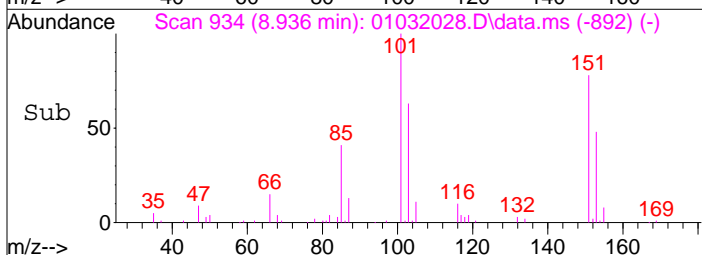
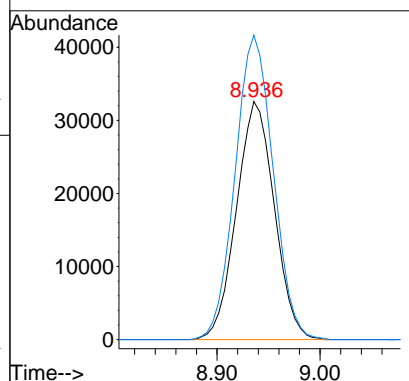
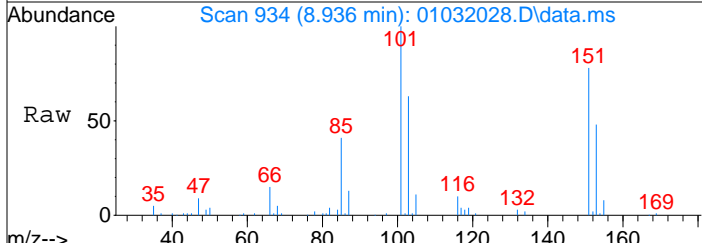
Ion	Ratio	Lower	Upper
84	100		
49	146.7	114.0	164.0





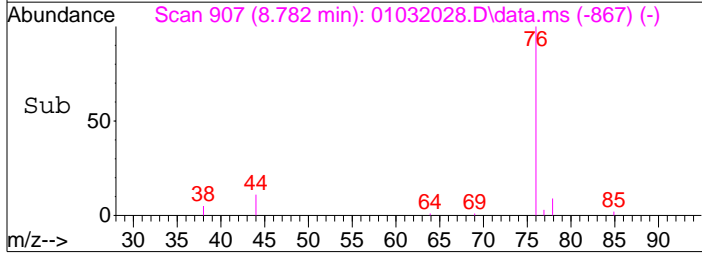
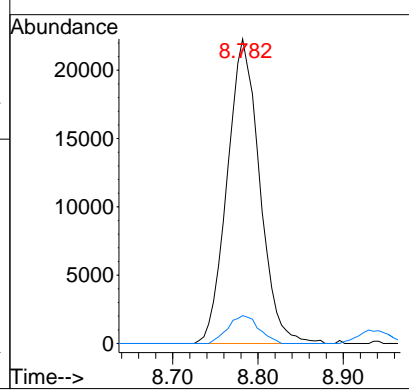
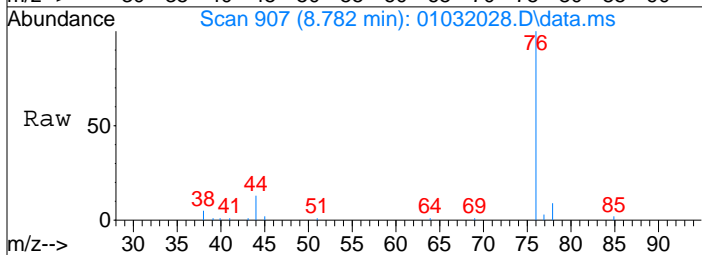
#21
 Trichlorotrifluoroethane
 Concen: 6.48 ng
 RT: 8.94 min Scan# 934
 Delta R.T. -0.011 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

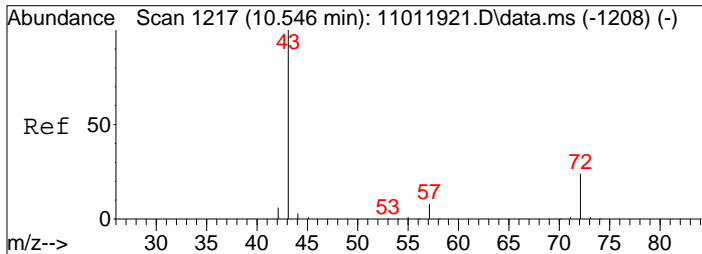
Tgt Ion	Resp	Lower	Upper
151	83305		
101	100	128.7	114.4
101	128.7	114.4	154.4



#22
 Carbon Disulfide
 Concen: 0.85 ng
 RT: 8.78 min Scan# 907
 Delta R.T. -0.023 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

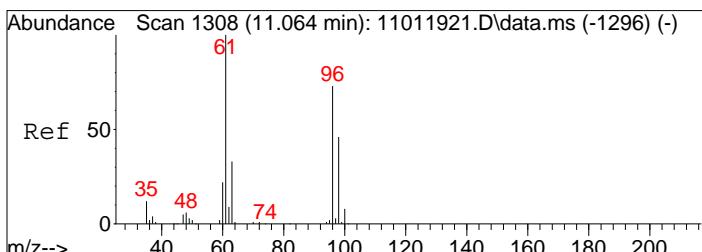
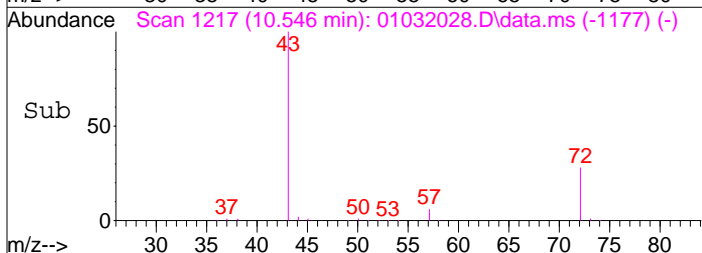
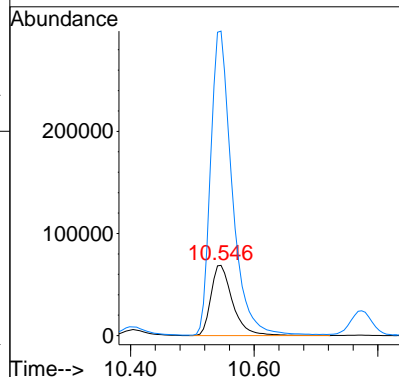
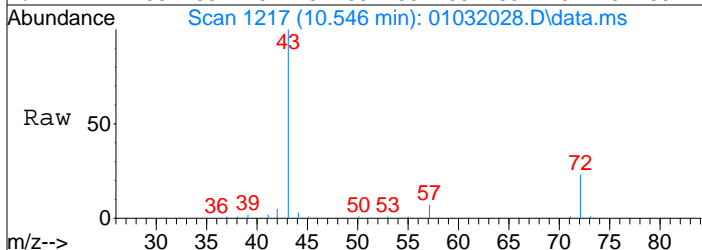
Tgt Ion	Resp	Lower	Upper
76	58902		
76	100		
78	8.7	0.0	29.2





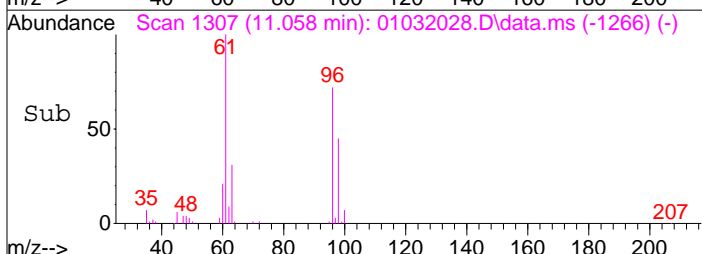
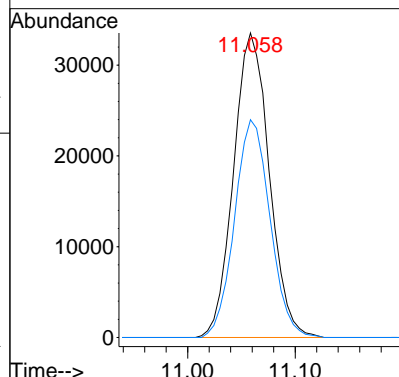
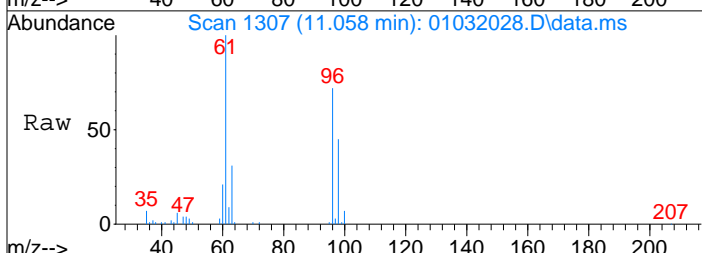
#27
 2-Butanone (MEK)
 Concen: 13.39 ng
 RT: 10.55 min Scan# 1217
 Delta R.T. -0.023 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

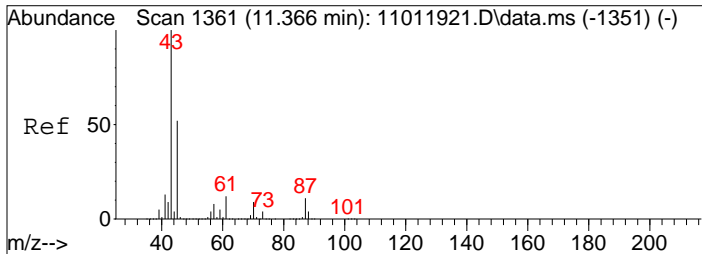
Tgt Ion:	Resp:	Lower	Upper
72	166923		
72	100		
43	431.0	392.5	432.5



#28
 cis-1,2-Dichloroethene
 Concen: 3.00 ng
 RT: 11.06 min Scan# 1307
 Delta R.T. -0.017 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

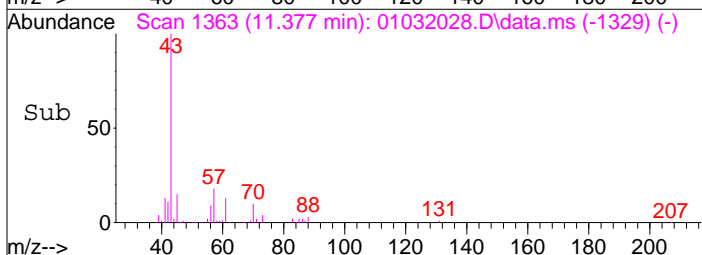
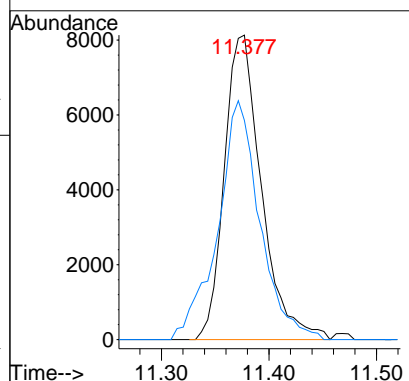
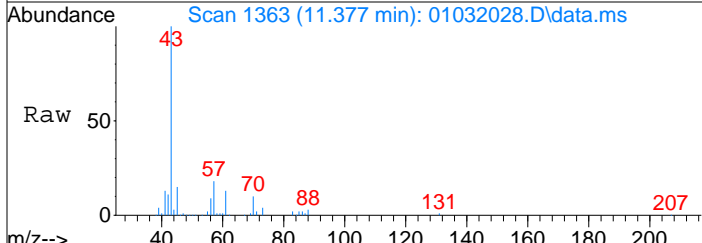
Tgt Ion:	Resp:	Lower	Upper
61	77339		
61	100		
96	71.1	51.9	91.9





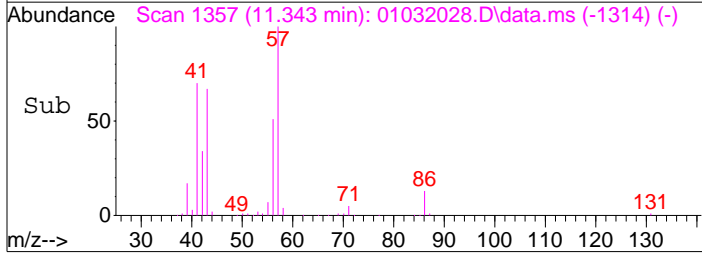
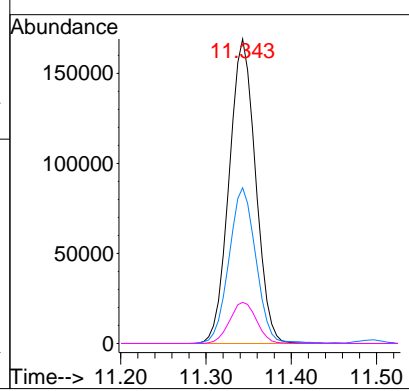
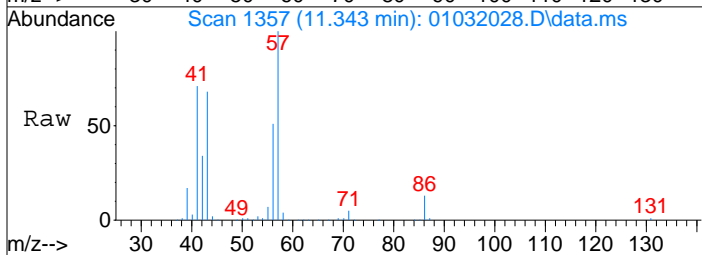
#30
 Ethyl Acetate
 Concen: 2.71 ng
 RT: 11.38 min Scan# 1363
 Delta R.T. -0.006 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

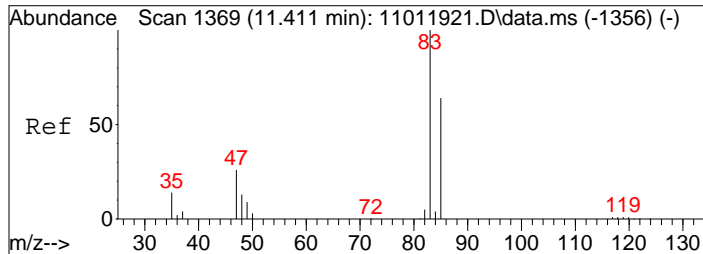
Tgt Ion:	Resp:	Lower	Upper
61	19517		
70	89.2	60.0	100.0



#31
 n-Hexane
 Concen: 10.78 ng
 RT: 11.34 min Scan# 1357
 Delta R.T. -0.006 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

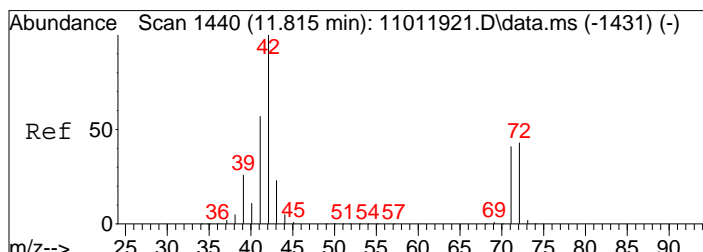
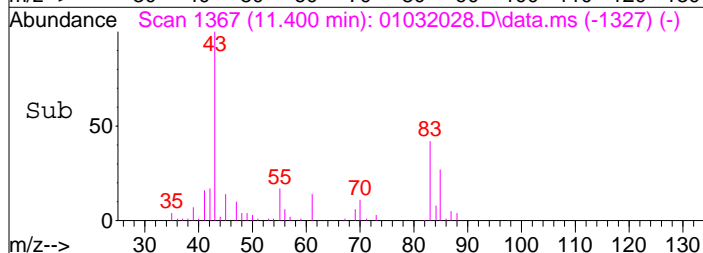
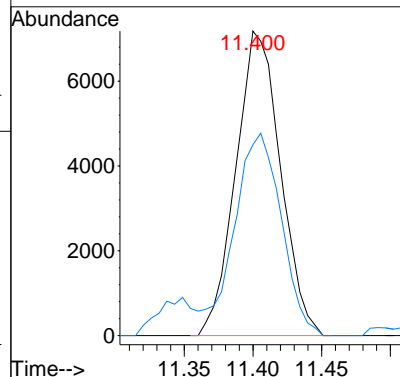
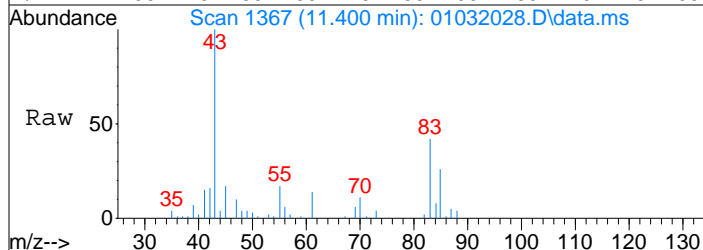
Tgt Ion:	Resp:	Lower	Upper
57	363531		
56	52.2	41.4	62.0
86	13.8	11.9	17.9





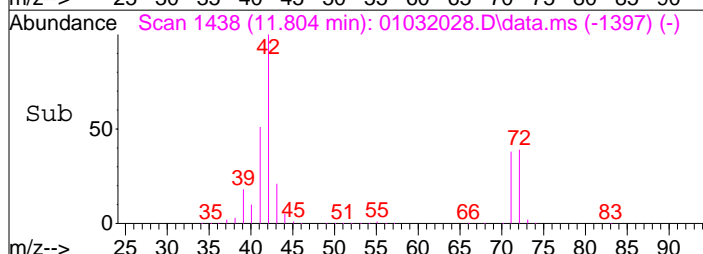
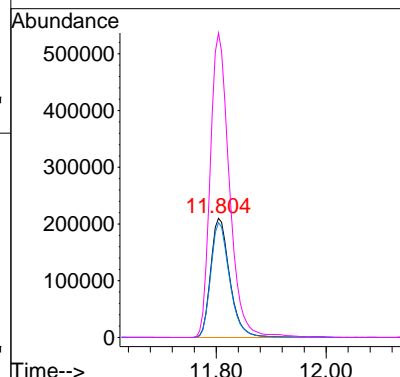
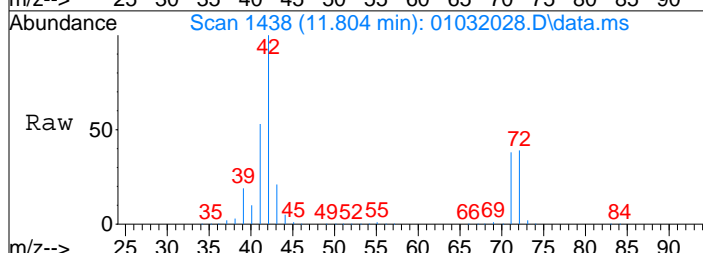
#32
 Chloroform
 Concen: 0.51 ng
 RT: 11.40 min Scan# 1367
 Delta R.T. -0.023 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

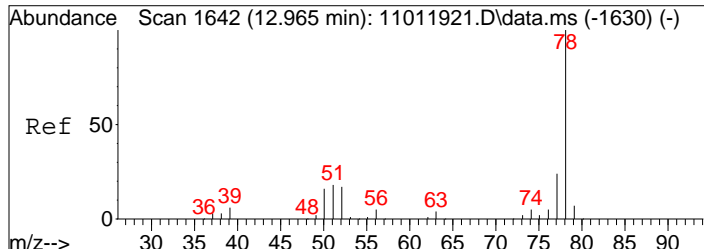
Tgt Ion:	83	Resp:	16220	Lower	Upper
Ion Ratio	83	100			
	85	69.9	45.3	85.3	



#34
 Tetrahydrofuran (THF)
 Concen: 40.74 ng
 RT: 11.80 min Scan# 1438
 Delta R.T. -0.017 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

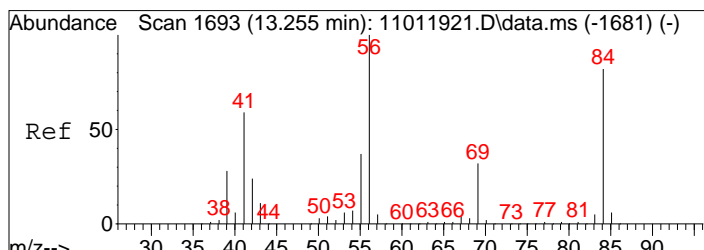
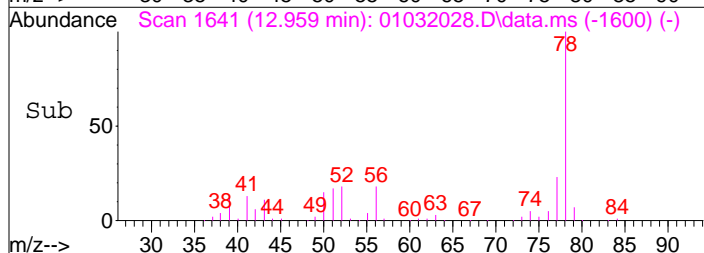
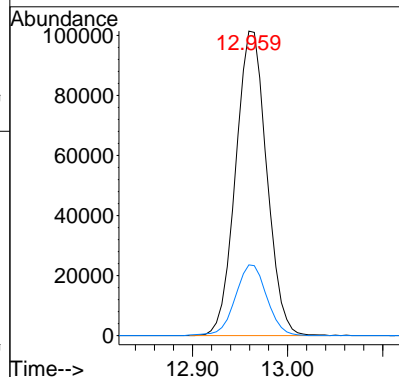
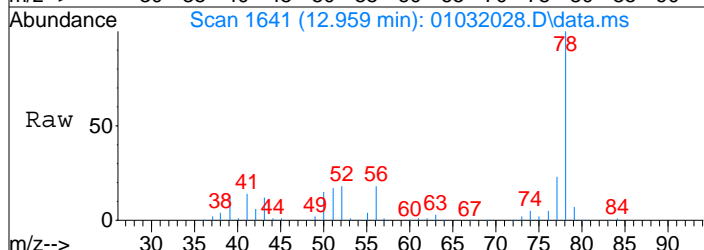
Tgt Ion:	72	Resp:	507974	Lower	Upper
Ion Ratio	72	100			
	71	95.3	76.0	116.0	
	42	257.0	216.3	256.3#	





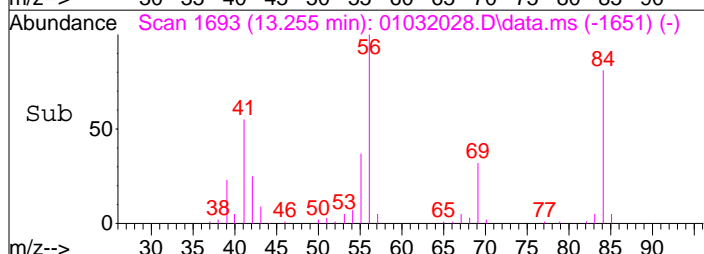
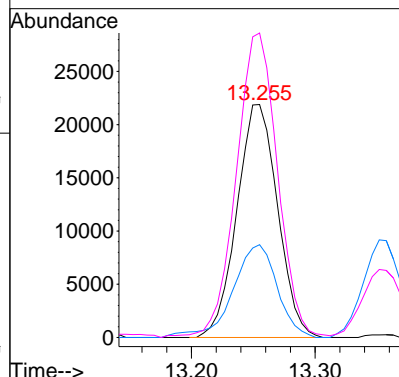
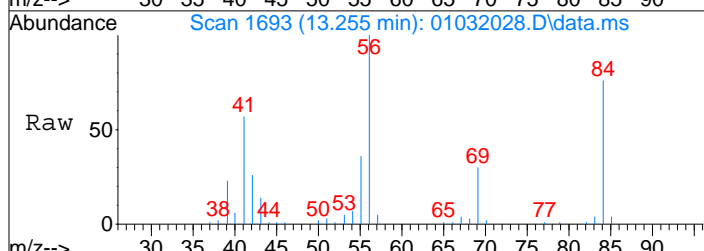
#41
Benzene
Concen: 2.76 ng
RT: 12.96 min Scan# 1641
Delta R.T. -0.017 min
Lab File: 01032028.D
Acq: 3 Jan 2020 21:21

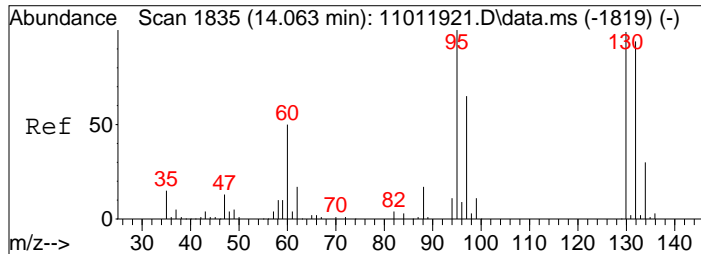
Tgt Ion	Resp	Lower	Upper
78	100		
77	23.6	4.0	44.0



#43
Cyclohexane
Concen: 1.67 ng
RT: 13.26 min Scan# 1693
Delta R.T. -0.011 min
Lab File: 01032028.D
Acq: 3 Jan 2020 21:21

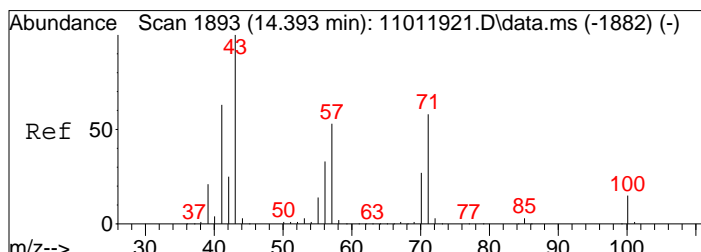
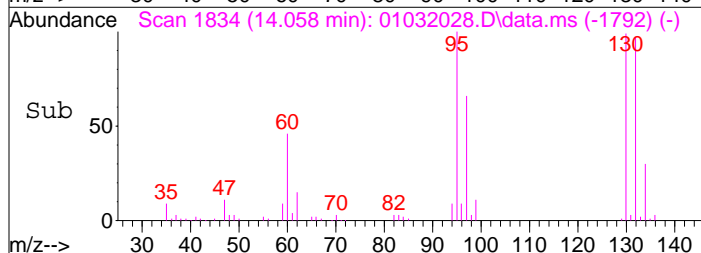
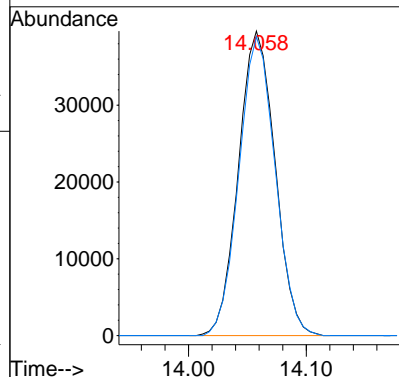
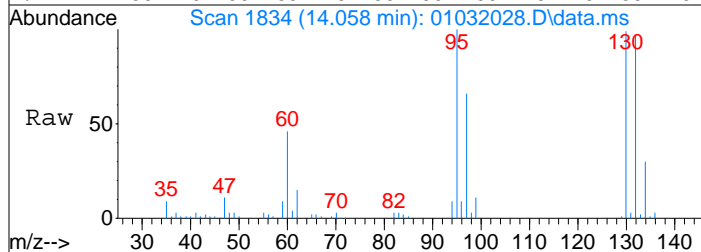
Tgt Ion	Resp	Lower	Upper
84	100		
69	43.3	18.3	58.3
56	132.5	102.3	142.3





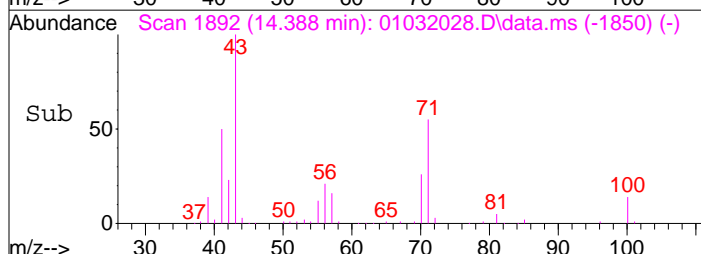
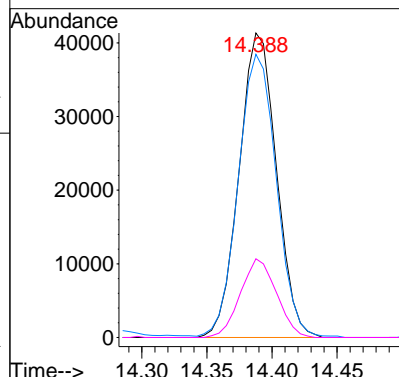
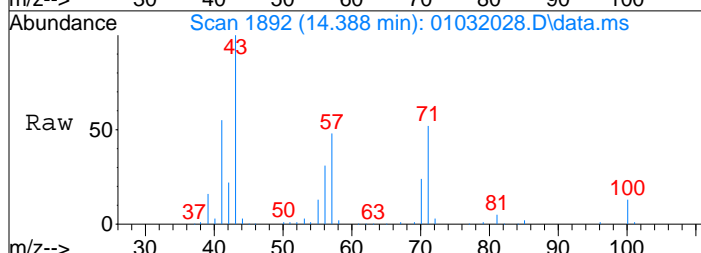
#47
 Trichloroethene
 Concen: 4.31 ng
 RT: 14.06 min Scan# 1834
 Delta R.T. -0.011 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

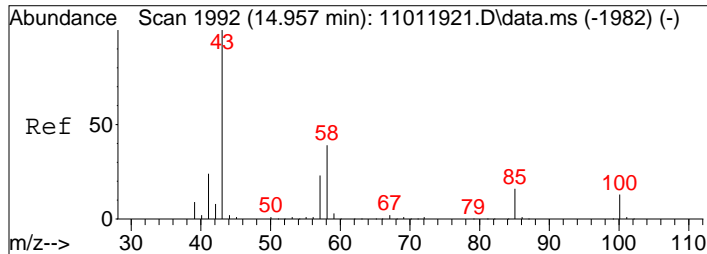
Tgt Ion: 130 Resp: 85603
 Ion Ratio Lower Upper
 130 100
 132 96.9 75.4 115.4



#51
 n-Heptane
 Concen: 4.00 ng
 RT: 14.39 min Scan# 1892
 Delta R.T. -0.011 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

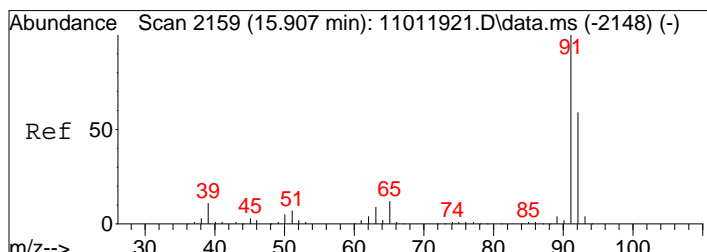
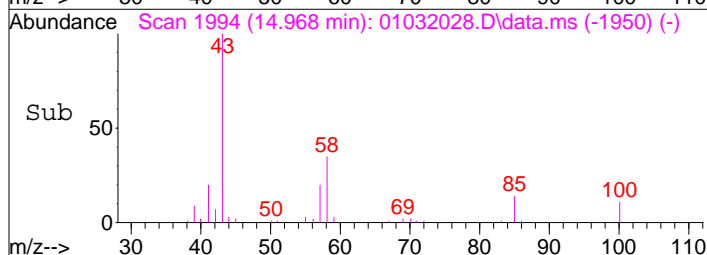
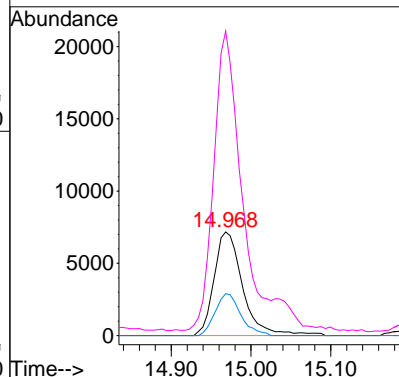
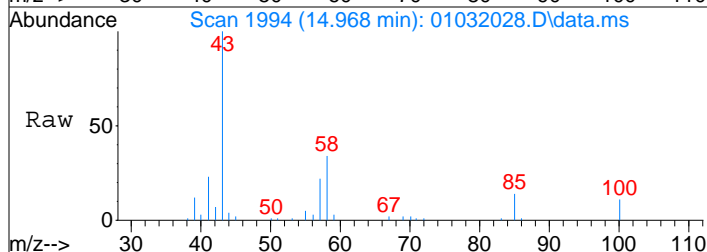
Tgt Ion: 71 Resp: 82304
 Ion Ratio Lower Upper
 71 100
 57 95.4 72.4 112.4
 100 25.0 6.6 46.6





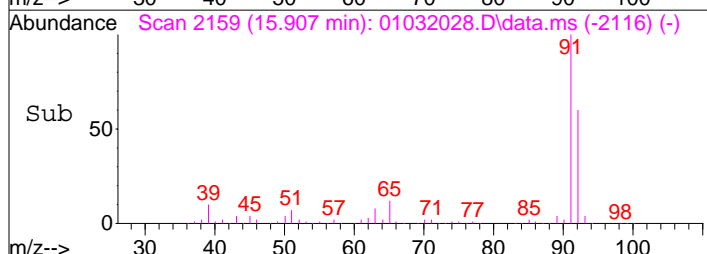
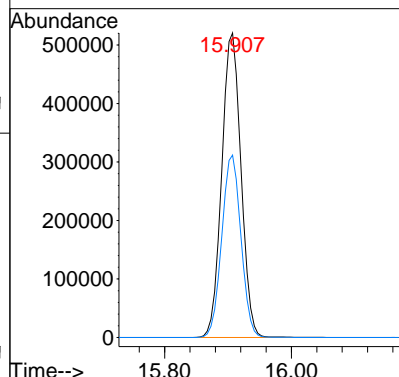
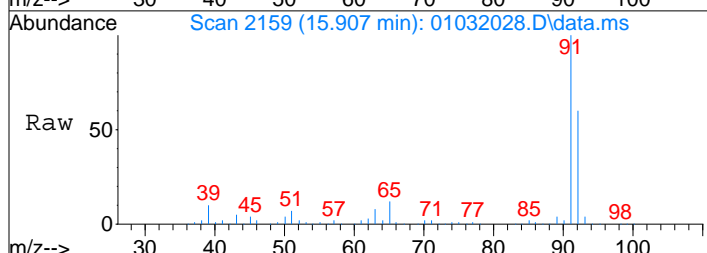
#53
 4-Methyl-2-pentanone
 Concen: 0.97 ng
 RT: 14.97 min Scan# 1994
 Delta R.T. -0.000 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

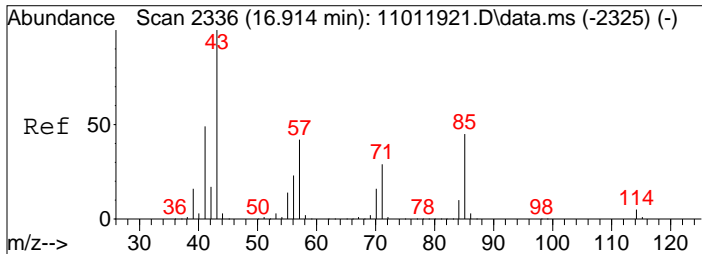
Tgt Ion	Resp	Lower	Upper
58	17939		
58	100		
85	36.1	34.4	51.6
43	300.8	204.9	307.3



#58
 Toluene
 Concen: 14.02 ng
 RT: 15.91 min Scan# 2159
 Delta R.T. -0.006 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

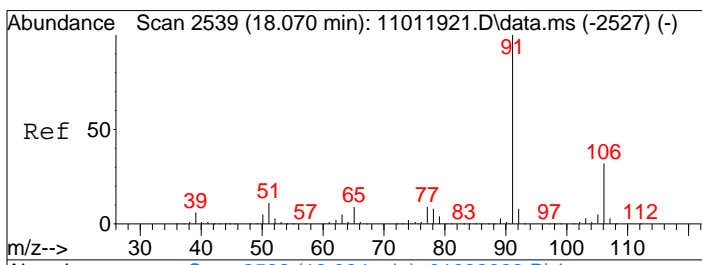
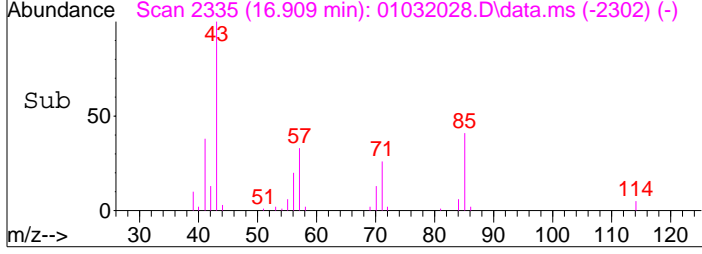
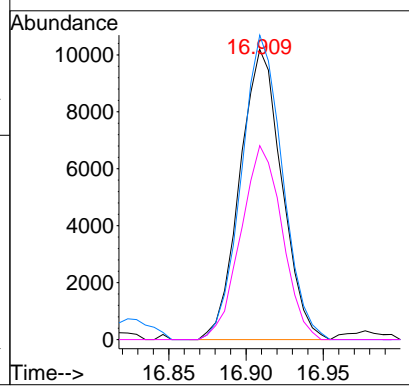
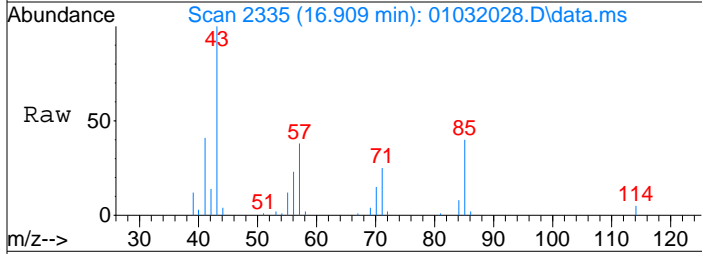
Tgt Ion	Resp	Lower	Upper
91	1096787		
91	100		
92	59.7	39.1	79.1





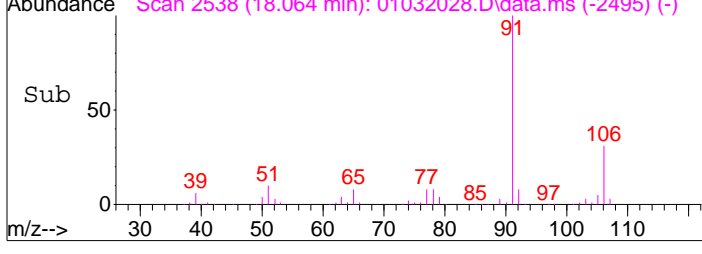
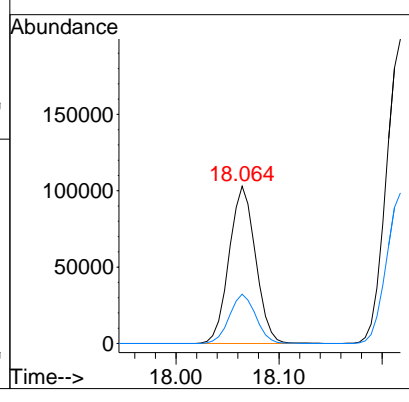
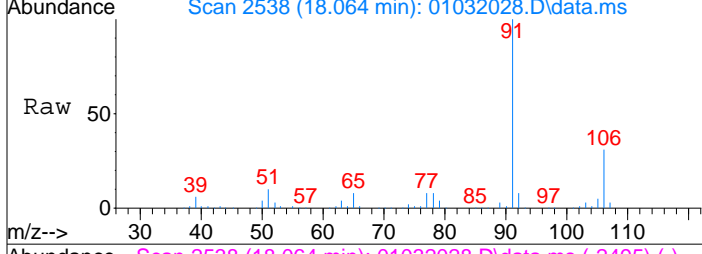
#63
 n-Octane
 Concen: 1.10 ng
 RT: 16.91 min Scan# 2335
 Delta R.T. -0.011 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

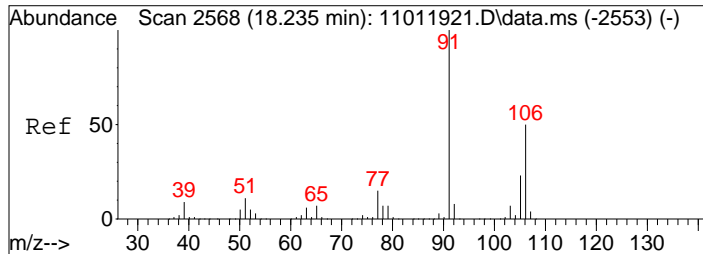
Tgt Ion	Resp	Lower	Upper
57	19287		
57	100		
85	102.8	87.9	131.9
71	65.9	55.8	83.8



#66
 Ethylbenzene
 Concen: 2.14 ng
 RT: 18.06 min Scan# 2538
 Delta R.T. -0.006 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

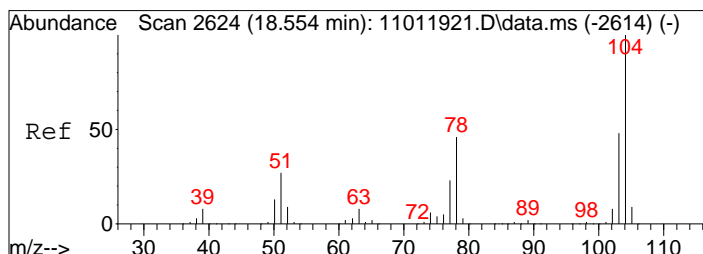
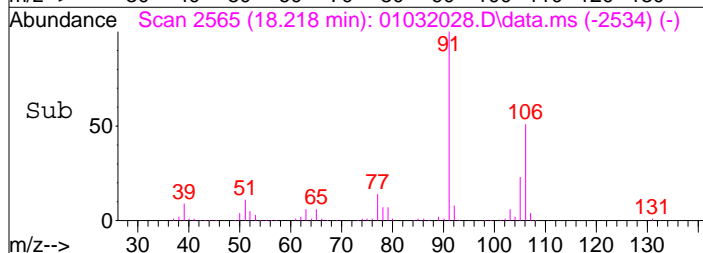
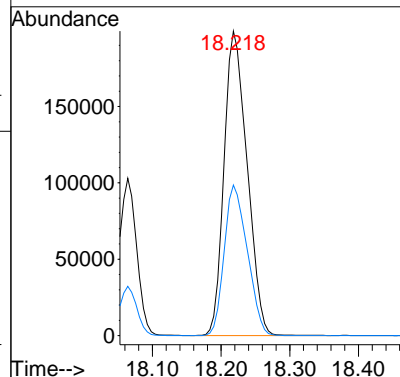
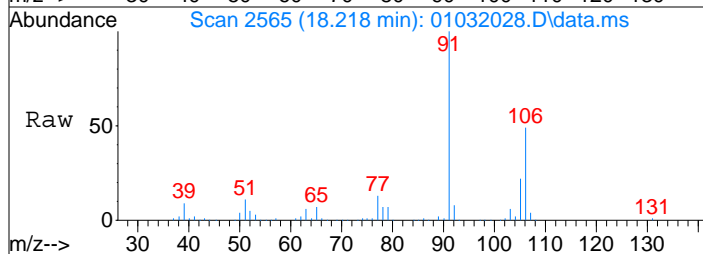
Tgt Ion	Resp	Lower	Upper
91	183825		
91	100		
106	31.1	11.5	51.5





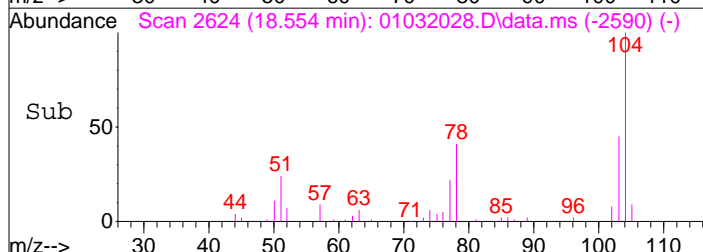
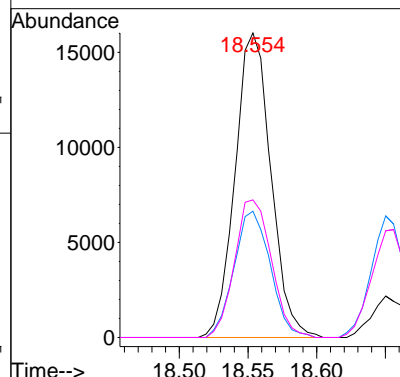
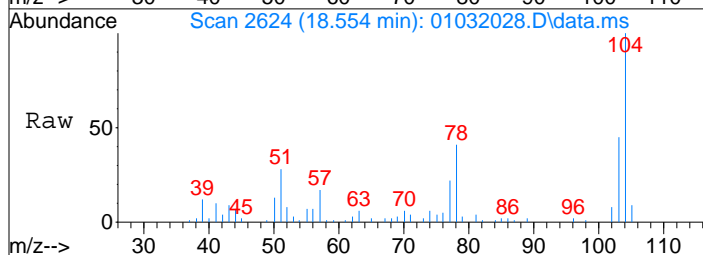
#67
 m- & p-Xylenes
 Concen: 6.86 ng
 RT: 18.22 min Scan# 2565
 Delta R.T. -0.023 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

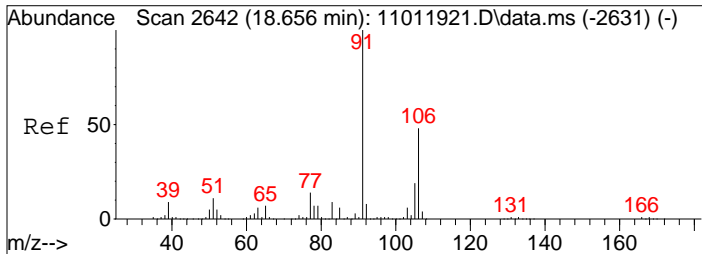
Tgt Ion:	Resp:	Lower	Upper
91	465513		
106	49.4	29.6	69.6



#69
 Styrene
 Concen: 0.59 ng
 RT: 18.55 min Scan# 2624
 Delta R.T. -0.006 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

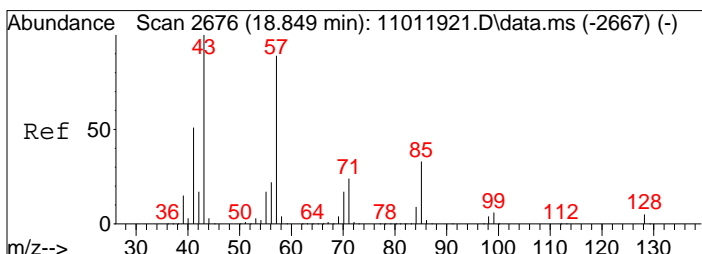
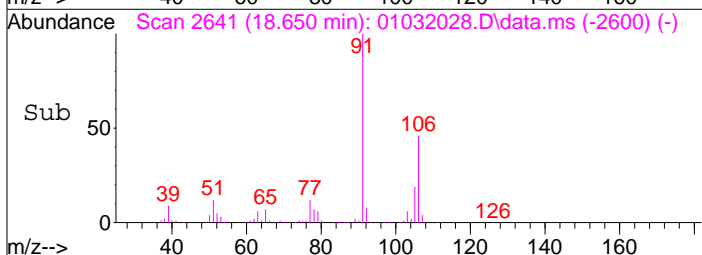
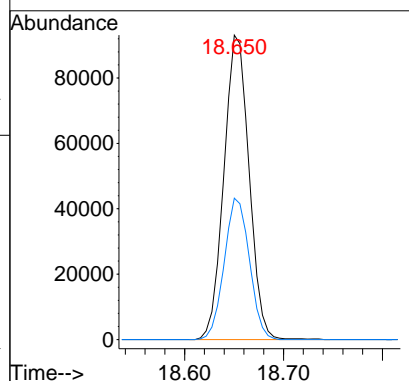
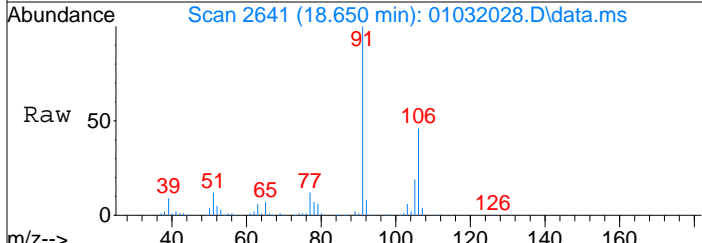
Tgt Ion:	Resp:	Lower	Upper
104	29022		
78	42.1	24.7	64.7
103	46.5	27.6	67.6





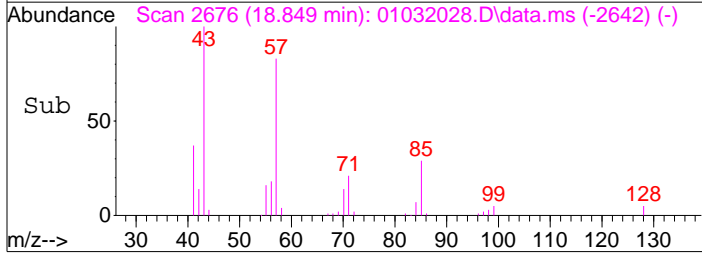
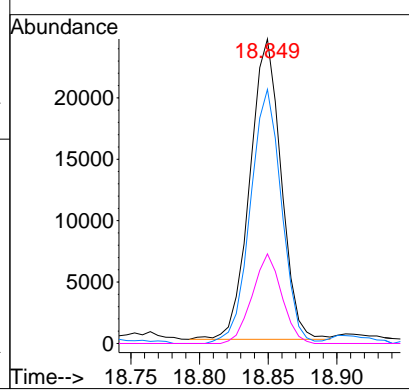
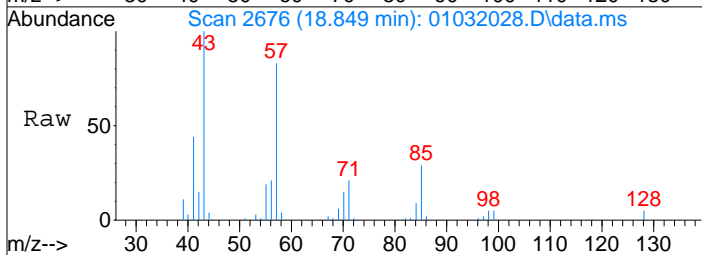
#70
 o-Xylene
 Concen: 2.36 ng
 RT: 18.65 min Scan# 2641
 Delta R.T. -0.017 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

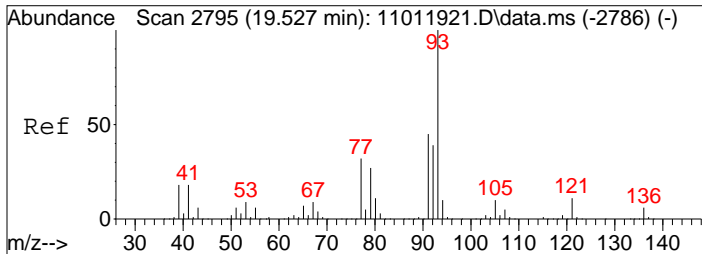
Tgt Ion	Resp	Lower	Upper
91	100		
106	46.4	27.2	67.2



#71
 n-Nonane
 Concen: 0.96 ng
 RT: 18.85 min Scan# 2676
 Delta R.T. -0.006 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

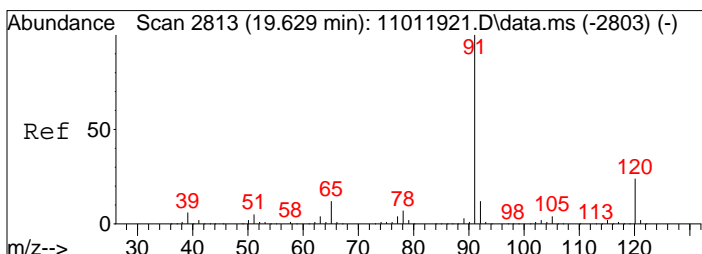
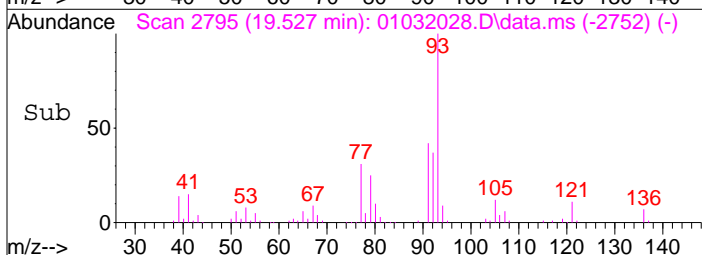
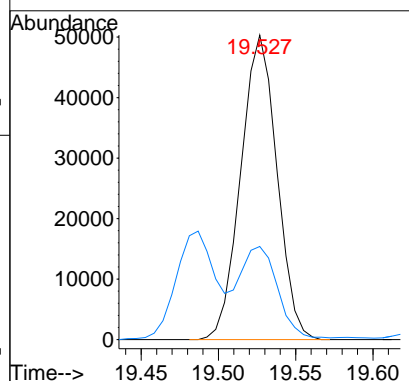
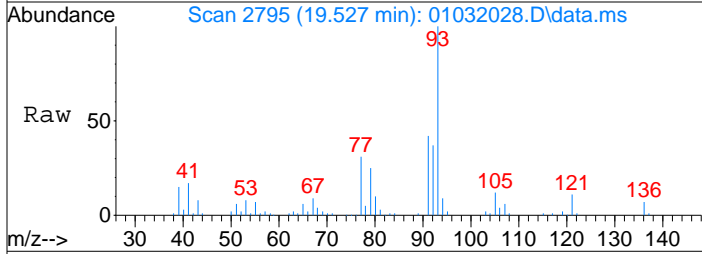
Tgt Ion	Resp	Lower	Upper
43	100		
57	84.2	68.5	108.5
85	28.1	13.4	53.4





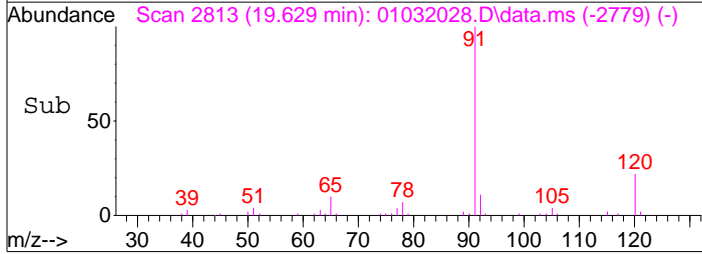
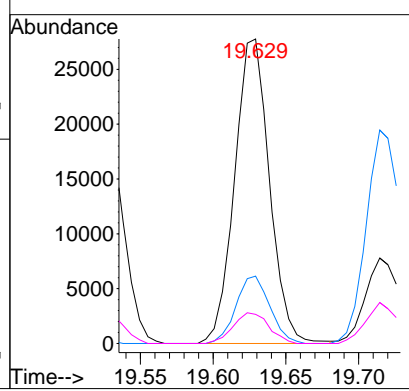
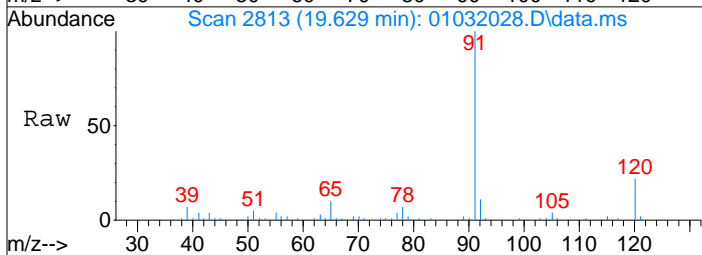
#75
 alpha-Pinene
 Concen: 1.86 ng
 RT: 19.53 min Scan# 2795
 Delta R.T. -0.006 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

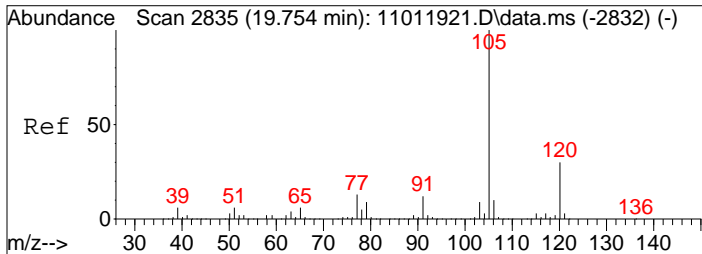
Tgt Ion	Resp	Lower	Upper
93	100		
77	34.0	12.7	52.7



#76
 n-Propylbenzene
 Concen: 0.46 ng
 RT: 19.63 min Scan# 2813
 Delta R.T. -0.006 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

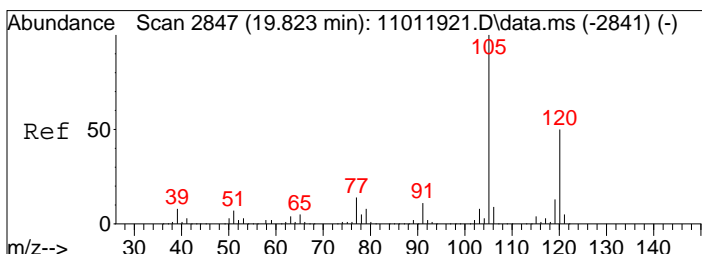
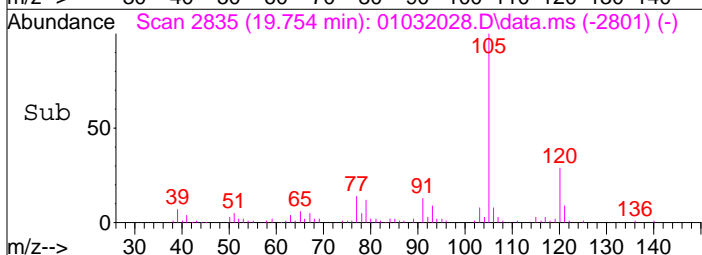
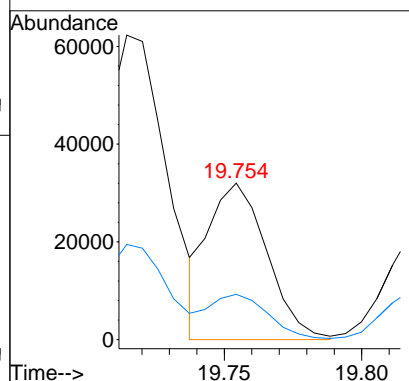
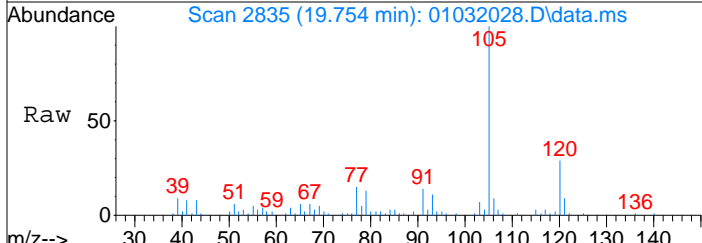
Tgt Ion	Resp	Lower	Upper
91	100		
120	21.4	3.0	43.0
65	10.3	0.0	31.6





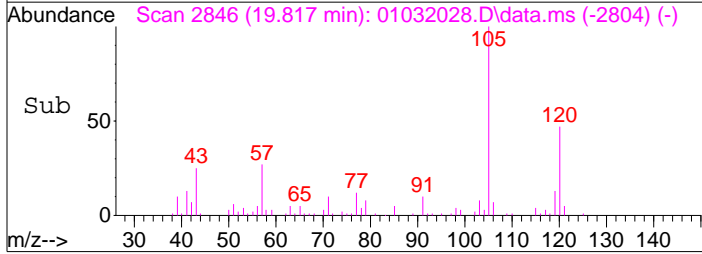
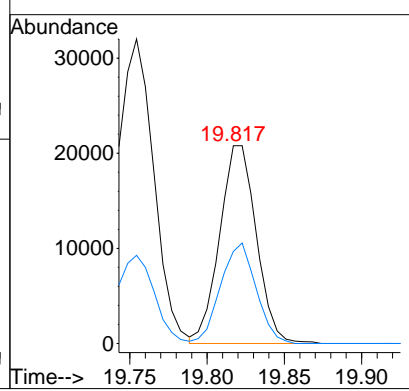
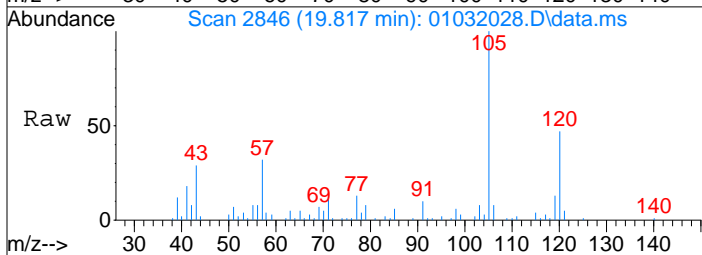
#78
 4-Ethyltoluene
 Concen: 0.61 ng
 RT: 19.75 min Scan# 2835
 Delta R.T. -0.006 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

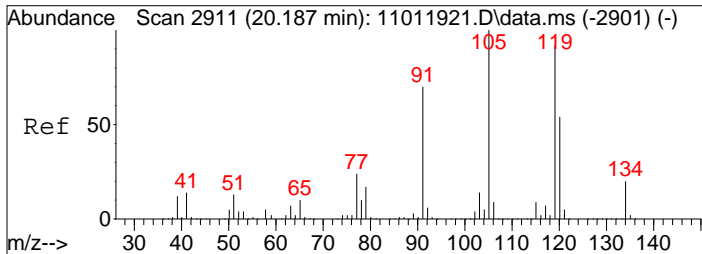
Tgt Ion	Resp	Lower	Upper
105	47752	100	100
120	29.8	10.9	50.9



#79
 1,3,5-Trimethylbenzene
 Concen: 0.49 ng
 RT: 19.82 min Scan# 2846
 Delta R.T. -0.011 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

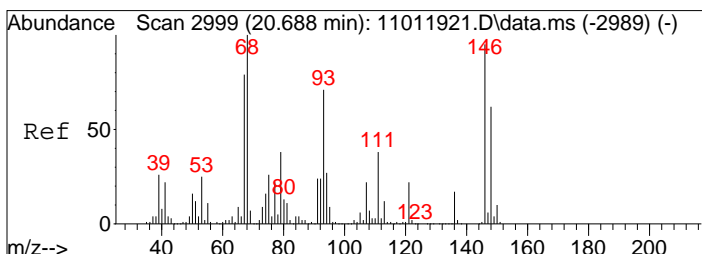
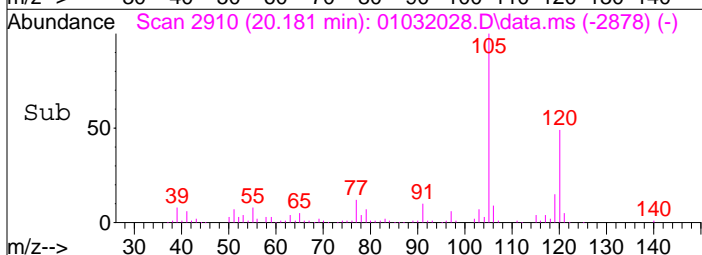
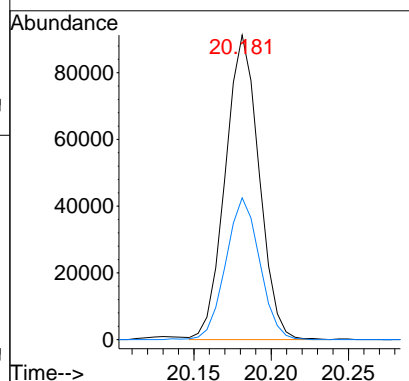
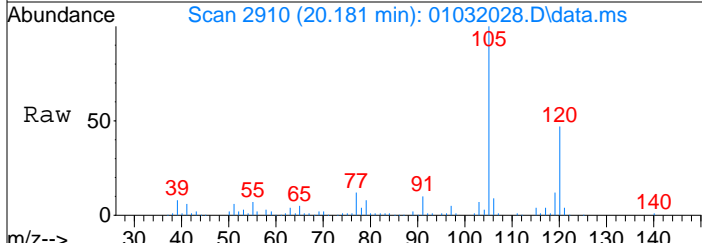
Tgt Ion	Resp	Lower	Upper
105	34481	100	100
120	49.0	29.8	69.8





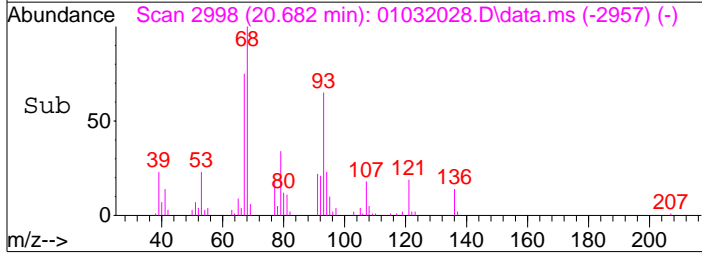
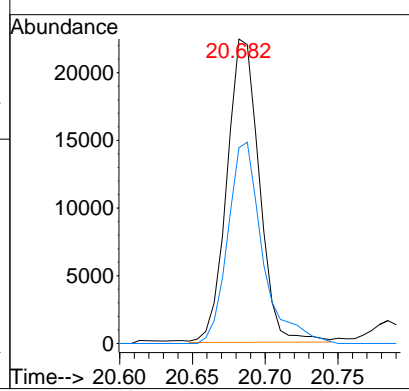
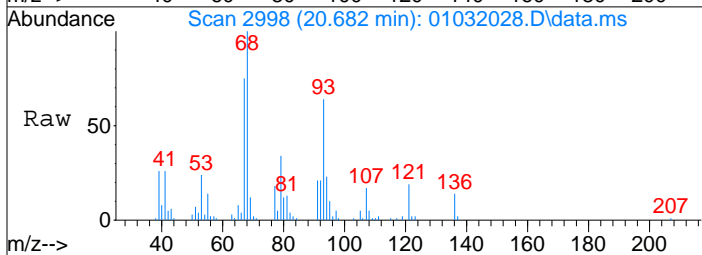
#82
 1,2,4-Trimethylbenzene
 Concen: 1.86 ng
 RT: 20.18 min Scan# 2910
 Delta R.T. -0.017 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

Tgt Ion	Resp	Lower	Upper
105	138575		
105	100		
120	46.7	34.1	74.1



#91
 d-Limonene
 Concen: 1.15 ng
 RT: 20.68 min Scan# 2998
 Delta R.T. -0.017 min
 Lab File: 01032028.D
 Acq: 3 Jan 2020 21:21

Tgt Ion	Resp	Lower	Upper
68	34837		
68	100		
93	70.8	50.4	90.4



Data File : I:\MS13\DATA\2020 01\03\01032029.D
 Acq On : 3 Jan 2020 21:54
 Sample : P1907777-004dil (100mL)
 Misc : S31-10251901

Vial: 6
 Operator: TD
 Inst : MS13

TD 1/7/20

Quant Time: Jan 07 10:46:44 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	11.22	130	160451	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.35	114	743299	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.67	82	360165	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	265831	11.125	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	89.04%	
57) Toluene-d8 (SS2)	15.80	98	868618	12.254	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	98.00%	
73) Bromofluorobenzene (SS3)	19.05	174	206588	13.628	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	109.04%	

Target Compounds

						Qvalue
2) Propene	4.21	42	11637	0.510	ng	# 45
3) Dichlorodifluoromethan...	4.35	85	7072	N.D.		
4) Chloromethane	4.63	50	3632	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	5.05	62	186	N.D.		
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.42	45	209881	13.872	ng	99
11) Acetonitrile	6.70	41	5654	N.D.		
12) Acrolein	6.90	56	1526	N.D.		
13) Acetone	7.09	58	167555	10.676	ng	88
14) Trichlorofluoromethane	7.33	101	6456	N.D.		
15) 2-Propanol (Isopropanol)	7.58	45	3064030	62.738	ng	94
16) Acrylonitrile	7.93	53	581	N.D.		
17) 1,1-Dichloroethene	0.00	96	0	N.D.		
18) 2-Methyl-2-Propanol (t...	8.59	59	3541	N.D.		
19) Methylene Chloride	8.52	84	1150	N.D.		
20) 3-Chloro-1-propene (Al...	8.60	41	3623	N.D.		
21) Trichlorotrifluoroethane	8.94	151	7880	0.604	ng	96
22) Carbon Disulfide	8.79	76	8276	N.D.		
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.		
24) 1,1-Dichloroethane	0.00	63	0	N.D.		
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	10.56	72	14587	1.154	ng	# 80
28) cis-1,2-Dichloroethene	11.05	61	7380	N.D.		
29) Diisopropyl Ether	0.00	87	0	N.D.		
30) Ethyl Acetate	11.40	61	1388	N.D.		
31) n-Hexane	11.34	57	34450	1.007	ng	99
32) Chloroform	11.39	83	1463	N.D.		
34) Tetrahydrofuran (THF)	11.83	72	48527	3.836	ng	# 87
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.21	62	158	N.D.		
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	12.99	56	4928	N.D.		
41) Benzene	12.96	78	23601	N.D.		
42) Carbon Tetrachloride	13.12	117	601	N.D.		
43) Cyclohexane	13.25	84	5037	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	14.02	83	469	N.D.		
47) Trichloroethene	14.06	130	8043	N.D.		
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	14.13	57	21701	N.D.		
50) Methyl Methacrylate	14.39	100	1732	N.D.		

Data File : I:\MS13\DATA\2020 01\03\01032029.D
 Acq On : 3 Jan 2020 21:54
 Sample : P1907777-004dil (100mL)
 Misc : S31-10251901

Vial: 6
 Operator: TD
 Inst : MS13

Quant Time: Jan 07 10:46:44 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

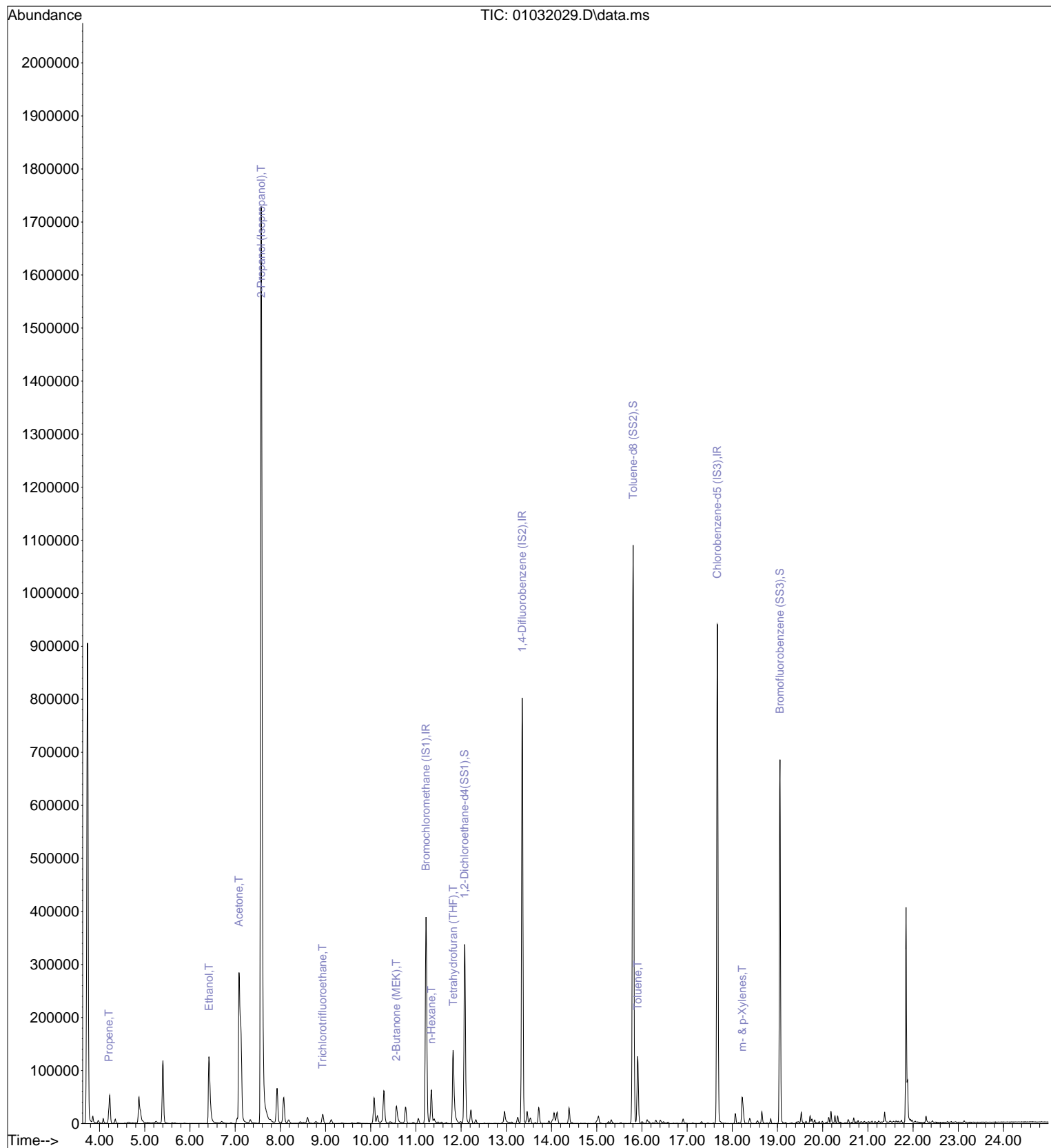
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	7351	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	15.00	58	1126	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	15.91	91	106754	1.389	ng	100
59) 2-Hexanone	16.16	43	1563	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.91	43	4996	N.D.		
63) n-Octane	16.91	57	1676	N.D.		
64) Tetrachloroethene	0.00	166	0	N.D.		
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	18.07	91	16676	N.D.		
67) m- & p-Xylenes	18.22	91	42598	0.638	ng	99
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.56	104	2277	N.D.		
70) o-Xylene	18.66	91	14836	N.D.		
71) n-Nonane	18.85	43	3505	N.D.		
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	19.19	105	1123	N.D.		
75) alpha-Pinene	19.53	93	7344	N.D.		
76) n-Propylbenzene	19.63	91	4114	N.D.		
77) 3-Ethyltoluene	19.72	105	9275	N.D.		
78) 4-Ethyltoluene	19.75	105	4381	N.D.		
79) 1,3,5-Trimethylbenzene	19.82	105	3273	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	19.99	105	3430	N.D.		
82) 1,2,4-Trimethylbenzene	20.19	105	12354	N.D.		
83) n-Decane	20.27	57	4972	N.D.		
84) Benzyl Chloride	20.39	91	126	N.D.		
85) 1,3-Dichlorobenzene	20.39	146	928	N.D.		
86) 1,4-Dichlorobenzene	20.39	146	928	N.D.		
87) sec-Butylbenzene	20.42	105	341	N.D.		
88) 4-Isopropyltoluene (p-...	20.56	119	1221	N.D.		
89) 1,2,3-Trimethylbenzene	20.56	105	2874	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	20.68	68	2601	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	21.37	57	6042	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	22.31	128	1309	N.D.		
96) n-Dodecane	22.29	57	4141	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	18.38	55	4552	N.D.		
99) tert-Butylbenzene	20.18	119	1472	N.D.		
100) n-Butylbenzene	20.93	91	1223	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2020 01\03\01032029.D
 Acq On : 3 Jan 2020 21:54
 Sample : P1907777-004dil (100mL)
 Misc : S31-10251901

Vial: 6
 Operator: TD
 Inst : MS13

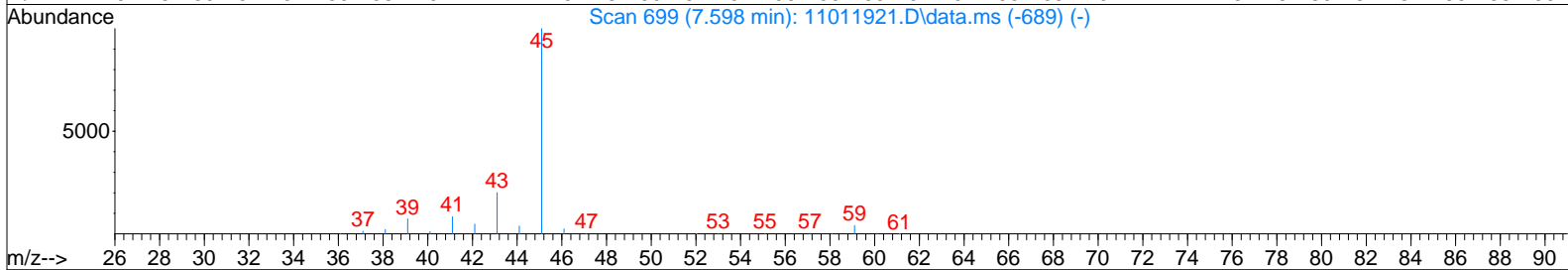
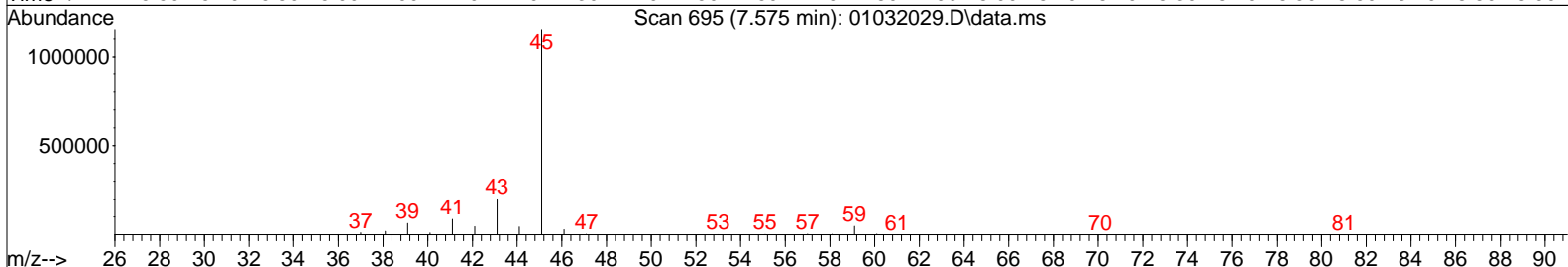
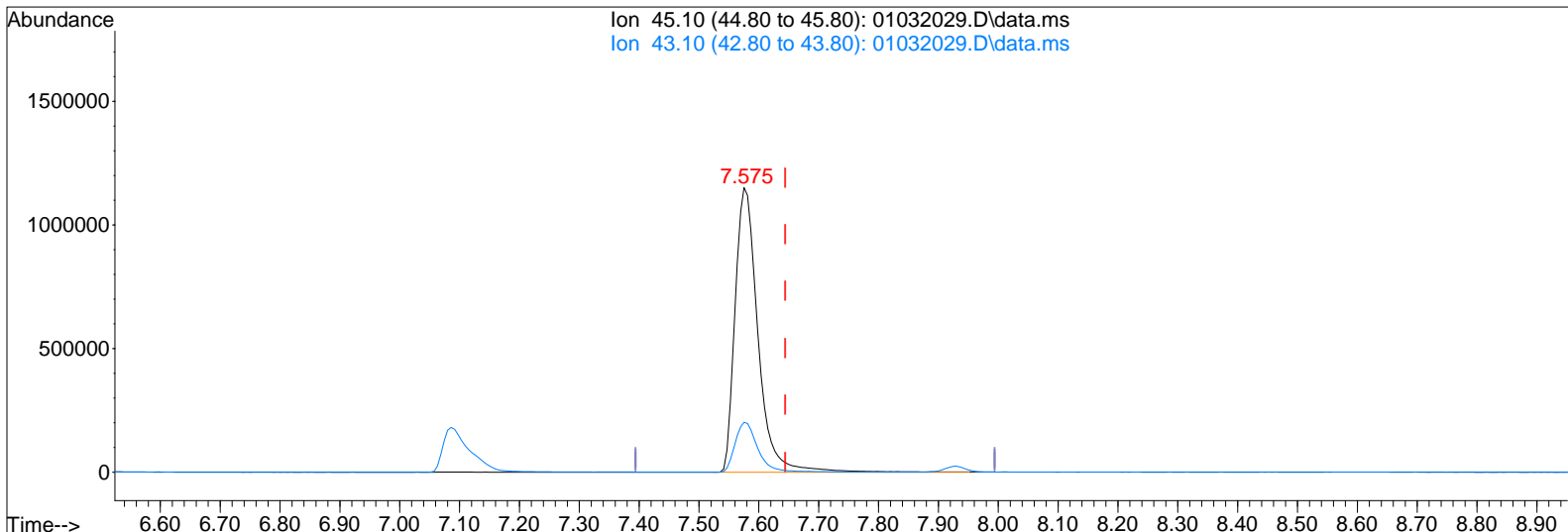
Quant Time: Jan 07 10:46:44 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2020 01\03\01032029.D
 Acq On : 3 Jan 2020 21:54
 Sample : P1907777-004dil (100mL)
 Misc : S31-10251901

Vial: 6
 Operator: TD
 Inst : MS13

Quant Time: Jan 04 07:17:55 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



TIC: 01032029.D\data.ms

(15) 2-Propanol (Isopropanol) (T)

7.575min (-0.069) 62.74ng

response 3064030

Ion	Exp%	Act%
45.10	100	100
43.10	20.20	17.40
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2020 01\03\01032005.D
 Acq On : 3 Jan 2020 3:11
 Sample : MB R13010320 1000mL
 Misc : S31-10251901/AC00880

Vial: 2
 Operator: TD
 Inst : MS13

Quant Time: Jan 03 07:54:41 2020

TD 1/320

Quant Method : I:\MS13\METHODS\R13110119.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Nov 02 09:55:49 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	11.22	130	164627	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.35	114	781429	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.67	82	371381	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	273578	11.159	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	89.28%	
57) Toluene-d8 (SS2)	15.80	98	905599	12.390	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	99.12%	
73) Bromofluorobenzene (SS3)	19.05	174	218367	13.970	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	111.76%	

Target Compounds

						Qvalue
2) Propene	4.21	42	840	N.D.		
3) Dichlorodifluoromethan...	0.00	85	0	N.D.		
4) Chloromethane	0.00	50	0	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	0.00	62	0	N.D.		
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.55	45	52	N.D.		
11) Acetonitrile	6.73	41	1650	N.D.		
12) Acrolein	6.93	56	719	0.061	ng	# 58
13) Acetone	7.15	58	8284	0.514	ng	# 74
14) Trichlorofluoromethane	0.00	101	0	N.D.		
15) 2-Propanol (Isopropanol)	7.71	45	1654	N.D.		
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	0.00	96	0	N.D.		
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.		
19) Methylene Chloride	0.00	84	0	N.D.		
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.		
21) Trichlorotrifluoroethane	0.00	151	0	N.D.		
22) Carbon Disulfide	8.79	76	2799	N.D.		
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.		
24) 1,1-Dichloroethane	0.00	63	0	N.D.		
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
26) Vinyl Acetate	10.28	86	304	0.060	ng	# 1
27) 2-Butanone (MEK)	10.65	72	109	N.D.		
28) cis-1,2-Dichloroethene	0.00	61	0	N.D.		
29) Diisopropyl Ether	0.00	87	0	N.D.		
30) Ethyl Acetate	0.00	61	0	N.D.		
31) n-Hexane	0.00	57	0	N.D.		
32) Chloroform	0.00	83	0	N.D.		
34) Tetrahydrofuran (THF)	11.91	72	243	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	0.00	62	0	N.D.		
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	13.02	56	3732	0.166	ng	# 67
41) Benzene	12.96	78	4850	0.056	ng	93
42) Carbon Tetrachloride	0.00	117	0	N.D.		
43) Cyclohexane	13.36	84	495	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.		
47) Trichloroethene	0.00	130	0	N.D.		
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	14.12	57	466	N.D.		
50) Methyl Methacrylate	0.00	100	0	N.D.		

Data File : I:\MS13\DATA\2020 01\03\01032005.D
 Acq On : 3 Jan 2020 3:11
 Sample : MB R13010320 1000mL
 Misc : S31-10251901/AC00880

Vial: 2
 Operator: TD
 Inst : MS13

Quant Time: Jan 03 07:54:41 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

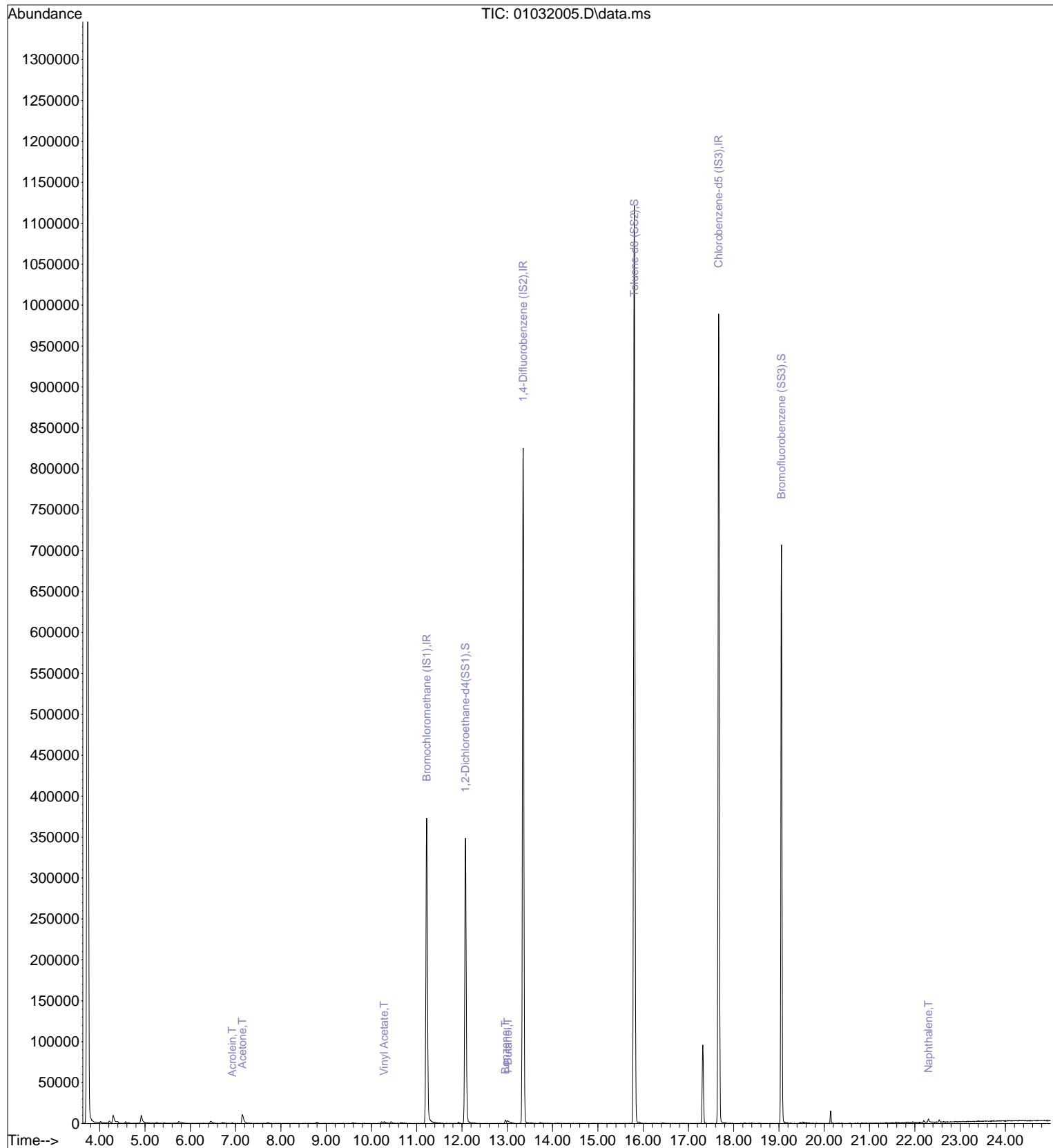
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	15.91	91	1305	N.D.		
59) 2-Hexanone	16.27	43	110	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	0.00	43	0	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	0.00	166	0	N.D.		
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	18.23	91	429	N.D.		
67) m- & p-Xylenes	18.23	91	760	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	0.00	104	0	N.D.		
70) o-Xylene	18.66	91	177	N.D.		
71) n-Nonane	0.00	43	0	N.D.		
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	19.19	105	189	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	19.61	91	544	N.D.		
77) 3-Ethyltoluene	19.73	105	535	N.D.		
78) 4-Ethyltoluene	19.77	105	569	N.D.		
79) 1,3,5-Trimethylbenzene	19.84	105	427	N.D.		
80) alpha-Methylstyrene	20.14	118	176	N.D.		
81) 2-Ethyltoluene	19.99	105	327	N.D.		
82) 1,2,4-Trimethylbenzene	20.20	105	357	N.D.		
83) n-Decane	0.00	57	0	N.D.		
84) Benzyl Chloride	20.32	91	448	N.D.		
85) 1,3-Dichlorobenzene	20.32	146	186	N.D.		
86) 1,4-Dichlorobenzene	20.39	146	412	N.D.		
87) sec-Butylbenzene	20.20	105	303	N.D.		
88) 4-Isopropyltoluene (p-...	20.56	119	476	N.D.		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.		
90) 1,2-Dichlorobenzene	20.69	146	178	N.D.		
91) d-Limonene	0.00	68	0	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	21.38	57	350	N.D.		
94) 1,2,4-Trichlorobenzene	22.20	180	1160	N.D.		
95) Naphthalene	22.30	128	5710	0.063 ng		87
96) n-Dodecane	22.29	57	453	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	18.41	55	363	N.D.		
99) tert-Butylbenzene	20.14	119	378	N.D.		
100) n-Butylbenzene	20.94	91	294	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2020 01\03\01032005.D
Acq On : 3 Jan 2020 3:11
Sample : MB R13010320 1000mL
Misc : S31-10251901/AC00880

Vial: 2
Operator: TD
Inst : MS13

Quant Time: Jan 03 07:54:41 2020
Quant Method : I:\MS13\METHODS\R13110119.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Nov 02 09:55:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2020 01\03\01032006.D
 Acq On : 3 Jan 2020 3:44
 Sample : LCS R13010320 25ng
 Misc : S31-10251901/S31-12061905

Vial: 2
 Operator: TD
 Inst : MS13

TD 1/3/20

Quant Time: Jan 03 07:54:43 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	11.24	130	178581	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.36	114	815742	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	382586	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	285003	10.717	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	85.76%	
57) Toluene-d8 (SS2)	15.81	98	935828	12.429	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	99.44%	
73) Bromofluorobenzene (SS3)	19.05	174	233185	14.481	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	115.84%	

Target Compounds

	R.T.	QIon	Response	Conc	Units	Qvalue
2) Propene	4.16	42	615760	24.242	ng	96
3) Dichlorodifluoromethan...	4.32	85	853457	20.831	ng	100
4) Chloromethane	4.60	50	511723	16.870	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.87	135	423642	19.001	ng	100
6) Vinyl Chloride	5.03	62	755180	21.776	ng	99
7) 1,3-Butadiene	5.29	54	571060	25.393	ng	99
8) Bromomethane	5.74	94	386531	22.783	ng	99
9) Chloroethane	6.07	64	367858	24.813	ng	99
10) Ethanol	6.45	45	1953938	116.031	ng	100
11) Acetonitrile	6.70	41	1044299	26.042	ng	99
12) Acrolein	6.88	56	320731	25.053	ng	100
13) Acetone	7.09	58	1919357	109.884	ng	88
14) Trichlorofluoromethane	7.33	101	713872	20.558	ng	99
15) 2-Propanol (Isopropanol)	7.59	45	2728624	50.198	ng	94
16) Acrylonitrile	7.85	53	714415	26.381	ng	99
17) 1,1-Dichloroethene	8.29	96	441664	24.062	ng	95
18) 2-Methyl-2-Propanol (t...	8.46	59	2199600	47.578	ng	96
19) Methylene Chloride	8.53	84	462935	23.037	ng	99
20) 3-Chloro-1-propene (Al...	8.68	41	809189	25.194	ng	97
21) Trichlorotrifluoroethane	8.94	151	366281	25.228	ng	93
22) Carbon Disulfide	8.79	76	1682021	21.591	ng	100
23) trans-1,2-Dichloroethene	9.79	61	710674	24.340	ng	100
24) 1,1-Dichloroethane	10.05	63	837618	23.128	ng	100
25) Methyl tert-Butyl Ether	10.14	73	934459	17.762	ng	98
26) Vinyl Acetate	10.30	86	589761	107.720	ng	# 89
27) 2-Butanone (MEK)	10.55	72	345684	24.564	ng	100
28) cis-1,2-Dichloroethene	11.06	61	672421	23.116	ng	100
29) Diisopropyl Ether	11.35	87	476169	23.978	ng	# 79
30) Ethyl Acetate	11.36	61	388265	47.814	ng	100
31) n-Hexane	11.34	57	885891	23.270	ng	100
32) Chloroform	11.41	83	775029	21.572	ng	100
34) Tetrahydrofuran (THF)	11.81	72	338343	24.028	ng	94
35) Ethyl tert-Butyl Ether	11.95	87	569622	24.069	ng	99
36) 1,2-Dichloroethane	12.20	62	589152	20.430	ng	100
38) 1,1,1-Trichloroethane	12.49	97	654764	21.503	ng	98
39) Isopropyl Acetate	12.91	61	667605	46.384	ng	95
40) 1-Butanol	12.93	56	1093236	46.564	ng	94
41) Benzene	12.96	78	1897923	20.944	ng	99
42) Carbon Tetrachloride	13.12	117	566622	20.882	ng	99
43) Cyclohexane	13.26	84	1449569	44.254	ng	96
44) tert-Amyl Methyl Ether	13.60	73	1390267	23.746	ng	98
45) 1,2-Dichloropropane	13.81	63	511568	23.787	ng	100
46) Bromodichloromethane	14.01	83	606243	21.692	ng	99
47) Trichloroethene	14.06	130	496582	22.989	ng	100
48) 1,4-Dioxane	14.03	88	408854	24.037	ng	97
49) 2,2,4-Trimethylpentane...	14.13	57	2187111	23.546	ng	92
50) Methyl Methacrylate	14.26	100	397213	48.031	ng	96

Data File : I:\MS13\DATA\2020 01\03\01032006.D
 Acq On : 3 Jan 2020 3:44
 Sample : LCS R13010320 25ng
 Misc : S31-10251901/S31-12061905

Vial: 2
 Operator: TD
 Inst : MS13

Quant Time: Jan 03 07:54:43 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

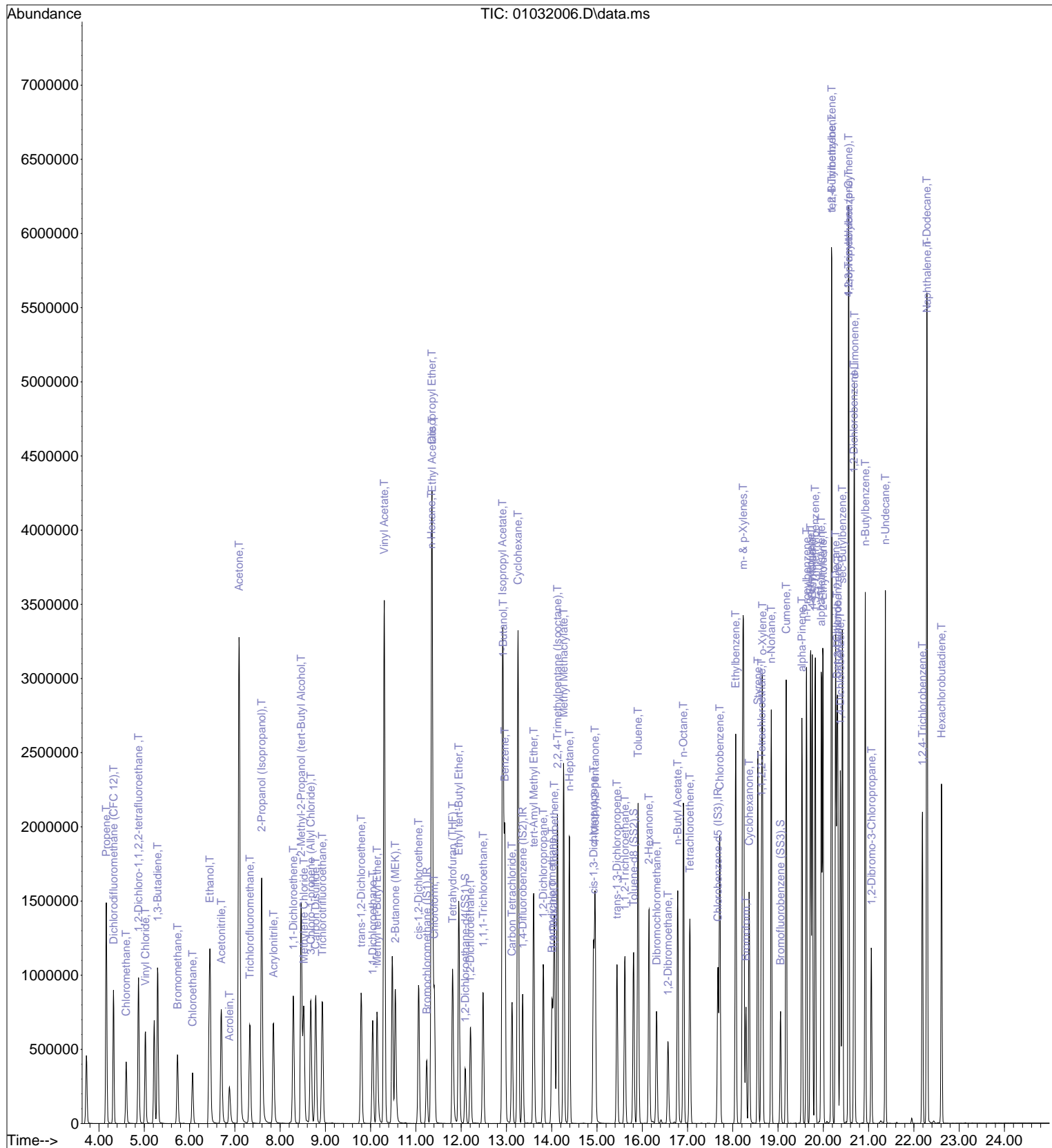
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	523074	23.378	ng	98
52) cis-1,3-Dichloropropene	14.92	75	834889	25.351	ng	100
53) 4-Methyl-2-pentanone	14.96	58	501274	24.812	ng	98
54) trans-1,3-Dichloropropene	15.44	75	708370	25.103	ng	100
55) 1,1,2-Trichloroethane	15.62	97	445506	23.160	ng	99
58) Toluene	15.91	91	1886516	23.101	ng	99
59) 2-Hexanone	16.15	43	1201456	25.590	ng	97
60) Dibromochloromethane	16.32	129	501060	24.814	ng	99
61) 1,2-Dibromoethane	16.57	107	485402	24.324	ng	100
62) n-Butyl Acetate	16.78	43	1369934	26.733	ng	98
63) n-Octane	16.91	57	459926	25.192	ng	98
64) Tetrachloroethene	17.05	166	502115	24.037	ng	100
65) Chlorobenzene	17.71	112	1222741	23.316	ng	100
66) Ethylbenzene	18.06	91	2117870	23.649	ng	100
67) m- & p-Xylenes	18.23	91	3292957	46.464	ng	99
68) Bromoform	18.29	173	422643	24.148	ng	100
69) Styrene	18.55	104	1339251	25.947	ng	98
70) o-Xylene	18.66	91	1680089	23.023	ng	99
71) n-Nonane	18.85	43	1065214	25.152	ng	99
72) 1,1,2,2-Tetrachloroethane	18.63	83	783614	22.647	ng	99
74) Cumene	19.18	105	2083657	23.788	ng	100
75) alpha-Pinene	19.53	93	1115400	24.282	ng	95
76) n-Propylbenzene	19.63	91	2528223	24.060	ng	98
77) 3-Ethyltoluene	19.72	105	2156139	24.622	ng	100
78) 4-Ethyltoluene	19.75	105	1942285	23.675	ng	100
79) 1,3,5-Trimethylbenzene	19.82	105	1756814	24.125	ng	98
80) alpha-Methylstyrene	19.95	118	974824	21.924	ng	93
81) 2-Ethyltoluene	19.99	105	2069298	24.242	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	1761484	22.655	ng	99
83) n-Decane	20.27	57	1086320	26.200	ng	98
84) Benzyl Chloride	20.30	91	1541781	22.005	ng	99
85) 1,3-Dichlorobenzene	20.32	146	1017712	24.871	ng	100
86) 1,4-Dichlorobenzene	20.37	146	1026800	25.510	ng	99
87) sec-Butylbenzene	20.42	105	2352999	24.391	ng	98
88) 4-Isopropyltoluene (p-...	20.56	119	2097213	23.384	ng	96
89) 1,2,3-Trimethylbenzene	20.56	105	1748736	22.360	ng	99
90) 1,2-Dichlorobenzene	20.68	146	974915	23.302	ng	100
91) d-Limonene	20.69	68	764825	24.144	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.06	157	353739	24.543	ng	# 84
93) n-Undecane	21.37	57	1151381	25.684	ng	98
94) 1,2,4-Trichlorobenzene	22.19	180	698326	25.123	ng	100
95) Naphthalene	22.29	128	2172610	23.220	ng	99
96) n-Dodecane	22.29	57	1143309	24.076	ng	97
97) Hexachlorobutadiene	22.61	225	468114	29.344	ng	100
98) Cyclohexanone	18.36	55	737856	24.933	ng	96
99) tert-Butylbenzene	20.19	119	1665479	23.497	ng	100
100) n-Butylbenzene	20.93	91	1909436	23.343	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2020 01\03\01032006.D
Acq On : 3 Jan 2020 3:44
Sample : LCS R13010320 25ng
Misc : S31-10251901/S31-12061905

Vial: 2
Operator: TD
Inst : MS13

Quant Time: Jan 03 07:54:43 2020
Quant Method : I:\MS13\METHODS\R13110119.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Nov 02 09:55:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Method Path : I:\MS13\METHODS\
 Method File : R13110119.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Sat Nov 02 09:55:49 2019
 Response Via : Initial Calibration

Calibration Files

0.1 =11011916.D 0.2 =11011917.D 0.5 =11011928.D 1.0 =11011919.D 5.0 =11011920.D 25 =11011921.D 50 =11011922.D
 100 =11011923.D

Compound 0.1 0.2 0.5 1.0 5.0 25 50 100 AVG %RSD

ADP 11/4/19

Compound	0.1	0.2	0.5	1.0	5.0	25	50	100	AVG	%RSD
1) IR Bromochloromethane... 2) T Propene	1.878	1.643	1.398	1.540	1.714	1.696	1.949	2.406	1.778	17.32
3) T Dichlorodifluo...	3.130	2.990	2.330	2.699	2.935	2.892	2.944	3.022	2.868	8.70
4) T Chloromethane	2.729	2.522	1.825	2.089	2.053	2.026	1.618		2.123	18.11
5) T 1,2-Dichloro-1...	1.543	1.465	1.304	1.433	1.577	1.759	1.639	1.764	1.561	10.25
6) T Vinyl Chloride	2.463	2.506	1.799	1.957	2.596	2.806	2.590	2.702	2.427	14.74
7) T 1,3-Butadiene	1.297	1.249	1.170	1.335	1.554	1.829	1.960	2.199	1.574	24.10
8) T Bromomethane	1.202	1.146	0.983	1.105	1.208	1.211	1.269	1.376	1.188	9.73
9) T Chloroethane	1.049	1.060	0.870	0.960	1.057	1.046	1.086	1.174	1.038	8.62
10) T Ethanol	1.342	1.092	0.922	0.993	1.119	1.245	1.323	1.394	1.179	14.69
11) T Acetonitrile	3.269	2.708	2.237	2.466	2.844	2.857	2.960	3.114	2.807	11.93
12) T Acrolein	0.870	0.890	0.708	0.826	0.973	0.955	0.947	1.000	0.896	10.64
13) T Acetone	1.405	1.198	0.977	1.038	1.177	1.311	1.367	1.308	1.223	12.61
14) T Trichlorofluor...	2.466	2.380	1.981	2.230	2.495	2.505	2.588	2.801	2.431	10.05
15) T 2-Propanol (Is...	3.908	3.728	3.240	3.564	4.067	4.289	4.116	3.526	3.805	9.28
16) T Acrylonitrile	1.777	1.697	1.456	1.668	2.035	2.103	2.156	2.271	1.896	15.05
17) T 1,1-Dichloroet...	1.253	1.224	1.012	1.175	1.313	1.350	1.399	1.552	1.285	12.51
18) T 2-Methyl-2-Pro...	3.563	3.421	2.878	3.379	3.528	3.763	3.057	2.299	3.236	14.60
19) T Methylene Chlo...	1.413	1.337	1.110	1.273	1.425	1.465	1.525	1.704	1.407	12.52
20) T 3-Chloro-1-pro...	2.250	2.093	1.796	1.976	2.335	2.420	2.486	2.629	2.248	12.37
21) T Trichlorotrifl...	0.939	1.024	0.823	0.942	1.031	1.064	1.088	1.220	1.016	11.64
22) T Carbon Disulfide	7.274	5.582	4.858	4.692	5.141	5.253	5.308	5.515	5.453	14.59
23) T trans-1,2-Dich...	2.042	1.945	1.601	1.883	2.114	2.164	2.227	2.374	2.044	11.60
24) T 1,1-Dichloroet...	2.599	2.545	2.106	2.346	2.628	2.622	2.652	2.782	2.535	8.36
25) T Methyl tert-Bu...	4.091	4.087	3.379	3.906	4.363	4.136	3.147	2.351	3.682	18.36
26) T Vinyl Acetate			0.249	0.298	0.368	0.447	0.484	0.453	0.383	24.65
27) T 2-Butanone (MEK)	0.746	0.879	0.758	0.903	1.059	1.114	1.156	1.265	0.985	19.44
28) T cis-1,2-Dichlo...	2.083	1.964	1.618	1.855	2.089	2.134	2.207	2.339	2.036	10.95
29) T Diisopropyl Ether	1.238	1.283	1.079	1.289	1.502	1.524	1.678	1.527	1.390	14.23
30) T Ethyl Acetate	0.485	0.453	0.421	0.485	0.581	0.687	0.747	0.688	0.568	22.01
31) T n-Hexane	2.541	2.439	2.096	2.352	2.687	3.042	3.217	2.944	2.665	14.28
32) T Chloroform	2.436	2.420	1.940	2.307	2.599	2.676	2.779	2.962	2.515	12.49
33) S 1,2-Dichloroet...	1.884	1.864	1.894	1.866	1.856	1.832	1.838	1.857	1.861	1.13
34) T Tetrahydrofura...	1.079	0.932	0.804	0.865	0.982	1.021	1.055	1.147	0.986	11.60
35) T Ethyl tert-But...	1.467	1.435	1.258	1.477	1.717	1.821	1.941	2.137	1.657	17.95
36) T 1,2-Dichloroet...	2.087	1.977	1.599	1.872	2.071	2.107	2.161	2.273	2.018	10.25
37) IR 1,4-Difluorobenzen...										
38) T 1,1,1-Trichlor...	0.448	0.448	0.372	0.427	0.487	0.505	0.516	0.529	0.467	11.30
39) T Isopropyl Acetate	0.189	0.192	0.165	0.188	0.220	0.259	0.279	0.273	0.221	20.06
40) T 1-Butanol	0.366	0.288	0.264	0.271	0.350	0.428	0.466	0.446	0.360	22.45
41) T Benzene	1.635	1.397	1.087	1.214	1.348	1.439	1.543	1.445	1.389	12.57
42) T Carbon Tetrach...	0.373	0.371	0.318	0.378	0.436	0.463	0.481	0.506	0.416	15.67

Method Path : I:\MS13\METHODS\
Method File : R13110119.M

Title	EPA TO-15 per SOP	VOA-TO15	(CASS TO-15/GC-MS)	0.499	0.467	0.388	0.450	0.513	0.566	0.588	0.546	0.502
43) T Cyclohexane	0.499	0.467	0.388	0.450	0.513	0.566	0.588	0.546	0.502	13.14		
44) T tert-Amyl Meth...	0.889	0.830	0.682	0.795	0.925	0.986	1.026	1.044	0.897	13.84		
45) T 1,2-Dichloropr...	0.380	0.314	0.260	0.297	0.330	0.340	0.349	0.367	0.330	11.77		
46) T Bromodichlorom...	0.441	0.368	0.319	0.366	0.437	0.474	0.495	0.527	0.428	16.77		
47) T Trichloroethene	0.385	0.296	0.243	0.279	0.317	0.345	0.372	0.412	0.331	17.42		
48) T 1,4-Dioxane	0.258	0.210	0.194	0.219	0.252	0.290	0.313	0.352	0.261	20.92		
49) T 2,2,4-Trimethy...	1.733	1.352	1.136	1.275	1.438	1.483	1.510	1.459	1.423	12.41		
50) T Methyl Methacr...	0.122	0.100	0.088	0.105	0.126	0.145	0.159	0.168	0.127	22.80		
51) T n-Heptane	0.356	0.311	0.258	0.300	0.343	0.368	0.392	0.415	0.343	15.02		
52) T cis-1,3-Dichlo...	0.435	0.415	0.381	0.449	0.536	0.579	0.604	0.637	0.505	19.09		
53) T 4-Methyl-2-pen...	0.276	0.268	0.230	0.270	0.318	0.351	0.369	0.395	0.310	18.63		
54) T trans-1,3-Dich...	0.340	0.340	0.320	0.377	0.471	0.515	0.534	0.562	0.432	22.81		
55) T 1,1,2-Trichlor...	0.285	0.274	0.222	0.269	0.301	0.319	0.332	0.356	0.295	14.14		
56) IR Chlorobenzene-d5	(...)	-----	ISTD	-----	-----	-----	-----	-----	-----	-----		
57) S Toluene-d8 (SS2)	2.508	2.474	2.502	2.504	2.468	2.446	2.416	2.363	2.460	2.06		
58) T Toluene	2.913	2.555	2.119	2.425	2.746	2.874	2.928	2.787	2.668	10.63		
59) T 2-Hexanone	1.472	1.240	1.211	1.369	1.620	1.754	1.809	1.797	1.534	16.00		
60) T Dibromochlorom...	0.527	0.516	0.494	0.575	0.701	0.780	0.817	0.868	0.660	22.73		
61) T 1,2-Dibromoethane	0.580	0.565	0.502	0.587	0.692	0.732	0.758	0.800	0.652	16.48		
62) T n-Butyl Acetate	1.561	1.385	1.327	1.489	1.783	1.926	1.975	1.948	1.674	15.83		
63) T n-Octane	0.540	0.536	0.458	0.525	0.611	0.661	0.704	0.737	0.596	16.39		
64) T Tetrachloroethene	0.625	0.622	0.505	0.592	0.666	0.746	0.809	0.896	0.683	18.56		
65) T Chlorobenzene	1.562	1.521	1.306	1.511	1.716	1.822	2.342	1.927	1.713	18.72		
66) T Ethylbenzene	2.877	2.696	2.273	2.676	3.066	3.338	3.408	3.074	2.926	12.83		
67) T m- & p-Xylenes	2.219	2.015	1.783	2.071	2.430	2.779	2.849	2.378	2.316	15.98		
68) T Bromoform	0.329	0.397	0.397	0.535	0.653	0.718	0.799	0.572	32.31			
69) T Styrene	1.326	1.255	1.159	1.497	1.845	2.086	2.194	2.128	1.686	25.23		
70) T o-Xylene	2.186	2.082	1.819	2.102	2.465	2.801	2.964	2.655	2.384	16.77		
71) T n-Nonane	1.242	1.212	1.091	1.227	1.469	1.601	1.667	1.559	1.384	15.56		
72) T 1,1,2,2-Tetrac...	0.972	0.919	0.837	0.985	1.180	1.332	1.435	1.384	1.131	20.52		
73) S Bromofluoroben...	0.503	0.512	0.510	0.515	0.532	0.542	0.545	0.549	0.526	3.43		
74) T Cumene	2.778	2.626	2.221	2.576	3.002	3.337	3.412	2.942	2.862	13.91		
75) T alpha-Pinene	1.325	1.343	0.990	1.290	1.575	1.782	1.910	1.793	1.501	21.05		
76) T n-Propylbenzene	3.284	2.997	2.740	3.199	3.741	4.096	4.058	3.351	3.433	14.26		
77) T 3-Ethyltoluene	2.628	2.398	2.181	2.548	3.046	3.380	3.670	3.038	2.861	17.81		
78) T 4-Ethyltoluene	2.345	2.197	2.063	2.429	2.887	3.385	3.268	2.869	2.680	18.44		
79) T 1,3,5-Trimethy...	2.031	1.912	1.790	2.127	2.530	2.904	3.061	2.678	2.379	20.11		
80) T alpha-Methylst...	1.036	1.338	1.556	1.715	1.619	1.453	1.619	1.453	1.453	18.67		
81) T 1,2,4-Trimethy...	2.476	2.320	2.109	2.466	2.999	3.397	3.516	3.029	2.789	18.60		
82) T 1,2,4-Trimethy...	1.766	2.110	2.649	3.343	3.152	2.222	2.540	2.540	2.540	24.37		
83) T n-Decane	0.920	0.940	1.049	1.244	1.480	1.724	1.866	1.616	1.355	27.18		
84) T Benzyl Chloride	1.396	2.061	2.651	2.871	2.467	2.289	2.467	2.289	2.289	25.38		
85) T 1,3-Dichlorobe...	1.070	0.941	0.941	1.117	1.397	1.683	1.857	1.690	1.337	27.58		
86) T 1,4-Dichlorobe...	1.037	0.936	0.949	1.136	1.381	1.589	1.815	1.677	1.315	26.45		
87) T sec-Butylbenzene	2.990	2.649	2.379	2.839	3.435	3.852	3.940	3.132	3.152	17.65		
88) T 4-Isopropyltol...	2.098	2.516	3.182	3.927	3.504	2.354	2.930	2.354	2.930	24.52		
89) T 1,2,3-Trimethy...	1.769	2.122	2.689	3.423	3.158	2.169	2.555	2.555	2.555	25.29		
90) T 1,2-Dichlorobe...	0.896	1.074	1.355	1.695	1.792	1.390	1.367	1.367	1.367	25.27		
91) T d-Limonene	0.529	0.841	1.093	1.332	1.382	1.034	1.035	1.035	1.035	30.72		
92) T 1,2-Dibromo-3-...	0.278	0.339	0.455	0.532	0.584	0.636	0.471	0.471	0.471	29.79		
93) T n-Undecane	0.998	1.200	1.481	1.700	1.805	1.603	1.465	1.465	1.465	21.12		
94) T 1,2,4-Trichlor...	0.564	0.685	0.847	0.981	1.146	1.227	0.908	1.227	0.908	28.51		

Method Path : I:\MS13\METHODS\
Method File : R13110119.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

95) T	Naphthalene	1.948	2.477	3.224	3.858	3.922	2.913	3.057	25.35
96) T	n-Dodecane	1.188	1.553	1.785	1.861	1.370	1.552	18.11	
97) T	Hexachlorobuta...	0.426	0.422	0.370	0.445	0.538	0.654	0.792	29.15
98) T	Cyclohexanone	0.891	0.774	0.784	0.981	1.142	1.198	1.247	21.47
99) T	tert-Butylbenzene	2.158	1.953	1.701	2.034	2.522	3.133	2.096	21.59
100) T	n-Butylbenzene	1.923	2.320	2.822	3.158	3.207	2.604	2.673	18.60

(#) = Out of Range

Primary Source Standards Concentrations (Working & Initial Calibration)

IDA 11/6/19

1ng/L Std. ID: S31-10301907
 4ng/L Std. ID: S31-10301905
 20ng/L Std. ID: S31-10301905
 200ng/L Std. ID: S31-10301902

Dilution Factors:

Compounds	Source Std. mg/m ³	Primary Working Standards				Working STD Conc. (ng/L): Injection (L): ICAL Points:	4	4	4	20	20	200	200	200	200
		200ng/L	20ng/L	4ng/L	1ng/L										
Propene	1.06	212	21.2	4.24	1.06	0.025	0.050	0.125	0.050	1ng	0.25	5ng	25ng	50ng	100ng
Dichlorodifluoromethane	1.06	212	21.2	4.24	1.06	0.106	0.212	0.530	1.06	5.30	26.50	53.0	26.50	53.0	106
Chloromethane	1.06	212	21.2	4.24	1.06	0.106	0.212	0.530	1.06	5.30	26.50	53.0	26.50	53.0	106
Freon-114	1.05	210	21.0	4.20	1.05	0.105	0.210	0.525	1.05	5.25	26.25	52.5	26.25	52.5	105
Vinyl Chloride	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	27.00	54.0	108
1,3-Butadiene	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	27.00	54.0	108
Bromomethane	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	27.00	54.0	108
Chloroethane	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	27.00	54.0	108
Ethanol	5.21	1042	104.2	20.84	5.21	0.521	1.042	2.605	5.21	26.05	130.25	260.5	130.25	260.5	521
Acetonitrile	1.05	210	21.0	4.20	1.05	0.105	0.210	0.525	1.05	5.25	26.25	52.5	26.25	52.5	105
Acrolein	1.03	206	20.6	4.12	1.03	0.103	0.206	0.515	1.03	5.15	25.75	51.5	25.75	51.5	103
Acetone	5.33	1066	106.6	21.32	5.33	0.533	1.066	2.665	5.33	26.65	133.25	266.5	133.25	266.5	533
Trichlorofluoromethane	1.06	212	21.2	4.24	1.06	0.106	0.212	0.530	1.06	5.30	26.50	53.0	26.50	53.0	106
Isopropanol	2.10	420	42.0	8.40	2.10	0.210	0.420	1.050	2.10	10.50	52.50	105.0	52.50	105.0	210
Acrylonitrile	1.05	210	21.0	4.20	1.05	0.105	0.210	0.525	1.05	5.25	26.25	52.5	26.25	52.5	105
1,1-Dichloroethene	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	27.00	54.0	108
tert-Butanol	2.16	432	43.2	8.64	2.16	0.216	0.432	1.080	2.16	10.80	54.00	108.0	54.00	108.0	216
Methylene Chloride	1.06	212	21.2	4.24	1.06	0.106	0.212	0.530	1.06	5.30	26.50	53.0	26.50	53.0	106
Allyl Chloride	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	27.00	54.0	108
Trichlorotrifluoroethane	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	27.00	54.0	108
Carbon Disulfide	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	26.75	53.5	107
trans-1,2-Dichloroethene	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	27.00	54.0	108
1,1-Dichloroethane	1.09	218	21.8	4.36	1.09	0.109	0.218	0.545	1.09	5.45	27.25	54.5	27.25	54.5	109
Methyl tert-Butyl Ether	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	27.00	54.0	108
Vinyl Acetate	5.35	1070	107.0	21.40	5.35	0.535	1.070	2.675	5.35	26.75	133.75	267.5	133.75	267.5	535
2-Butanone	1.06	212	21.2	4.24	1.06	0.106	0.212	0.530	1.06	5.30	26.50	53.0	26.50	53.0	106
cis-1,2-Dichloroethene	1.06	212	21.2	4.24	1.06	0.106	0.212	0.530	1.06	5.30	26.50	53.0	26.50	53.0	106
Diisopropyl Ether	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	27.00	54.0	108
Ethyl Acetate	2.17	434	43.4	8.68	2.17	0.217	0.434	1.085	2.17	10.85	54.25	108.5	54.25	108.5	217
n-Hexane	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	27.00	54.0	108
Chloroform	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	26.75	53.5	107
Tetrahydrofuran	1.09	218	21.8	4.36	1.09	0.109	0.218	0.545	1.09	5.45	27.25	54.5	27.25	54.5	109
Ethyl tert-Butyl Ether	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	27.00	54.0	108
1,2-Dichloroethane	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	27.00	54.0	108
1,1,1-Trichloroethane	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	26.75	53.5	107
Isopropyl Acetate	2.11	422	42.2	8.44	2.11	0.211	0.422	1.055	2.11	10.55	52.75	105.5	52.75	105.5	211
1-Butanol	2.08	416	41.6	8.32	2.08	0.208	0.416	1.040	2.08	10.40	52.00	104.0	52.00	104.0	208
Benzene	1.06	212	21.2	4.24	1.06	0.106	0.212	0.530	1.06	5.30	26.50	53.0	26.50	53.0	106
Carbon Tetrachloride	1.05	210	21.0	4.20	1.05	0.105	0.210	0.525	1.05	5.25	26.25	52.5	26.25	52.5	105
Cyclohexane	2.12	424	42.4	8.48	2.12	0.212	0.424	1.060	2.12	10.60	53.00	106.0	53.00	106.0	212
tert-Amyl Methyl Ether	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	27.00	54.0	108
1,2-Dichloropropane	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	27.00	54.0	108
Bromodichloromethane	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	27.00	54.0	108
Trichloroethene	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	26.75	53.5	107
1,4-Dioxane	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	27.00	54.0	108
Isooctane	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	26.75	53.5	107
Methyl Methacrylate	2.15	430	43.0	8.60	2.15	0.215	0.430	1.075	2.15	10.75	53.75	107.5	53.75	107.5	215
n-Heptane	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	27.00	54.0	108

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID:
 4ng/L Std. ID: S31-10301907
 20ng/L Std. ID: S31-10301905
 200ng/L Std. ID: S31-10301902

Compounds	Source Std. mg/m ³	Dilution Factors:										Working STD Conc.(ng/L): Injection (L): ICAL Points:		
		5		250		1000		4		20			200	
		200ng/L	4ng/L	20ng/L	4ng/L	1ng/L	0.025	0.050	0.125	0.050	0.025		0.050	0.125
cis-1,3-Dichloropropene	1.04	208	20.8	4.16	1.04	0.104	0.208	0.520	1.04	5.20	26.00	52.0	104	
4-Methyl-2-pentanone	1.06	212	21.2	4.24	1.06	0.106	0.212	0.530	1.06	5.30	26.50	53.0	106	
trans-1,3-Dichloropropene	1.06	212	21.2	4.24	1.06	0.106	0.212	0.530	1.06	5.30	26.50	53.0	106	
1,1,2-Trichloroethane	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
Toluene	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
2-Hexanone	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
Dibromochloromethane	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
1,2-Dibromoethane	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
n-Butyl Acetate	1.09	218	21.8	4.36	1.09	0.109	0.218	0.545	1.09	5.45	27.25	54.5	109	
n-Octane	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	108	
Tetrachloroethene	1.04	208	20.8	4.16	1.04	0.104	0.208	0.520	1.04	5.20	26.00	52.0	104	
Chlorobenzene	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
Ethylbenzene	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
m- & p-Xylene	2.14	428	42.8	8.56	2.14	0.214	0.428	1.070	2.14	10.70	53.50	107.0	214	
Bromoform	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
Styrene	1.06	212	21.2	4.24	1.06	0.106	0.212	0.530	1.06	5.30	26.50	53.0	106	
o-Xylene	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
n-Nonane	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
1,1,2,2-Tetrachloroethane	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
Cumene	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	108	
alpha-Prinene	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
n-Propylbenzene	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	108	
3-Ethyltoluene	1.06	212	21.2	4.24	1.06	0.106	0.212	0.530	1.06	5.30	26.50	53.0	106	
4-Ethyltoluene	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	108	
1,3,5-Trimethylbenzene	1.06	212	21.2	4.24	1.06	0.106	0.212	0.530	1.06	5.30	26.50	53.0	106	
alpha-Methylstyrene	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
2-Ethyltoluene	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	108	
1,2,4-Trimethylbenzene	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
n-Decane	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
Benzyl Chloride	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	108	
1,3-Dichlorobenzene	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
1,4-Dichlorobenzene	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
sec-Butylbenzene	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
p-Isopropyltoluene	1.09	218	21.8	4.36	1.09	0.109	0.218	0.545	1.09	5.45	27.25	54.5	109	
1,2,3-Trimethylbenzene	1.09	218	21.8	4.36	1.09	0.109	0.218	0.545	1.09	5.45	27.25	54.5	109	
1,2-Dichlorobenzene	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
d-Limonene	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	108	
1,2-Dibromo-3-chloropropane	1.05	210	21.0	4.20	1.05	0.105	0.210	0.525	1.05	5.25	26.25	52.5	105	
n-Undecane	1.08	216	21.6	4.32	1.08	0.108	0.216	0.540	1.08	5.40	27.00	54.0	108	
1,2,4-Trichlorobenzene	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
Naphthalene	1.03	206	20.6	4.12	1.03	0.103	0.206	0.515	1.03	5.15	25.75	51.5	103	
n-Dodecane	1.04	208	20.8	4.16	1.04	0.104	0.208	0.520	1.04	5.20	26.00	52.0	104	
Hexachloro-1,3-butadiene	1.06	212	21.2	4.24	1.06	0.106	0.212	0.530	1.06	5.30	26.50	53.0	106	
Methacrylonitrile	1.06	212	21.2	4.24	1.06	0.106	0.212	0.530	1.06	5.30	26.50	53.0	106	
Cyclohexanone	1.00	200	20.0	4.00	1.00	0.100	0.200	0.500	1.00	5.00	25.00	50.0	100	
tert-Butylbenzene	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	
n-Butylbenzene	1.07	214	21.4	4.28	1.07	0.107	0.214	0.535	1.07	5.35	26.75	53.5	107	

Method : I:\MS13\METHODS\R13110119.M (RTE Integrator)
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	0.1	0	13	I:\MS13\DATA\2019_11\01\11011916.D
2	0.2	0	13	I:\MS13\DATA\2019_11\01\11011917.D
3	0.5	1	13	I:\MS13\DATA\2019_11\01\11011928.D
4	1.0	1	13	I:\MS13\DATA\2019_11\01\11011919.D
5	5.0	5	13	I:\MS13\DATA\2019_11\01\11011920.D
6	25	27	13	I:\MS13\DATA\2019_11\01\11011921.D
7	50	53	13	I:\MS13\DATA\2019_11\01\11011922.D
8	100	106	13	I:\MS13\DATA\2019_11\01\11011923.D

DA 11/4/19

#	ID	Update Time	Quant Time	Acquisition Time
1	0.1	Nov 02 09:01 2019	Nov 02 08:53 2019	1 Nov 2019 18:13
2	0.2	Nov 02 09:01 2019	Nov 02 08:53 2019	1 Nov 2019 18:46
3	0.5	Nov 02 09:03 2019	Nov 02 08:53 2019	2 Nov 2019 8:18
4	1.0	Nov 02 09:15 2019	Nov 02 08:53 2019	1 Nov 2019 19:52
5	5.0	Nov 02 09:02 2019	Nov 02 08:53 2019	1 Nov 2019 20:25
6	25	Nov 02 09:02 2019	Nov 02 08:53 2019	1 Nov 2019 20:59
7	50	Nov 02 09:02 2019	Nov 02 08:53 2019	1 Nov 2019 21:32
8	100	Nov 02 09:55 2019	Nov 02 08:53 2019	1 Nov 2019 22:05

R13110119.M

Mon Nov 04 06:49:33 2019

Data File : I:\MS13\DATA\2019 11\01\11011916.D
 Acq On : 1 Nov 2019 18:13
 Sample : 0.1ng R13110119 ICAL Std
 Misc : S31-10251901/S31-10301907 (11/28)

Vial: 10
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 07:53:25 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 08:52:46 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

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Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	11.22	130	126986	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.35	114	575963	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	277390	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	239292	12.654	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	101.20%	
57) Toluene-d8 (SS2)	15.80	98	695643	12.743	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	101.92%	
73) Bromofluorobenzene (SS3)	19.05	174	139559	11.953	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	95.60%	

Target Compounds

						Qvalue
2) Propene	4.20	42	2022	0.112	ng	96
3) Dichlorodifluoromethan...	4.35	85	3371	0.116	ng	# 89
4) Chloromethane	4.63	50	2939	0.145	ng	96
5) 1,2-Dichloro-1,1,2,2-t...	4.89	135	1646	0.104	ng	95
6) Vinyl Chloride	5.04	62	2702	0.110	ng	93
7) 1,3-Butadiene	5.32	54	1397	0.087	ng	88
8) Bromomethane	5.74	94	1319	0.109	ng	98
9) Chloroethane	6.08	64	1151	0.109	ng	70
10) Ethanol	6.41	45	7104	0.593	ng	91
11) Acetonitrile	6.68	41	3487	0.122	ng	# 69
12) Acrolein	6.90	56	910	0.100	ng	87
13) Acetone	7.12	58	7608	0.612	ng	# 85
14) Trichlorofluoromethane	7.34	101	2655	0.108	ng	100
15) 2-Propanol (Isopropanol)	7.63	45	8338	0.216	ng	98
16) Acrylonitrile	7.84	53	1896	0.098	ng	97
17) 1,1-Dichloroethene	8.29	96	1375	0.105	ng	94
18) 2-Methyl-2-Propanol (t...	8.52	59	7818	0.238	ng	93
19) Methylene Chloride	8.49	84	1522	0.107	ng	87
20) 3-Chloro-1-propene (Al...	8.67	41	2469	0.108	ng	90
21) Trichlorotrifluoroethane	8.93	151	1030	0.100	ng	90
22) Carbon Disulfide	8.78	76	7907	0.143	ng	93
23) trans-1,2-Dichloroethene	9.77	61	2240	0.108	ng	92
24) 1,1-Dichloroethane	10.03	63	2878	0.112	ng	93
25) Methyl tert-Butyl Ether	10.20	73	4488	0.120	ng	93
26) Vinyl Acetate	10.30	86	1425	0.395	ng	# 29
27) 2-Butanone (MEK)	10.60	72	803	0.080	ng	# 12
28) cis-1,2-Dichloroethene	11.04	61	2243	0.108	ng	91
29) Diisopropyl Ether	11.38	87	1358	0.096	ng	# 82
30) Ethyl Acetate	11.37	61	1070	0.185	ng	92
31) n-Hexane	11.34	57	2788	0.103	ng	# 94
32) Chloroform	11.38	83	2648	0.104	ng	99
34) Tetrahydrofuran (THF)	11.88	72	1195	0.119	ng	# 82
35) Ethyl tert-Butyl Ether	11.98	87	1609	0.096	ng	92
36) 1,2-Dichloroethane	12.20	62	2290	0.112	ng	90
38) 1,1,1-Trichloroethane	12.47	97	2210	0.103	ng	95
39) Isopropyl Acetate	12.93	61	1840	0.181	ng	# 68
40) 1-Butanol	12.96	56	3505	0.211	ng	93
41) Benzene	12.96	78	7985	0.125	ng	97
42) Carbon Tetrachloride	13.11	117	1807	0.094	ng	95
43) Cyclohexane	13.25	84	4875	0.211	ng	98
44) tert-Amyl Methyl Ether	13.63	73	4425	0.107	ng	97
45) 1,2-Dichloropropane	13.81	63	1890	0.124	ng	99
46) Bromodichloromethane	14.01	83	2196	0.111	ng	99
47) Trichloroethene	14.06	130	1898	0.124	ng	100
48) 1,4-Dioxane	14.08	88	1286	0.107	ng	84
49) 2,2,4-Trimethylpentane...	14.12	57	8544	0.130	ng	94
50) Methyl Methacrylate	14.27	100	1213	0.208	ng	93

Data File : I:\MS13\DATA\2019 11\01\11011916.D
 Acq On : 1 Nov 2019 18:13
 Sample : 0.1ng R13110119 ICAL Std
 Misc : S31-10251901/S31-10301907 (11/28)

Vial: 10
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 07:53:25 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 08:52:46 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

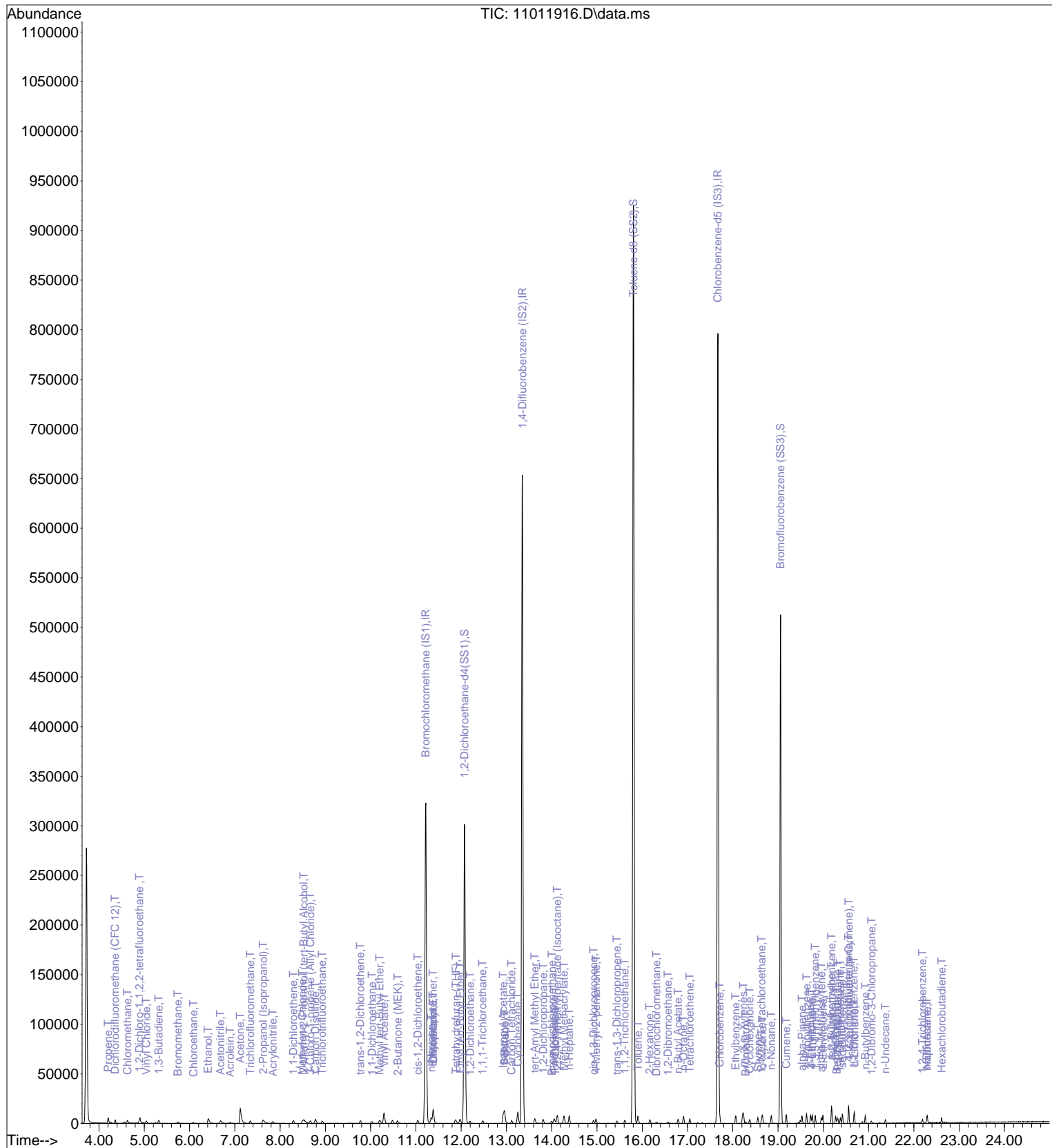
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
51) n-Heptane	14.39	71	1774	0.112	ng	94
52) cis-1,3-Dichloropropene	14.92	75	2086	0.090	ng	91
53) 4-Methyl-2-pentanone	14.98	58	1347	0.094	ng	91
54) trans-1,3-Dichloropropene	15.44	75	1661	0.083	ng	93
55) 1,1,2-Trichloroethane	15.61	97	1406	0.104	ng	98
58) Toluene	15.91	91	6917	0.117	ng	94
59) 2-Hexanone	16.16	43	3496	0.103	ng	91
60) Dibromochloromethane	16.31	129	1252	0.086	ng	95
61) 1,2-Dibromoethane	16.57	107	1376	0.095	ng	99
62) n-Butyl Acetate	16.79	43	3776	0.102	ng	94
63) n-Octane	16.91	57	1295	0.098	ng	97
64) Tetrachloroethene	17.05	166	1443	0.095	ng	99
65) Chlorobenzene	17.71	112	3710	0.098	ng	97
66) Ethylbenzene	18.06	91	6831	0.105	ng	97
67) m- & p-Xylenes	18.23	91	10537	0.205	ng	95
68) Bromoform	18.29	173	874	0.076	ng	83
69) Styrene	18.55	104	3119	0.083	ng	97
70) o-Xylene	18.66	91	5191	0.098	ng	99
71) n-Nonane	18.85	43	2950	0.096	ng	96
72) 1,1,2,2-Tetrachloroethane	18.63	83	2308	0.092	ng	97
74) Cumene	19.18	105	6657	0.105	ng	97
75) alpha-Pinene	19.53	93	3146	0.094	ng	100
76) n-Propylbenzene	19.63	91	7871	0.103	ng	96
77) 3-Ethyltoluene	19.72	105	6181	0.097	ng	98
78) 4-Ethyltoluene	19.75	105	5619	0.094	ng	92
79) 1,3,5-Trimethylbenzene	19.82	105	4778	0.090	ng	94
80) alpha-Methylstyrene	19.96	118	1936	0.073	ng	94
81) 2-Ethyltoluene	19.99	105	5934	0.096	ng	95
82) 1,2,4-Trimethylbenzene	20.18	105	4591	0.087	ng	99
83) n-Decane	20.27	57	2184	0.073	ng	92
84) Benzyl Chloride	20.30	91	2090	0.053	ng	84
85) 1,3-Dichlorobenzene	20.32	146	2540	0.086	ng	94
86) 1,4-Dichlorobenzene	20.37	146	2462	0.084	ng	100
87) sec-Butylbenzene	20.42	105	7100	0.102	ng	95
88) 4-Isopropyltoluene (p-...	20.56	119	5736	0.093	ng	96
89) 1,2,3-Trimethylbenzene	20.56	105	4762	0.090	ng	97
90) 1,2-Dichlorobenzene	20.68	146	2483	0.088	ng	98
91) d-Limonene	20.69	68	1691	0.080	ng	96
92) 1,2-Dibromo-3-Chloropr...	21.06	157	723	0.076	ng	# 71
93) n-Undecane	21.37	57	1112	0.041	ng	92
94) 1,2,4-Trichlorobenzene	22.19	180	1378	0.078	ng	# 91
95) Naphthalene	22.29	128	5451	0.090	ng	93
96) n-Dodecane	22.29	57	615	0.024	ng	# 68
97) Hexachlorobutadiene	22.62	225	1003	0.080	ng	97
98) Cyclohexanone	18.37	55	1978	0.092	ng	94
99) tert-Butylbenzene	20.18	119	5124	0.100	ng	95
100) n-Butylbenzene	20.93	91	4905	0.089	ng	92

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2019 11\01\11011916.D
Acq On : 1 Nov 2019 18:13
Sample : 0.1ng R13110119 ICAL Std
Misc : S31-10251901/S31-10301907 (11/28)

Vial: 10
Operator: WA
Inst : MS13

Quant Time: Nov 02 07:53:25 2019
Quant Method : I:\MS13\METHODS\R13110119.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Nov 02 08:52:46 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 11\01\11011917.D
 Acq On : 1 Nov 2019 18:46
 Sample : 0.2ng R13110119 ICAL Std
 Misc : S31-10251901/S31-10301907 (11/28)

Vial: 10
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 07:53:27 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 08:52:56 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

 11/4/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	11.22	130	126680	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.35	114	573260	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	277689	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	236189	12.520	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	100.16%	
57) Toluene-d8 (SS2)	15.80	98	687140	12.573	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	100.56%	
73) Bromofluorobenzene (SS3)	19.05	174	142267	12.172	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.36%	

Target Compounds

						Qvalue
2) Propene	4.20	42	3529	0.196	ng	94
3) Dichlorodifluoromethan...	4.35	85	6425	0.221	ng	95
4) Chloromethane	4.62	50	5419	0.268	ng	94
5) 1,2-Dichloro-1,1,2,2-t...	4.89	135	3118	0.197	ng	96
6) Vinyl Chloride	5.04	62	5486	0.223	ng	97
7) 1,3-Butadiene	5.31	54	2683	0.168	ng	87
8) Bromomethane	5.74	94	2508	0.208	ng	99
9) Chloroethane	6.07	64	2320	0.221	ng	88
10) Ethanol	6.41	45	11531	0.965	ng	96
11) Acetonitrile	6.68	41	5764	0.203	ng	80
12) Acrolein	6.89	56	1857	0.204	ng	100
13) Acetone	7.11	58	12943	1.045	ng	# 82
14) Trichlorofluoromethane	7.34	101	5113	0.208	ng	100
15) 2-Propanol (Isopropanol)	7.60	45	15869	0.411	ng	97
16) Acrylonitrile	7.84	53	3611	0.188	ng	94
17) 1,1-Dichloroethene	8.29	96	2680	0.206	ng	99
18) 2-Methyl-2-Propanol (t...	8.50	59	14976	0.457	ng	95
19) Methylene Chloride	8.49	84	2873	0.202	ng	94
20) 3-Chloro-1-propene (Al...	8.66	41	4582	0.201	ng	92
21) Trichlorotrifluoroethane	8.94	151	2242	0.218	ng	97
22) Carbon Disulfide	8.78	76	12107	0.219	ng	98
23) trans-1,2-Dichloroethene	9.77	61	4257	0.206	ng	98
24) 1,1-Dichloroethane	10.03	63	5622	0.219	ng	97
25) Methyl tert-Butyl Ether	10.19	73	8947	0.240	ng	97
26) Vinyl Acetate	10.29	86	3012	0.837	ng	# 57
27) 2-Butanone (MEK)	10.57	72	1889	0.189	ng	# 74
28) cis-1,2-Dichloroethene	11.04	61	4220	0.205	ng	98
29) Diisopropyl Ether	11.37	87	2808	0.199	ng	# 94
30) Ethyl Acetate	11.38	61	1992	0.346	ng	99
31) n-Hexane	11.34	57	5340	0.198	ng	98
32) Chloroform	11.38	83	5248	0.206	ng	97
34) Tetrahydrofuran (THF)	11.86	72	2058	0.206	ng	# 90
35) Ethyl tert-Butyl Ether	11.97	87	3141	0.187	ng	# 90
36) 1,2-Dichloroethane	12.19	62	4328	0.212	ng	96
38) 1,1,1-Trichloroethane	12.47	97	4397	0.205	ng	99
39) Isopropyl Acetate	12.93	61	3707	0.367	ng	# 89
40) 1-Butanol	12.96	56	5492	0.333	ng	83
41) Benzene	12.95	78	13585	0.213	ng	99
42) Carbon Tetrachloride	13.12	117	3569	0.187	ng	100
43) Cyclohexane	13.25	84	9074	0.394	ng	96
44) tert-Amyl Methyl Ether	13.62	73	8219	0.200	ng	98
45) 1,2-Dichloropropane	13.81	63	3109	0.206	ng	98
46) Bromodichloromethane	14.00	83	3643	0.185	ng	100
47) Trichloroethene	14.05	130	2901	0.191	ng	99
48) 1,4-Dioxane	14.07	88	2083	0.174	ng	94
49) 2,2,4-Trimethylpentane...	14.13	57	13269	0.203	ng	99
50) Methyl Methacrylate	14.27	100	1974	0.340	ng	96

Data File : I:\MS13\DATA\2019 11\01\11011917.D
 Acq On : 1 Nov 2019 18:46
 Sample : 0.2ng R13110119 ICAL Std
 Misc : S31-10251901/S31-10301907 (11/28)

Vial: 10
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 07:53:27 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 08:52:56 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

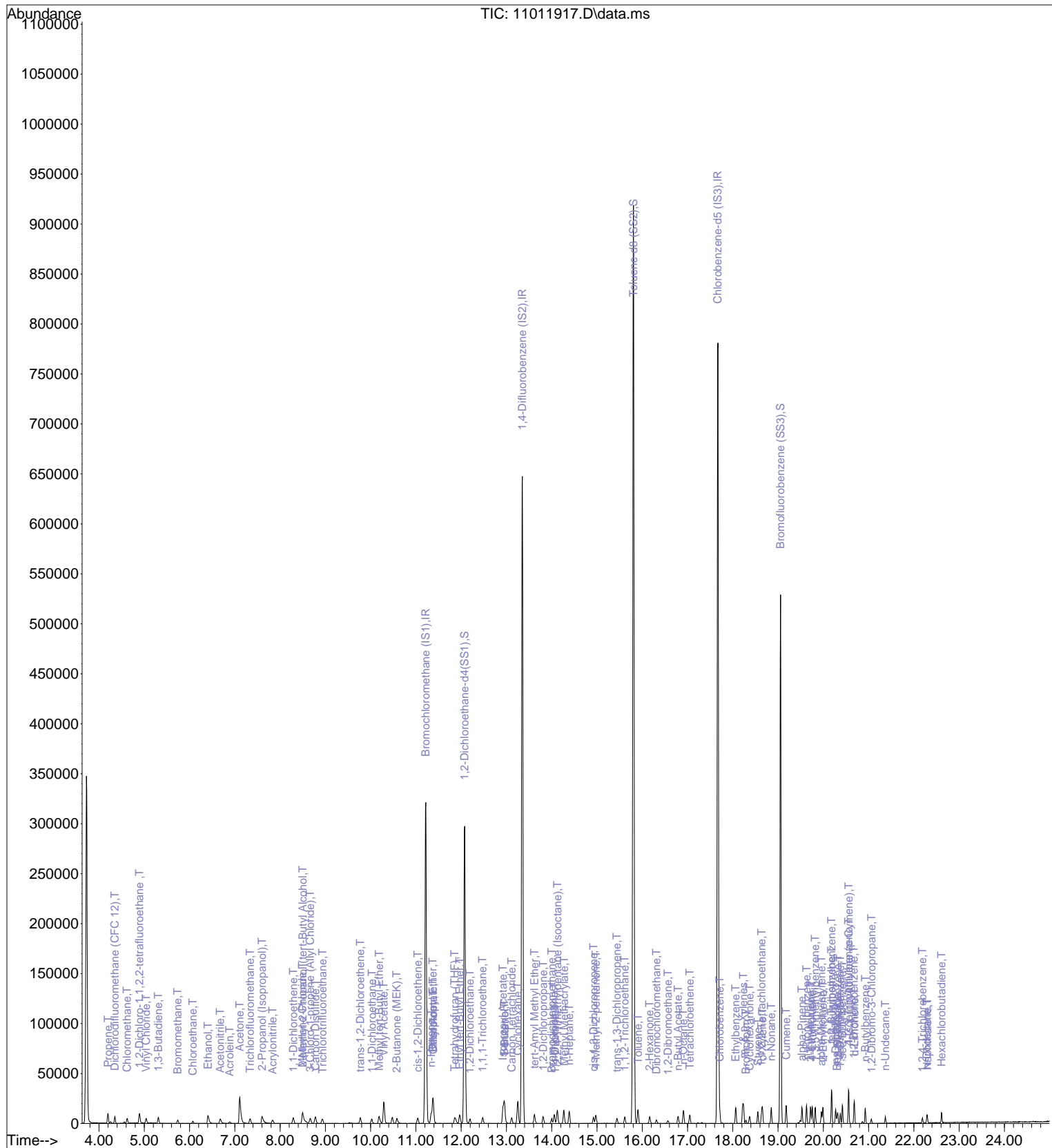
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
51) n-Heptane	14.39	71	3079	0.196	ng	98
52) cis-1,3-Dichloropropene	14.92	75	3963	0.171	ng	97
53) 4-Methyl-2-pentanone	14.97	58	2602	0.183	ng #	90
54) trans-1,3-Dichloropropene	15.44	75	3303	0.167	ng	99
55) 1,1,2-Trichloroethane	15.61	97	2694	0.199	ng	100
58) Toluene	15.91	91	12146	0.205	ng	99
59) 2-Hexanone	16.16	43	5897	0.173	ng	99
60) Dibromochloromethane	16.31	129	2452	0.167	ng	96
61) 1,2-Dibromoethane	16.57	107	2687	0.186	ng	97
62) n-Butyl Acetate	16.79	43	6708	0.180	ng	98
63) n-Octane	16.91	57	2570	0.194	ng	97
64) Tetrachloroethene	17.05	166	2874	0.190	ng	94
65) Chlorobenzene	17.71	112	7230	0.190	ng	99
66) Ethylbenzene	18.06	91	12819	0.197	ng	97
67) m- & p-Xylenes	18.23	91	19163	0.373	ng	99
68) Bromoform	18.29	173	1719	0.149	ng	91
69) Styrene	18.55	104	5910	0.158	ng	98
70) o-Xylene	18.66	91	9896	0.187	ng	99
71) n-Nonane	18.85	43	5763	0.187	ng	95
72) 1,1,2,2-Tetrachloroethane	18.63	83	4371	0.174	ng	99
74) Cumene	19.18	105	12603	0.198	ng	97
75) alpha-Pinene	19.53	93	6384	0.191	ng	97
76) n-Propylbenzene	19.63	91	14381	0.189	ng	97
77) 3-Ethyltoluene	19.72	105	11294	0.178	ng	97
78) 4-Ethyltoluene	19.75	105	10543	0.177	ng	96
79) 1,3,5-Trimethylbenzene	19.82	105	9004	0.170	ng	96
80) alpha-Methylstyrene	19.96	118	3752	0.142	ng #	88
81) 2-Ethyltoluene	19.99	105	11134	0.180	ng	95
82) 1,2,4-Trimethylbenzene	20.18	105	8588	0.163	ng	98
83) n-Decane	20.27	57	4467	0.148	ng	97
84) Benzyl Chloride	20.30	91	3976	0.100	ng	91
85) 1,3-Dichlorobenzene	20.32	146	4472	0.151	ng	98
86) 1,4-Dichlorobenzene	20.37	146	4451	0.152	ng	95
87) sec-Butylbenzene	20.42	105	12592	0.180	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	10765	0.175	ng	98
89) 1,2,3-Trimethylbenzene	20.56	105	8983	0.169	ng	94
90) 1,2-Dichlorobenzene	20.68	146	4534	0.160	ng	100
91) d-Limonene	20.69	68	3350	0.158	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.06	157	1270	0.134	ng #	81
93) n-Undecane	21.37	57	2019	0.075	ng	90
94) 1,2,4-Trichlorobenzene	22.19	180	1782	0.100	ng #	95
95) Naphthalene	22.30	128	5476	0.090	ng	96
96) n-Dodecane	22.29	57	954	0.038	ng	95
97) Hexachlorobutadiene	22.61	225	1989	0.159	ng	89
98) Cyclohexanone	18.37	55	3438	0.160	ng	97
99) tert-Butylbenzene	20.18	119	9285	0.180	ng	98
100) n-Butylbenzene	20.93	91	8777	0.158	ng	96

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2019 11\01\11011917.D
Acq On : 1 Nov 2019 18:46
Sample : 0.2ng R13110119 ICAL Std
Misc : S31-10251901/S31-10301907 (11/28)

Vial: 10
Operator: WA
Inst : MS13

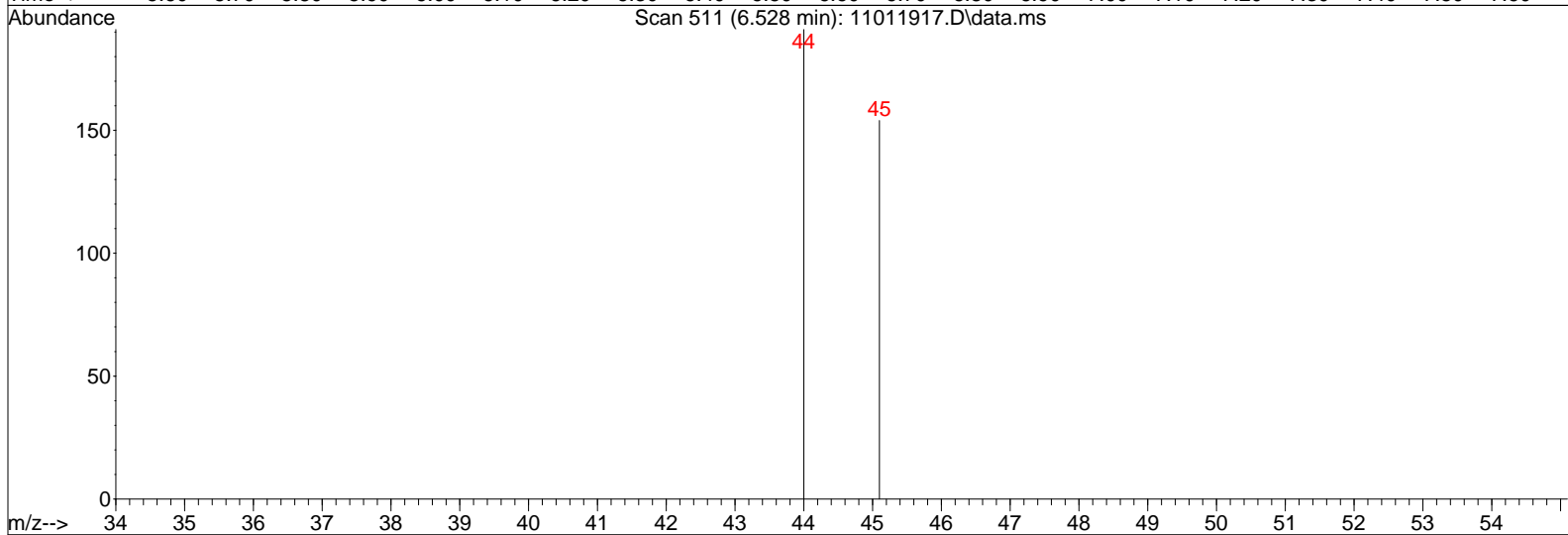
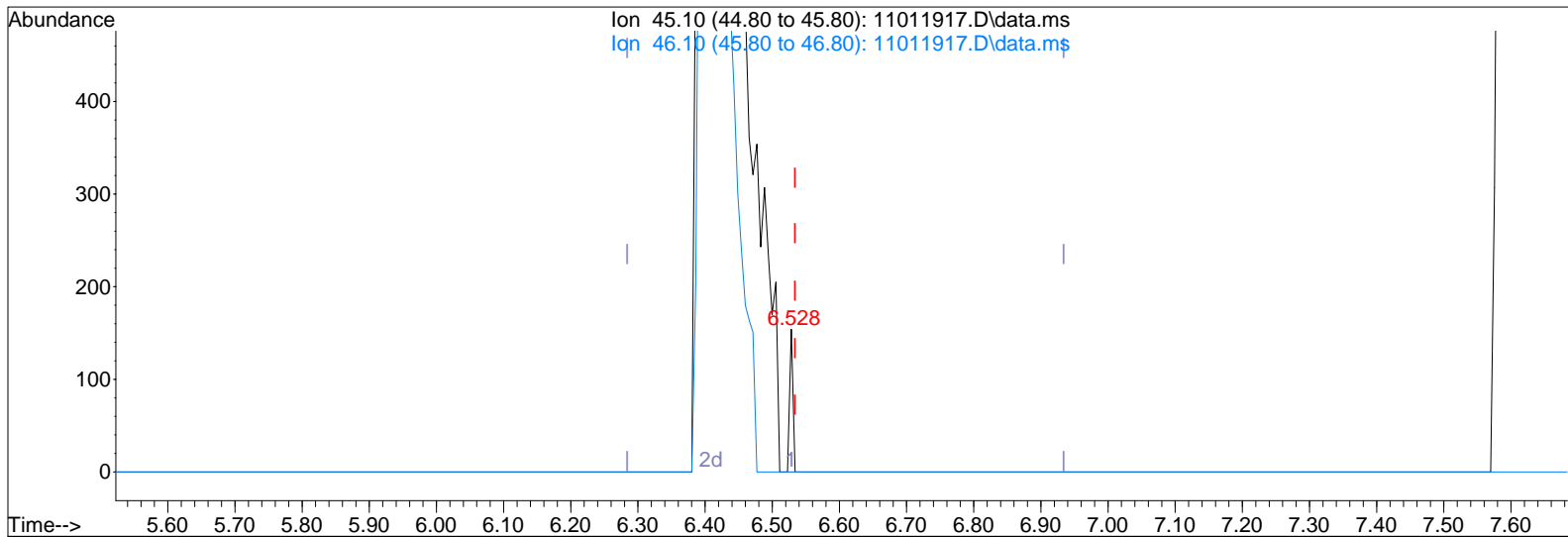
Quant Time: Nov 02 07:53:27 2019
Quant Method : I:\MS13\METHODS\R13110119.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Nov 02 08:52:56 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 11\01\11011917.D
 Acq On : 1 Nov 2019 18:46
 Sample : 0.2ng R13110119 ICAL Std
 Misc : S31-10251901/S31-10301907 (11/28)

Vial: 10
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 07:14:55 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Nov 01 13:42:30 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



TIC: 11011917.D\data.ms

(10) Ethanol (T)

6.528min (-0.006) 0.00ng

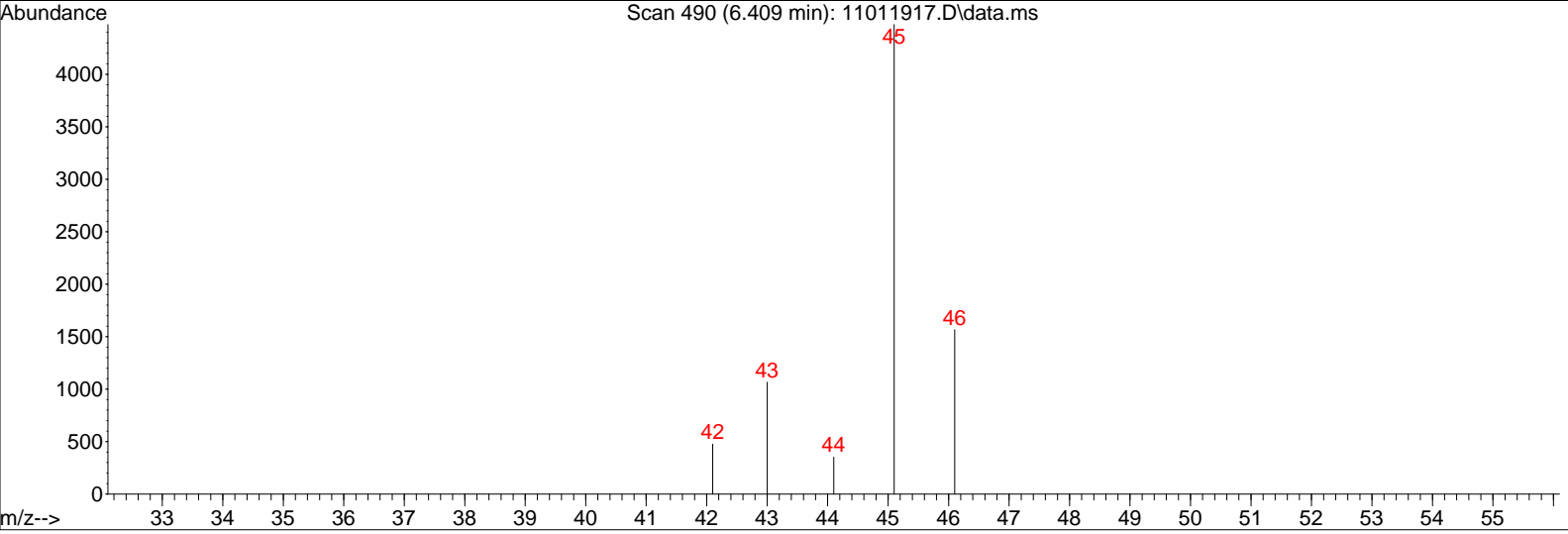
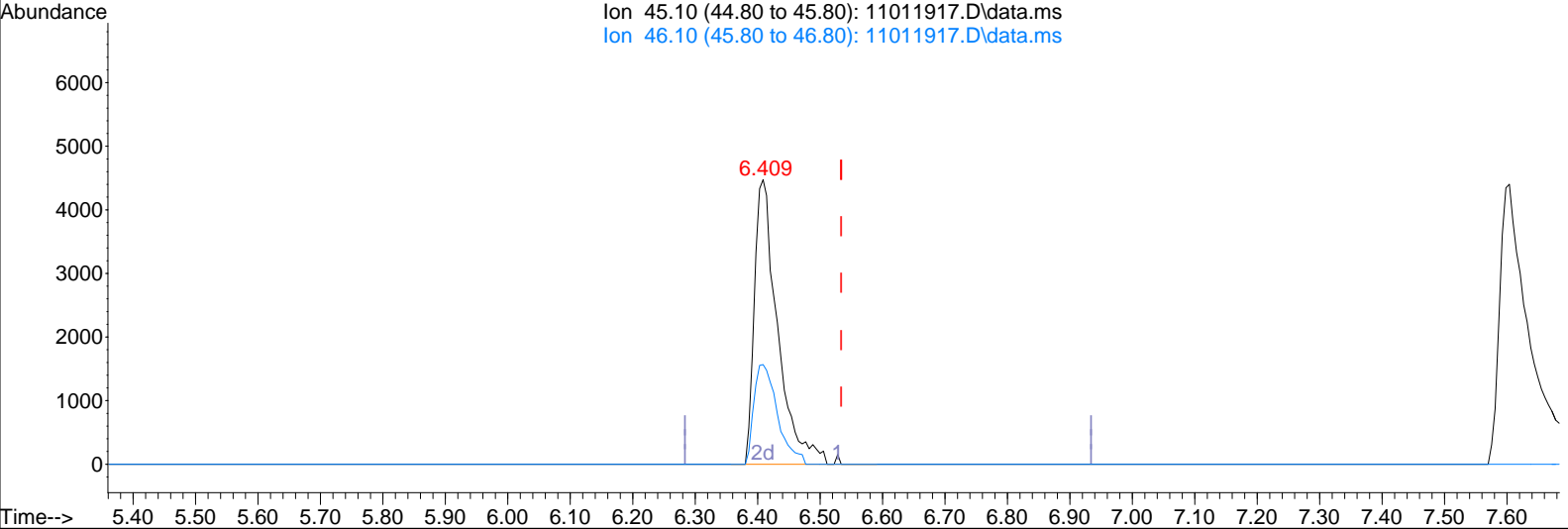
response 53

Ion	Exp%	Act%
45.10	100	100
46.10	38.10	0.00#
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2019 11\01\11011917.D
 Acq On : 1 Nov 2019 18:46
 Sample : 0.2ng R13110119 ICAL Std
 Misc : S31-10251901/S31-10301907 (11/28)

Vial: 10
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 07:14:55 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Nov 01 13:42:30 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



TIC: 11011917.D\data.ms

(10) Ethanol (T)

6.409min (-0.125) 0.94ng m

response 11584

MP TD 11/8/19

~~107~~ 11/2/19

Ion	Exp%	Act%
45.10	100	100
46.10	38.10	0.00#
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2019 11\01\11011928.D
 Acq On : 2 Nov 2019 8:18
 Sample : 0.5ng R13110119 ICAL Std
 Misc : S31-10251901/S31-10301907 (11/28)

Vial: 10
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 07:53:41 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 08:52:56 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

11/4/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	11.22	130	125187	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.35	114	572725	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	276607	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	237143	12.721	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	101.76%	
57) Toluene-d8 (SS2)	15.80	98	692006	12.712	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	101.68%	
73) Bromofluorobenzene (SS3)	19.05	174	140969	12.108	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	96.88%	

Target Compounds

						Qvalue
2) Propene	4.20	42	7421	0.417	ng	99
3) Dichlorodifluoromethan...	4.35	85	12369	0.431	ng	98
4) Chloromethane	4.62	50	9685	0.485	ng	98
5) 1,2-Dichloro-1,1,2,2-t...	4.89	135	6856	0.439	ng	99
6) Vinyl Chloride	5.04	62	9730	0.400	ng	96
7) 1,3-Butadiene	5.30	54	6211	0.394	ng	98
8) Bromomethane	5.73	94	5318	0.447	ng	98
9) Chloroethane	6.07	64	4706	0.453	ng	98
10) Ethanol	6.41	45	24051	2.036	ng	97
11) Acetonitrile	6.68	41	11764	0.418	ng	87
12) Acrolein	6.88	56	3654	0.407	ng	98
13) Acetone	7.10	58	26076	2.129	ng	# 83
14) Trichlorofluoromethane	7.34	101	10516	0.432	ng	100
15) 2-Propanol (Isopropanol)	7.60	45	34066	0.894	ng	99
16) Acrylonitrile	7.84	53	7657	0.403	ng	98
17) 1,1-Dichloroethene	8.29	96	5472	0.425	ng	94
18) 2-Methyl-2-Propanol (t...	8.48	59	31130	0.960	ng	98
19) Methylene Chloride	8.49	84	5893	0.418	ng	95
20) 3-Chloro-1-propene (Al...	8.67	41	9712	0.431	ng	93
21) Trichlorotrifluoroethane	8.94	151	4450	0.437	ng	97
22) Carbon Disulfide	8.78	76	26029	0.477	ng	99
23) trans-1,2-Dichloroethene	9.77	61	8661	0.423	ng	100
24) 1,1-Dichloroethane	10.03	63	11496	0.453	ng	99
25) Methyl tert-Butyl Ether	10.17	73	18273	0.495	ng	100
26) Vinyl Acetate	10.29	86	6662	1.874	ng	# 53
27) 2-Butanone (MEK)	10.57	72	4023	0.408	ng	# 76
28) cis-1,2-Dichloroethene	11.04	61	8588	0.421	ng	98
29) Diisopropyl Ether	11.37	87	5836	0.419	ng	97
30) Ethyl Acetate	11.37	61	4573	0.803	ng	95
31) n-Hexane	11.34	57	11333	0.425	ng	98
32) Chloroform	11.39	83	10395	0.413	ng	99
34) Tetrahydrofuran (THF)	11.84	72	4386	0.444	ng	93
35) Ethyl tert-Butyl Ether	11.96	87	6806	0.410	ng	93
36) 1,2-Dichloroethane	12.20	62	8649	0.428	ng	100
38) 1,1,1-Trichloroethane	12.48	97	9115	0.426	ng	99
39) Isopropyl Acetate	12.92	61	7961	0.788	ng	# 86
40) 1-Butanol	12.95	56	12574	0.763	ng	89
41) Benzene	12.96	78	26405	0.415	ng	100
42) Carbon Tetrachloride	13.11	117	7660	0.402	ng	99
43) Cyclohexane	13.25	84	18831	0.819	ng	97
44) tert-Amyl Methyl Ether	13.61	73	16877	0.411	ng	97
45) 1,2-Dichloropropane	13.81	63	6434	0.426	ng	97
46) Bromodichloromethane	14.00	83	7882	0.402	ng	97
47) Trichloroethene	14.05	130	5947	0.392	ng	99
48) 1,4-Dioxane	14.06	88	4807	0.403	ng	93
49) 2,2,4-Trimethylpentane...	14.13	57	27842	0.427	ng	100
50) Methyl Methacrylate	14.27	100	4315	0.743	ng	96

Data File : I:\MS13\DATA\2019 11\01\11011928.D
 Acq On : 2 Nov 2019 8:18
 Sample : 0.5ng R13110119 ICAL Std
 Misc : S31-10251901/S31-10301907 (11/28)

Vial: 10
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 07:53:41 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 08:52:56 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

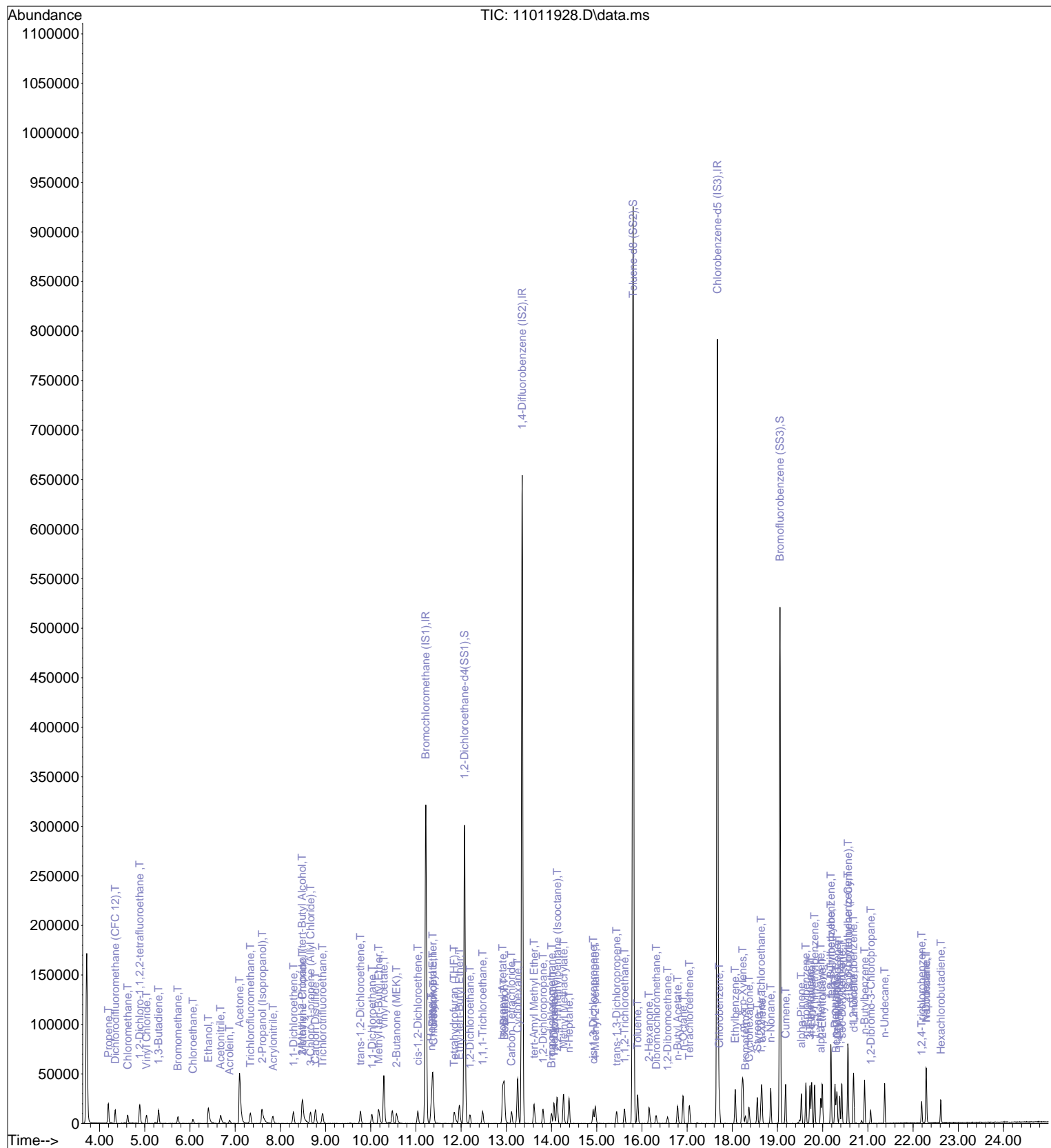
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
51) n-Heptane	14.39	71	6373	0.406	ng	99
52) cis-1,3-Dichloropropene	14.92	75	9088	0.393	ng	100
53) 4-Methyl-2-pentanone	14.97	58	5590	0.394	ng	89
54) trans-1,3-Dichloropropene	15.44	75	7780	0.393	ng	98
55) 1,1,2-Trichloroethane	15.62	97	5447	0.403	ng	98
58) Toluene	15.90	91	25084	0.425	ng	99
59) 2-Hexanone	16.16	43	14333	0.422	ng	95
60) Dibromochloromethane	16.32	129	5844	0.400	ng	97
61) 1,2-Dibromoethane	16.57	107	5946	0.412	ng	99
62) n-Butyl Acetate	16.79	43	16007	0.432	ng	96
63) n-Octane	16.91	57	5474	0.415	ng	98
64) Tetrachloroethene	17.05	166	5811	0.385	ng	99
65) Chlorobenzene	17.71	112	15456	0.408	ng	99
66) Ethylbenzene	18.06	91	26913	0.416	ng	98
67) m- & p-Xylenes	18.23	91	42221	0.824	ng	97
68) Bromoform	18.29	173	3892	0.338	ng	98
69) Styrene	18.55	104	13597	0.364	ng	99
70) o-Xylene	18.66	91	21537	0.408	ng	97
71) n-Nonane	18.85	43	12920	0.422	ng	95
72) 1,1,2,2-Tetrachloroethane	18.63	83	9912	0.396	ng	97
74) Cumene	19.18	105	26541	0.419	ng	98
75) alpha-Pinene	19.53	93	11716	0.353	ng	99
76) n-Propylbenzene	19.63	91	32744	0.431	ng	97
77) 3-Ethyltoluene	19.72	105	25576	0.404	ng	96
78) 4-Ethyltoluene	19.75	105	24657	0.416	ng	97
79) 1,3,5-Trimethylbenzene	19.82	105	20994	0.399	ng	96
80) alpha-Methylstyrene	19.96	118	7803	0.296	ng	99
81) 2-Ethyltoluene	19.99	105	25200	0.408	ng	97
82) 1,2,4-Trimethylbenzene	20.18	105	20906	0.398	ng	98
83) n-Decane	20.27	57	12415	0.414	ng	97
84) Benzyl Chloride	20.30	91	13254	0.336	ng	96
85) 1,3-Dichlorobenzene	20.32	146	11141	0.377	ng	99
86) 1,4-Dichlorobenzene	20.37	146	11238	0.386	ng	100
87) sec-Butylbenzene	20.43	105	28161	0.404	ng	97
88) 4-Isopropyltoluene (p-...	20.56	119	25308	0.413	ng	98
89) 1,2,3-Trimethylbenzene	20.56	105	21338	0.403	ng	97
90) 1,2-Dichlorobenzene	20.68	146	10604	0.376	ng	99
91) d-Limonene	20.69	68	6323	0.300	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.06	157	3235	0.343	ng	# 83
93) n-Undecane	21.37	57	11924	0.446	ng	97
94) 1,2,4-Trichlorobenzene	22.19	180	6675	0.377	ng	98
95) Naphthalene	22.29	128	22205	0.366	ng	98
96) n-Dodecane	22.29	57	9930	0.395	ng	96
97) Hexachlorobutadiene	22.62	225	4345	0.348	ng	96
98) Cyclohexanone	18.37	55	7938	0.371	ng	99
99) tert-Butylbenzene	20.18	119	20138	0.393	ng	97
100) n-Butylbenzene	20.93	91	22768	0.413	ng	97

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2019 11\01\11011928.D
Acq On : 2 Nov 2019 8:18
Sample : 0.5ng R13110119 ICAL Std
Misc : S31-10251901/S31-10301907 (11/28)

Vial: 10
Operator: WA
Inst : MS13

Quant Time: Nov 02 07:53:41 2019
Quant Method : I:\MS13\METHODS\R13110119.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Nov 02 08:52:56 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 11\01\11011919.D
 Acq On : 1 Nov 2019 19:52
 Sample : 1.0ng R13110119 ICAL Std
 Misc : S31-10251901/S31-10301905 (11/28)

Vial: 11
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 07:53:31 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 08:52:56 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

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Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.22	130	123897	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.35	114	563104	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	272140	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	231137	12.527	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	100.24%	
57) Toluene-d8 (SS2)	15.80	98	681504	12.724	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	101.76%	
73) Bromofluorobenzene (SS3)	19.05	174	140261	12.245	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	98.00%	

Target Compounds

	R.T.	QIon	Response	Conc	Units	Qvalue
2) Propene	4.18	42	16176	0.918	ng	98
3) Dichlorodifluoromethan...	4.34	85	28353	0.997	ng	99
4) Chloromethane	4.61	50	21946	1.110	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.88	135	14915	0.964	ng	100
6) Vinyl Chloride	5.03	62	20952	0.871	ng	99
7) 1,3-Butadiene	5.30	54	14026	0.899	ng	99
8) Bromomethane	5.73	94	11831	1.005	ng	97
9) Chloroethane	6.06	64	10278	0.999	ng	98
10) Ethanol	6.40	45	51261	4.384	ng	98
11) Acetonitrile	6.67	41	25665	0.922	ng	89
12) Acrolein	6.87	56	8434	0.949	ng	99
13) Acetone	7.08	58	54836	4.525	ng	87
14) Trichlorofluoromethane	7.34	101	23431	0.973	ng	99
15) 2-Propanol (Isopropanol)	7.58	45	74184	1.967	ng	97
16) Acrylonitrile	7.83	53	17361	0.924	ng	100
17) 1,1-Dichloroethene	8.29	96	12576	0.988	ng	98
18) 2-Methyl-2-Propanol (t...	8.46	59	72353	2.256	ng	98
19) Methylene Chloride	8.49	84	13370	0.959	ng	95
20) 3-Chloro-1-propene (Al...	8.67	41	21151	0.949	ng	98
21) Trichlorotrifluoroethane	8.94	151	10082	1.001	ng	98
22) Carbon Disulfide	8.78	76	49765	0.921	ng	100
23) trans-1,2-Dichloroethene	9.77	61	20159	0.995	ng	98
24) 1,1-Dichloroethane	10.03	63	25351	1.009	ng	100
25) Methyl tert-Butyl Ether	10.16	73	41809	1.145	ng	99
26) Vinyl Acetate	10.29	86	15825	4.499	ng	# 61
27) 2-Butanone (MEK)	10.56	72	9490	0.972	ng	# 91
28) cis-1,2-Dichloroethene	11.04	61	19491	0.966	ng	99
29) Diisopropyl Ether	11.37	87	13796	1.001	ng	# 84
30) Ethyl Acetate	11.37	61	10428	1.851	ng	97
31) n-Hexane	11.34	57	25180	0.953	ng	100
32) Chloroform	11.39	83	24469	0.982	ng	98
34) Tetrahydrofuran (THF)	11.83	72	9347	0.957	ng	96
35) Ethyl tert-Butyl Ether	11.96	87	15806	0.963	ng	97
36) 1,2-Dichloroethane	12.20	62	20034	1.001	ng	99
38) 1,1,1-Trichloroethane	12.48	97	20597	0.980	ng	99
39) Isopropyl Acetate	12.92	61	17855	1.797	ng	# 89
40) 1-Butanol	12.94	56	25428	1.569	ng	87
41) Benzene	12.96	78	57961	0.927	ng	99
42) Carbon Tetrachloride	13.11	117	17882	0.955	ng	98
43) Cyclohexane	13.25	84	42972	1.901	ng	99
44) tert-Amyl Methyl Ether	13.61	73	38699	0.958	ng	99
45) 1,2-Dichloropropane	13.81	63	14441	0.973	ng	99
46) Bromodichloromethane	14.00	83	17802	0.923	ng	97
47) Trichloroethene	14.06	130	13461	0.903	ng	100
48) 1,4-Dioxane	14.05	88	10534	0.897	ng	98
49) 2,2,4-Trimethylpentane...	14.13	57	61453	0.958	ng	100
50) Methyl Methacrylate	14.26	100	10181	1.783	ng	97

Data File : I:\MS13\DATA\2019 11\01\11011919.D
 Acq On : 1 Nov 2019 19:52
 Sample : 1.0ng R13110119 ICAL Std
 Misc : S31-10251901/S31-10301905 (11/28)

Vial: 11
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 07:53:31 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 08:52:56 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

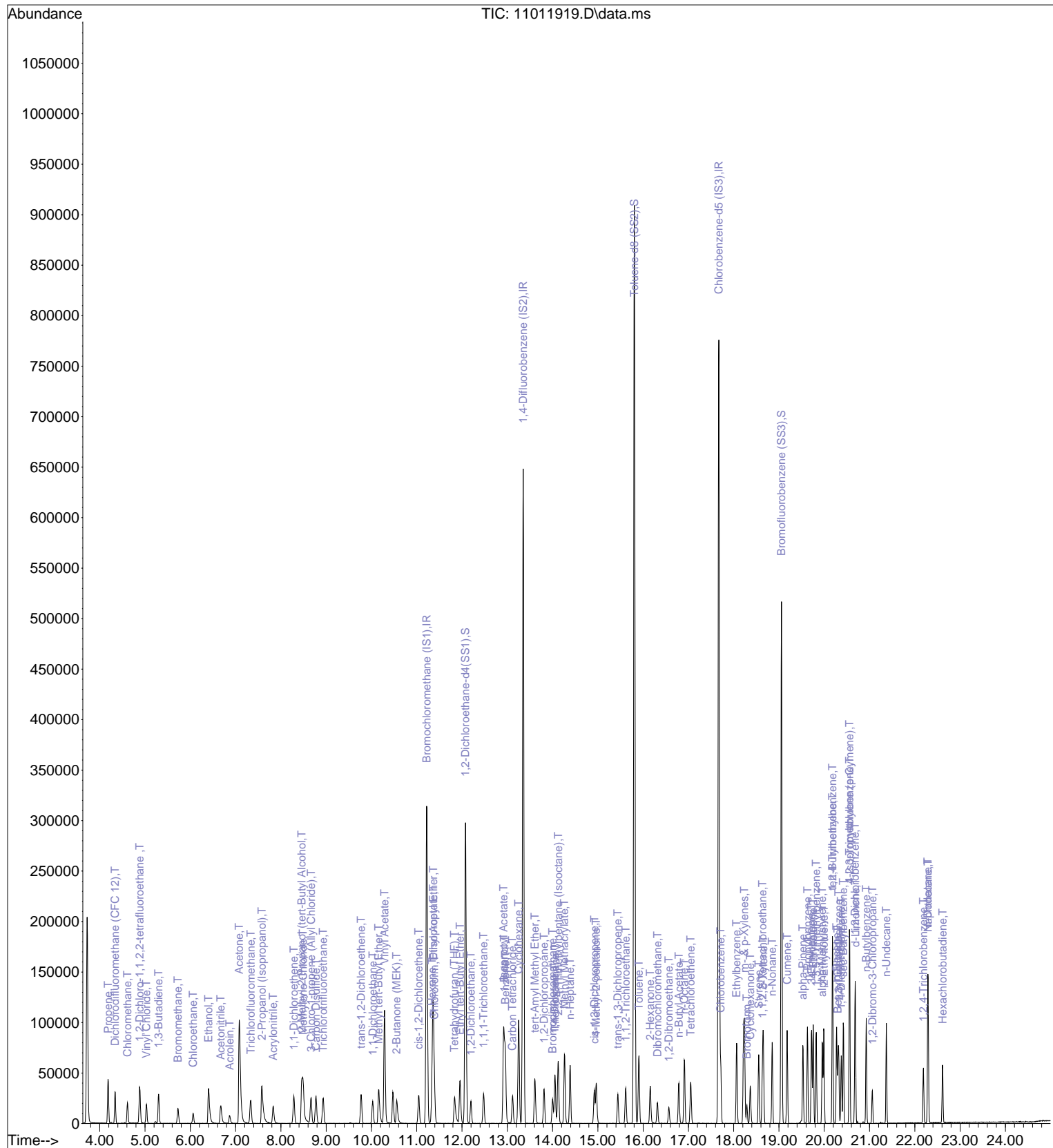
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
51) n-Heptane	14.39	71	14597	0.945	ng	100
52) cis-1,3-Dichloropropene	14.92	75	21021	0.925	ng	99
53) 4-Methyl-2-pentanone	14.96	58	12904	0.925	ng	95
54) trans-1,3-Dichloropropene	15.44	75	18008	0.924	ng	99
55) 1,1,2-Trichloroethane	15.62	97	12962	0.976	ng	99
58) Toluene	15.91	91	56486	0.972	ng	100
59) 2-Hexanone	16.16	43	31896	0.955	ng	98
60) Dibromochloromethane	16.32	129	13396	0.933	ng	98
61) 1,2-Dibromoethane	16.57	107	13664	0.963	ng	99
62) n-Butyl Acetate	16.79	43	35334	0.969	ng	99
63) n-Octane	16.91	57	12343	0.950	ng	100
64) Tetrachloroethene	17.05	166	13403	0.902	ng	98
65) Chlorobenzene	17.71	112	35207	0.944	ng	100
66) Ethylbenzene	18.06	91	62332	0.979	ng	97
67) m- & p-Xylenes	18.23	91	96491	1.914	ng	99
68) Bromoform	18.29	173	9248	0.817	ng	100
69) Styrene	18.55	104	34556	0.941	ng	99
70) o-Xylene	18.66	91	48959	0.943	ng	97
71) n-Nonane	18.85	43	28594	0.949	ng	99
72) 1,1,2,2-Tetrachloroethane	18.63	83	22938	0.932	ng	99
74) Cumene	19.18	105	60576	0.972	ng	98
75) alpha-Pinene	19.53	93	30040	0.919	ng	93
76) n-Propylbenzene	19.63	91	75213	1.006	ng	97
77) 3-Ethyltoluene	19.72	105	58806	0.944	ng	97
78) 4-Ethyltoluene	19.75	105	57114	0.979	ng	97
79) 1,3,5-Trimethylbenzene	19.82	105	49094	0.948	ng	96
80) alpha-Methylstyrene	19.95	118	24126	0.931	ng	98
81) 2-Ethyltoluene	19.99	105	57990	0.955	ng	98
82) 1,2,4-Trimethylbenzene	20.18	105	49158	0.952	ng	99
83) n-Decane	20.27	57	28973	0.982	ng	97
84) Benzyl Chloride	20.30	91	32833	0.846	ng	96
85) 1,3-Dichlorobenzene	20.32	146	26016	0.894	ng	99
86) 1,4-Dichlorobenzene	20.37	146	26463	0.924	ng	98
87) sec-Butylbenzene	20.42	105	66146	0.964	ng	98
88) 4-Isopropyltoluene (p-...	20.56	119	59716	0.989	ng	97
89) 1,2,3-Trimethylbenzene	20.56	105	50366	0.966	ng	99
90) 1,2-Dichlorobenzene	20.68	146	25030	0.902	ng	99
91) d-Limonene	20.69	68	19770	0.954	ng	96
92) 1,2-Dibromo-3-Chloropr...	21.06	157	7760	0.837	ng	84
93) n-Undecane	21.37	57	28225	1.072	ng	99
94) 1,2,4-Trichlorobenzene	22.19	180	15954	0.915	ng	99
95) Naphthalene	22.29	128	55539	0.931	ng	98
96) n-Dodecane	22.29	57	26889	1.087	ng	97
97) Hexachlorobutadiene	22.62	225	10269	0.836	ng	99
98) Cyclohexanone	18.37	55	17066	0.811	ng	99
99) tert-Butylbenzene	20.18	119	47388	0.940	ng	97
100) n-Butylbenzene	20.93	91	54047	0.996	ng	96

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2019 11\01\11011919.D
Acq On : 1 Nov 2019 19:52
Sample : 1.0ng R13110119 ICAL Std
Misc : S31-10251901/S31-10301905 (11/28)

Vial: 11
Operator: WA
Inst : MS13

Quant Time: Nov 02 07:53:31 2019
Quant Method : I:\MS13\METHODS\R13110119.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Nov 02 08:52:56 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 11\01\11011920.D
 Acq On : 1 Nov 2019 20:25
 Sample : 5.0ng R13110119 ICAL Std
 Misc : S31-10251901/S31-10301905 (11/28)

Vial: 11
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 07:53:33 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 08:52:56 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

 11/4/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	11.23	130	113134	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.35	114	514934	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	248795	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.08	65	209970	12.463	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	99.68%	
57) Toluene-d8 (SS2)	15.80	98	614038	12.540	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	100.32%	
73) Bromofluorobenzene (SS3)	19.05	174	132393	12.643	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	101.12%	

Target Compounds

						Qvalue
2) Propene	4.17	42	82223	5.110	ng	99
3) Dichlorodifluoromethan...	4.33	85	140767	5.423	ng	100
4) Chloromethane	4.60	50	98492	5.456	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.87	135	74927	5.305	ng	100
6) Vinyl Chloride	5.02	62	126859	5.774	ng	99
7) 1,3-Butadiene	5.29	54	74552	5.233	ng	99
8) Bromomethane	5.72	94	59025	5.492	ng	99
9) Chloroethane	6.06	64	51639	5.498	ng	100
10) Ethanol	6.41	45	263802	24.708	ng	99
11) Acetonitrile	6.68	41	135139	5.318	ng	97
12) Acrolein	6.87	56	45347	5.587	ng	99
13) Acetone	7.08	58	283845	25.649	ng	88
14) Trichlorofluoromethane	7.32	101	119678	5.440	ng	99
15) 2-Propanol (Isopropanol)	7.58	45	386509	11.222	ng	98
16) Acrylonitrile	7.84	53	96718	5.637	ng	99
17) 1,1-Dichloroethene	8.29	96	64187	5.520	ng	99
18) 2-Methyl-2-Propanol (t...	8.45	59	344843	11.773	ng	99
19) Methylene Chloride	8.51	84	68340	5.368	ng	98
20) 3-Chloro-1-propene (Al...	8.67	41	114129	5.609	ng	99
21) Trichlorotrifluoroethane	8.93	151	50378	5.477	ng	98
22) Carbon Disulfide	8.78	76	248951	5.044	ng	100
23) trans-1,2-Dichloroethene	9.78	61	103317	5.586	ng	100
24) 1,1-Dichloroethane	10.03	63	129649	5.651	ng	100
25) Methyl tert-Butyl Ether	10.15	73	213234	6.398	ng	99
26) Vinyl Acetate	10.29	86	89166	27.758	ng	# 64
27) 2-Butanone (MEK)	10.55	72	50802	5.698	ng	97
28) cis-1,2-Dichloroethene	11.05	61	100196	5.437	ng	99
29) Diisopropyl Ether	11.35	87	73427	5.837	ng	# 84
30) Ethyl Acetate	11.36	61	57039	11.088	ng	98
31) n-Hexane	11.34	57	131344	5.446	ng	100
32) Chloroform	11.40	83	125859	5.530	ng	99
34) Tetrahydrofuran (THF)	11.82	72	48447	5.431	ng	98
35) Ethyl tert-Butyl Ether	11.95	87	83905	5.596	ng	98
36) 1,2-Dichloroethane	12.20	62	101238	5.542	ng	100
38) 1,1,1-Trichloroethane	12.48	97	107404	5.588	ng	99
39) Isopropyl Acetate	12.91	61	95401	10.500	ng	# 87
40) 1-Butanol	12.92	56	149756	10.103	ng	94
41) Benzene	12.96	78	294207	5.143	ng	100
42) Carbon Tetrachloride	13.12	117	94295	5.505	ng	100
43) Cyclohexane	13.25	84	223920	10.830	ng	99
44) tert-Amyl Methyl Ether	13.60	73	205823	5.569	ng	99
45) 1,2-Dichloropropane	13.81	63	73502	5.414	ng	100
46) Bromodichloromethane	14.00	83	97125	5.505	ng	100
47) Trichloroethene	14.06	130	69774	5.117	ng	100
48) 1,4-Dioxane	14.03	88	55950	5.211	ng	99
49) 2,2,4-Trimethylpentane...	14.13	57	317028	5.407	ng	100
50) Methyl Methacrylate	14.26	100	55734	10.676	ng	95

Data File : I:\MS13\DATA\2019 11\01\11011920.D
 Acq On : 1 Nov 2019 20:25
 Sample : 5.0ng R13110119 ICAL Std
 Misc : S31-10251901/S31-10301905 (11/28)

Vial: 11
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 07:53:33 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 08:52:56 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

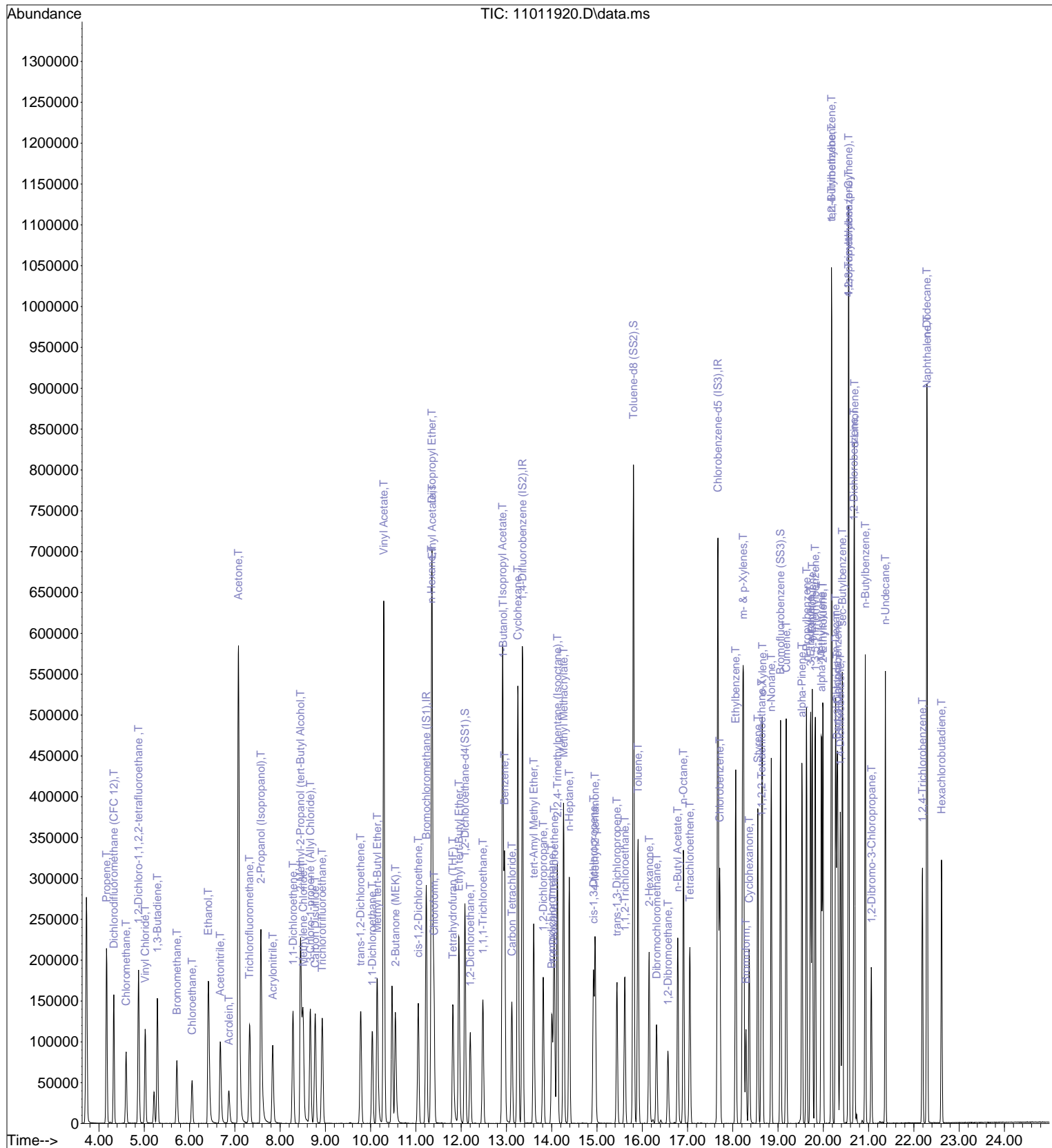
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	76270	5.400	ng	99
52) cis-1,3-Dichloropropene	14.92	75	114915	5.528	ng	99
53) 4-Methyl-2-pentanone	14.96	58	69504	5.450	ng	96
54) trans-1,3-Dichloropropene	15.44	75	102865	5.775	ng	100
55) 1,1,2-Trichloroethane	15.62	97	66271	5.458	ng	99
58) Toluene	15.91	91	292355	5.505	ng	98
59) 2-Hexanone	16.15	43	172546	5.651	ng	98
60) Dibromochloromethane	16.32	129	74649	5.685	ng	99
61) 1,2-Dibromoethane	16.57	107	73637	5.674	ng	99
62) n-Butyl Acetate	16.78	43	193406	5.804	ng	99
63) n-Octane	16.91	57	65632	5.528	ng	98
64) Tetrachloroethene	17.05	166	68911	5.073	ng	100
65) Chlorobenzene	17.71	112	182706	5.357	ng	99
66) Ethylbenzene	18.06	91	326454	5.606	ng	98
67) m- & p-Xylenes	18.23	91	517557	11.230	ng	98
68) Bromoform	18.29	173	56965	5.503	ng	100
69) Styrene	18.55	104	194624	5.798	ng	100
70) o-Xylene	18.66	91	262519	5.532	ng	98
71) n-Nonane	18.85	43	156459	5.681	ng	98
72) 1,1,2,2-Tetrachloroethane	18.63	83	125649	5.584	ng	99
74) Cumene	19.18	105	322679	5.665	ng	98
75) alpha-Pinene	19.53	93	167720	5.615	ng	100
76) n-Propylbenzene	19.63	91	402107	5.884	ng	98
77) 3-Ethyltoluene	19.72	105	321344	5.643	ng	98
78) 4-Ethyltoluene	19.75	105	310320	5.817	ng	98
79) 1,3,5-Trimethylbenzene	19.82	105	266935	5.637	ng	98
80) alpha-Methylstyrene	19.96	118	142480	6.011	ng	92
81) 2-Ethyltoluene	19.99	105	322311	5.806	ng	97
82) 1,2,4-Trimethylbenzene	20.18	105	282098	5.973	ng	99
83) n-Decane	20.27	57	157587	5.845	ng	99
84) Benzyl Chloride	20.30	91	221516	6.245	ng	98
85) 1,3-Dichlorobenzene	20.32	146	148802	5.592	ng	100
86) 1,4-Dichlorobenzene	20.37	146	147085	5.619	ng	100
87) sec-Butylbenzene	20.42	105	365745	5.830	ng	98
88) 4-Isopropyltoluene (p-...	20.56	119	345182	6.256	ng	97
89) 1,2,3-Trimethylbenzene	20.56	105	291673	6.120	ng	99
90) 1,2-Dichlorobenzene	20.68	146	144280	5.685	ng	98
91) d-Limonene	20.69	68	117424	6.199	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.06	157	47539	5.607	ng	94
93) n-Undecane	21.37	57	159203	6.616	ng	99
94) 1,2,4-Trichlorobenzene	22.19	180	90229	5.663	ng	99
95) Naphthalene	22.29	128	330438	6.058	ng	99
96) n-Dodecane	22.29	57	160764	7.106	ng	97
97) Hexachlorobutadiene	22.61	225	56781	5.059	ng	99
98) Cyclohexanone	18.36	55	97615	5.072	ng	99
99) tert-Butylbenzene	20.18	119	268524	5.826	ng	98
100) n-Butylbenzene	20.93	91	300494	6.055	ng	97

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2019 11\01\11011920.D
Acq On : 1 Nov 2019 20:25
Sample : 5.0ng R13110119 ICAL Std
Misc : S31-10251901/S31-10301905 (11/28)

Vial: 11
Operator: WA
Inst : MS13

Quant Time: Nov 02 07:53:33 2019
Quant Method : I:\MS13\METHODS\R13110119.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Nov 02 08:52:56 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 11\01\11011921.D
 Acq On : 1 Nov 2019 20:59
 Sample : 25ng R13110119 ICAL Std
 Misc : S31-10251901/S31-10301902 (11/28)

Vial: 12
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 07:53:35 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 08:52:56 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

107 11/4/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	11.24	130	119670	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.36	114	541048	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	261916	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	219183	12.299	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	98.40%	
57) Toluene-d8 (SS2)	15.81	98	640545	12.426	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	99.44%	
73) Bromofluorobenzene (SS3)	19.05	174	142029	12.884	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	103.04%	

Target Compounds

						Qvalue
2) Propene	4.16	42	430363	25.283	ng	100
3) Dichlorodifluoromethan...	4.32	85	733733	26.725	ng	100
4) Chloromethane	4.60	50	514086	26.921	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.87	135	442171	29.595	ng	100
6) Vinyl Chloride	5.03	62	725343	31.212	ng	100
7) 1,3-Butadiene	5.29	54	464082	30.794	ng	100
8) Bromomethane	5.74	94	313104	27.540	ng	100
9) Chloroethane	6.07	64	270295	27.207	ng	100
10) Ethanol	6.45	45	1552672	137.485	ng	100
11) Acetonitrile	6.70	41	717988	26.713	ng	100
12) Acrolein	6.88	56	235436	27.421	ng	100
13) Acetone	7.10	58	1672220	142.854	ng	100
14) Trichlorofluoromethane	7.34	101	635593	27.314	ng	100
15) 2-Propanol (Isopropanol)	7.60	45	2155869	59.175	ng	100
16) Acrylonitrile	7.85	53	528462	29.120	ng	100
17) 1,1-Dichloroethene	8.30	96	348963	28.371	ng	100
18) 2-Methyl-2-Propanol (t...	8.47	59	1945416	62.791	ng	100
19) Methylene Chloride	8.53	84	371754	27.606	ng	100
20) 3-Chloro-1-propene (Al...	8.68	41	625427	29.059	ng	100
21) Trichlorotrifluoroethane	8.94	151	274952	28.260	ng	100
22) Carbon Disulfide	8.79	76	1345151	25.763	ng	100
23) trans-1,2-Dichloroethene	9.79	61	559356	28.588	ng	100
24) 1,1-Dichloroethane	10.05	63	683932	28.181	ng	100
25) Methyl tert-Butyl Ether	10.14	73	1069152	30.327	ng	100
26) Vinyl Acetate	10.31	86	572220	168.409	ng	100
27) 2-Butanone (MEK)	10.55	72	282633	29.970	ng	100
28) cis-1,2-Dichloroethene	11.06	61	541448	27.777	ng	100
29) Diisopropyl Ether	11.35	87	394030	29.610	ng	100
30) Ethyl Acetate	11.37	61	356851	65.579	ng	100
31) n-Hexane	11.35	57	786286	30.821	ng	100
32) Chloroform	11.41	83	685271	28.463	ng	100
34) Tetrahydrofuran (THF)	11.82	72	266314	28.223	ng	100
35) Ethyl tert-Butyl Ether	11.95	87	470728	29.682	ng	100
36) 1,2-Dichloroethane	12.21	62	544725	28.189	ng	100
38) 1,1,1-Trichloroethane	12.49	97	584408	28.937	ng	100
39) Isopropyl Acetate	12.91	61	592270	62.042	ng	100
40) 1-Butanol	12.94	56	962650	61.811	ng	100
41) Benzene	12.96	78	1650846	27.467	ng	100
42) Carbon Tetrachloride	13.12	117	526341	29.245	ng	100
43) Cyclohexane	13.26	84	1297796	59.737	ng	100
44) tert-Amyl Methyl Ether	13.60	73	1151845	29.663	ng	100
45) 1,2-Dichloropropane	13.82	63	397552	27.871	ng	100
46) Bromodichloromethane	14.01	83	553782	29.875	ng	100
47) Trichloroethene	14.06	130	399812	27.906	ng	100
48) 1,4-Dioxane	14.03	88	338518	30.006	ng	100
49) 2,2,4-Trimethylpentane...	14.13	57	1717525	27.878	ng	100
50) Methyl Methacrylate	14.27	100	338307	61.677	ng	100

Data File : I:\MS13\DATA\2019 11\01\11011921.D
 Acq On : 1 Nov 2019 20:59
 Sample : 25ng R13110119 ICAL Std
 Misc : S31-10251901/S31-10301902 (11/28)

Vial: 12
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 07:53:35 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 08:52:56 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

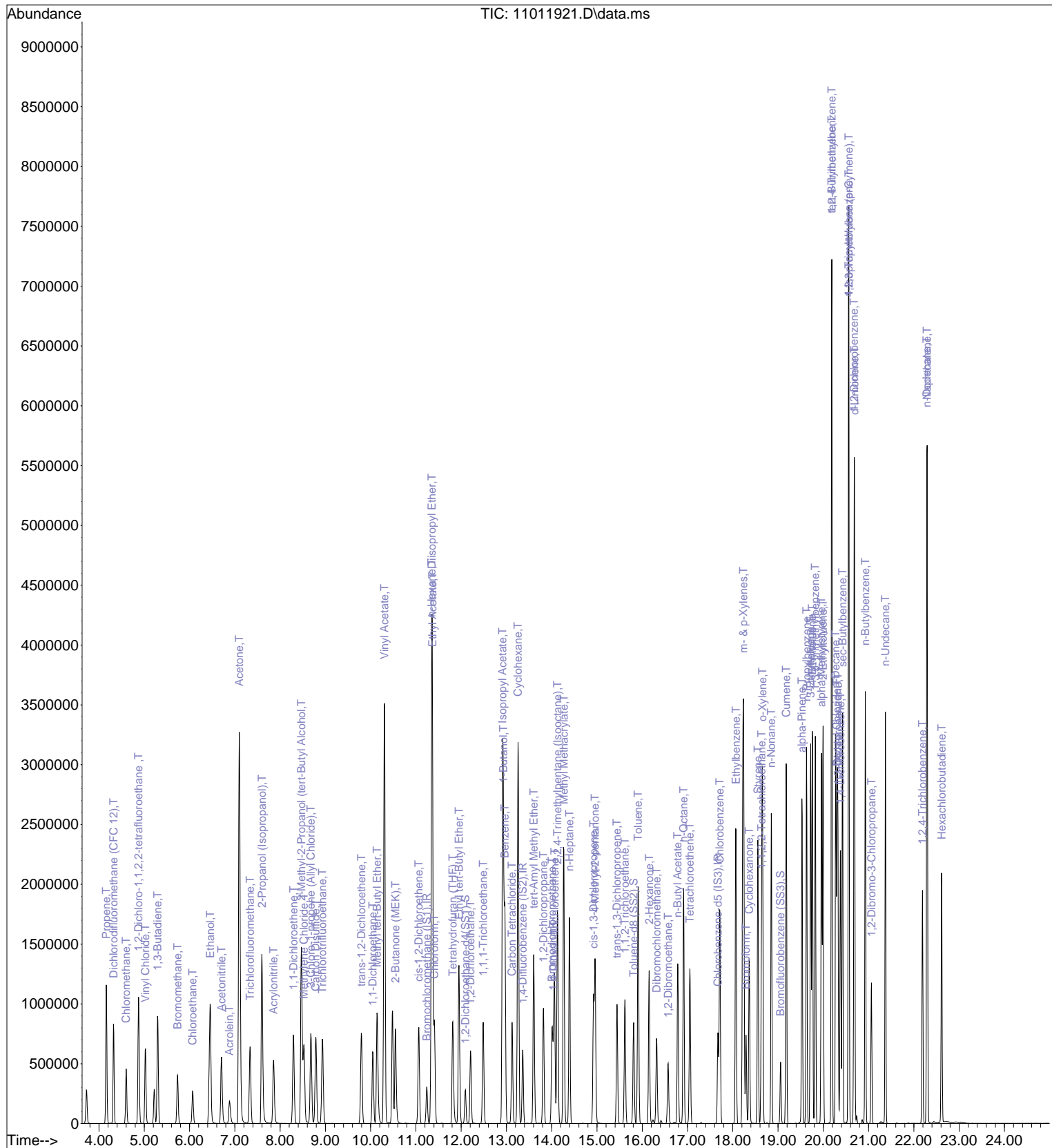
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
51) n-Heptane	14.39	71	430306	28.996	ng	100
52) cis-1,3-Dichloropropene	14.92	75	651842	29.842	ng	100
53) 4-Methyl-2-pentanone	14.96	58	402805	30.060	ng	100
54) trans-1,3-Dichloropropene	15.44	75	590808	31.566	ng	100
55) 1,1,2-Trichloroethane	15.62	97	369017	28.923	ng	100
58) Toluene	15.91	91	1610798	28.812	ng	100
59) 2-Hexanone	16.15	43	982933	30.581	ng	100
60) Dibromochloromethane	16.32	129	437009	31.613	ng	100
61) 1,2-Dibromoethane	16.57	107	410471	30.046	ng	100
62) n-Butyl Acetate	16.78	43	1099445	31.340	ng	100
63) n-Octane	16.91	57	373732	29.903	ng	100
64) Tetrachloroethene	17.05	166	406266	28.409	ng	100
65) Chlorobenzene	17.71	112	1021257	28.446	ng	100
66) Ethylbenzene	18.07	91	1870697	30.513	ng	100
67) m- & p-Xylenes	18.23	91	3114958	64.202	ng	100
68) Bromoform	18.29	173	365979	33.584	ng	100
69) Styrene	18.55	104	1158351	32.782	ng	100
70) o-Xylene	18.66	91	1569893	31.424	ng	100
71) n-Nonane	18.85	43	897544	30.958	ng	100
72) 1,1,2,2-Tetrachloroethane	18.63	83	746591	31.518	ng	100
74) Cumene	19.18	105	1888042	31.486	ng	100
75) alpha-Pinene	19.53	93	998719	31.758	ng	100
76) n-Propylbenzene	19.63	91	2317292	32.212	ng	100
77) 3-Ethyltoluene	19.72	105	1876816	31.306	ng	100
78) 4-Ethyltoluene	19.75	105	1914866	34.094	ng	100
79) 1,3,5-Trimethylbenzene	19.82	105	1612584	32.347	ng	100
80) alpha-Methylstyrene	19.96	118	871901	34.941	ng	100
81) 2-Ethyltoluene	19.99	105	1921695	32.885	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	1873746	37.688	ng	100
83) n-Decane	20.27	57	966484	34.050	ng	100
84) Benzyl Chloride	20.30	91	1499765	40.166	ng	100
85) 1,3-Dichlorobenzene	20.32	146	943279	33.673	ng	100
86) 1,4-Dichlorobenzene	20.38	146	890691	32.323	ng	100
87) sec-Butylbenzene	20.43	105	2158841	32.688	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	2242134	38.603	ng	100
89) 1,2,3-Trimethylbenzene	20.56	105	1954613	38.961	ng	100
90) 1,2-Dichlorobenzene	20.68	146	950035	35.557	ng	100
91) d-Limonene	20.69	68	753412	37.782	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.06	157	292793	32.803	ng	100
93) n-Undecane	21.37	57	961513	37.953	ng	100
94) 1,2,4-Trichlorobenzene	22.19	180	549691	32.771	ng	100
95) Naphthalene	22.29	128	2081522	36.250	ng	100
96) n-Dodecane	22.29	57	972577	40.835	ng	100
97) Hexachlorobutadiene	22.62	225	363239	30.743	ng	100
98) Cyclohexanone	18.36	55	598312	29.533	ng	100
99) tert-Butylbenzene	20.19	119	1756043	36.189	ng	100
100) n-Butylbenzene	20.93	91	1770321	33.885	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2019 11\01\11011921.D
Acq On : 1 Nov 2019 20:59
Sample : 25ng R13110119 ICAL Std
Misc : S31-10251901/S31-10301902 (11/28)

Vial: 12
Operator: WA
Inst : MS13

Quant Time: Nov 02 07:53:35 2019
Quant Method : I:\MS13\METHODS\R13110119.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Nov 02 08:52:56 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 11\01\11011922.D
 Acq On : 1 Nov 2019 21:32
 Sample : 50ng R13110119 ICAL Std
 Misc : S31-10251901/S31-10301902 (11/28)

Vial: 12
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 07:53:38 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 08:52:56 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

11/4/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	11.25	130	126157	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.36	114	574068	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.67	82	277763	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	231930	12.345	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	98.80%	
57) Toluene-d8 (SS2)	15.81	98	671132	12.277	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	98.24%	
73) Bromofluorobenzene (SS3)	19.05	174	151394	12.950	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	103.60%	

Target Compounds

						Qvalue
2) Propene	4.16	42	1042626	58.103	ng	99
3) Dichlorodifluoromethan...	4.32	85	1574659	54.406	ng	99
4) Chloromethane	4.60	50	865253	42.980	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.88	135	868259	55.126	ng	99
6) Vinyl Chloride	5.03	62	1411771	57.626	ng	99
7) 1,3-Butadiene	5.30	54	1048391	65.988	ng	100
8) Bromomethane	5.75	94	691470	57.693	ng	99
9) Chloroethane	6.08	64	591939	56.519	ng	100
10) Ethanol	6.48	45	3479270	292.239	ng	99
11) Acetonitrile	6.72	41	1568181	55.346	ng	100
12) Acrolein	6.89	56	492087	54.367	ng	99
13) Acetone	7.11	58	3676437	297.920	ng	# 81
14) Trichlorofluoromethane	7.34	101	1384139	56.423	ng	99
15) 2-Propanol (Isopropanol)	7.62	45	4361812	113.568	ng	100
16) Acrylonitrile	7.87	53	1142511	59.718	ng	100
17) 1,1-Dichloroethene	8.30	96	762362	58.793	ng	99
18) 2-Methyl-2-Propanol (t...	8.49	59	3332323	102.025	ng	100
19) Methylene Chloride	8.53	84	815831	57.467	ng	98
20) 3-Chloro-1-propene (Al...	8.69	41	1354696	59.706	ng	100
21) Trichlorotrifluoroethane	8.94	151	593177	57.833	ng	99
22) Carbon Disulfide	8.80	76	2866021	52.070	ng	99
23) trans-1,2-Dichloroethene	9.80	61	1213671	58.840	ng	100
24) 1,1-Dichloroethane	10.05	63	1458530	57.007	ng	99
25) Methyl tert-Butyl Ether	10.15	73	1715314	46.153	ng	100
26) Vinyl Acetate	10.32	86	1307920	365.138	ng	# 56
27) 2-Butanone (MEK)	10.55	72	618441	62.206	ng	97
28) cis-1,2-Dichloroethene	11.07	61	1180289	57.436	ng	100
29) Diisopropyl Ether	11.36	87	914596	65.194	ng	# 79
30) Ethyl Acetate	11.37	61	818267	142.641	ng	98
31) n-Hexane	11.35	57	1753162	65.187	ng	99
32) Chloroform	11.42	83	1500409	59.115	ng	100
34) Tetrahydrofuran (THF)	11.82	72	580422	58.349	ng	100
35) Ethyl tert-Butyl Ether	11.95	87	1057753	63.267	ng	97
36) 1,2-Dichloroethane	12.21	62	1177523	57.802	ng	100
38) 1,1,1-Trichloroethane	12.49	97	1267881	59.168	ng	100
39) Isopropyl Acetate	12.92	61	1350352	133.318	ng	# 85
40) 1-Butanol	12.95	56	2227226	134.783	ng	94
41) Benzene	12.97	78	3756286	58.903	ng	99
42) Carbon Tetrachloride	13.13	117	1159207	60.705	ng	100
43) Cyclohexane	13.26	84	2860688	124.102	ng	99
44) tert-Amyl Methyl Ether	13.61	73	2543650	61.737	ng	99
45) 1,2-Dichloropropane	13.82	63	864283	57.106	ng	100
46) Bromodichloromethane	14.01	83	1227732	62.422	ng	99
47) Trichloroethene	14.06	130	913288	60.080	ng	100
48) 1,4-Dioxane	14.04	88	776168	64.841	ng	100
49) 2,2,4-Trimethylpentane...	14.13	57	3709851	56.753	ng	99
50) Methyl Methacrylate	14.27	100	784605	134.814	ng	96

Data File : I:\MS13\DATA\2019 11\01\11011922.D
 Acq On : 1 Nov 2019 21:32
 Sample : 50ng R13110119 ICAL Std
 Misc : S31-10251901/S31-10301902 (11/28)

Vial: 12
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 07:53:38 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 08:52:56 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

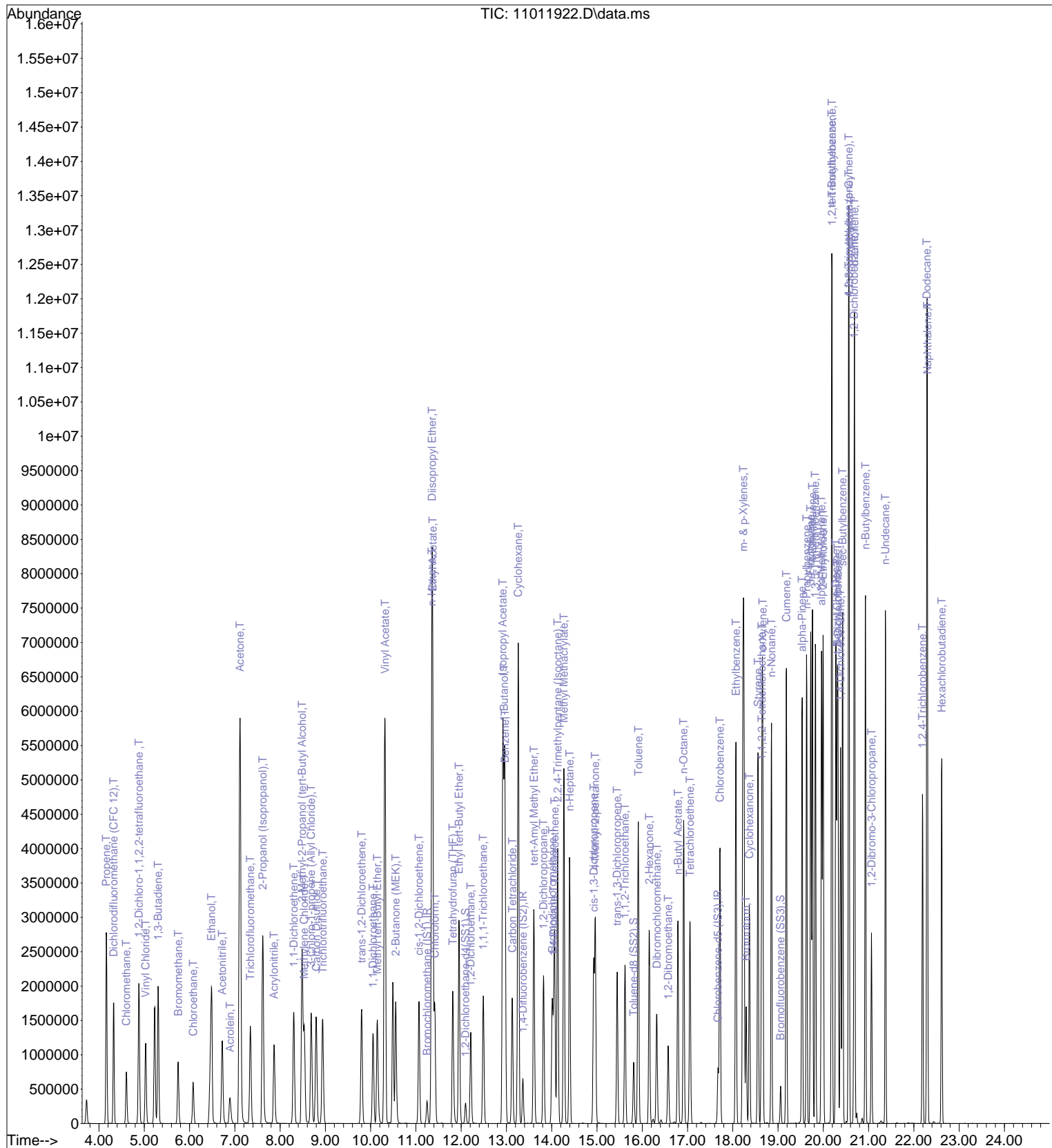
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	972181	61.741	ng	100
52) cis-1,3-Dichloropropene	14.93	75	1441915	62.215	ng	99
53) 4-Methyl-2-pentanone	14.96	58	897429	63.121	ng	97
54) trans-1,3-Dichloropropene	15.45	75	1299734	65.449	ng	99
55) 1,1,2-Trichloroethane	15.62	97	816180	60.291	ng	100
58) Toluene	15.91	91	3480765	58.708	ng	98
59) 2-Hexanone	16.15	43	2150042	63.076	ng	99
60) Dibromochloromethane	16.32	129	971660	66.280	ng	99
61) 1,2-Dibromoethane	16.57	107	901588	62.230	ng	99
62) n-Butyl Acetate	16.79	43	2391891	64.291	ng	99
63) n-Octane	16.91	57	845351	63.778	ng	99
64) Tetrachloroethene	17.06	166	934328	61.607	ng	100
65) Chlorobenzene	17.72	112	2264169	59.467	ng	98
66) Ethylbenzene	18.07	91	4051606	62.315	ng	97
67) m- & p-Xylenes	18.23	91	6773690	131.646	ng	97
68) Bromoform	18.30	173	853847	73.882	ng	100
69) Styrene	18.56	104	2584429	68.968	ng	98
70) o-Xylene	18.66	91	3523856	66.512	ng	98
71) n-Nonane	18.85	43	1981356	64.441	ng	97
72) 1,1,2,2-Tetrachloroethane	18.64	83	1706126	67.916	ng	100
74) Cumene	19.18	105	4093656	64.373	ng	97
75) alpha-Pinene	19.53	93	2270275	68.074	ng	99
76) n-Propylbenzene	19.63	91	4868937	63.821	ng	96
77) 3-Ethyltoluene	19.72	105	4321801	67.977	ng	97
78) 4-Ethyltoluene	19.76	105	3921748	65.842	ng	96
79) 1,3,5-Trimethylbenzene	19.82	105	3605014	68.187	ng	97
80) alpha-Methylstyrene	19.96	118	2038666	77.037	ng	91
81) 2-Ethyltoluene	19.99	105	4218525	68.070	ng	96
82) 1,2,4-Trimethylbenzene	20.19	105	3746927	71.065	ng	99
83) n-Decane	20.28	57	2217880	73.679	ng	98
84) Benzyl Chloride	20.31	91	3445118	87.003	ng	97
85) 1,3-Dichlorobenzene	20.32	146	2207633	74.312	ng	99
86) 1,4-Dichlorobenzene	20.38	146	2157906	73.842	ng	99
87) sec-Butylbenzene	20.43	105	4684423	66.883	ng	96
88) 4-Isopropyltoluene (p-...	20.56	119	4243278	68.888	ng	96
89) 1,2,3-Trimethylbenzene	20.56	105	3824638	71.886	ng	100
90) 1,2-Dichlorobenzene	20.68	146	2130405	75.185	ng	99
91) d-Limonene	20.69	68	1658353	78.418	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.06	157	681681	72.014	ng	97
93) n-Undecane	21.37	57	2166389	80.634	ng	98
94) 1,2,4-Trichlorobenzene	22.19	180	1361853	76.558	ng	99
95) Naphthalene	22.30	128	4488335	73.705	ng	98
96) n-Dodecane	22.29	57	2150617	85.144	ng	98
97) Hexachlorobutadiene	22.62	225	932578	74.427	ng	100
98) Cyclohexanone	18.37	55	1331222	61.961	ng	99
99) tert-Butylbenzene	20.19	119	3483444	67.691	ng	97
100) n-Butylbenzene	20.93	91	3813068	68.820	ng	97

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2019 11\01\11011922.D
 Acq On : 1 Nov 2019 21:32
 Sample : 50ng R13110119 ICAL Std
 Misc : S31-10251901/S31-10301902 (11/28)

Vial: 12
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 07:53:38 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 08:52:56 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 11\01\11011923.D
 Acq On : 1 Nov 2019 22:05
 Sample : 100ng R13110119 ICAL Std
 Misc : S31-10251901/S31-10301902 (11/28)

Vial: 12
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 07:53:40 2019

Quant Method : I:\MS13\METHODS\R13110119.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Sat Nov 02 08:52:56 2019

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Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	11.25	130	128952	12.500	ng	0.01
37) 1,4-Difluorobenzene (IS2)	13.37	114	600982	12.500	ng	0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	291995	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.10	65	239478	12.471	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery =	99.76%		
57) Toluene-d8 (SS2)	15.82	98	689840	12.004	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery =	96.00%		
73) Bromofluorobenzene (SS3)	19.06	174	160310	13.044	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery =	104.32%		

Target Compounds

	R.T.	QIon	Response	Conc	Units	Qvalue
2) Propene	4.17	42	2631230	143.455	ng	96
3) Dichlorodifluoromethan...	4.33	85	3304085	111.685	ng	97
4) Chloromethane	4.61	50	1197756	58.207	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.90	135	1911274	118.718	ng	99
6) Vinyl Chloride	5.04	62	3009975	120.198	ng	99
7) 1,3-Butadiene	5.32	54	2404173	148.043	ng	98
8) Bromomethane	5.76	94	1532989	125.132	ng	99
9) Chloroethane	6.09	64	1308129	122.195	ng	100
10) Ethanol	6.53	45	7490759	615.543	ng	98
11) Acetonitrile	6.75	41	3372892	116.459	ng	99
12) Acrolein	6.90	56	1062910	114.887	ng	99
13) Acetone	7.14	58	7194627	570.380	ng	# 60
14) Trichlorofluoromethane	7.35	101	3062646	122.139	ng	98
15) 2-Propanol (Isopropanol)	7.64	45	7638195	194.564	ng	98
16) Acrylonitrile	7.89	53	2459853	125.788	ng	100
17) 1,1-Dichloroethene	8.31	96	1729140	130.461	ng	94
18) 2-Methyl-2-Propanol (t...	8.51	59	5122467	153.434	ng	99
19) Methylene Chloride	8.54	84	1863787	128.439	ng	94
20) 3-Chloro-1-propene (Al...	8.70	41	2929599	126.319	ng	99
21) Trichlorotrifluoroethane	8.95	151	1358744	129.603	ng	98
22) Carbon Disulfide	8.80	76	6087623	108.203	ng	98
23) trans-1,2-Dichloroethene	9.81	61	2644992	125.453	ng	97
24) 1,1-Dichloroethane	10.06	63	3128408	119.625	ng	98
25) Methyl tert-Butyl Ether	10.15	73	2619309	68.949	ng	99
26) Vinyl Acetate	10.34	86	2498094	682.288	ng	# 19
27) 2-Butanone (MEK)	10.57	72	1383409	136.135	ng	# 87
28) cis-1,2-Dichloroethene	11.08	61	2557929	121.778	ng	97
29) Diisopropyl Ether	11.37	87	1701035	118.625	ng	# 60
30) Ethyl Acetate	11.38	61	1540202	262.670	ng	94
31) n-Hexane	11.35	57	3279868	119.310	ng	98
32) Chloroform	11.42	83	3269058	126.008	ng	99
34) Tetrahydrofuran (THF)	11.82	72	1290101	126.881	ng	96
35) Ethyl tert-Butyl Ether	11.96	87	2381263	139.343	ng	# 90
36) 1,2-Dichloroethane	12.22	62	2532844	121.637	ng	98
38) 1,1,1-Trichloroethane	12.49	97	2722464	121.359	ng	99
39) Isopropyl Acetate	12.93	61	2773922	261.600	ng	# 63
40) 1-Butanol	12.96	56	4457215	257.653	ng	90
41) Benzene	12.98	78	7365883	110.332	ng	97
42) Carbon Tetrachloride	13.13	117	2553430	127.728	ng	99
43) Cyclohexane	13.27	84	5563535	230.548	ng	96
44) tert-Amyl Methyl Ether	13.61	73	5421301	125.688	ng	98
45) 1,2-Dichloropropane	13.82	63	1904554	120.204	ng	99
46) Bromodichloromethane	14.01	83	2736776	132.915	ng	98
47) Trichloroethene	14.07	130	2119266	133.170	ng	100
48) 1,4-Dioxane	14.05	88	1825194	145.649	ng	99
49) 2,2,4-Trimethylpentane...	14.14	57	7507393	109.705	ng	98
50) Methyl Methacrylate	14.28	100	1740089	285.600	ng	# 89

Data File : I:\MS13\DATA\2019 11\01\11011923.D
 Acq On : 1 Nov 2019 22:05
 Sample : 100ng R13110119 ICAL Std
 Misc : S31-10251901/S31-10301902 (11/28)

Vial: 12
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 07:53:40 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 08:52:56 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

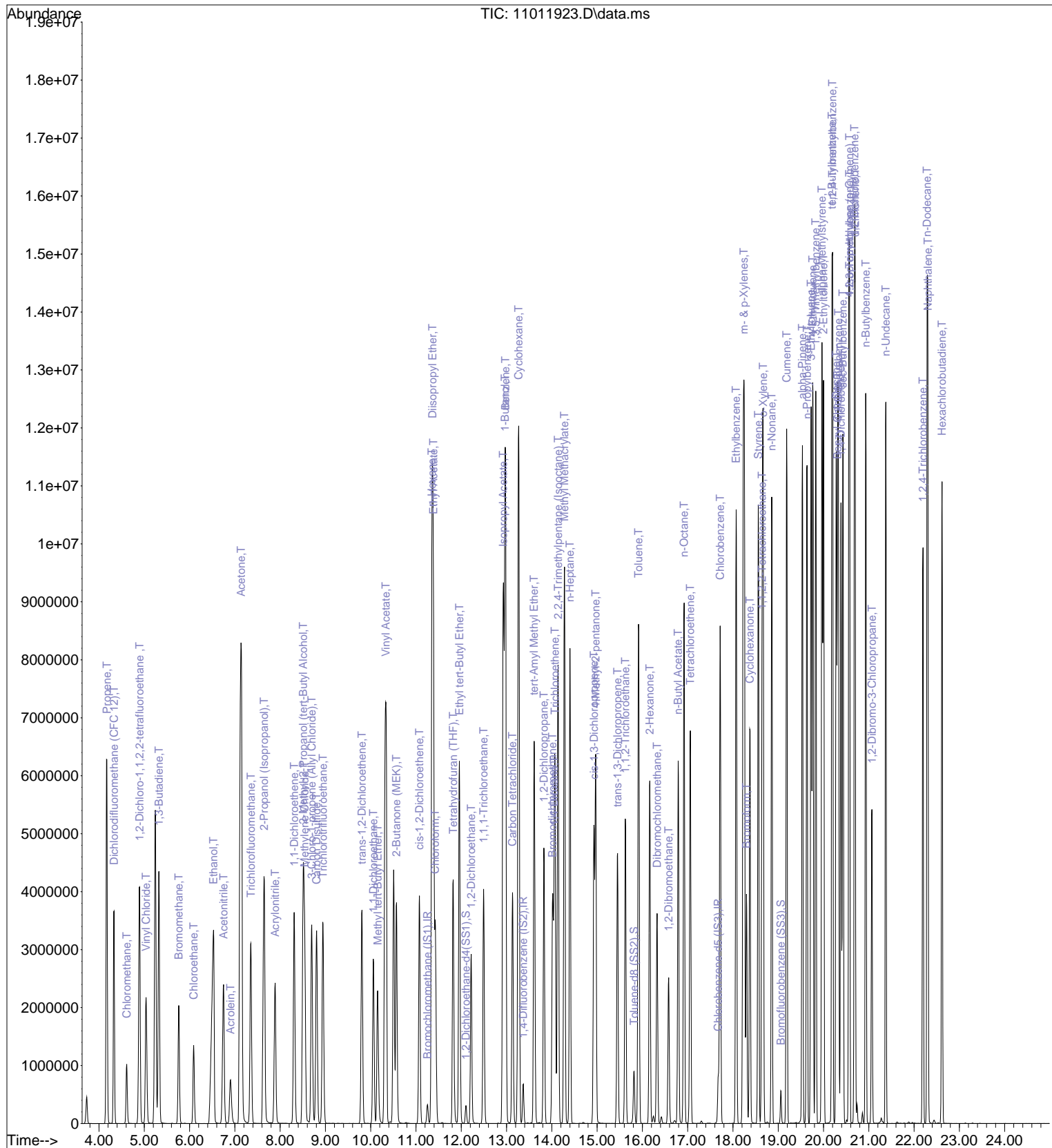
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.40	71	2154346	130.691	ng	99
52) cis-1,3-Dichloropropene	14.93	75	3184394	131.246	ng	98
53) 4-Methyl-2-pentanone	14.97	58	2010987	135.108	ng	89
54) trans-1,3-Dichloropropene	15.45	75	2863145	137.718	ng	98
55) 1,1,2-Trichloroethane	15.62	97	1830096	129.135	ng	99
58) Toluene	15.91	91	6965069	111.749	ng	94
59) 2-Hexanone	16.16	43	4490603	125.319	ng	95
60) Dibromochloromethane	16.32	129	2169815	140.795	ng	98
61) 1,2-Dibromoethane	16.58	107	2000071	131.322	ng	99
62) n-Butyl Acetate	16.79	43	4960407	126.831	ng	94
63) n-Octane	16.92	57	1859755	133.472	ng	99
64) Tetrachloroethene	17.06	166	2175991	136.486	ng	99
65) Chlorobenzene	17.72	112	4816692	120.342	ng	96
66) Ethylbenzene	18.07	91	7683142	112.410	ng	90
67) m- & p-Xylenes	18.24	91	11887317	219.769	ng	92
68) Bromoform	18.30	173	1997413	164.410	ng	99
69) Styrene	18.56	104	5268840	133.751	ng	94
70) o-Xylene	18.67	91	6635948	119.148	ng	93
71) n-Nonane	18.86	43	3896132	120.540	ng	94
72) 1,1,2,2-Tetrachloroethane	18.64	83	3458294	130.955	ng	99
74) Cumene	19.19	105	7422009	111.023	ng	89
75) alpha-Pinene	19.53	93	4481803	127.837	ng	95
76) n-Propylbenzene	19.63	91	8454089	105.413	ng	87
77) 3-Ethyltoluene	19.73	105	7523028	112.562	ng	90
78) 4-Ethyltoluene	19.76	105	7237572	115.589	ng	87
79) 1,3,5-Trimethylbenzene	19.83	105	6630519	119.301	ng	93
80) alpha-Methylstyrene	19.96	118	4047874	145.506	ng	# 89
81) 2-Ethyltoluene	20.00	105	7641438	117.292	ng	90
82) 1,2,4-Trimethylbenzene	20.20	105	5554250	100.208	ng	97
83) n-Decane	20.28	57	4038272	127.614	ng	96
84) Benzyl Chloride	20.31	91	6223101	149.498	ng	91
85) 1,3-Dichlorobenzene	20.33	146	4223550	135.241	ng	97
86) 1,4-Dichlorobenzene	20.39	146	4190828	136.417	ng	96
87) sec-Butylbenzene	20.43	105	7827656	106.314	ng	88
88) 4-Isopropyltoluene (p-...	20.57	119	5993896	92.566	ng	94
89) 1,2,3-Trimethylbenzene	20.57	105	5523855	98.763	ng	98
90) 1,2-Dichlorobenzene	20.68	146	3473621	116.614	ng	98
91) d-Limonene	20.70	68	2607556	117.293	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.07	157	1559639	156.733	ng	87
93) n-Undecane	21.38	57	4044970	143.218	ng	94
94) 1,2,4-Trichlorobenzene	22.20	180	3066262	163.971	ng	99
95) Naphthalene	22.30	128	7009210	109.491	ng	95
96) n-Dodecane	22.29	57	3329128	125.378	ng	96
97) Hexachlorobutadiene	22.62	225	2135940	162.156	ng	99
98) Cyclohexanone	18.37	55	2913633	129.003	ng	97
99) tert-Butylbenzene	20.19	119	5238072	96.827	ng	95
100) n-Butylbenzene	20.93	91	6509037	111.753	ng	# 90

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2019 11\01\11011923.D
Acq On : 1 Nov 2019 22:05
Sample : 100ng R13110119 ICAL Std
Misc : S31-10251901/S31-10301902 (11/28)

Vial: 12
Operator: WA
Inst : MS13

Quant Time: Nov 02 07:53:40 2019
Quant Method : I:\MS13\METHODS\R13110119.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Sat Nov 02 08:52:56 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019 11\01\11011930.D
 Acq On : 2 Nov 2019 9:28
 Sample : 25ng R1311019 ICV
 Misc : S31-10251901/S31-10141905 (11/12)

Vial: 15
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 10:35:00 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

11/2/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	11.24	130	117771	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.36	114	535488	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	257438	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	217262	12.388	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	99.12%	
57) Toluene-d8 (SS2)	15.81	98	637730	12.587	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	100.72%	
73) Bromofluorobenzene (SS3)	19.05	174	139469	12.872	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	102.96%	

Target Compounds

	R.T.	QIon	Response	Conc	Units	Qvalue
2) Propene	4.17	42	428551	25.583	ng	100
3) Dichlorodifluoromethan...	4.33	85	699868	25.903	ng	100
4) Chloromethane	4.60	50	400153	20.004	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.88	135	396906	26.994	ng	100
6) Vinyl Chloride	5.03	62	660102	28.863	ng	99
7) 1,3-Butadiene	5.30	54	418586	28.224	ng	98
8) Bromomethane	5.74	94	292372	26.132	ng	99
9) Chloroethane	6.07	64	256695	26.255	ng	100
10) Ethanol	6.45	45	1385372	124.746	ng	100
11) Acetonitrile	6.70	41	682247	25.798	ng	100
12) Acrolein	6.88	56	224190	26.554	ng	100
13) Acetone	7.10	58	1593560	138.338	ng	99
14) Trichlorofluoromethane	7.34	101	615549	26.879	ng	99
15) 2-Propanol (Isopropanol)	7.59	45	2046504	57.089	ng	100
16) Acrylonitrile	7.85	53	508327	28.463	ng	99
17) 1,1-Dichloroethene	8.30	96	340277	28.111	ng	100
18) 2-Methyl-2-Propanol (t...	8.47	59	1688744	55.389	ng	100
19) Methylene Chloride	8.53	84	359586	27.133	ng	100
20) 3-Chloro-1-propene (Al...	8.68	41	592679	27.981	ng	99
21) Trichlorotrifluoroethane	8.94	151	268691	28.062	ng	100
22) Carbon Disulfide	8.79	76	1301616	25.335	ng	100
23) trans-1,2-Dichloroethene	9.80	61	546532	28.383	ng	100
24) 1,1-Dichloroethane	10.05	63	639812	26.788	ng	100
25) Methyl tert-Butyl Ether	10.14	73	838690	24.173	ng	100
26) Vinyl Acetate	10.30	86	545850	151.178	ng	98
27) 2-Butanone (MEK)	10.55	72	269612	29.050	ng	99
28) cis-1,2-Dichloroethene	11.06	61	527941	27.520	ng	100
29) Diisopropyl Ether	11.35	87	435955	33.289	ng	# 75
30) Ethyl Acetate	11.36	61	343013	64.052	ng	99
31) n-Hexane	11.34	57	765812	30.502	ng	100
32) Chloroform	11.41	83	666706	28.138	ng	100
34) Tetrahydrofuran (THF)	11.82	72	257212	27.698	ng	99
35) Ethyl tert-Butyl Ether	11.95	87	455821	29.205	ng	100
36) 1,2-Dichloroethane	12.21	62	524664	27.589	ng	100
38) 1,1,1-Trichloroethane	12.49	97	569098	28.471	ng	100
39) Isopropyl Acetate	12.91	61	572868	60.633	ng	99
40) 1-Butanol	12.93	56	931393	60.433	ng	99
41) Benzene	12.96	78	1569708	26.388	ng	100
42) Carbon Tetrachloride	13.12	117	502190	28.193	ng	100
43) Cyclohexane	13.26	84	1235319	57.451	ng	100
44) tert-Amyl Methyl Ether	13.60	73	1111081	28.910	ng	100
45) 1,2-Dichloropropane	13.82	63	383938	27.196	ng	100
46) Bromodichloromethane	14.01	83	526627	28.705	ng	100
47) Trichloroethene	14.06	130	386709	27.272	ng	100
48) 1,4-Dioxane	14.03	88	327708	29.349	ng	100
49) 2,2,4-Trimethylpentane...	14.13	57	1662134	27.259	ng	100
50) Methyl Methacrylate	14.27	100	324039	59.689	ng	99

Data File : I:\MS13\DATA\2019 11\01\11011930.D
 Acq On : 2 Nov 2019 9:28
 Sample : 25ng R1311019 ICV
 Misc : S31-10251901/S31-10141905 (11/12)

Vial: 15
 Operator: WA
 Inst : MS13

Quant Time: Nov 02 10:35:00 2019
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	417488	28.424	ng	100
52) cis-1,3-Dichloropropene	14.92	75	667446	30.874	ng	100
53) 4-Methyl-2-pentanone	14.96	58	393369	29.661	ng	99
54) trans-1,3-Dichloropropene	15.44	75	574375	31.007	ng	100
55) 1,1,2-Trichloroethane	15.62	97	358747	28.410	ng	100
58) Toluene	15.91	91	1555463	28.306	ng	100
59) 2-Hexanone	16.15	43	975083	30.864	ng	100
60) Dibromochloromethane	16.32	129	421458	31.019	ng	100
61) 1,2-Dibromoethane	16.57	107	397924	29.634	ng	100
62) n-Butyl Acetate	16.78	43	1083509	31.423	ng	100
63) n-Octane	16.91	57	363064	29.554	ng	99
64) Tetrachloroethene	17.05	166	393801	28.016	ng	99
65) Chlorobenzene	17.71	112	992112	28.115	ng	100
66) Ethylbenzene	18.07	91	1800743	29.883	ng	100
67) m- & p-Xylenes	18.23	91	2996721	62.839	ng	100
68) Bromoform	18.29	173	356913	30.306	ng	100
69) Styrene	18.55	104	1125445	32.405	ng	100
70) o-Xylene	18.66	91	1503054	30.610	ng	100
71) n-Nonane	18.85	43	865572	30.374	ng	100
72) 1,1,2,2-Tetrachloroethane	18.63	83	715951	30.750	ng	100
74) Cumene	19.18	105	1796742	30.485	ng	100
75) alpha-Pinene	19.53	93	949615	30.722	ng	99
76) n-Propylbenzene	19.63	91	2214758	31.322	ng	100
77) 3-Ethyltoluene	19.72	105	1850122	31.398	ng	100
78) 4-Ethyltoluene	19.76	105	1770773	32.077	ng	100
79) 1,3,5-Trimethylbenzene	19.82	105	1555064	31.736	ng	100
80) alpha-Methylstyrene	19.96	118	857665	28.666	ng	100
81) 2-Ethyltoluene	19.99	105	1834983	31.947	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	1790628	34.225	ng	100
83) n-Decane	20.27	57	922348	33.060	ng	99
84) Benzyl Chloride	20.30	91	1444718	30.643	ng	100
85) 1,3-Dichlorobenzene	20.32	146	908371	32.991	ng	100
86) 1,4-Dichlorobenzene	20.38	146	856583	31.627	ng	100
87) sec-Butylbenzene	20.43	105	2069431	31.879	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	2090163	34.634	ng	100
89) 1,2,3-Trimethylbenzene	20.56	105	1776954	33.766	ng	100
90) 1,2-Dichlorobenzene	20.68	146	906980	34.536	ng	100
91) d-Limonene	20.69	68	714997	33.544	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.06	157	276968	28.559	ng	100
93) n-Undecane	21.37	57	940934	31.194	ng	100
94) 1,2,4-Trichlorobenzene	22.19	180	518684	27.731	ng	99
95) Naphthalene	22.29	128	1996011	31.703	ng	100
96) n-Dodecane	22.29	57	1006673	31.504	ng	100
97) Hexachlorobutadiene	22.62	225	347241	32.349	ng	100
98) Cyclohexanone	18.37	55	591684	29.714	ng	100
99) tert-Butylbenzene	20.19	119	1665912	34.928	ng	100
100) n-Butylbenzene	20.93	91	1702441	33.153	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 11011930.D

Acq. Method File: TO15.M

Data File Path: I:\MS13\DATA\2019_11\01\

Sample Name: 25ng R1311019 ICV

Operator: WA

Misc Info: S31-10251901/S31-10141905 (

Date Acquired: 11/2/2019

9:28

Instrument Name: MS13

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
2)	Propene	4.17	25.6	26.25	98	53	112	*	*
3)	Dichlorodifluoromethane (CFC 12)	4.33	25.9	26.25	99	62	103	*	*
4)	Chloromethane	4.60	20.0	26.50	75	51	121	*	*
5)	1,2-Dichloro-1,1,2,2-tetrafluoroethane	4.88	27.0	25.75	105	56	111	*	*
6)	Vinyl Chloride	5.03	28.9	26.50	109	57	117	*	*
7)	1,3-Butadiene	5.30	28.2	26.50	106	53	134	*	*
8)	Bromomethane	5.74	26.1	26.50	98	65	110	*	*
9)	Chloroethane	6.07	26.3	26.75	98	64	111	*	*
10)	Ethanol	6.45	125	132.50	94	57	124	*	*
11)	Acetonitrile	6.70	25.8	26.75	96	57	126	*	*
12)	Acrolein	6.88	26.6	25.75	103	62	121	*	*
13)	Acetone	7.10	138	133.50	103	60	113	*	*
14)	Trichlorofluoromethane	7.34	26.9	26.50	102	63	104	*	*
15)	2-Propanol (Isopropanol)	7.59	57.1	52.75	108	60	124	*	*
16)	Acrylonitrile	7.85	28.5	26.50	108	66	125	*	*
17)	1,1-Dichloroethene	8.30	28.1	26.75	105	68	107	*	*
18)	2-Methyl-2-Propanol (tert-Butyl Alcohol)	8.47	55.4	53.75	103	64	114	*	*
19)	Methylene Chloride	8.53	27.1	26.25	103	66	105	*	*
20)	3-Chloro-1-propene (Allyl Chloride)	8.68	28.0	26.75	105	63	127	*	*
21)	Trichlorotrifluoroethane	8.94	28.1	27.00	104	59	109	*	*
22)	Carbon Disulfide	8.79	25.3	26.50	95	67	109	*	*
23)	trans-1,2-Dichloroethene	9.80	28.4	26.75	106	70	115	*	*
24)	1,1-Dichloroethane	10.05	26.8	26.50	101	66	106	*	*
25)	Methyl tert-Butyl Ether	10.14	24.2	26.75	90	67	109	*	*
26)	Vinyl Acetate	10.30	151	133.25	113	68	136	*	*
27)	2-Butanone (MEK)	10.55	29.1	26.50	110	71	116	*	*
28)	cis-1,2-Dichloroethene	11.06	27.5	26.50	104	67	110	*	*
29)	Diisopropyl Ether	11.35	33.3	27.00	123	62	109	FAIL	*
30)	Ethyl Acetate	11.36	64.1	54.00	119	64	127	*	*
31)	n-Hexane	11.34	30.5	27.00	113	60	115	*	*
32)	Chloroform	11.41	28.1	26.75	105	66	105	*	*
34)	Tetrahydrofuran (THF)	11.82	27.7	27.50	101	65	110	*	*
35)	Ethyl tert-Butyl Ether	11.95	29.2	26.75	109	69	109	*	*
36)	1,2-Dichloroethane	12.21	27.6	26.75	103	60	110	*	*
38)	1,1,1-Trichloroethane	12.49	28.5	26.75	107	64	108	*	*
39)	Isopropyl Acetate	12.91	60.6	52.50	115	66	119	*	*
40)	1-Butanol	12.93	60.4	53.25	113	54	143	*	*
41)	Benzene	12.96	26.4	26.25	101	67	106	*	*
42)	Carbon Tetrachloride	13.12	28.2	26.00	108	64	112	*	*
43)	Cyclohexane	13.26	57.5	52.75	109	67	110	*	*
44)	tert-Amyl Methyl Ether	13.60	28.9	26.75	108	68	112	*	*
45)	1,2-Dichloropropane	13.82	27.2	26.75	102	66	112	*	*
46)	Bromodichloromethane	14.01	28.7	27.25	105	67	113	*	*
47)	Trichloroethene	14.06	27.3	27.00	101	66	108	*	*
48)	1,4-Dioxane	14.03	29.3	27.00	109	70	116	*	*
49)	2,2,4-Trimethylpentane (Isooctane)	14.13	27.3	26.75	102	64	113	*	*

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 11011930.D

TO15.M

Data File Path: I:\MS13\DATA\2019_11\01\

Sample Name: 25ng R1311019 ICV

Operator: WA

Misc Info: S31-10251901/S31-10141905 (

Date Acquired: 11/2/2019

9:28

Instrument Name: MS13

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
50)	Methyl Methacrylate	14.27	59.7	53.75	111	73	118	*	*
51)	n-Heptane	14.39	28.4	26.75	106	66	110	*	*
52)	cis-1,3-Dichloropropene	14.92	30.9	26.75	116	75	120	*	*
53)	4-Methyl-2-pentanone	14.96	29.7	26.50	112	65	124	*	*
54)	trans-1,3-Dichloropropene	15.44	31.0	26.50	117	77	123	*	*
55)	1,1,2-Trichloroethane	15.62	28.4	26.75	106	68	112	*	*
58)	Toluene	15.91	28.3	26.50	107	62	111	*	*
59)	2-Hexanone	16.15	30.9	27.00	114	59	128	*	*
60)	Dibromochloromethane	16.32	31.0	26.75	116	67	123	*	*
61)	1,2-Dibromoethane	16.57	29.6	26.75	111	66	122	*	*
62)	n-Butyl Acetate	16.78	31.4	27.25	115	64	128	*	*
63)	n-Octane	16.91	29.6	27.00	110	65	114	*	*
64)	Tetrachloroethene	17.05	28.0	26.00	108	55	120	*	*
65)	Chlorobenzene	17.71	28.1	26.75	105	61	114	*	*
66)	Ethylbenzene	18.07	29.9	26.50	113	64	113	*	*
67)	m- & p-Xylenes	18.23	62.8	53.25	118	64	114	FAIL	*
68)	Bromoform	18.29	30.3	26.75	113	65	132	*	*
69)	Styrene	18.55	32.4	26.50	122	67	124	*	*
70)	o-Xylene	18.66	30.6	26.75	114	65	114	*	*
71)	n-Nonane	18.85	30.4	26.75	114	64	117	*	*
72)	1,1,2,2-Tetrachloroethane	18.63	30.8	26.75	115	66	119	*	*
74)	Cumene	19.18	30.5	26.75	114	61	116	*	*
75)	alpha-Pinene	19.53	30.7	26.50	116	65	120	*	*
76)	n-Propylbenzene	19.63	31.3	26.75	117	63	117	*	*
77)	3-Ethyltoluene	19.72	31.4	26.75	117	60	117	*	*
78)	4-Ethyltoluene	19.76	32.1	26.25	122	63	124	*	*
79)	1,3,5-Trimethylbenzene	19.82	31.7	26.50	120	60	117	FAIL	*
80)	alpha-Methylstyrene	19.96	28.7	26.50	108	64	131	*	*
81)	2-Ethyltoluene	19.99	31.9	26.75	119	62	116	FAIL	*
82)	1,2,4-Trimethylbenzene	20.19	34.2	26.50	129	61	122	FAIL	*
83)	n-Decane	20.27	33.1	26.75	124	67	120	FAIL	*
84)	Benzyl Chloride	20.30	30.6	26.75	114	77	142	*	*
85)	1,3-Dichlorobenzene	20.32	33.0	26.75	123	61	125	*	*
86)	1,4-Dichlorobenzene	20.38	31.6	26.75	118	59	123	*	*
87)	sec-Butylbenzene	20.43	31.9	26.50	120	62	117	FAIL	*
88)	4-Isopropyltoluene (p-Cymene)	20.56	34.6	27.25	127	58	122	FAIL	*
89)	1,2,3-Trimethylbenzene	20.56	33.8	27.00	125	62	124	FAIL	*
90)	1,2-Dichlorobenzene	20.68	34.5	26.75	129	61	126	FAIL	*
91)	d-Limonene	20.69	33.5	26.50	126	66	124	FAIL	*
92)	1,2-Dibromo-3-Chloropropane	21.06	28.6	26.75	107	67	138	*	*
93)	n-Undecane	21.37	31.2	27.00	116	68	127	*	*
94)	1,2,4-Trichlorobenzene	22.19	27.7	27.00	103	62	141	*	*
95)	Naphthalene	22.29	31.7	26.50	120	62	145	*	*
96)	n-Dodecane	22.29	31.5	26.50	119	64	152	*	*
97)	Hexachlorobutadiene	22.62	32.3	26.75	121	49	131	*	*
98)	Cyclohexanone	18.37	29.7	25.25	118	61	127	*	*
99)	tert-Butylbenzene	20.19	34.9	26.50	132	58	122	FAIL	FAIL
100)	n-Butylbenzene	20.93	33.2	26.75	124	64	121	FAIL	*

Bold = 75 Compound List

Data File : I:\MS13\DATA\2020 01\03\01032002.D
 Acq On : 3 Jan 2020 2:04
 Sample : CCV R13010320 25ng
 Misc : S31-10251901/S31-12061901

Vial: 2
 Operator: TD
 Inst : MS13

Quant Time: Jan 03 07:54:37 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

TD 1/3/20

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
 Max. RRF Dev : 30% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev (min)
1 IR	Bromochloromethane (IS1)	1.000	1.000	0.0	145	-0.01
2 T	Propene	1.778	2.001	-12.5	171	-0.03
3 T	Dichlorodifluoromethane (CF	2.868	2.787	2.8	140	-0.03
4 T	Chloromethane	2.123	2.071	2.4	149	-0.02
5 T	1,2-Dichloro-1,1,2,2-tetra	1.561	1.442	7.6	119	-0.03
6 T	Vinyl Chloride	2.427	2.455	-1.2	127	-0.02
7 T	1,3-Butadiene	1.574	1.886	-19.8	150	-0.03
8 T	Bromomethane	1.188	1.300	-9.4	156	-0.03
9 T	Chloroethane	1.038	1.214	-17.0	169	-0.03
10 T	Ethanol	1.179	1.327	-12.6	155	-0.08
11 T	Acetonitrile	2.807	3.456	-23.1	176	-0.06
12 T	Acrolein	0.896	1.106	-23.4	168	-0.03
13 T	Acetone	1.223	1.240	-1.4	137	-0.05
14 T	Trichlorofluoromethane	2.431	2.333	4.0	135	-0.03
15 T	2-Propanol (Isopropanol)	3.805	4.506	-18.4	153	-0.05
16 T	Acrylonitrile	1.896	2.380	-25.5	165	-0.04
17 T	1,1-Dichloroethene	1.285	1.419	-10.4	153	-0.02
18 T	2-Methyl-2-Propanol (tert-B	3.236	3.780	-16.8	146	-0.05
19 T	Methylene Chloride	1.407	1.526	-8.5	151	-0.02
20 T	3-Chloro-1-propene (Allyl C	2.248	2.739	-21.8	165	-0.02
21 T	Trichlorotrifluoroethane	1.016	1.183	-16.4	162	-0.02
22 T	Carbon Disulfide	5.453	5.522	-1.3	153	-0.02
23 T	trans-1,2-Dichloroethene	2.044	2.279	-11.5	153	-0.02
24 T	1,1-Dichloroethane	2.535	2.765	-9.1	153	-0.01
25 T	Methyl tert-Butyl Ether	3.682	3.513	4.6	123	-0.02
26 T	Vinyl Acetate	0.383	0.384	-0.3	125	-0.03
27 T	2-Butanone (MEK)	0.985	1.147	-16.4	150	-0.03
28 T	cis-1,2-Dichloroethene	2.036	2.191	-7.6	149	-0.02
29 T	Diisopropyl Ether	1.390	1.336	3.9	127	-0.01
30 T	Ethyl Acetate	0.568	0.613	-7.9	130	-0.02
31 T	n-Hexane	2.665	2.798	-5.0	134	-0.01
32 T	Chloroform	2.515	2.498	0.7	136	-0.02
33 S	1,2-Dichloroethane-d4 (SS1)	1.861	1.606	13.7	127	-0.01
34 T	Tetrahydrofuran (THF)	0.986	1.072	-8.7	153	-0.01
35 T	Ethyl tert-Butyl Ether	1.657	1.835	-10.7	147	-0.01
36 T	1,2-Dichloroethane	2.018	1.894	6.1	131	-0.02
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	148	-0.01
38 T	1,1,1-Trichloroethane	0.467	0.458	1.9	135	-0.01
39 T	Isopropyl Acetate	0.221	0.236	-6.8	135	-0.01
40 T	1-Butanol	0.360	0.398	-10.6	138	-0.03
41 T	Benzene	1.389	1.356	2.4	140	-0.01
42 T	Carbon Tetrachloride	0.416	0.413	0.7	132	0.00
43 T	Cyclohexane	0.502	0.515	-2.6	135	-0.01
44 T	tert-Amyl Methyl Ether	0.897	0.972	-8.4	146	0.00
45 T	1,2-Dichloropropane	0.330	0.353	-7.0	154	-0.01
46 T	Bromodichloromethane	0.428	0.426	0.5	133	0.00
47 T	Trichloroethene	0.331	0.337	-1.8	145	-0.01
48 T	1,4-Dioxane	0.261	0.285	-9.2	146	-0.01
49 T	2,2,4-Trimethylpentane (Iso	1.423	1.525	-7.2	153	-0.01
50 T	Methyl Methacrylate	0.127	0.140	-10.2	143	-0.02
51 T	n-Heptane	0.343	0.363	-5.8	146	0.00
52 T	cis-1,3-Dichloropropene	0.505	0.573	-13.5	147	0.00
53 T	4-Methyl-2-pentanone	0.310	0.357	-15.2	151	-0.01
54 T	trans-1,3-Dichloropropene	0.432	0.511	-18.3	147	-0.01
55 T	1,1,2-Trichloroethane	0.295	0.313	-6.1	146	0.00

Data File : I:\MS13\DATA\2020 01\03\01032002.D
 Acq On : 3 Jan 2020 2:04
 Sample : CCV R13010320 25ng
 Misc : S31-10251901/S31-12061901

Vial: 2
 Operator: TD
 Inst : MS13

Quant Time: Jan 03 07:54:37 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
 Max. RRF Dev : 30% Max. Rel. Area : 200%

Compound	AvgRF	CCRF	%Dev	Area%	Dev (min)
56 IR Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	145	0.00
57 S Toluene-d8 (SS2)	2.460	2.426	1.4	144	0.00
58 T Toluene	2.668	2.793	-4.7	141	0.00
59 T 2-Hexanone	1.534	1.776	-15.8	147	-0.02
60 T Dibromochloromethane	0.660	0.754	-14.2	140	0.00
61 T 1,2-Dibromoethane	0.652	0.731	-12.1	145	-0.01
62 T n-Butyl Acetate	1.674	1.999	-19.4	150	0.00
63 T n-Octane	0.596	0.675	-13.3	148	-0.01
64 T Tetrachloroethene	0.683	0.771	-12.9	150	0.00
65 T Chlorobenzene	1.713	1.824	-6.5	145	0.00
66 T Ethylbenzene	2.926	3.130	-7.0	136	0.00
67 T m- & p-Xylenes	2.316	2.438	-5.3	127	-0.01
68 T Bromoform	0.572	0.629	-10.0	140	0.00
69 T Styrene	1.686	2.024	-20.0	140	0.00
70 T o-Xylene	2.384	2.502	-4.9	129	-0.01
71 T n-Nonane	1.384	1.589	-14.8	144	0.00
72 T 1,1,2,2-Tetrachloroethane	1.131	1.213	-7.3	132	0.00
73 S Bromofluorobenzene (SS3)	0.526	0.609	-15.8	163	0.00
74 T Cumene	2.862	3.067	-7.2	133	0.00
75 T alpha-Pinene	1.501	1.693	-12.8	138	0.00
76 T n-Propylbenzene	3.433	3.726	-8.5	132	0.00
77 T 3-Ethyltoluene	2.861	3.160	-10.5	135	0.00
78 T 4-Ethyltoluene	2.680	2.958	-10.4	127	0.00
79 T 1,3,5-Trimethylbenzene	2.379	2.640	-11.0	132	0.00
80 T alpha-Methylstyrene	1.453	1.478	-1.7	138	0.00
81 T 2-Ethyltoluene	2.789	3.051	-9.4	130	0.00
82 T 1,2,4-Trimethylbenzene	2.540	2.604	-2.5	113	-0.01
83 T n-Decane	1.355	1.625	-19.9	136	0.00
84 T Benzyl Chloride	2.289	2.330	-1.8	127	0.00
85 T 1,3-Dichlorobenzene	1.337	1.541	-15.3	133	-0.01
86 T 1,4-Dichlorobenzene	1.315	1.561	-18.7	142	-0.01
87 T sec-Butylbenzene	3.152	3.489	-10.7	131	0.00
88 T 4-Isopropyltoluene (p-Cymen)	2.930	3.089	-5.4	114	-0.01
89 T 1,2,3-Trimethylbenzene	2.555	2.639	-3.3	112	-0.02
90 T 1,2-Dichlorobenzene	1.367	1.465	-7.2	125	0.00
91 T d-Limonene	1.035	1.158	-11.9	126	-0.01
92 T 1,2-Dibromo-3-Chloropropane	0.471	0.555	-17.8	151	0.00
93 T n-Undecane	1.465	1.693	-15.6	144	0.00
94 T 1,2,4-Trichlorobenzene	0.908	1.110	-22.2	164	0.00
95 T Naphthalene	3.057	3.505	-14.7	132	-0.01
96 T n-Dodecane	1.552	1.763	-13.6	143	0.00
97 T Hexachlorobutadiene	0.521	0.717	-37.6#	159	0.00
98 T Cyclohexanone	0.967	1.196	-23.7	152	-0.01
99 T tert-Butylbenzene	2.316	2.471	-6.7	114	0.00
100 T n-Butylbenzene	2.673	2.831	-5.9	130	0.00

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

Data File : I:\MS13\DATA\2020 01\03\01032002.D
 Acq On : 3 Jan 2020 2:04
 Sample : CCV R13010320 25ng
 Misc : S31-10251901/S31-12061901

Vial: 2
 Operator: TD
 Inst : MS13

TD 1/3/20

Quant Time: Jan 03 07:54:37 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	11.24	130	173945	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.36	114	802852	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.67	82	379243	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	279326	10.783	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery =	86.24%		
57) Toluene-d8 (SS2)	15.81	98	920032	12.327	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery =	98.64%		
73) Bromofluorobenzene (SS3)	19.05	174	231091	14.477	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery =	115.84%		

Target Compounds

						Qvalue
2) Propene	4.14	42	737858	29.823	ng	96
3) Dichlorodifluoromethan...	4.30	85	1027709	25.753	ng	100
4) Chloromethane	4.59	50	763857	25.854	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.86	135	526711	24.254	ng	100
6) Vinyl Chloride	5.01	62	922364	27.306	ng	100
7) 1,3-Butadiene	5.29	54	695523	31.751	ng	99
8) Bromomethane	5.73	94	488559	29.565	ng	99
9) Chloroethane	6.06	64	456273	31.597	ng	99
10) Ethanol	6.45	45	2404362	146.583	ng	99
11) Acetonitrile	6.69	41	1262562	32.324	ng	98
12) Acrolein	6.88	56	396330	31.784	ng	99
13) Acetone	7.09	58	2298706	135.109	ng	87
14) Trichlorofluoromethane	7.33	101	860464	25.439	ng	98
15) 2-Propanol (Isopropanol)	7.59	45	3292035	62.177	ng	94
16) Acrylonitrile	7.85	53	869384	32.960	ng	99
17) 1,1-Dichloroethene	8.29	96	533056	29.815	ng	95
18) 2-Methyl-2-Propanol (t...	8.46	59	2840741	63.084	ng	96
19) Methylene Chloride	8.52	84	562561	28.740	ng	99
20) 3-Chloro-1-propene (Al...	8.67	41	1029089	32.895	ng	97
21) Trichlorotrifluoroethane	8.93	151	444656	31.443	ng	93
22) Carbon Disulfide	8.78	76	2055368	27.087	ng	100
23) trans-1,2-Dichloroethene	9.79	61	856430	30.114	ng	100
24) 1,1-Dichloroethane	10.05	63	1048630	29.726	ng	100
25) Methyl tert-Butyl Ether	10.14	73	1320023	25.760	ng	98
26) Vinyl Acetate	10.30	86	715383	134.147	ng	# 95
27) 2-Butanone (MEK)	10.54	72	422940	30.854	ng	100
28) cis-1,2-Dichloroethene	11.06	61	808050	28.519	ng	100
29) Diisopropyl Ether	11.35	87	501943	25.950	ng	99
30) Ethyl Acetate	11.36	61	462914	58.526	ng	99
31) n-Hexane	11.34	57	1051084	28.345	ng	100
32) Chloroform	11.41	83	929790	26.569	ng	100
34) Tetrahydrofuran (THF)	11.81	72	406428	29.633	ng	94
35) Ethyl tert-Butyl Ether	11.95	87	689631	29.916	ng	99
36) 1,2-Dichloroethane	12.20	62	711802	25.342	ng	100
38) 1,1,1-Trichloroethane	12.48	97	786637	26.249	ng	98
39) Isopropyl Acetate	12.91	61	798038	56.337	ng	94
40) 1-Butanol	12.93	56	1330308	57.572	ng	93
41) Benzene	12.96	78	2307925	25.878	ng	99
42) Carbon Tetrachloride	13.12	117	696774	26.090	ng	99
43) Cyclohexane	13.26	84	1754205	54.415	ng	96
44) tert-Amyl Methyl Ether	13.60	73	1684977	29.242	ng	98
45) 1,2-Dichloropropane	13.81	63	611425	28.887	ng	100
46) Bromodichloromethane	14.01	83	737935	26.828	ng	99
47) Trichloroethene	14.06	130	579360	27.252	ng	100
48) 1,4-Dioxane	14.03	88	493982	29.508	ng	97
49) 2,2,4-Trimethylpentane...	14.13	57	2620556	28.665	ng	92
50) Methyl Methacrylate	14.26	100	482391	59.267	ng	95

Data File : I:\MS13\DATA\2020 01\03\01032002.D
 Acq On : 3 Jan 2020 2:04
 Sample : CCV R13010320 25ng
 Misc : S31-10251901/S31-12061901

Vial: 2
 Operator: TD
 Inst : MS13

Quant Time: Jan 03 07:54:37 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

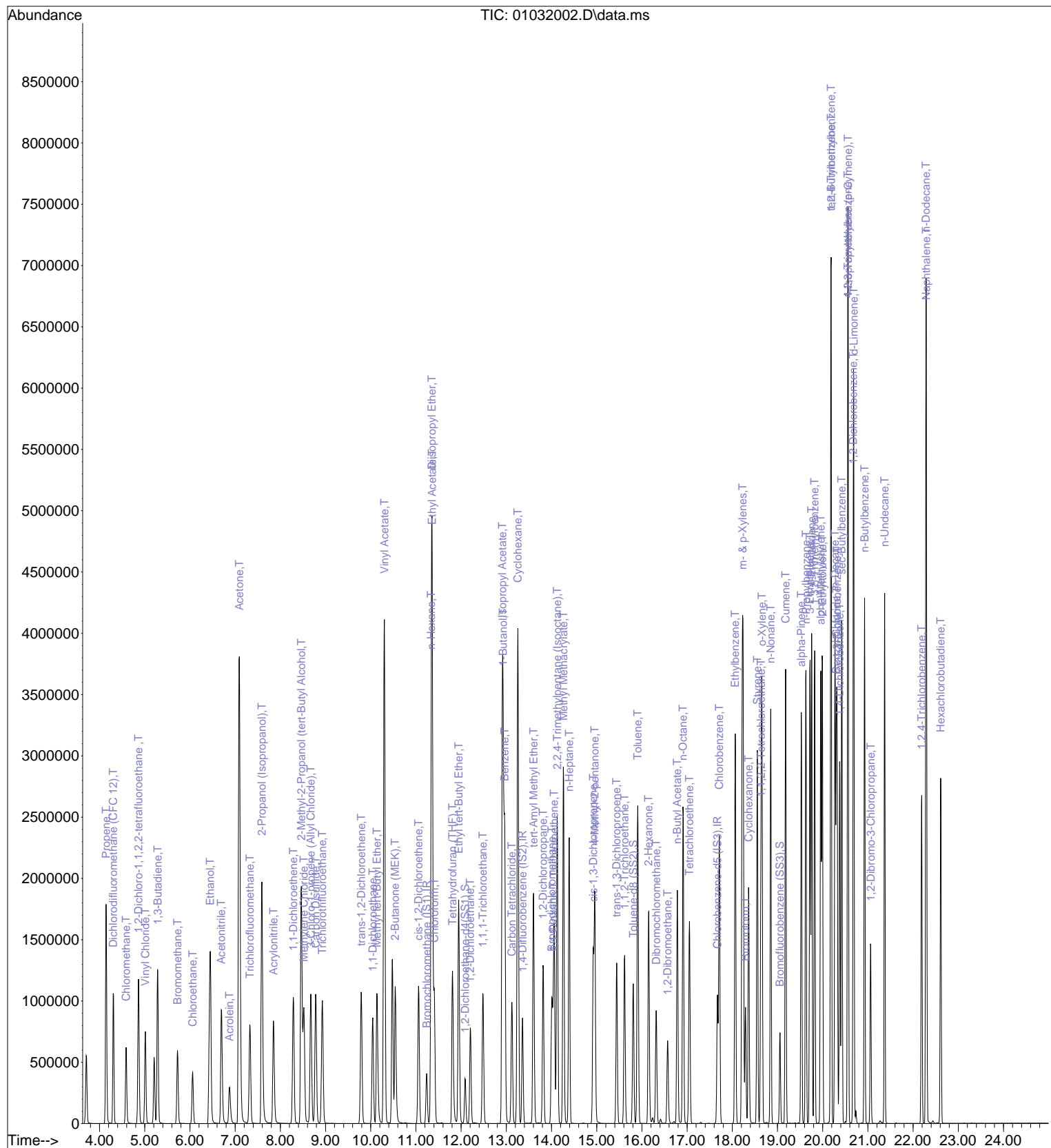
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
51) n-Heptane	14.39	71	629255	28.575	ng	98
52) cis-1,3-Dichloropropene	14.92	75	956950	29.524	ng	100
53) 4-Methyl-2-pentanone	14.96	58	608445	30.600	ng	96
54) trans-1,3-Dichloropropene	15.44	75	870263	31.335	ng	100
55) 1,1,2-Trichloroethane	15.62	97	538556	28.446	ng	99
58) Toluene	15.91	91	2266608	28.000	ng	99
59) 2-Hexanone	16.15	43	1440988	30.962	ng	97
60) Dibromochloromethane	16.32	129	612312	30.591	ng	100
61) 1,2-Dibromoethane	16.57	107	593502	30.003	ng	100
62) n-Butyl Acetate	16.78	43	1652718	32.536	ng	98
63) n-Octane	16.91	57	552860	30.550	ng	98
64) Tetrachloroethene	17.05	166	608094	29.367	ng	100
65) Chlorobenzene	17.71	112	1480319	28.476	ng	100
66) Ethylbenzene	18.06	91	2540521	28.619	ng	99
67) m- & p-Xylenes	18.23	91	3957149	56.328	ng	99
68) Bromoform	18.29	173	510613	29.432	ng	99
69) Styrene	18.55	104	1627146	31.803	ng	99
70) o-Xylene	18.66	91	2030599	28.072	ng	99
71) n-Nonane	18.85	43	1289334	30.713	ng	99
72) 1,1,2,2-Tetrachloroethane	18.63	83	984516	28.704	ng	99
74) Cumene	19.18	105	2511984	28.931	ng	99
75) alpha-Pinene	19.53	93	1373714	30.169	ng	95
76) n-Propylbenzene	19.63	91	3051907	29.299	ng	98
77) 3-Ethyltoluene	19.72	105	2540947	29.272	ng	100
78) 4-Ethyltoluene	19.75	105	2422865	29.793	ng	99
79) 1,3,5-Trimethylbenzene	19.82	105	2122747	29.407	ng	99
80) alpha-Methylstyrene	19.96	118	1199853	27.223	ng	93
81) 2-Ethyltoluene	19.99	105	2499256	29.537	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	2113176	27.418	ng	99
83) n-Decane	20.27	57	1319008	32.093	ng	98
84) Benzyl Chloride	20.30	91	1908653	27.481	ng	99
85) 1,3-Dichlorobenzene	20.32	146	1250449	30.829	ng	99
86) 1,4-Dichlorobenzene	20.37	146	1266802	31.751	ng	99
87) sec-Butylbenzene	20.42	105	2831564	29.610	ng	98
88) 4-Isopropyltoluene (p-...	20.56	119	2554224	28.730	ng	97
89) 1,2,3-Trimethylbenzene	20.56	105	2181747	28.143	ng	99
90) 1,2-Dichlorobenzene	20.68	146	1189263	28.675	ng	100
91) d-Limonene	20.69	68	948412	30.204	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.06	157	441713	30.918	ng	# 84
93) n-Undecane	21.37	57	1386734	31.207	ng	98
94) 1,2,4-Trichlorobenzene	22.19	180	901025	32.701	ng	100
95) Naphthalene	22.29	128	2738579	29.527	ng	99
96) n-Dodecane	22.29	57	1390357	29.536	ng	98
97) Hexachlorobutadiene	22.61	225	576125	36.433	ng	99
98) Cyclohexanone	18.36	55	907308	30.930	ng	95
99) tert-Butylbenzene	20.19	119	2005067	28.537	ng	100
100) n-Butylbenzene	20.93	91	2297242	28.332	ng	98

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2020 01\03\01032002.D
 Acq On : 3 Jan 2020 2:04
 Sample : CCV R13010320 25ng
 Misc : S31-10251901/S31-12061901

Vial: 2
 Operator: TD
 Inst : MS13

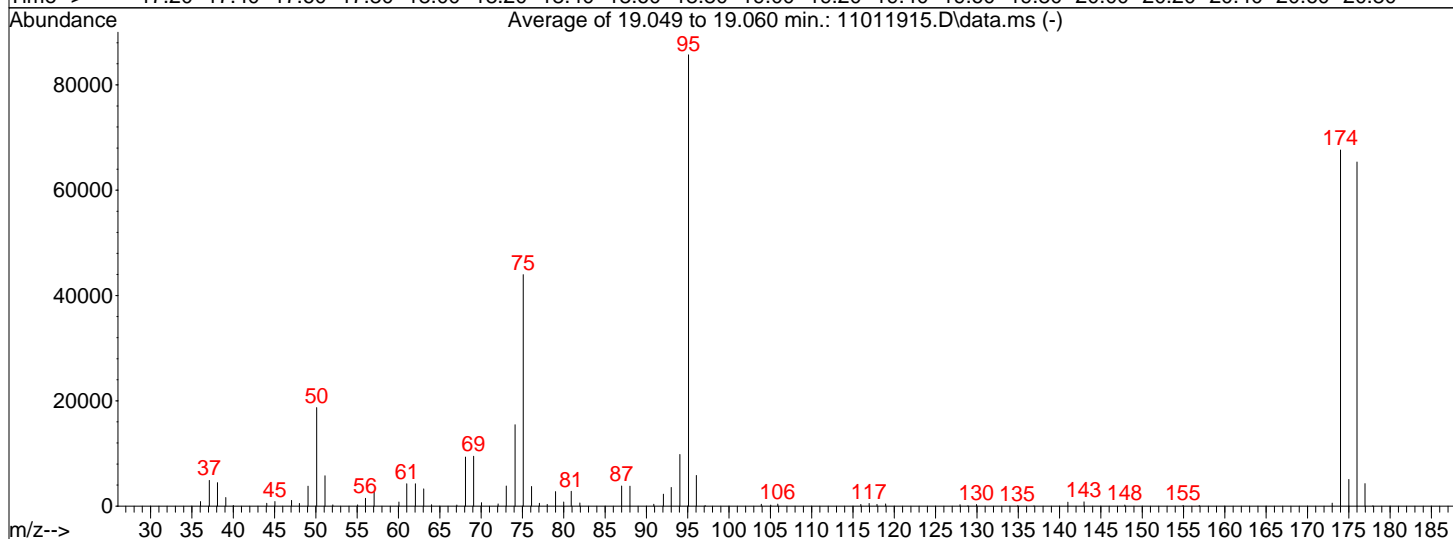
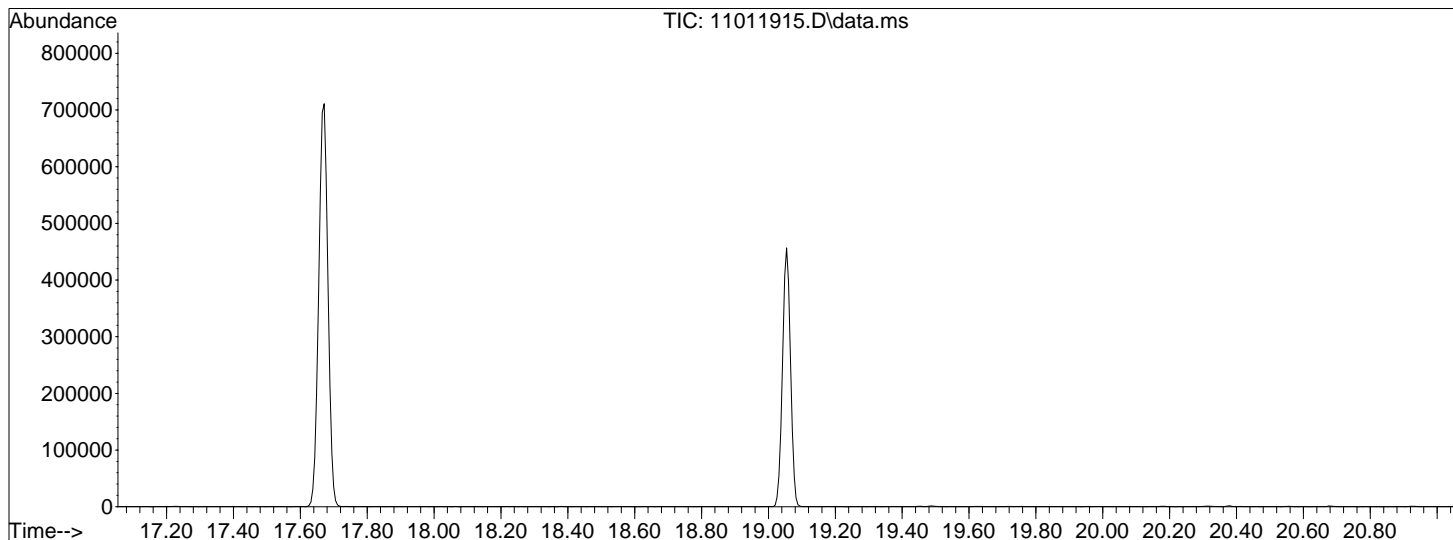
Quant Time: Jan 03 07:54:37 2020
 Quant Method : I:\MS13\METHODS\R13110119.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Sat Nov 02 09:55:49 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



Data Path : I:\MS13\DATA\2019 11\01\
 Data File : 11011915.D
 Acq On : 1 Nov 2019 17:40
 Operator : WA
 Sample : BFB Std
 Misc : S31-10251901
 ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS13\METHODS\R13110119.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Sat Nov 02 07:24:43 2019



AutoFind: Scans 2711, 2712, 2713; Background Corrected with Scan 2704

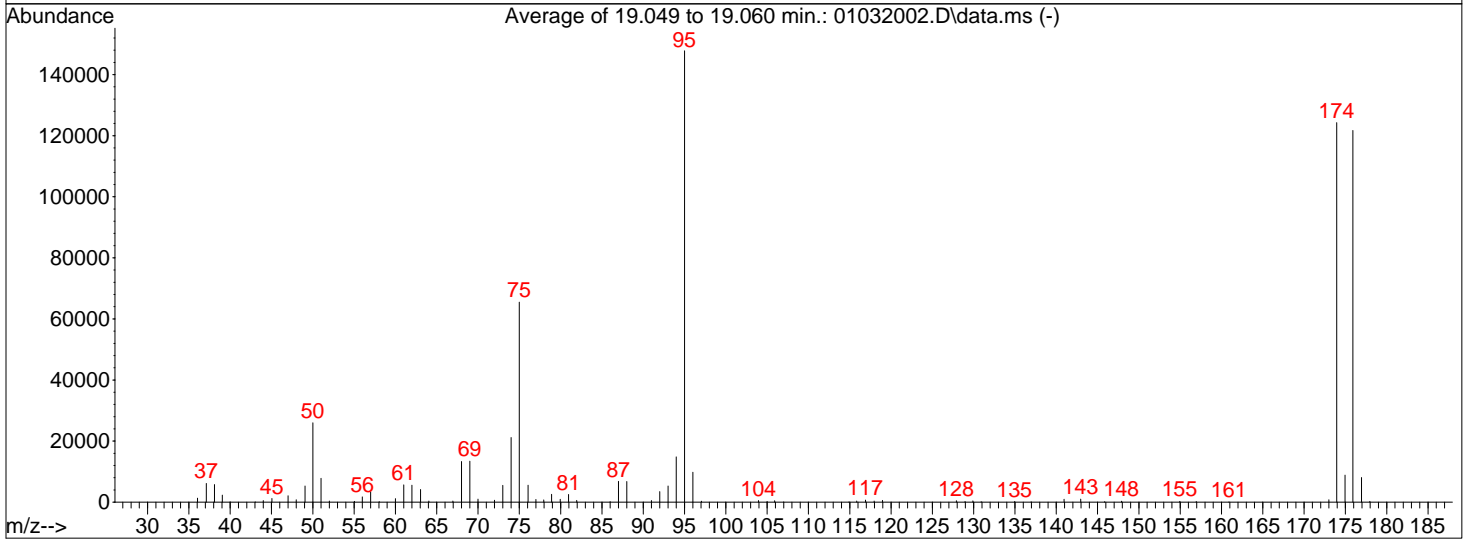
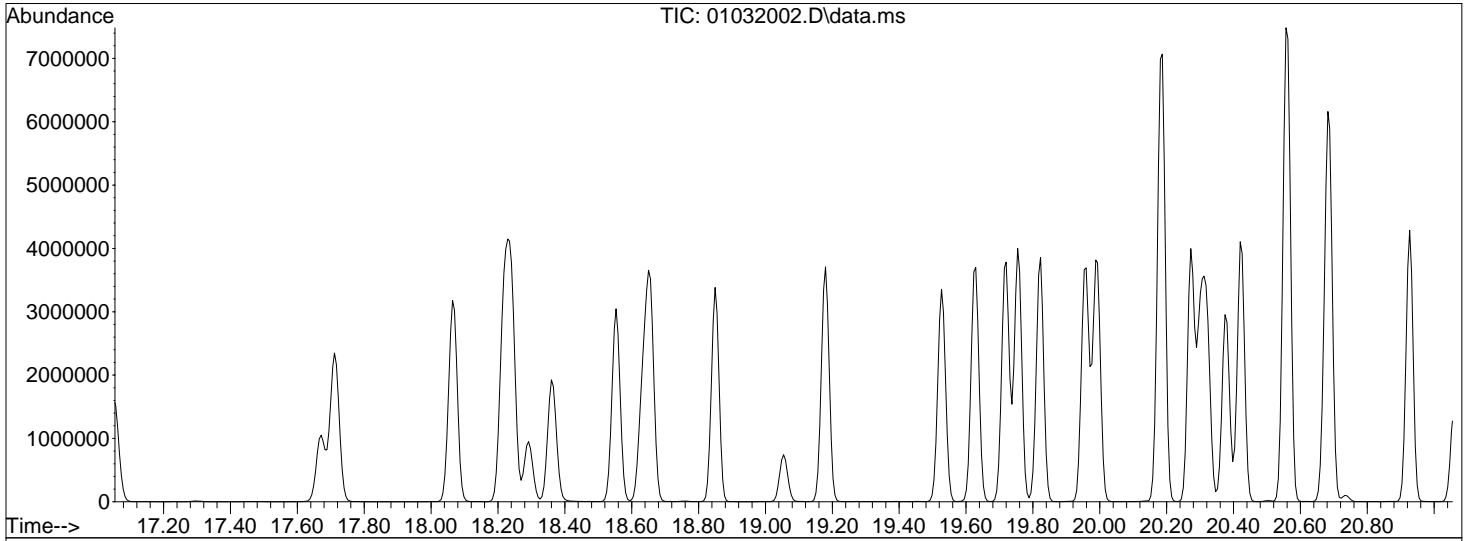
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	21.9	18733	PASS
75	95	30	66	51.3	43965	PASS
95	95	100	100	100.0	85715	PASS
96	95	5	9	6.8	5822	PASS
173	174	0.00	2	0.9	576	PASS
174	95	50	120	78.9	67648	PASS
175	174	4	9	7.5	5076	PASS
176	174	93	101	96.6	65363	PASS
177	176	5	9	6.5	4272	PASS

WA 11/8/19

Data Path : I:\MS13\DATA\2020 01\03\
 Data File : 01032002.D
 Acq On : 3 Jan 2020 2:04
 Operator : TD
 Sample : CCV R13010320 25ng
 Misc : S31-10251901/S31-12061901
 ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS13\METHODS\R13110119.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Sat Nov 02 09:55:49 2019



AutoFind: Scans 2711, 2712, 2713; Background Corrected with Scan 2704

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	17.6	26013	PASS
75	95	30	66	44.3	65509	PASS
95	95	100	100	100.0	147797	PASS
96	95	5	9	6.6	9804	PASS
173	174	0.00	2	0.6	805	PASS
174	95	50	120	84.1	124256	PASS
175	174	4	9	7.1	8839	PASS
176	174	93	101	97.9	121688	PASS
177	176	5	9	6.6	8084	PASS

TD 1/3/20

Injection Log

Directory: J:\MS13\DATA\2019_11\01\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
15	11/1/19 17:40	11011915.D	BFB Std	S31-10251901	WA	2	Pass
16	11/1/19 18:13	11011916.D	0.1ng R13110119 ICAL Std	S31-10251901/S31-10301907 (11/28)	WA	10	
17	11/1/19 18:46	11011917.D	0.2ng R13110119 ICAL Std	S31-10251901/S31-10301907 (11/28)	WA	10	
18	11/1/19 19:19	11011918.D	0.5ng R13110119 ICAL Std	S31-10251901/S31-10301907 (11/28)	WA	10	rerun
19	11/1/19 19:52	11011919.D	1.0ng R13110119 ICAL Std	S31-10251901/S31-10301905 (11/28)	WA	11	
20	11/1/19 20:25	11011920.D	5.0ng R13110119 ICAL Std	S31-10251901/S31-10301905 (11/28)	WA	11	
21	11/1/19 20:59	11011921.D	25ng R13110119 ICAL Std	S31-10251901/S31-10301902 (11/28)	WA	12	
22	11/1/19 21:32	11011922.D	50ng R13110119 ICAL Std	S31-10251901/S31-10301902 (11/28)	WA	12	
23	11/1/19 22:05	11011923.D	100ng R13110119 ICAL Std	S31-10251901/S31-10301902 (11/28)	WA	12	
24	11/1/19 22:38	11011924.D	Blank	S31-10251901	WA	2	
25	11/1/19 23:11	11011925.D	25ng R131101 ICV	S31-10251901/S31-10141905 (11/12)	WA	15	not used
26	11/1/19 23:44	11011926.D	25ng R131101 ICV	S31-10251901/S31-10241901 (11/22)	WA	2	not used
27	11/2/19 7:45	11011927.D	Blank	S31-10251901	WA	2	
28	11/2/19 8:18	11011928.D	0.5ng R13110119 ICAL Std	S31-10251901/S31-10301907 (11/28)	WA	10	
29	11/2/19 8:51	11011929.D	Std check	S31-10251901/S31-10301905 (11/28)	WA	11	
30	11/2/19 9:28	11011930.D	25ng R1311019 ICV	S31-10251901/S31-10141905 (11/12)	WA	15	Pass all cmpds
<i>R13110119.M : ranges from 0.1ng --> 100ng; except: chloromethane, hexachlorobutadiene: 0.1ng --> 50ng; bromoform, 1,2,4-TMB, p-Cymene, 1,2,3-TMB, 1,2-DCB, d-Limonene, 1,2-DBCP, 1,2,4-TCB, Naphthalene, n-Butylbenzene: from 0.5ng --> 100ng; benzyl-ci: 1ng -->100ng</i>							
%RSD for bromoform and d-Limonene > 30%							

Injection Log

TD 1/4/20

Directory: I:\MS13\DATA\2020_01\03\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	1/3/20 1:31	01032001.D	System	S31-10251901/S31-12061901	TD	2	
2	1/3/20 2:04	01032002.D	CCV R13010320_25ng	S31-10251901/S31-12061901	TD	2	passed
3	1/3/20 2:38	01032003.D	CCV C13010320_5.0ng	S31-10251901/S31-12111906	TD	16	not using
4	1/3/20 3:11	01032005.D	MB R13010320_1000mL	S31-10251901/AC00880	TD	2	passed
5	1/3/20 3:44	01032006.D	LCS R13010320_25ng	S31-10251901/S31-12061905	TD	2	passed
6	1/3/20 4:18	01032007.D	LCSD R13010320_25ng	S31-10251901/S31-12061905	TD	2	passed
7	1/3/20 9:09	01032008.D	P1907782-001 (1000mL)	S31-10251901	TD	14	
8	1/3/20 9:42	01032009.D	P1907782-002 (1000mL)	S31-10251901	TD	15	
9	1/3/20 10:15	01032010.D	P1907790-001 (17.9mL)	S31-10251901	TD	11	
10	1/3/20 10:48	01032011.D	P1907790-003 (17.8mL)	S31-10251901	TD	12	
11	1/3/20 11:32	01032012.D	P1907688-001 (5.0mL)	S31-10251901	TD	3	
12	1/3/20 12:32	01032013.D	P1907777-001 (5.0mL)	S31-10251901	TD	3	
13	1/3/20 13:05	01032014.D	P1907777-002 (5.0mL)	S31-10251901	TD	3	
14	1/3/20 13:38	01032015.D	P1907787-001 (400mL)	S31-10251901	TD	7	
15	1/3/20 14:11	01032016.D	P1907787-002 (400mL)	S31-10251901	TD	8	
16	1/3/20 14:45	01032017.D	P1907787-003 (400mL)	S31-10251901	TD	9	
17	1/3/20 15:18	01032018.D	P1907787-004 (400mL)	S31-10251901	TD	10	
18	1/3/20 15:51	01032019.D	P1907787-005 (400mL)	S31-10251901	TD	11	
19	1/3/20 16:54	01032020.D	P1907787-006 (400mL)	S31-10251901	TD	12	
20	1/3/20 17:27	01032021.D	P1907787-007 (400mL)	S31-10251901	TD	13	
21	1/3/20 18:00	01032022.D	P1907787-008 (400mL)	S31-10251901	TD	14	
22	1/3/20 18:34	01032023.D	P1907740-001 (1000mL)	S31-10251901	TD	15	
23	1/3/20 19:07	01032024.D	P1907740-001dup (1000mL)	S31-10251901	TD	15	passed
24	1/3/20 19:40	01032025.D	P1907740-002 (1000mL)	S31-10251901	TD	1	
25	1/3/20 20:14	01032026.D	P1907740-003 (1000mL)	S31-10251901	TD	4	
26	1/3/20 20:47	01032027.D	P1907777-003 (1000mL)	S31-10251901	TD	5	
27	1/3/20 21:21	01032028.D	P1907777-004 (1000mL)	S31-10251901	TD	6	
28	1/3/20 21:54	01032029.D	P1907777-004dil (100mL)	S31-10251901	TD	6	
29	1/3/20 22:27	01032030.D	Blank	S31-10251901	TD	3	

File 0103204.D skipped in injection log

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GWTP QUARTERLY EVALUATION REPORT – 4TH QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

APPENDIX I
PROTOCOL FOR DISCHARGING GWTP EFFLUENT

GWTP QUARTERLY EVALUATION REPORT —4TH QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

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MEMORANDUM

DATE: August 28, 2017

PROJECT NAME: Remediation of Multiple Sites, Longhorn Army Ammunition Plant, Karnack, TX

TO: Richard Mayer Senior Project Engineer
US Environmental Protection Agency
Federal Facilities Section (6PD-F)

April Palmie Project and Grant Manager
Superfund Section, Remediation Division
Texas Commission on Environmental Quality

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

SUBJECT: **Protocol for Discharging GWTP Effluent
Longhorn Army Ammunition Plant, Karnack, TX
(Contract: W912DY-09-D-0059, Task Order DS01)**

INTRODUCTION

The purpose of this memo is to document the protocol for discharging Longhorn Army Ammunition Plant groundwater treatment plant (GWTP) effluent to Harrison Bayou, the INF-Pond, or LHAAP-18/24.

The GWTP is designed to:

- Extract groundwater from LHAAP-18/24 and LHAAP-16 for hydraulic control;
- Remove metals by pH adjustment, polymer addition, and gravity separation;
- Remove volatile organic compounds (VOCs) by air stripping;
- Remove perchlorate in a fluidized bed reactor (FBR) and an ion exchange scavenger system; and
- Discharge the effluent continuously.

DISCHARGE CRITERIA

The discharge criteria established for discharge to Harrison Bayou are:

Parameter	Discharge Criteria (µg/L)	
	Daily Average	Daily Maximum
Volatiles		
1,1,1-Trichloroethane	3,417	7,230
1,1,2-Trichloroethane	102.5	216.9
1,1-Dichloroethane	6,633	14,032
1,1-Dichloroethene	119	253
1,2-Dichloroethane	85	181
Acetone	1,132	2,395
Benzene	85	181
Carbon Tetrachloride	85	181
Chlorobenzene	22,300	47,180
Chloroform	1,708	3,615
Ethylbenzene	26,954	57,025
Xylenes	39.5	83.6
Methylene Chloride	803	1,699
Styrene	2,829	5,987
Tetrachloroethene	85.4	180.7
Toluene	1,980	4,189
Trichloroethene	85	181
Vinyl Chloride	34	72
Anions		
Chloride	*	*
Sulfate	*	*
Perchlorate**	278	589
Metals		
Aluminum	777	1,644
Arsenic	365	772
Barium	1,000	2,000
Cadmium	1.6	3.4
Chromium, Total	355	752
Chromium, Hexavalent	58	124
Cobalt	5,433	11,495
Iron	1,132	2,395
Lead	2.2	4.6
Nickel	87	184
Manganese	7,323	15,494
Silver	1.4	3
Selenium	5.7	12
Vanadium	1,698	3,592
Zinc	146	310
Other		
Hexachlorobenzene	0.22	0.47
1,4-Dioxane		134.2
Oil and Grease		15
Chemical Oxygen Demand		200

* - Based upon flow in Harrison Bayou

** - Discharge criteria, when diverted to the INF Pond, is 17 µg/L

PROTOCOL FOR DISCHARGING GWTP EFFLUENT

In accordance with the *Sampling and Analysis Plan, Groundwater Treatment Plant and Well Fields* (SAP) Table 2-2, indicator parameters for the FBR, such as temperature, pH and oxidation reduction potential (ORP), are monitored in real time to predict FBR performance and perchlorate removal. Based upon these indicator parameters, the operator of the GWTP can make adjustments such as:

- Bring the ion exchange system online;
- Increase or decrease the addition rate of electron donor (acetic acid);
- Increase or decrease the nutrient addition rate (urea or phosphoric acid); or
- Increase or decrease the FBR recirculation rate

Samples of the GWTP effluent are collected weekly, analyzed for perchlorate, nutrients (ammonia-nitrogen and ortho-phosphate), total organic carbon (TOC), chloride, and sulfate, with the results received from the laboratory 14 days later. Other parameters (e.g. Record of Decision metals and volatiles) are collected and analyzed in GWTP effluent samples according to the frequencies listed in Table 2-1 of the SAP.

As shown in Figure 1, groundwater is continuously extracted, treated, and discharged. If Harrison Bayou is flowing and indicator parameters are within their historical optimal ranges, then the ion exchange vessels can be bypassed and the GWTP effluent sample will be collected after the FBR. If Harrison Bayou is not flowing or the indicator parameters are not within historical optimal ranges, then the ion exchange vessels will be put on line, and the GWTP effluent sample will be collected between the lead and lag ion exchange vessel. Professional judgement may also be used as to when to bring the ion exchange vessels online, such as after a power outage or during anticipated cold temperatures when the FBR has historically not performed optimally.

If a parameter is measured in the effluent at a concentration above the discharge criteria, then a confirmation sample and an effluent sample after the lag ion exchange vessel will be collected and analyzed for the parameter with a 24-hour turnaround time. Corrective measures (e.g. increased nutrient or electron donor addition rates, bring ion exchange vessels on line) will be implemented as appropriate to bring the parameter back within the discharge criteria. ***If an upset condition in the FBR leads to high concentrations of perchlorate going into the lead ion exchange vessel and breaking through at the sample location between the vessels, the lag vessel will still remove perchlorate before it is discharged to Harrison Bayou, the INF Pond, or LHAAP-18/24.*** It is estimated that the lag ion exchange vessel can remove all of the perchlorate from two weeks of typical groundwater extraction at a concentration of 920 µg/L. If the residual perchlorate concentration after the FBR and lead ion exchange vessel is only 600 µg/L, the lag ion exchange vessel could last almost 2.5 years before perchlorate would be detected in the discharged effluent.

If a parameter exceeds the discharge criteria by more than 40% (see Appendix A-2, SAP, Section 7c of Monitoring and Reporting Requirements) or reaches 920 µg/L of perchlorate, then the GWTP will be put into full recycle mode (no discharge) until the parameter is below the discharge criteria again. Appendix A-2 of the SAP requires GWTP data to be provided to TCEQ monthly including a list of noncompliance(s), if applicable.

Discharge to Harrison Bayou

As shown in Figure 1, the GWTP effluent will be discharged to Harrison Bayou as long as it has a measurable flow. The flowrate in Harrison Bayou is estimated by measuring the height of water with a staff gauge and velocity in feet/sec at intervals along the width as described in the Installation-Wide Work Plan, Standard Operating Procedures, Attachment 18 – Water Depth and Velocity Measurements (AECOM, July 2014).

The allowable flow rate of GWTP effluent that can be discharged to Harrison Bayou is given by:

$$Q_E \leq \frac{Q_S (C_C - C_A)}{(C_E - C_C)}$$

where Q_E = GWTP effluent flow Q_S = Harrison Bayou flow

C_C = Criteria concentration (100 mg/L for chloride, 50 mg/L for sulfate)

C_A = Ambient concentration = 10 mg/L

C_E = Chloride or sulfate concentration in GWTP effluent

The allowable GWTP effluent flow will be the lower of the calculated values given the measured concentrations of chloride and sulfate in the discharge stream. For each day that GWTP effluent is discharged to Harrison Bayou, the measured Harrison Bayou flow, the allowable effluent flow, and the actual effluent flow are recorded.

Discharge to INF Pond

If Harrison Bayou is not flowing, then GWTP effluent will be discharged to the Intermediate-Range Nuclear Forces (INF) Pond for temporary storage until Harrison Bayou flow resumes. Perchlorate concentration detected in the effluent must be 17 µg/L or less, when this occurs.

The INF Pond has a flexible membrane liner protected by a soil cover with a gravity discharge pipe (and valve) to Harrison Bayou. The INF Pond has a nominal capacity of 3 million gallons with a staff gage to measure the height of water stored in the pond. The GWTP operator maintains the INF Pond by visually inspecting for erosion, vegetative growth including tree growth along the anchor trench, and liner integrity and making necessary repairs. Periodically, accumulated debris must be removed from the influent and effluent piping to the INF Pond.

Prior to discharging to the INF Pond, a lead and lag ion exchange vessel will be brought online. The GWTP Operator will also confirm that the discharge valve is closed, will record the reading on the effluent totalizer, and will record the height of water using the staff gage. The GWTP Operator will then configure valves and pumps to direct GWTP effluent to the INF Pond. The height of water in the INF Pond and totalizer reading will be recorded at the beginning and end of each shift for the duration of active discharge. When the height of water in the pond reaches 3 feet below the height of the berm (freeboard), the GWTP Operator will stop discharging to the INF Pond and TCEQ will be notified. After the TCEQ acknowledges the INF Pond level, GWTP effluent may be discharged to the INF Pond again until 2 feet of freeboard is reached. The GWTP Operator will stop discharging to the INF Pond and TCEQ will be notified again. After the TCEQ acknowledges 2 feet of freeboard in the INF Pond, GWTP effluent may be discharged again until 1 foot of freeboard remains. No additional GWTP effluent can be accepted at the INF Pond until greater than 1 foot of freeboard is measured.

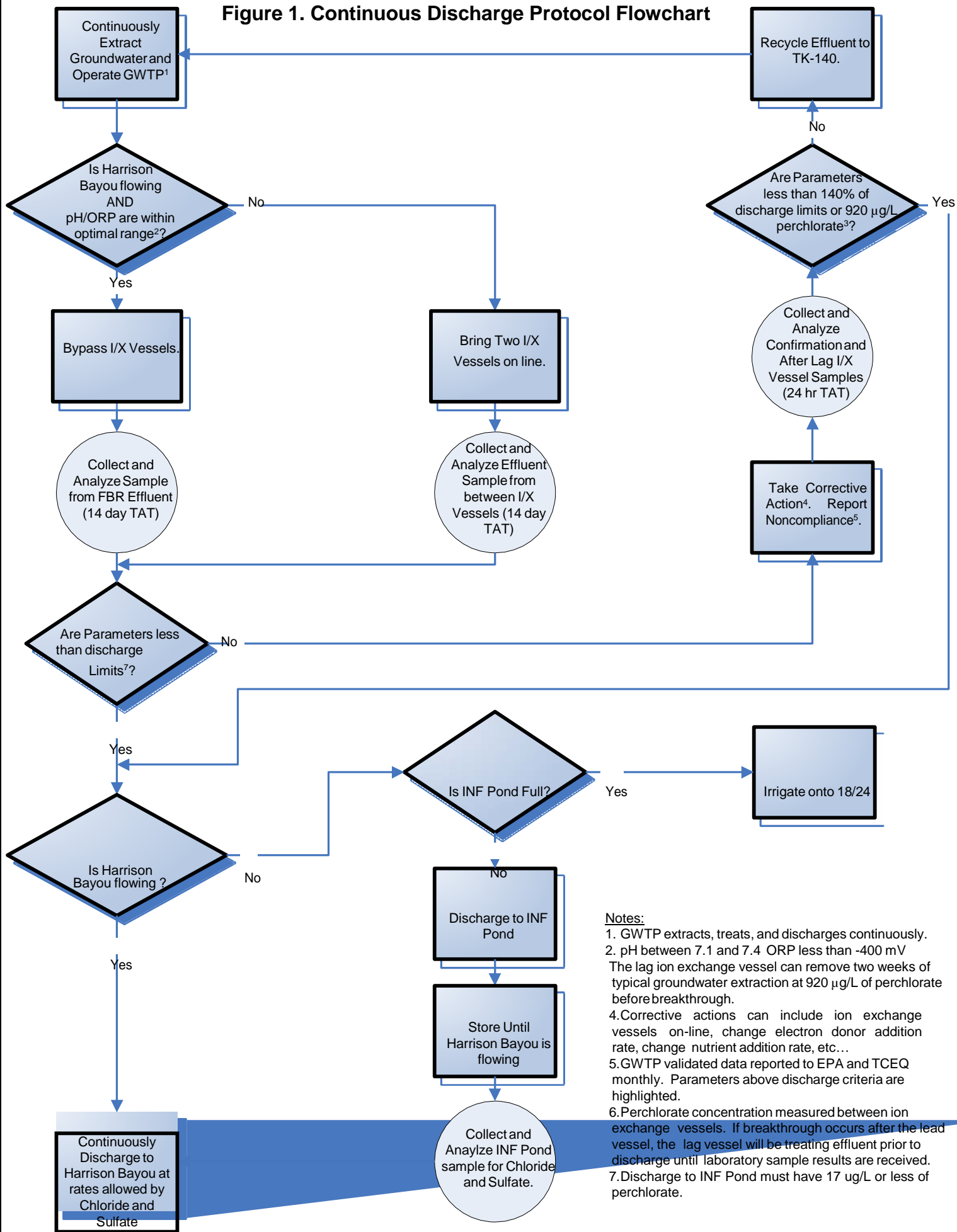
As soon as flow in Harrison Bayou returns, stored GWTP effluent from the INF Pond will be discharged. As with direct discharges from the GWTP to Harrison Bayou, the allowable flowrate of effluent from the INF Pond is calculated based upon the chloride and sulfate concentrations in the pond and the flow in Harrison Bayou. If effluent from the INF Pond and the GWTP are discharged simultaneously, total flow of both streams together should not exceed the calculated discharge level for either discharge location. For each day that INF Pond contents are discharged to Harrison Bayou, the measured Harrison Bayou flow, the allowable effluent flow, and the actual effluent flow are recorded.

Irrigation onto LHAAP-18/24

If Harrison Bayou is not flowing and the INF Pond has less than 1 foot of freeboard, then GWTP effluent will be irrigated onto LHAAP-18/24 using one of the three main sprinkler lines. To avoid pooling and runoff of irrigation water, only one line will be used for half a day at a time, with a separate line being used the second half of the day. If needed, the irrigation will occur 5 days a week for 8 hours each day (using 3 sprinklers in each line). If conditions are wet due to rain events, irrigation will not be conducted to avoid ponding and potential runoff, the GWTP will be put into recycle mode, and groundwater extraction will be interrupted if storage space is not available.

While irrigating, site inspections will be performed to ensure pooling and runoff are not occurring. During the irrigation activities, inspections will be performed twice a day, once approximately three hours and again approximately six hours into the 8-hour irrigation shift. The system will be inspected to ensure that the sprinkler heads are operating properly and not leaking large amounts of water. If ponding or runoff is observed, irrigation at that sprinkler line will cease, and irrigation at another sprinkler line will be started if possible. Volumes of GWTP effluent and twice daily inspections will be recorded daily and reported monthly until flow resumes in Harrison Bayou or greater than 1 foot of freeboard is available in the INF Pond.

Figure 1. Continuous Discharge Protocol Flowchart



- Notes:**
1. GWTP extracts, treats, and discharges continuously.
 2. pH between 7.1 and 7.4 ORP less than -400 mV The lag ion exchange vessel can remove two weeks of typical groundwater extraction at 920 µg/L of perchlorate before breakthrough.
 4. Corrective actions can include ion exchange vessels on-line, change electron donor addition rate, change nutrient addition rate, etc...
 5. GWTP validated data reported to EPA and TCEQ monthly. Parameters above discharge criteria are highlighted.
 6. Perchlorate concentration measured between ion exchange vessels. If breakthrough occurs after the lead vessel, the lag vessel will be treating effluent prior to discharge until laboratory sample results are received.
 7. Discharge to INF Pond must have 17 ug/L or less of perchlorate.

GWTP QUARTERLY EVALUATION REPORT – 4TH QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

APPENDIX J
AIR DATA TABLES, PID READINGS, AND CALIBRATION LOGS

GWTP QUARTERLY EVALUATION REPORT —4TH QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

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Appendix J Table 1. Ambient Air Data - December 2019
Longhorn Army Ammunition Plant
Groundwater Treatment Plant

Pollutant	CAS #	Short Term ESL	AMCVs	GWTP Ambient Air Concentrations (1)	Status (3)	Downwind Ambient Air Concentrations	Status (3)
		March 2012	(ST Health)			(2)	
		$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$		$\mu\text{g}/\text{m}^3$	
1,1-Dichloroethane	75-34-3	4,000	4,047	0.65	U PASS	0.72	U PASS
1,1-Dichloroethene	75-35-4	210	714	0.64	U PASS	0.71	U PASS
1,2-Dichloroethane	107-06-2	160	162	0.64	U PASS	0.71	U PASS
Acetone	67-64-1	5,900	NA	12.0	PASS	150.0	PASS
Benzene	71-43-2	170	575	1.10	PASS	3.6	PASS
Carbon disulfide	75-15-0	30	NA	1.3	U PASS	1.4	U PASS
Chloroform	67-66-3	100	98	0.64	U PASS	0.71	U PASS
cis-1,2-Dichloroethene	156-59-2	7,900	NA	5.4	PASS	3.90	PASS
Methylene chloride	75-09-2	3,600	12,158	0.89	PASS	0.85	PASS
Tetrachloroethene	127-18-4	2,000	6,782	0.62	U PASS	0.68	U PASS
trans-1,2-Dichloroethene	156-60-5	7,900	NA	0.64	U PASS	0.71	U PASS
Trichloroethene	79-01-6	540	537	8.1	PASS	5.70	PASS
Vinyl chloride	75-01-4	20,000	66,460	0.64	U PASS	0.71	U PASS
n-Hexane	110-54-3	5,300	6,336	2.40	PASS	14.00	PASS
Styrene	100-42-5	110	21,725	0.63	U PASS	0.77	PASS
Toluene	108-88-3	640	15,074	1.8	PASS	18.0	PASS
Ethylbenzene	100-41-4	740	86,844	0.64	U PASS	2.80	PASS
m,p-Xylenes	179601-23-1	180	7,382	1.3	U PASS	9.0	PASS
o-Xylene	95-47-6	1,600	7,382	0.64	U PASS	3.10	PASS
1,3-Dichlorobenzene	541-73-1	720	NA	0.64	U PASS	0.71	U PASS
Propene (C3 H6)	115-07-1	Asphyxiant	Asphyxiant	8.90	NA	110	NA
Dichlorodifluoromethane (CFC 12)	75-71-8	50,000	49,452	2.3	PASS	2.5	PASS
Ethanol	64-17-5	18,800	NA	15.0	PASS	180.0	PASS
Trichlorofluoromethane (CFC 11)	75-69-4	28,000	56,184	1.4	PASS	3.0	PASS
Trichlorotrifluoroethane (CFC 113)	76-13-1	38,000	NA	13	PASS	8.5	PASS
alpha-Pinene	80-56-8	60	3,499	2.40	PASS	2.40	PASS
d-Limonene	5989-27-5	1,100	NA	0.64	U PASS	1.50	PASS

Notes:

(1) Sample collected over an 8-hour period on December 16, 2019, between 8 AM and 4 PM

(2) Sample collected over a 24-hour period beginning on December 16, 2019, at 6:30 AM and ending on December 17, 2019 at 6:30 AM

(3) Status based on comparison of air sample result to Air Monitoring Comparison Values (AMCVs). When there is no AMCV value for a chemical, the air sample concentration is compared to the short-term Effects Screening Level (ESL).

CAS # = Chemical Abstracts Service Number

GWTP = Groundwater Treatment Plant

U = non-detect

$\mu\text{g}/\text{m}^3$ = micrograms per cubic meter

Appendix J Table 2. Emission Stack Air Data - December 2019
Longhorn Army Ammunition Plant
Groundwater Treatment Plant

Pollutant	CAS #	Measured Air Stripper Stack Concentrations (1)		Air Stripper Emission Rates (2)		Air Stripper Emission Rates (2a)		Allowable Annual Emission (3)		Status (4)	TLV (L)	TLV Reference	Compliance section	Distance Downwind to nearest off-site Receptor (D)	(K) conversion value	Allowable Maximum Hourly Emission Limit at Nearest off-site Receptor ⁽⁶⁾⁽⁷⁾ (E) = L/K	Status (8)
		$\mu\text{g}/\text{m}^3$	U	lb/hr	U	tpy	U	tpy	mg/ m^3								
1,1-Dichloroethane	75-34-3	140	U	1.15E-03	U	7.46E-04	U	5	PASS		405	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
1,1-Dichloroethene	75-35-4	320		5.25E-03		3.41E-03		5	PASS		20	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.4	PASS
1,2-Dichloroethane	107-06-2	190		3.12E-03		2.02E-03		5	PASS		40	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	2.9	PASS
Acetone	67-64-1	1,700		2.79E-02		1.81E-02		5	PASS		590	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Benzene	71-43-2	130	U	1.07E-03	U	6.93E-04	U	5	PASS		3	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	0.21	PASS
Carbon disulfide	75-15-0	940		1.54E-02		1.00E-02		5	PASS		31	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	2.2	PASS
Chloroform	67-66-3	140	U	1.15E-03	U	7.46E-04	U	5	PASS		10	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	0.71	PASS
cis-1,2-Dichloroethene	156-59-2	17,000		2.79E-01		1.81E-01		5	PASS		793	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Methylene chloride	75-09-2	3,700		6.07E-02		3.94E-02		5	PASS		26	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.9	PASS
Tetrachloroethene	127-18-4	240		3.93E-03		2.56E-03		5	PASS		33.5	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	2.4	PASS
trans-1,2-Dichloroethene	156-60-5	140	U	1.15E-03	U	7.46E-04	U	5	PASS		793	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Trichloroethene	79-01-6	25,000		4.10E-01		2.66E-01		5	PASS		135	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	6.0	PASS
Vinyl chloride	75-01-4	650		1.07E-02		6.93E-03		5	PASS		2	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	0.14	PASS
n-Hexane	110-54-3	140	U	1.15E-03	U	7.46E-04	U	5	PASS		1,800	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Styrene	100-42-5	130	U	1.07E-03	U	6.93E-04	U	5	PASS		21	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.5	PASS
Toluene	108-88-3	140	U	1.15E-03	U	7.46E-04	U	5	PASS		188	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	6.0	PASS
Ethylbenzene	100-41-4	140	U	1.15E-03	U	7.46E-04	U	5	PASS		434	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
m,p-Xylenes	179601-23-1	280	U	2.30E-03	U	1.49E-03	U	5	PASS		434	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
o-Xylene	95-47-6	140	U	1.15E-03	U	7.46E-04	U	5	PASS		434	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
1,3-Dichlorobenzene	541-73-1	140	U	1.15E-03	U	7.46E-04	U	5	PASS		(5)	--	30 TAC 106.533(f)(1)(A)(i)	2,000	14	1.0	PASS
Propene (C3 H6)	115-07-1	130	U	1.07E-03	U	6.93E-04	U	5	PASS		(5)	--	30 TAC 106.533(f)(1)(A)(i)	2,000	14	6.0	PASS
Dichlorodifluoromethane (CFC 12)	75-71-8	130	U	1.07E-03	U	6.93E-04	U	5	PASS		4,950	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Ethanol	64-17-5	1,300	U	1.07E-02	U	6.93E-03	U	5	PASS		1,880	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Trichlorofluoromethane (CFC 11)	75-69-4	130	U	1.07E-03	U	6.93E-04	U	5	PASS		5,620	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Trichlorotrifluoroethane (CFC 113)	76-13-1	24,000		3.93E-01		2.56E-01		5	PASS		7,670	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
alpha-Pinene	80-56-8	140	U	1.15E-03	U	7.46E-04	U	5	PASS		(5)	--	30 TAC 106.533(f)(1)(A)(i)	2,000	14	1.0	PASS
d-Limonene	5989-27-5	140	U	1.15E-03	U	7.46E-04	U	5	PASS		(5)	--	30 TAC 106.533(f)(1)(A)(i)	2,000	14	1.0	PASS
TOTAL				1.239													

Notes:

- (1) Sample collected on December 16, 2019. The higher value of the sample or duplicate is reported.
- (2) Based on a blower flow rate of 4,390 cubic feet per minute (cfm). Note that plant operations is less than or equal to 25 hours per week. 1/2 of detection limit was used for estimating mass rate
- (2a) Based on operation of 25 hours per week, 52 weeks per year.
- (3) Per 30TAC 106.533(f)(1)(B)
- (4) Based on comparing the calculated air stripper stack sample emission rate in tons per year (tpy) to the allowable annual emission limit per chemical of 5 tpy.
- (5) No Threshold Limit Values (TLVs) for these chemicals
- (6) The maximum hourly limit allowed by 30 Texas Administrative Code (TAC) 106.262, per pollutant, is 6 pounds per hour (lb/hr) per "Figure 1: 30 TAC 106.262(a)". The E value was overridden with 6 lb/hr when the calculated E was higher.
- (7) The maximum hourly emission rate allowed by 30 TAC 106.261(a)(3) for chemicals with a limit value (L) greater than 200 mg/m³ is 1 lb/hr.
- (8) Based on comparing the calculated air stripper stack sample emission rate in lb/hr to the allowable maximum emission limit per chemical based on distance downwind to nearest off-site receptor.

CAS # = Chemical Abstracts Service Number

mg/m³ = milligrams per cubic meter $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter

U = non-detect

Appendix J Table 3. PID Readings - 4th Quarter 2019Longhorn Army Ammunition Plant
Groundwater Treatment Plant

<u>Date</u>	<u>Time</u>	<u>Location</u>	<u>Air Flow Rate at Blower</u>	<u>Instrument ID</u>	<u>Person Collecting</u>	<u>PID Reading</u>	<u>Weather Conditions</u>
10/3/2019	8:00	Outside GWTP Office	3770 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 71°F
10/3/2019	8:00	Downwind	3770 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 71°F
10/3/2019	8:00	Stripper	3770 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.3 ppm Steady State 7.1 ppm	Clear 71°F
10/3/2019	13:00	Outside GWTP Office	3432 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 90°F
10/3/2019	13:00	Downwind	3432 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 90°F
10/3/2019	13:00	Stripper	3432 ACFM	MiniRAE 3000	Kennie Moore	Max. 20.7 ppm Steady State 5.9 ppm	Clear 90°F
10/7/2019	8:00	Outside GWTP Office	3450 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 61°F
10/7/2019	8:00	Downwind	3450 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 61°F
10/7/2019	8:00	Stripper	3450 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.9 ppm Steady State 6.5 ppm	Clear 61°F
11/19/2019	8:00	Outside GWTP Office	3107 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 39°F
11/19/2019	8:00	Downwind	3107 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 39°F
11/19/2019	8:00	Stripper	3107 ACFM	MiniRAE 3000	Kennie Moore	Max. 24.1 ppm Steady State 8.9 ppm	Clear 39°F
11/19/2019	14:00	Outside GWTP Office	3090 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 77°F
11/19/2019	14:00	Downwind	3090 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 77°F
11/19/2019	14:00	Stripper	3090 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.2 ppm Steady State 7.8 ppm	Clear 77°F
11/21/2019	8:00	Outside GWTP Office	3110 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 63°F
11/21/2019	8:00	Downwind	3110 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 63°F
11/21/2019	8:00	Stripper	3110 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.6 ppm Steady State 6.2 ppm	Clear 63°F
11/21/2019	12:30	Outside GWTP Office	3025 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 72°F
11/21/2019	12:30	Downwind	3025 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 72°F
11/21/2019	12:30	Stripper	3025 ACFM	MiniRAE 3000	Kennie Moore	Max. 20.3 ppm Steady State 5.8 ppm	Clear 72°F
11/26/2019	8:00	Outside GWTP Office	3117 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 70°F
11/26/2019	8:00	Downwind	3117 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 70°F
11/26/2019	8:00	Stripper	3117 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.9 ppm Steady State 7.3 ppm	Clear 70°F
11/26/2019	14:00	Outside GWTP Office	3055 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 76°F
11/26/2019	14:00	Downwind	3055 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 76°F
11/26/2019	14:00	Stripper	3055 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.0 ppm Steady State 7.1 ppm	Clear 76°F
12/2/2019	8:00	Outside GWTP Office	3148 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 38°F
12/2/2019	8:00	Downwind	3148 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 38°F
12/2/2019	8:00	Stripper	3148 ACFM	MiniRAE 3000	Kennie Moore	Max. 24.1 ppm Steady State 8.7 ppm	Clear 38°F
12/2/2019	14:00	Outside GWTP Office	3076 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 59°F
12/2/2019	14:00	Downwind	3076 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 59°F
12/2/2019	14:00	Stripper	3076 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.7 ppm Steady State 6.3 ppm	Clear 59°F
12/12/2019	8:00	Outside GWTP Office	4105 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 28°F
12/12/2019	8:00	Downwind	4105 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 28°F
12/12/2019	8:00	Stripper	4105 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.3 ppm Steady State 7.6 ppm	Clear 28°F
12/12/2019	14:00	Outside GWTP Office	3890 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 55°F
12/12/2019	14:00	Downwind	3890 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 55°F
12/12/2019	14:00	Stripper	3890 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.2 ppm Steady State 6.3 ppm	Clear 55°F
12/16/2019	8:00	Outside GWTP Office	3862 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 57°F
12/16/2019	8:00	Downwind	3862 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 57°F
12/16/2019	8:00	Stripper	3862 ACFM	MiniRAE 3000	Kennie Moore	Max. 24.3 ppm Steady State 7.9 ppm	Clear 57°F

Appendix J Table 3. PID Readings - 4th Quarter 2019Longhorn Army Ammunition Plant
Groundwater Treatment Plant

<u>Date</u>	<u>Time</u>	<u>Location</u>	<u>Air Flow Rate at Blower</u>	<u>Instrument ID</u>	<u>Person Collecting</u>	<u>PID Reading</u>	<u>Weather Conditions</u>
12/16/2019	14:00	Outside GWTP Office	3747 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 48°F
12/16/2019	14:00	Downwind	3747 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 48°F
12/16/2019	14:00	Stripper	3747 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.9 ppm Steady State 5.8 ppm	Clear 48°F
12/19/2019	8:00	Outside GWTP Office	4120 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 34°F
12/19/2019	8:00	Downwind	4120 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 34°F
12/19/2019	8:00	Stripper	4120 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.9 ppm Steady State 7.3 ppm	Clear 34°F
12/19/2019	13:00	Outside GWTP Office	3810 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 58°F
12/19/2019	13:00	Downwind	3810 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 58°F
12/19/2019	13:00	Stripper	3810 ACFM	MiniRAE 3000	Kennie Moore	Max. 20.4 ppm Steady State 5.8 ppm	Clear 58°F
12/23/2019	8:00	Outside GWTP Office	4015 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 36°F
12/23/2019	8:00	Downwind	4015 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 36°F
12/23/2019	8:00	Stripper	4015 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.2 ppm Steady State 6.9 ppm	Clear 36°F
12/23/2019	14:00	Outside GWTP Office	3654 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 68°F
12/23/2019	14:00	Downwind	3654 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 68°F
12/23/2019	14:00	Stripper	3654 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.3 ppm Steady State 6.2 ppm	Clear 68°F
12/26/2019	8:00	Outside GWTP Office	3961 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 44°F
12/26/2019	8:00	Downwind	3961 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 44°F
12/26/2019	8:00	Stripper	3961 ACFM	MiniRAE 3000	Kennie Moore	Max. 24.5 ppm Steady State 8.1 ppm	Clear 44°F
12/26/2019	13:00	Outside GWTP Office	3665 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 69°F
12/26/2019	13:00	Downwind	3665 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 69°F
12/26/2019	13:00	Stripper	3665 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.0 ppm Steady State 7.5 ppm	Clear 69°F
12/30/2019	8:00	Outside GWTP Office	3851 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 40°F
12/30/2019	8:00	Downwind	3851 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 40°F
12/30/2019	8:00	Stripper	3851 ACFM	MiniRAE 3000	Kennie Moore	Max. 24.3 ppm Steady State 8.5 ppm	Clear 40°F
12/30/2019	14:00	Outside GWTP Office	3767 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 54°F
12/30/2019	14:00	Downwind	3767 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 54°F
12/30/2019	14:00	Stripper	3767 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.1 ppm Steady State 6.8 ppm	Clear 54°F

EQUIPMENT CALIBRATION DAILY LOG

Date: 10/3/19
 Project Number: NW01312.0150 Project Name: LHAAP - GWTP
 Recorded By: Scott Beesinger

PID	Model: <u>Mini Rate 3000</u>		Bulb: <u>11.7</u> <u>100 meV</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #: <u>PGM 7320</u>						
	Parameter	Standard	Exp. Date	Lot #	Time: <u>0715</u>	Time:	Time:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Initials: <u>SB</u>	Initials:	Initials:
					Value: <u>TO ZERO</u>	Value:	Value:
					Initials: <u>SB</u>	Initials:	Initials:
Second Point Calibration	Vapor conc. (ppm)	<u>100 ppm</u> (isobutylene)	<u>10/5/21</u>	<u>SBH-248-100-19</u>	Value: <u>SB</u>	Value:	Value:

COMB. GAS/O ₂ METER	Model:				Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time:	Time:	Time:
First Point Calibration	O ₂ (%)				Initials:	Initials:	Initials:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER	Model:				Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time:	Time:	Time:
First Point Calibration (Auto)	pH	4.00			Initials:	Initials:	Initials:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

EQUIPMENT CALIBRATION DAILY LOG

Date: 11/19/19
 Project Number: NW01312.0150 Project Name: LHAAP - GWTP
 Recorded By: Scott Beesinger

PID	Model: <u>Mini Rae 3000</u>		Bulb: <u>11.7</u> <u>100 meV</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #: <u>PGM 7320</u>						
	Parameter	Standard	Exp. Date	Lot #	Time: <u>0625</u>	Time:	Time:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Initials: <u>SB</u>	Initials:	Initials:
Second Point Calibration	Vapor conc. (ppm)	<u>100 ppm</u> (isobutylene)	<u>10/5/21</u>	<u>SBH-248-100-19</u>	Value: <u>TO ZERO</u> <u>SB</u>	Value:	Value:

COMB. GAS/O ₂ METER	Model:		Equipment ID #:		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Parameter	Standard	Exp. Date	Lot #			
First Point Calibration	O ₂ (%)				Time:	Time:	Time:
	% LEL Pentane				Initials:	Initials:	Initials:
					Value:	Value:	Value:
					Value:	Value:	Value:

WATER QUALITY METER	Model:		Equipment ID #:		Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
	Parameter	Standard	Exp. Date	Lot #			
First Point Calibration (Auto)	pH	4.00			Time:	Time:	Time:
	Conductivity (mS/cm)	4.49			Initials:	Initials:	Initials:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

EQUIPMENT CALIBRATION DAILY LOG

Date: 11/21/19
 Project Number: NW01312.0150 Project Name: LHAAP - GWTP
 Recorded By: Scott Beesinger

PID	Model: <u>Mini RAE 3000</u>		Bulb: <u>11.7</u> <u>10.5 meV</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #: <u>PGM 7320</u>						
	Parameter	Standard	Exp. Date	Lot #	Time: <u>0720</u>	Time:	Time:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Initials: <u>SB</u>	Initials:	Initials:
Second Point Calibration	Vapor conc. (ppm)	<u>100 ppm</u> (isobutylene)	<u>10/5/21</u>	<u>JBH-248-100-19</u>	Value: <u>TO ZERO SB</u>	Value:	Value:

COMB. GAS/O ₂ METER	Model:		Equipment ID #:		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Parameter	Standard	Exp. Date	Lot #			
First Point Calibration	O ₂ (%)				Time:	Time:	Time:
	% LEL Pentane				Initials:	Initials:	Initials:
					Value:	Value:	Value:

WATER QUALITY METER	Model:		Equipment ID #:		Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
	Parameter	Standard	Exp. Date	Lot #			
First Point Calibration (Auto)	pH	4.00			Time:	Time:	Time:
	Conductivity (mS/cm)	4.49			Initials:	Initials:	Initials:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

EQUIPMENT CALIBRATION DAILY LOG

Date: 11/26/19
 Project Number: NW01312.0150 Project Name: LHAAP - GWTP
 Recorded By: Scott Beesinger

PID	Model: <u>Mini Rae 3000</u>		Bulb: <u>11.7</u> <u>10.5 meV</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #: <u>PGM 7320</u>						
	Parameter	Standard	Exp. Date	Lot #	Time: <u>0630</u>	Time:	Time:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Initials: <u>SB</u> Value: <u>TO ZERO</u> <u>SB</u>	Initials:	Initials:
Second Point Calibration	Vapor conc. (ppm)	<u>100 ppm</u> (isobutylene)	<u>10/5/21</u>	<u>JBH-248-</u> <u>100-19</u>	Value: <u>SB</u>	Value:	Value:

COMB. GAS/O ₂ METER	Model:				Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time:	Time:	Time:
First Point Calibration	O ₂ (%)				Initials:	Initials:	Initials:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER	Model:				Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time:	Time:	Time:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

EQUIPMENT CALIBRATION DAILY LOG

Date: 12/2/19
 Project Number: NW01312.0150 Project Name: LHAAP - GWTP
 Recorded By: Scott Beesinger

PID	Model: <u>Mini-Rae 3000</u>		Bulb: <u>11.7</u> <u>106 meV</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #: <u>PGM 7320</u>						
	Parameter	Standard	Exp. Date	Lot #	Time: <u>0615</u>	Time:	Time:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Initials: <u>SB</u>	Initials:	Initials:
					Value: <u>TO ZERO</u>	Value:	Value:
					Value: <u>SB</u>	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	<u>100 ppm</u> (isobutylene)	<u>10/5/21</u>	<u>SBH-248-100-19</u>	Value: <u>SB</u>	Value:	Value:

COMB. GAS/O ₂ METER	Model:		Equipment ID #:		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Parameter	Standard	Exp. Date	Lot #			
First Point Calibration	O ₂ (%)				Time:	Time:	Time:
	% LEL Pentane				Initials:	Initials:	Initials:
					Value:	Value:	Value:
					Value:	Value:	Value:

WATER QUALITY METER	Model:		Equipment ID #:		Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
	Parameter	Standard	Exp. Date	Lot #			
First Point Calibration (Auto)	pH	4.00			Time:	Time:	Time:
	Conductivity (mS/cm)	4.49			Initials:	Initials:	Initials:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

EQUIPMENT CALIBRATION DAILY LOG

Date: **12/12/19**
 Project Number: **NW01312.0150** Project Name: **LHAAP - GWTP**
 Recorded By: **Scott Beesinger**

PID	Model: Mini Rae 3000		Bulb: 11.7		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #: PGM 7320						
	Parameter	Standard	Exp. Date	Lot #	Time: 0625	Time:	Time:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Initials: SB	Initials:	Initials:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: TO ZERO SB	Value:	Value:

COMB. GAS/O ₂ METER	Model:		Equipment ID #:		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Parameter	Standard	Exp. Date	Lot #			
First Point Calibration	O ₂ (%)				Time:	Time:	Time:
	% LEL Pentane				Initials:	Initials:	Initials:
					Value:	Value:	Value:

WATER QUALITY METER	Model:		Equipment ID #:		Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
	Parameter	Standard	Exp. Date	Lot #			
First Point Calibration (Auto)	pH	4.00			Time:	Time:	Time:
	Conductivity (mS/cm)	4.49			Initials:	Initials:	Initials:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

EQUIPMENT CALIBRATION DAILY LOG

Date: 12/16/19
 Project Number: NW01312.0150 Project Name: LHAAP - GwTP
 Recorded By: Scott Beesinger

PID	Model: <u>Mini Rate 3000</u>		Bulb: <u>11.7</u> <u>10.6 meV</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #: <u>PGM 7320</u>						
	Parameter	Standard	Exp. Date	Lot #	Time: <u>0630</u>	Time:	Time:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Initials: <u>SB</u>	Initials:	Initials:
					Value: <u>TO ZERO</u>	Value:	Value:
					Value: <u>SB</u>	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	<u>100 ppm</u> (isobutylene)	<u>10/5/21</u>	<u>JBH-248-100-19</u>	Value:	Value:	Value:

COMB. GAS/O ₂ METER	Model:				Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time:	Time:	Time:
First Point Calibration	O ₂ (%)				Initials:	Initials:	Initials:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER	Model:				Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time:	Time:	Time:
First Point Calibration (Auto)	pH	4.00			Initials:	Initials:	Initials:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

EQUIPMENT CALIBRATION DAILY LOG

Date: 12/19/19
 Project Number: NW01312.0150 Project Name: LMAPP - GWTP
 Recorded By: Scott Beesinger

PID	Model: <u>Mini RAE 3000</u>		Bulb: <u>11.7</u> <u>1006 meV</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #: <u>PGM 7320</u>						
	Parameter	Standard	Exp. Date	Lot #	Time: <u>0715</u>	Time:	Time:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Initials: <u>SB</u>	Initials:	Initials:
Second Point Calibration	Vapor conc. (ppm)	<u>100 ppm</u> (isobutylene)	<u>10/5/21</u>	<u>JBH-248-100-19</u>	Value: <u>TO ZERO SB</u>	Value:	Value:

COMB. GAS/O ₂ METER	Model:		Equipment ID #:		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Parameter	Standard	Exp. Date	Lot #			
First Point Calibration	O ₂ (%)				Time:	Time:	Time:
	% LEL Pentane				Initials:	Initials:	Initials:
					Value:	Value:	Value:
					Value:	Value:	Value:

WATER QUALITY METER	Model:		Equipment ID #:		Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
	Parameter	Standard	Exp. Date	Lot #			
First Point Calibration (Auto)	pH	4.00			Time:	Time:	Time:
	Conductivity (mS/cm)	4.49			Initials:	Initials:	Initials:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

EQUIPMENT CALIBRATION DAILY LOG

Date: 12/23/19
 Project Number: NW01312.0150 Project Name: LMAPP - GUTP
 Recorded By: Scott Beesinger

PID	Model: <u>Mini RAE 3000</u>		Bulb: <u>11.7</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #: <u>PGM 7320</u>						
	Parameter	Standard	Exp. Date	Lot #	Time: <u>0630</u>	Time:	Time:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Initials: <u>SB</u>	Initials:	Initials:
					Value: <u>TO ZERO</u>	Value:	Value:
					Value: <u>SB</u>	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	<u>100 ppm</u> (isobutylene)	<u>10/5/21</u>	<u>JBH-248-100-19</u>	Value:	Value:	Value:

COMB. GAS/O ₂ METER	Model:		Equipment ID #:		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Parameter	Standard	Exp. Date	Lot #			
First Point Calibration	O ₂ (%)				Time:	Time:	Time:
					Initials:	Initials:	Initials:
					Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER	Model:		Equipment ID #:		Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
	Parameter	Standard	Exp. Date	Lot #			
First Point Calibration (Auto)	pH	4.00			Time:	Time:	Time:
	Conductivity (mS/cm)	4.49			Initials:	Initials:	Initials:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

EQUIPMENT CALIBRATION DAILY LOG

Date: 12/26/19
 Project Number: NW01312.0150 Project Name: LMAPP - GWTP
 Recorded By: Scott Beesinger

PID	Model: <u>Mini Rate 3000</u>		Bulb: <u>11.7</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #: <u>PGM 7320</u>						
	Parameter	Standard	Exp. Date	Lot #	Time: <u>0725</u>	Time:	Time:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Initials: <u>SB</u>	Initials:	Initials:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: <u>TO ZERO SB</u>	Value:	Value:

COMB. GAS/O ₂ METER	Model:		Equipment ID #:		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Parameter	Standard	Exp. Date	Lot #			
First Point Calibration	O ₂ (%)				Initials:	Initials:	Initials:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER	Model:		Equipment ID #:		Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
	Parameter	Standard	Exp. Date	Lot #			
First Point Calibration (Auto)	pH	4.00			Initials:	Initials:	Initials:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

EQUIPMENT CALIBRATION DAILY LOG

Date: 12/30/19 Project Name: LHAAP - GWTP
 Project Number: NW01312.0150 Recorded By: Scott Beesinger

PID	Model: <u>Mini RAE 3000</u>		Bulb: <u>11.7</u> <u>10.5 meV</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #: <u>PGM 7320</u>						
	Parameter	Standard	Exp. Date	Lot #	Time: <u>0635</u>	Time:	Time:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Initials: <u>SB</u>	Initials:	Initials:
					Value: <u>TO ZERO</u> <u>SB</u>	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	<u>100 ppm</u> (isobutylene)	<u>10/5/21</u>	<u>JBH-248-100-19</u>	Value: <u>SB</u>	Value:	Value:

COMB. GAS/O ₂ METER	Model:				Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time:	Time:	Time:
First Point Calibration	O ₂ (%)				Initials:	Initials:	Initials:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER	Model:				Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time:	Time:	Time:
First Point Calibration (Auto)	pH	4.00			Initials:	Initials:	Initials:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:



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December 10, 2019

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

Work Order: **HS19120107**

Laboratory Results for: **Longhorn GW Treatment Plant Monthly Effluent Samples**

Dear Marcia,

ALS Environmental received 3 sample(s) on Dec 04, 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,

A handwritten signature in black ink, appearing to read 'Raj. P. Modashia', enclosed in a circular scribble.

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS19120107

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120107-01	LH18/24-SP650_120319	Water		03-Dec-2019 14:00	04-Dec-2019 09:13	<input type="checkbox"/>
HS19120107-02	LH18/24-SP650_120319_AIX	Water		03-Dec-2019 14:00	04-Dec-2019 09:13	<input type="checkbox"/>
HS19120107-03	Trip Blank	Water	C&G- 050119-180	03-Dec-2019 00:00	04-Dec-2019 09:13	<input type="checkbox"/>

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS19120107

CASE NARRATIVE

Work Order Comments

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

GCMS Semivolatiles by Method SW8270SIM**Batch ID: 148234**

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

GCMS Volatiles by Method SW8260**Batch ID: R351826****Sample ID: CCV**

- 1,2,3-Trichlorobenzene exceeded %D limits for CCV. Samples are ND for this compound.

Sample ID: LH18/24-SP650_120319 (HS19120107-01MS)

- MS and MSD failed QC limits for some compounds
-

Metals by Method SW6020**Batch ID: 148236****Sample ID: LH18/24-SP650_120319 (HS19120107-01MS)**

- Lead failed on the MSMSD but passed on the PDS.

Sample ID: LH18/24-SP650_120319 (HS19120107-01MSD)

- Silver failed on the MSD but passed on the MS and PDS.
-

WetChemistry by Method SW7196**Batch ID: R351814**

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

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Monthly Effluent Samples
 Sample ID: LH18/24-SP650_120319
 Collection Date: 03-Dec-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19120107
 Lab ID:HS19120107-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
1,2-Dichloroethane	1.4		0.20	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	04-Dec-2019 16:22	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	04-Dec-2019 16:22	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	04-Dec-2019 16:22	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	04-Dec-2019 16:22	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	04-Dec-2019 16:22	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 16:22	

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

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Monthly Effluent Samples
 Sample ID: LH18/24-SP650_120319
 Collection Date: 03-Dec-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19120107
 Lab ID:HS19120107-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
cis-1,2-Dichloroethene	46		0.20	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	04-Dec-2019 16:22	
Methylene chloride	4.1		0.40	1.0	2.0	UG/L	1	04-Dec-2019 16:22	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Trichloroethene	9.3		0.20	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
Vinyl chloride	0.65	J	0.20	0.50	1.0	UG/L	1	04-Dec-2019 16:22	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>102</i>			0	<i>81-118</i>	%REC	<i>1</i>	<i>04-Dec-2019 16:22</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.2</i>			0	<i>85-114</i>	%REC	<i>1</i>	<i>04-Dec-2019 16:22</i>	
<i>Surr: Dibromofluoromethane</i>	<i>99.6</i>			0	<i>80-119</i>	%REC	<i>1</i>	<i>04-Dec-2019 16:22</i>	
<i>Surr: Toluene-d8</i>	<i>96.8</i>			0	<i>89-112</i>	%REC	<i>1</i>	<i>04-Dec-2019 16:22</i>	
SEMIVOLATILES SIM		Method:SW8270SIM						Prep:SW3510 / 04-Dec-2019 Analyst: LG	
1,4-Dioxane	20		1.0	1.0	1.0	ug/L	100	05-Dec-2019 17:04	
<i>Surr: 2-Fluorobiphenyl</i>	<i>108</i>			0	<i>40-140</i>	%REC	<i>100</i>	<i>05-Dec-2019 17:04</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>128</i>			0	<i>40-140</i>	%REC	<i>100</i>	<i>05-Dec-2019 17:04</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>109</i>			0	<i>40-140</i>	%REC	<i>100</i>	<i>05-Dec-2019 17:04</i>	
METALS BY ICPMS BY SW6020A		Method:SW6020						Prep:SW3010A / 04-Dec-2019 Analyst: JC	
Barium	0.117		0.00190	0.00250	0.00500	mg/L	1	04-Dec-2019 22:29	
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	04-Dec-2019 22:29	
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	04-Dec-2019 22:29	
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	04-Dec-2019 22:29	

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

ALS Houston, US

Date: 10-Dec-19

Client: Bhatte Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Monthly Effluent Samples
 Sample ID: LH18/24-SP650_120319
 Collection Date: 03-Dec-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19120107
 Lab ID:HS19120107-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
HEXAVALENT CHROMIUM BY SW7196A		Method:SW7196							Analyst: MZD
Chromium, Hexavalent	0.0100	U	0.00600	0.0100	0.0100	mg/L	1	04-Dec-2019 12:34	

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Monthly Effluent Samples
 Sample ID: LH18/24-SP650_120319_AIX
 Collection Date: 03-Dec-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19120107
 Lab ID:HS19120107-02
 Matrix:Water

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	10-Dec-2019 09:45

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Monthly Effluent Samples
 Sample ID: Trip Blank
 Collection Date: 03-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19120107
 Lab ID:HS19120107-03
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	04-Dec-2019 15:57	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	04-Dec-2019 15:57	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	04-Dec-2019 15:57	
Acetone	48		0.40	1.0	2.0	UG/L	1	04-Dec-2019 15:57	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	04-Dec-2019 15:57	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 15:57	

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

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Monthly Effluent Samples
 Sample ID: Trip Blank
 Collection Date: 03-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19120107
 Lab ID:HS19120107-03
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	04-Dec-2019 15:57	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Dec-2019 15:57	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Trichlorofluoromethane	1.8		0.30	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Dec-2019 15:57	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>103</i>			0	<i>81-118</i>	<i>%REC</i>	1	04-Dec-2019 15:57	
<i>Surr: 4-Bromofluorobenzene</i>	<i>96.7</i>			0	<i>85-114</i>	<i>%REC</i>	1	04-Dec-2019 15:57	
<i>Surr: Dibromofluoromethane</i>	<i>100.0</i>			0	<i>80-119</i>	<i>%REC</i>	1	04-Dec-2019 15:57	
<i>Surr: Toluene-d8</i>	<i>96.2</i>			0	<i>89-112</i>	<i>%REC</i>	1	04-Dec-2019 15:57	

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

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19120107

Batch ID: 148234 **Start Date:** 04 Dec 2019 11:21 **End Date:** 04 Dec 2019 15:00
Method: SV AQ SEP FUN EXTRACT-LOWLEV - 3510C **Prep Code:** 3510_B_SIM

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120107-01	1	1000 (mL)	1 (mL)	0.001

Batch ID: 148236 **Start Date:** 04 Dec 2019 11:00 **End Date:** 04 Dec 2019 15:00
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120107-01		10 (mL)	10 (mL)	1

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19120107

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 148234 (0)		Test Name : SEMIVOLATILES SIM			Matrix: Water	
HS19120107-01	LH18/24-SP650_120319	03 Dec 2019 14:00		04 Dec 2019 11:21	05 Dec 2019 17:04	100
Batch ID: 148236 (0)		Test Name : METALS BY ICPMS BY SW6020A			Matrix: Water	
HS19120107-01	LH18/24-SP650_120319	03 Dec 2019 14:00		04 Dec 2019 11:00	04 Dec 2019 22:29	1
Batch ID: R351814 (0)		Test Name : HEXAVALENT CHROMIUM BY SW7196A			Matrix: Water	
HS19120107-01	LH18/24-SP650_120319	03 Dec 2019 14:00			04 Dec 2019 12:34	1
Batch ID: R351826 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19120107-01	LH18/24-SP650_120319	03 Dec 2019 14:00			04 Dec 2019 16:22	1
HS19120107-03	Trip Blank	03 Dec 2019 00:00			04 Dec 2019 15:57	1
Batch ID: R352119 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Water	
HS19120107-02	LH18/24-SP650_120319_AIX	03 Dec 2019 14:00			10 Dec 2019 09:45	1

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19120107

QC BATCH REPORT

Batch ID: 148236 (0)		Instrument: ICPMS04		Method: METALS BY ICPMS BY SW6020A						
MBLK	Sample ID: MBLK-148236	Units: mg/L		Analysis Date: 04-Dec-2019 22:25						
Client ID:	Run ID: ICPMS04_351809	SeqNo: 5374351		PrepDate: 04-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.00250	0.00500								U
Lead	0.00100	0.00500								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
LCS	Sample ID: LCS-148236	Units: mg/L		Analysis Date: 04-Dec-2019 22:27						
Client ID:	Run ID: ICPMS04_351809	SeqNo: 5374352		PrepDate: 04-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.04311	0.00500	0.05	0	86.2	86 - 114				
Selenium	0.04753	0.00500	0.05	0	95.1	80 - 120				
Silver	0.0428	0.00500	0.05	0	85.6	85 - 116				
LCS	Sample ID: LCS-148236	Units: mg/L		Analysis Date: 05-Dec-2019 13:06						
Client ID:	Run ID: ICPMS04_351857	SeqNo: 5375344		PrepDate: 04-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.04405	0.00500	0.05	0	88.1	88 - 115				
MS	Sample ID: HS19120107-01MS	Units: mg/L		Analysis Date: 04-Dec-2019 22:34						
Client ID: LH18/24-SP650_120319	Run ID: ICPMS04_351809	SeqNo: 5374355		PrepDate: 04-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.1745	0.00500	0.05	0.1172	115	86 - 114				S
Lead	0.04399	0.00500	0.05	0.000142	87.7	88 - 115				S
Selenium	0.04817	0.00500	0.05	0.000497	95.3	80 - 120				
Silver	0.04269	0.00500	0.05	0.000006	85.4	85 - 116				

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19120107

QC BATCH REPORT

Batch ID: 148236 (0)		Instrument: ICPMS04		Method: METALS BY ICPMS BY SW6020A						
MSD		Sample ID: HS19120107-01MSD		Units: mg/L		Analysis Date: 04-Dec-2019 22:36				
Client ID: LH18/24-SP650_120319		Run ID: ICPMS04_351809		SeqNo: 5374356		PrepDate: 04-Dec-2019		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.1699	0.00500	0.05	0.1172	105	86 - 114	0.1745	2.64	20	
Lead	0.04101	0.00500	0.05	0.000142	81.7	88 - 115	0.04399	7.02	20	S
Selenium	0.04364	0.00500	0.05	0.000497	86.3	80 - 120	0.04817	9.86	20	
Silver	0.03877	0.00500	0.05	0.000006	77.5	85 - 116	0.04269	9.63	20	S
PDS		Sample ID: HS19120107-01PDS		Units: mg/L		Analysis Date: 04-Dec-2019 22:38				
Client ID: LH18/24-SP650_120319		Run ID: ICPMS04_351809		SeqNo: 5374357		PrepDate: 04-Dec-2019		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.218	0.00500	0.1	0.1172	101	80 - 120				
Lead	0.09294	0.00500	0.1	0.000142	92.8	80 - 120				
Selenium	0.101	0.00500	0.1	0.000497	101	80 - 120				
Silver	0.08632	0.00500	0.1	0.000006	86.3	80 - 120				
SD		Sample ID: HS19120107-01SD		Units: mg/L		Analysis Date: 04-Dec-2019 22:31				
Client ID: LH18/24-SP650_120319		Run ID: ICPMS04_351809		SeqNo: 5374354		PrepDate: 04-Dec-2019		DF: 5		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	0.1191	0.0250					0.1172	1.67	10	
Lead	0.00500	0.0250					0.000142	0	10	U
Selenium	0.0125	0.0250					0.000497	0	10	U
Silver	0.00250	0.0250					0.000006	0	10	U

The following samples were analyzed in this batch:

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19120107

QC BATCH REPORT

Batch ID: 148234 (0)		Instrument: SV-6		Method: SEMIVOLATILES SIM						
MBLK	Sample ID: MBLK-148234	Units: ug/L		Analysis Date: 05-Dec-2019 15:43						
Client ID:	Run ID: SV-6_351886	SeqNo: 5375872		PrepDate: 04-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	0.07234	0	0.08	0	90.4	40 - 140				
Surr: 4-Terphenyl-d14	0.07067	0	0.08	0	88.3	40 - 140				
Surr: Nitrobenzene-d5	0.09257	0	0.08	0	116	40 - 140				

LCS	Sample ID: LCS-148234	Units: ug/L		Analysis Date: 05-Dec-2019 16:02						
Client ID:	Run ID: SV-6_351886	SeqNo: 5375873		PrepDate: 04-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

1,4-Dioxane	0.09228	0.010	0.08	0	115	40 - 140				
Surr: 2-Fluorobiphenyl	0.07675	0	0.08	0	95.9	40 - 140				
Surr: 4-Terphenyl-d14	0.07259	0	0.08	0	90.7	40 - 140				
Surr: Nitrobenzene-d5	0.09775	0	0.08	0	122	40 - 140				

LCSD	Sample ID: LCSD-148234	Units: ug/L		Analysis Date: 05-Dec-2019 16:21						
Client ID:	Run ID: SV-6_351886	SeqNo: 5375874		PrepDate: 04-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

1,4-Dioxane	0.09175	0.010	0.08	0	115	40 - 140	0.09228	0.576	20	
Surr: 2-Fluorobiphenyl	0.07413	0	0.08	0	92.7	40 - 140	0.07675	3.47	20	
Surr: 4-Terphenyl-d14	0.07389	0	0.08	0	92.4	40 - 140	0.07259	1.77	20	
Surr: Nitrobenzene-d5	0.09494	0	0.08	0	119	40 - 140	0.09775	2.92	20	

The following samples were analyzed in this batch: HS19120107-01

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19120107

QC BATCH REPORT

Batch ID: R351826 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191204	Units: UG/L			Analysis Date: 04-Dec-2019 14:45					
Client ID:	Run ID: VOA6_351826	SeqNo: 5374673	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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	50.98	1.0	50	0	102	81 - 118				
Surr: 4-Bromofluorobenzene	48.62	1.0	50	0	97.2	85 - 114				
Surr: Dibromofluoromethane	50.09	1.0	50	0	100	80 - 119				
Surr: Toluene-d8	48.31	1.0	50	0	96.6	89 - 112				

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19120107

QC BATCH REPORT

Batch ID: R351826 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191204	Units: UG/L			Analysis Date: 04-Dec-2019 15:09					
Client ID:	Run ID: VOA6_351826	SeqNo: 5374674	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	21.1	1.0	20	0	106	78 - 124				
1,1,1-Trichloroethane	22.64	1.0	20	0	113	74 - 131				
1,1,2,2-Tetrachloroethane	20.99	1.0	20	0	105	71 - 121				
1,1,2-Trichloroethane	20.87	1.0	20	0	104	80 - 119				
1,1-Dichloroethane	22.16	1.0	20	0	111	77 - 125				
1,1-Dichloroethene	19.41	1.0	20	0	97.0	71 - 131				
1,1-Dichloropropene	20.5	1.0	20	0	102	78 - 125				
1,2,3-Trichlorobenzene	21.62	1.0	20	0	108	69 - 129				
1,2,3-Trichloropropane	21.47	1.0	20	0	107	73 - 122				
1,2,4-Trichlorobenzene	21.37	1.0	20	0	107	69 - 130				
1,2,4-Trimethylbenzene	21.92	1.0	20	0	110	76 - 124				
1,2-Dibromo-3-chloropropane	21.85	1.0	20	0	109	62 - 128				
1,2-Dibromoethane	21.34	1.0	20	0	107	77 - 121				
1,2-Dichlorobenzene	21.3	1.0	20	0	107	80 - 119				
1,2-Dichloroethane	22.14	1.0	20	0	111	73 - 128				
1,2-Dichloropropane	20.72	1.0	20	0	104	78 - 122				
1,3,5-Trimethylbenzene	21.95	1.0	20	0	110	75 - 124				
1,3-Dichlorobenzene	21.68	1.0	20	0	108	80 - 119				
1,3-Dichloropropane	20.83	1.0	20	0	104	80 - 119				
1,4-Dichlorobenzene	21.45	1.0	20	0	107	79 - 118				
2,2-Dichloropropane	22.46	1.0	20	0	112	60 - 139				
2-Butanone	46.24	2.0	40	0	116	56 - 143				
2-Chlorotoluene	22.93	1.0	20	0	115	79 - 122				
2-Hexanone	40.37	2.0	40	0	101	57 - 139				
4-Chlorotoluene	22.33	1.0	20	0	112	78 - 122				
4-Isopropyltoluene	21.4	1.0	20	0	107	77 - 127				
4-Methyl-2-pentanone	39.72	2.0	40	0	99.3	67 - 130				
Acetone	44.43	2.0	40	0	111	39 - 160				
Benzene	21.09	1.0	20	0	105	79 - 120				
Bromobenzene	21.92	1.0	20	0	110	80 - 120				
Bromochloromethane	22.42	1.0	20	0	112	78 - 123				
Bromodichloromethane	21.77	1.0	20	0	109	79 - 125				
Bromoform	20.75	1.0	20	0	104	66 - 130				
Bromomethane	21.31	1.0	20	0	107	53 - 141				

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19120107

QC BATCH REPORT

Batch ID: R351826 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191204	Units: UG/L			Analysis Date: 04-Dec-2019 15:09					
Client ID:	Run ID: VOA6_351826	SeqNo: 5374674	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	43.2	2.0	40	0	108	64 - 133				
Carbon tetrachloride	20.15	1.0	20	0	101	72 - 136				
Chlorobenzene	20.81	1.0	20	0	104	82 - 118				
Chloroethane	19.49	1.0	20	0	97.4	60 - 138				
Chloroform	22.34	1.0	20	0	112	79 - 124				
Chloromethane	16.21	1.0	20	0	81.0	50 - 139				
cis-1,2-Dichloroethene	22.91	1.0	20	0	115	78 - 123				
cis-1,3-Dichloropropene	21.51	1.0	20	0	108	75 - 124				
Dibromochloromethane	21.34	1.0	20	0	107	74 - 126				
Dibromomethane	21.76	1.0	20	0	109	79 - 123				
Dichlorodifluoromethane	22.75	1.0	20	0	114	32 - 152				
Ethylbenzene	21.14	1.0	20	0	106	79 - 121				
Hexachlorobutadiene	19.04	1.0	20	0	95.2	66 - 134				
Isopropylbenzene	20.99	1.0	20	0	105	72 - 131				
m,p-Xylene	42.16	2.0	40	0	105	80 - 121				
Methylene chloride	21.23	2.0	20	0	106	74 - 124				
Naphthalene	19.8	1.0	20	0	99.0	61 - 128				
n-Butylbenzene	21.42	1.0	20	0	107	75 - 128				
n-Propylbenzene	22.23	1.0	20	0	111	76 - 126				
o-Xylene	20.87	1.0	20	0	104	78 - 122				
sec-Butylbenzene	21.49	1.0	20	0	107	77 - 126				
Styrene	21.23	1.0	20	0	106	78 - 123				
tert-Butylbenzene	21.65	1.0	20	0	108	78 - 124				
Tetrachloroethene	20.14	1.0	20	0	101	74 - 129				
Toluene	21.16	1.0	20	0	106	80 - 121				
trans-1,2-Dichloroethene	22.36	1.0	20	0	112	75 - 124				
trans-1,3-Dichloropropene	21.26	1.0	20	0	106	73 - 127				
Trichloroethene	21.51	1.0	20	0	108	79 - 123				
Trichlorofluoromethane	20.25	1.0	20	0	101	65 - 141				
Vinyl chloride	19.88	1.0	20	0	99.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	58.47	1.0	50	0	117	81 - 118				
Surr: 4-Bromofluorobenzene	54.21	1.0	50	0	108	85 - 114				
Surr: Dibromofluoromethane	56.85	1.0	50	0	114	80 - 119				
Surr: Toluene-d8	49.57	1.0	50	0	99.1	89 - 112				

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19120107

QC BATCH REPORT

Batch ID: R351826 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS		Sample ID: HS19120107-01MS		Units: UG/L		Analysis Date: 04-Dec-2019 16:46				
Client ID: LH18/24-SP650_120319		Run ID: VOA6_351826		SeqNo: 5374677		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	18.2	1.0	20	0	91.0	78 - 124				
1,1,1-Trichloroethane	19.31	1.0	20	0	96.5	74 - 131				
1,1,2,2-Tetrachloroethane	17.87	1.0	20	0	89.4	71 - 121				
1,1,2-Trichloroethane	17.86	1.0	20	0	89.3	80 - 119				
1,1-Dichloroethane	17.94	1.0	20	0	89.7	77 - 125				
1,1-Dichloroethene	16.96	1.0	20	0	84.8	71 - 131				
1,1-Dichloropropene	18.52	1.0	20	0	92.6	78 - 125				
1,2,3-Trichlorobenzene	12.39	1.0	20	0	62.0	69 - 129			S	
1,2,3-Trichloropropane	17.82	1.0	20	0	89.1	73 - 122				
1,2,4-Trichlorobenzene	13.02	1.0	20	0	65.1	69 - 130			S	
1,2,4-Trimethylbenzene	19.54	1.0	20	0	97.7	76 - 124				
1,2-Dibromo-3-chloropropane	15.51	1.0	20	0	77.6	62 - 128				
1,2-Dibromoethane	17.75	1.0	20	0	88.8	77 - 121				
1,2-Dichlorobenzene	18.17	1.0	20	0	90.9	80 - 119				
1,2-Dichloroethane	19.61	1.0	20	1.38	91.2	73 - 128				
1,2-Dichloropropane	17.08	1.0	20	0	85.4	78 - 122				
1,3,5-Trimethylbenzene	19.93	1.0	20	0	99.6	75 - 124				
1,3-Dichlorobenzene	19.02	1.0	20	0	95.1	80 - 119				
1,3-Dichloropropane	17.33	1.0	20	0	86.6	80 - 119				
1,4-Dichlorobenzene	18.82	1.0	20	0	94.1	79 - 118				
2,2-Dichloropropane	18.98	1.0	20	0	94.9	60 - 139				
2-Butanone	31.37	2.0	40	0	78.4	56 - 143				
2-Chlorotoluene	20.35	1.0	20	0	102	79 - 122				
2-Hexanone	32.07	2.0	40	0	80.2	57 - 139				
4-Chlorotoluene	19.66	1.0	20	0	98.3	78 - 122				
4-Isopropyltoluene	19.47	1.0	20	0	97.3	77 - 127				
4-Methyl-2-pentanone	33.44	2.0	40	0	83.6	67 - 130				
Acetone	24.99	2.0	40	0	62.5	39 - 160				
Benzene	18.03	1.0	20	0	90.1	79 - 120				
Bromobenzene	18.83	1.0	20	0	94.2	80 - 120				
Bromochloromethane	17.66	1.0	20	0	88.3	78 - 123				
Bromodichloromethane	18.09	1.0	20	0	90.4	79 - 125				
Bromoform	17	1.0	20	0	85.0	66 - 130				
Bromomethane	16.32	1.0	20	0	81.6	53 - 141				

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19120107

QC BATCH REPORT

Batch ID: R351826 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS		Sample ID: HS19120107-01MS		Units: UG/L		Analysis Date: 04-Dec-2019 16:46				
Client ID: LH18/24-SP650_120319		Run ID: VOA6_351826		SeqNo: 5374677		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Carbon disulfide	37.38	2.0	40	0	93.5	64 - 133				
Carbon tetrachloride	18.53	1.0	20	0	92.6	72 - 136				
Chlorobenzene	17.87	1.0	20	0	89.4	82 - 118				
Chloroethane	16.1	1.0	20	0	80.5	60 - 138				
Chloroform	17.86	1.0	20	0	89.3	79 - 124				
Chloromethane	11.76	1.0	20	0	58.8	50 - 139				
cis-1,2-Dichloroethene	65.39	1.0	20	46.15	96.2	78 - 123				
cis-1,3-Dichloropropene	17.45	1.0	20	0	87.2	75 - 124				
Dibromochloromethane	17.61	1.0	20	0	88.1	74 - 126				
Dibromomethane	17.55	1.0	20	0	87.8	79 - 123				
Dichlorodifluoromethane	14.48	1.0	20	0	72.4	32 - 152				
Ethylbenzene	18.37	1.0	20	0	91.8	79 - 121				
Hexachlorobutadiene	13.5	1.0	20	0	67.5	66 - 134				
Isopropylbenzene	18.86	1.0	20	0	94.3	72 - 131				
m,p-Xylene	37.22	2.0	40	0	93.1	80 - 121				
Methylene chloride	20.98	2.0	20	4.086	84.5	74 - 124				
Naphthalene	11.97	1.0	20	0	59.8	61 - 128			S	
n-Butylbenzene	19.62	1.0	20	0	98.1	75 - 128				
n-Propylbenzene	20.44	1.0	20	0	102	76 - 126				
o-Xylene	18.12	1.0	20	0	90.6	78 - 122				
sec-Butylbenzene	20.17	1.0	20	0	101	77 - 126				
Styrene	17.73	1.0	20	0	88.7	78 - 123				
tert-Butylbenzene	19.98	1.0	20	0	99.9	78 - 124				
Tetrachloroethene	18.12	1.0	20	0	90.6	74 - 129				
Toluene	18.33	1.0	20	0	91.6	80 - 121				
trans-1,2-Dichloroethene	18.24	1.0	20	0	91.2	75 - 124				
trans-1,3-Dichloropropene	17.54	1.0	20	0	87.7	73 - 127				
Trichloroethene	27.54	1.0	20	9.264	91.4	79 - 123				
Trichlorofluoromethane	17.6	1.0	20	0	88.0	65 - 141				
Vinyl chloride	15.91	1.0	20	0.6462	76.3	58 - 137				
Surr: 1,2-Dichloroethane-d4	50.38	1.0	50	0	101	81 - 118				
Surr: 4-Bromofluorobenzene	50.01	1.0	50	0	100	85 - 114				
Surr: Dibromofluoromethane	50.17	1.0	50	0	100	80 - 119				
Surr: Toluene-d8	47.96	1.0	50	0	95.9	89 - 112				

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19120107

QC BATCH REPORT

Batch ID: R351826 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19120107-01MSD	Units: UG/L			Analysis Date: 04-Dec-2019 17:10					
Client ID: LH18/24-SP650_120319	Run ID: VOA6_351826	SeqNo: 5374678	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	17.65	1.0	20	0	88.3	78 - 124	18.2	3.03	20	
1,1,1-Trichloroethane	18.58	1.0	20	0	92.9	74 - 131	19.31	3.84	20	
1,1,2,2-Tetrachloroethane	17.45	1.0	20	0	87.3	71 - 121	17.87	2.38	20	
1,1,2-Trichloroethane	17.02	1.0	20	0	85.1	80 - 119	17.86	4.83	20	
1,1-Dichloroethane	17.34	1.0	20	0	86.7	77 - 125	17.94	3.39	20	
1,1-Dichloroethene	15.69	1.0	20	0	78.4	71 - 131	16.96	7.79	20	
1,1-Dichloropropene	17.47	1.0	20	0	87.3	78 - 125	18.52	5.83	20	
1,2,3-Trichlorobenzene	14.61	1.0	20	0	73.0	69 - 129	12.39	16.4	20	
1,2,3-Trichloropropane	17.67	1.0	20	0	88.4	73 - 122	17.82	0.849	20	
1,2,4-Trichlorobenzene	14.43	1.0	20	0	72.2	69 - 130	13.02	10.3	20	
1,2,4-Trimethylbenzene	18.79	1.0	20	0	93.9	76 - 124	19.54	3.92	20	
1,2-Dibromo-3-chloropropane	15.52	1.0	20	0	77.6	62 - 128	15.51	0.0288	20	
1,2-Dibromoethane	17.26	1.0	20	0	86.3	77 - 121	17.75	2.8	20	
1,2-Dichlorobenzene	17.47	1.0	20	0	87.4	80 - 119	18.17	3.94	20	
1,2-Dichloroethane	19.3	1.0	20	1.38	89.6	73 - 128	19.61	1.61	20	
1,2-Dichloropropane	16.67	1.0	20	0	83.4	78 - 122	17.08	2.4	20	
1,3,5-Trimethylbenzene	19.02	1.0	20	0	95.1	75 - 124	19.93	4.65	20	
1,3-Dichlorobenzene	18.18	1.0	20	0	90.9	80 - 119	19.02	4.52	20	
1,3-Dichloropropane	16.87	1.0	20	0	84.4	80 - 119	17.33	2.68	20	
1,4-Dichlorobenzene	17.9	1.0	20	0	89.5	79 - 118	18.82	5	20	
2,2-Dichloropropane	18.4	1.0	20	0	92.0	60 - 139	18.98	3.09	20	
2-Butanone	31.38	2.0	40	0	78.4	56 - 143	31.37	0.0371	20	
2-Chlorotoluene	19.48	1.0	20	0	97.4	79 - 122	20.35	4.38	20	
2-Hexanone	32.55	2.0	40	0	81.4	57 - 139	32.07	1.5	20	
4-Chlorotoluene	18.82	1.0	20	0	94.1	78 - 122	19.66	4.38	20	
4-Isopropyltoluene	18.68	1.0	20	0	93.4	77 - 127	19.47	4.12	20	
4-Methyl-2-pentanone	32.09	2.0	40	0	80.2	67 - 130	33.44	4.12	20	
Acetone	24.82	2.0	40	0	62.1	39 - 160	24.99	0.684	20	
Benzene	17.62	1.0	20	0	88.1	79 - 120	18.03	2.3	20	
Bromobenzene	18.2	1.0	20	0	91.0	80 - 120	18.83	3.43	20	
Bromochloromethane	17.37	1.0	20	0	86.8	78 - 123	17.66	1.69	20	
Bromodichloromethane	17.81	1.0	20	0	89.1	79 - 125	18.09	1.53	20	
Bromoform	16.73	1.0	20	0	83.6	66 - 130	17	1.63	20	
Bromomethane	14.59	1.0	20	0	72.9	53 - 141	16.32	11.2	20	

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19120107

QC BATCH REPORT

Batch ID: R351826 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19120107-01MSD	Units: UG/L			Analysis Date: 04-Dec-2019 17:10					
Client ID: LH18/24-SP650_120319	Run ID: VOA6_351826	SeqNo: 5374678	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.84	2.0	40	0	89.6	64 - 133	37.38	4.2	20	
Carbon tetrachloride	17.96	1.0	20	0	89.8	72 - 136	18.53	3.11	20	
Chlorobenzene	17.15	1.0	20	0	85.8	82 - 118	17.87	4.11	20	
Chloroethane	15.12	1.0	20	0	75.6	60 - 138	16.1	6.26	20	
Chloroform	17.37	1.0	20	0	86.8	79 - 124	17.86	2.8	20	
Chloromethane	11.45	1.0	20	0	57.3	50 - 139	11.76	2.65	20	
cis-1,2-Dichloroethene	63.46	1.0	20	46.15	86.6	78 - 123	65.39	2.99	20	
cis-1,3-Dichloropropene	17.3	1.0	20	0	86.5	75 - 124	17.45	0.826	20	
Dibromochloromethane	17.24	1.0	20	0	86.2	74 - 126	17.61	2.14	20	
Dibromomethane	17.48	1.0	20	0	87.4	79 - 123	17.55	0.412	20	
Dichlorodifluoromethane	13.65	1.0	20	0	68.3	32 - 152	14.48	5.91	20	
Ethylbenzene	17.56	1.0	20	0	87.8	79 - 121	18.37	4.48	20	
Hexachlorobutadiene	14.22	1.0	20	0	71.1	66 - 134	13.5	5.15	20	
Isopropylbenzene	17.8	1.0	20	0	89.0	72 - 131	18.86	5.81	20	
m,p-Xylene	35.24	2.0	40	0	88.1	80 - 121	37.22	5.49	20	
Methylene chloride	20.62	2.0	20	4.086	82.6	74 - 124	20.98	1.77	20	
Naphthalene	13.76	1.0	20	0	68.8	61 - 128	11.97	14	20	
n-Butylbenzene	18.91	1.0	20	0	94.5	75 - 128	19.62	3.68	20	
n-Propylbenzene	19.33	1.0	20	0	96.7	76 - 126	20.44	5.58	20	
o-Xylene	17.53	1.0	20	0	87.6	78 - 122	18.12	3.33	20	
sec-Butylbenzene	19.18	1.0	20	0	95.9	77 - 126	20.17	5.06	20	
Styrene	16.96	1.0	20	0	84.8	78 - 123	17.73	4.46	20	
tert-Butylbenzene	19.15	1.0	20	0	95.8	78 - 124	19.98	4.26	20	
Tetrachloroethene	17.04	1.0	20	0	85.2	74 - 129	18.12	6.17	20	
Toluene	17.61	1.0	20	0	88.0	80 - 121	18.33	4.02	20	
trans-1,2-Dichloroethene	17.72	1.0	20	0	88.6	75 - 124	18.24	2.91	20	
trans-1,3-Dichloropropene	17.18	1.0	20	0	85.9	73 - 127	17.54	2.08	20	
Trichloroethene	26.67	1.0	20	9.264	87.0	79 - 123	27.54	3.19	20	
Trichlorofluoromethane	16.54	1.0	20	0	82.7	65 - 141	17.6	6.2	20	
Vinyl chloride	15.14	1.0	20	0.6462	72.5	58 - 137	15.91	4.91	20	
Surr: 1,2-Dichloroethane-d4	51.96	1.0	50	0	104	81 - 118	50.38	3.08	20	
Surr: 4-Bromofluorobenzene	50.1	1.0	50	0	100	85 - 114	50.01	0.194	20	
Surr: Dibromofluoromethane	50.05	1.0	50	0	100	80 - 119	50.17	0.224	20	
Surr: Toluene-d8	47.14	1.0	50	0	94.3	89 - 112	47.96	1.73	20	

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19120107

QC BATCH REPORT**Batch ID:** R351826 (0)**Instrument:** VOA6**Method:** VOLATILES ORGANICS BY METHOD
8260C

The following samples were analyzed in this batch:

HS19120107-01	HS19120107-03
---------------	---------------

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19120107

QC BATCH REPORT

Batch ID: R351814 (0)		Instrument: UV-2450		Method: HEXAVALENT CHROMIUM BY SW7196A					
MBLK	Sample ID: MBLK-351814	Units: mg/L		Analysis Date: 04-Dec-2019 12:34					
Client ID:	Run ID: UV-2450_351814	SeqNo: 5374440		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chromium, Hexavalent	0.0100	0.0100							U
LCS	Sample ID: LCS-351814	Units: mg/L		Analysis Date: 04-Dec-2019 12:34					
Client ID:	Run ID: UV-2450_351814	SeqNo: 5374441		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chromium, Hexavalent	0.261	0.0100	0.25	0	104	90 - 111			
MS	Sample ID: HS19120107-01MS	Units: mg/L		Analysis Date: 04-Dec-2019 12:34					
Client ID: LH18/24-SP650_120319	Run ID: UV-2450_351814	SeqNo: 5374442		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chromium, Hexavalent	0.274	0.0100	0.25	0	110	90 - 111			
MSD	Sample ID: HS19120107-01MSD	Units: mg/L		Analysis Date: 04-Dec-2019 12:34					
Client ID: LH18/24-SP650_120319	Run ID: UV-2450_351814	SeqNo: 5374443		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Chromium, Hexavalent	0.268	0.0100	0.25	0	107	90 - 111	0.274	2.21	20

The following samples were analyzed in this batch: HS19120107-01

ALS Houston, US

Date: 10-Dec-19

Client:	Bhate Environmental Associates, Inc.	QUALIFIERS, ACRONYMS, UNITS
Project:	Longhorn GW Treatment Plant Monthly Effluent Samples	
WorkOrder:	HS19120107	

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 Quantitation 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: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS19120107

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19120107-01	LH18/24-SP650_120319	Login	12/4/2019 10:30:22 AM	PMG	EXT055
HS19120107-01	LH18/24-SP650_120319	Login	12/4/2019 10:30:22 AM	PMG	WET188
HS19120107-01	LH18/24-SP650_120319	Login	12/4/2019 10:30:22 AM	PMG	MET096
HS19120107-02	LH18/24-SP650_120319_AIX	Login	12/4/2019 10:30:22 AM	PMG	Sub

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19120107

Date/Time Received: **04-Dec-2019 09:13**
 Received by: **PMG**

Checklist completed by: Paresh M. Giga 4-Dec-2019
 eSignature Date

Reviewed by: RJ Modashia 4-Dec-2019
 eSignature Date

Matrices: **Water**

Carrier name: **FedEx**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes No Not Present
- Chain of custody present? Yes No 1 Page(s)
- Chain of custody signed when relinquished and received? Yes No COC IDs:None
- Samplers name present on COC? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s): 1.6c U/C IR25
 Cooler(s)/Kit(s): 44851
 Date/Time sample(s) sent to storage: 12/4/19 10:45

- 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:

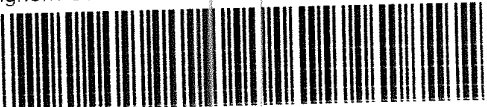
Client Contacted: Date Contacted: Person Contacted:
 Contacted By: Regarding:

Comments:


Corrective Action:

CHAIN OF CUSTODY

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

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS			Project No. NWO1312.0150.0 16.0001			Analyses										HS19120107 Bhate Environmental Associates. Inc. Longhorn GW Treatment Plant Monthly Effluent Sample 								
Job: GROUNDWATER TREATMENT PLANT MONTHLY EFFLUENT SAMPLES						MS / MSD	No. OF CONTAINERS	VOLATILES	SILVER, SELENIUM, LEAD, BARIUM	HEXAVALENT CHROMIUM	1, 4 - DIOXANE	PERCHLORATE												
Prepared By: Scott Beesinger			P.O. Number																					
Field Sample I.D.	Sample Matrix	Date / Time															Remarks (Preservatives, etc.)	Lab I.D.#						
LH18/24-SP650_120319	Water	12/03/19 / 14:00		3	X												HCL							
LH18/24-SP650_120319	Water	12/03/19 / 14:00		2			X	X									NONE							
LH18/24-SP650_120319_AIX	Water	12/03/19 / 14:00		1					X								NONE							
LH18/24-SP650_120319	Water	12/03/19 / 14:00		1		X											HNO3							
Trip Blank	Water	12/03/19		2	X												HCL							
Additional Remarks: STANDARD TURN AROUND TIME																								
Relinquished By: <i>Scott Beesinger</i>		Date 12/03/19	Time 14:30	Received By: <i>[Signature]</i>		Date 12/4/19	Time 09:13	Relinquished By:		Date	Time	Received By:		Date	Time									
For Lab Use Only																								
Received At Lab By:			Date	Time	Airbill No.	Opened By:			Date	Time	Temp of Container	Seal No.	Condition											
Remarks:																								

44851
 GIC.
 1.60
 #25
 4150.00

 <p>10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5837</p>	<p>44951</p>	Date:	12/3	Time:	1430	Seal Broken By:	
		Name:					Date:
		Company:	Scott Bess. NGR				
				SHTA			

FedEx
 TRK# 4809 7830 4806
 0221

WED - 04 DEC 10:30A
 PRIORITY OVERNIGHT

AB SGRA

77099
 TX-US
 IAH



11/1800/05A2



Case Narrative

Method: 6850

Analysis: Perchlorate

Analysis SOP: LC-MS-CLO4

ALS WO ID(s): 1933152; 1933786; 1934085;
1934086; 1934088

Client: ALS Laboratories (Houston, TX)

Matrix: Water

ELMS Batch (HBN): 2324 (253208)

General Set Information: There were five 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 ¹⁸O 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 ¹⁸O 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 1934086001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 687322) was less than 1/2 the CRDL. The recovery for the LCS (687319) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on sample 1933152001 (Client ID: LH18/24-SP650_AIX Water). 3.0 μ L of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The MS/MSD (687323/24) failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

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

NC/CAR(s): NA

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

where: A = Analyte concentration from the standard curve (μ g/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 – 687320) is reported from the analysis of the Laboratory Control Sample (LCS – 687319) at a level of 3.0 μ g/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).

Thomas Bosch December 09, 2019
Analyst Date



ANALYTICAL REPORT

Report Date: December 09, 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: **34-1934085**

Project ID: HS19120107

Purchase Order: HS19120107

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_120319_AIX	1934085001	12/03/19	12/05/19	

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

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ANALYTICAL REPORT

Workorder: **34-1934085**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: LH18/24-SP650_120319_AIX	Sampling Site: NA	Collected: 12/03/2019				
Lab ID: 1934085001	Media: 125 mL Nalgene	Received: 12/05/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2324 (HBN: 253208) Analyzed: 12/08/2019 15:15	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	1.3	1.0	2.0	4.0	1	J

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

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 12/09/2019 13:27	/S/ Stephen Brose 12/09/2019 14:23

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.alssl.com



ANALYTICAL REPORT

Workorder: 34-1934085

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: 1934085
Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2324 (HBN: 253208)
Analyzed By: Thomas Bosch

Blank

LMB: 687322 Analyzed: 12/08/2019 14:06 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 687319 Analyzed: 12/08/2019 13:38 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.17	3.00	106	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1933152001 Analyzed: 12/08/2019 14:20 Dilution: 1 Units: ug/L		MS: 687323 Analyzed: 12/08/2019 14:34 Dilution: 1 Units: ug/L				MSD: 687324 Analyzed: 12/08/2019 14:48 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	11.0	13.7	3	# 77.7	78.8 123.8	12.9	# 48.8	6.53	0.0 20.0

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

Analyst	Peer Review
/S/ Thomas Bosch 12/09/2019 13:31	/S/ Stephen Brose 12/09/2019 14:23

Symbols and Definitions

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

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



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Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

18698/42

SAMPLING STATE: Dept of Defense

COC ID: 12767

SUBCONTRACT TO:

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

Phone: +1 801 266 7700

1934085

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19120107
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19120107-02	LH18/24-SP650_120319_AIX	Water	03 Dec 2019 14:00
SUB_Perch-6850			12 Dec 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: [Signature]
Received By: [Signature]
Cooler ID(s): _____

Date/Time: 12.4.19
Date/Time: 12/05/19 0952
Temperature(s): _____

WARRANTY INFORMATION | ANALYSIS DATA SHEET



ALS Environmental
CHAIN-OF-CUSTODY

Project / Job / Task: HS19120107		Split:		Workorder ID: 1934085		Level: ENV_LVL4		Requested Analysis	
Client: ALS Environmental (Houston)				Account: 8101		Type: 12SPoly			
Comments:									
Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Containers	Count	
1	12/03/2019 14:00	LH18/24-SP650_120319_AIX	1934085001		Water	A	1000	1	A
2									
3									
4									
5									
6									
7									
8									
9									
10									

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY					SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY				
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location	Sample Prep / Analysis for:	Lab Notebook No.:	Prepared / Analyzed by:	Date / Time:	Received By: (Signature)	Reason for Transfer / Storage Location
<i>Julie Warpath</i>	12/05/2019 09:52	ALS Sample Receiving	Storage Login						
<i>R.334</i>	12/19/18:40	<i>LOB</i>	<i>storage</i>						
		<i>T. Booth</i>	<i>cell analysis</i>						

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: <u>ALS Houston</u>		Project/Task/Site: <u>HS19120107</u>							
Date/Time of Receipt: <u>12/05/19</u> <u>0952</u>		Number of Coolers Received: <u>1</u> <u>1934685</u>							
Condition of Coolers: <u>Acceptable</u> /Unacceptable		Temperature Control: <u>Present</u> /Not Included							
Cooler Custody Seals: <u>Present</u> /Absent/NA		Location Temp Taken: <u>Control</u> /Between Samples							
Container Custody Seals: <u>Intact</u> /Broken/NA		Are all temperatures within project specific guidelines? Yes/No/NA							
Ice Present: <u>Yes</u> /No/NA		VOA Headspace Present? Yes/No/NA							
Ice Present: <u>Frozen</u> /Melted/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	<u>Good</u>	<u>2</u> °C	4		°C	7		°C	
2		°C	5		°C	8		°C	
3		°C	6		°C	9		°C	
Taken By: <u>[Signature]</u>		Signature		Printed Name: <u>Rebecca Wise</u>		Date: <u>12/05/19</u>		Date	

CLIENT-RELATED INFORMATION

- | | | | |
|--|---|--|---|
| <input type="checkbox"/> Missing Cooler | <input type="checkbox"/> Missing Samples/Bottles | <input type="checkbox"/> Incorrect Preservation | <input type="checkbox"/> Insufficient Sample Volume |
| <input type="checkbox"/> Cooler Conditions | <input type="checkbox"/> Broken/Leaking Samples | <input type="checkbox"/> pH Criteria Not Met | <input type="checkbox"/> Chain of Custody Problems |
| <input type="checkbox"/> Missing Paperwork | <input type="checkbox"/> Incorrect Bottle Type | <input type="checkbox"/> Residual Chlorine Present | <input type="checkbox"/> Other: |
| <input type="checkbox"/> Missing/Incorrect Bottle Labels | <input type="checkbox"/> Cooler Temperatures Out of Range | <input type="checkbox"/> 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: _____ Returned to Sample Receipt by: _____ Date: _____
Printed Name Signature



Part # 183400-424 RIT EXP (7/02) 00

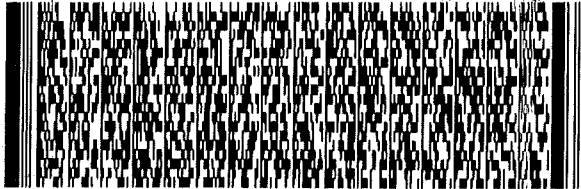
ORIGIN ID: 86RA (281) 530-5656
 SHIPPING DEPT
 ALS LABORATORY GROUP
 10450 STANCLIFF RD
 SUITE 210
 HOUSTON, TX 77099
 UNITED STATES US

SHIP DATE: 04DEC19
 ACTWGT: 10.90 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) 288-7700
 REF: HS19120107/0109/0110 - RJ



FedEx
Express



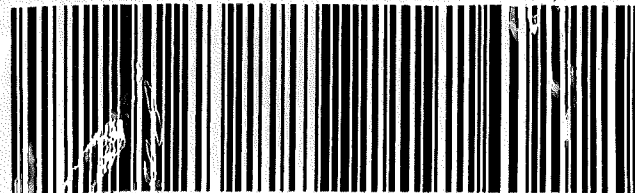

010358208111818

TRK# 1251 0292 5618
0201

THU - 05 DEC 10:30A
PRIORITY OVERNIGHT

AX BTFA

84123
UT-US SLC

ALS
 10450 Stancliff Rd., Suite 210
 Houston, Texas 77099
 Tel: +1 281 530 5656
 Fax: +1 281 530 5687

Date: _____
 Name: _____
 Origin: _____





Batch Worklist

HBN: 253208

Instrument: WP
Status: WP

Created: 12/8/2019 13:11
Analyst: T. Bosch

Batch: ELMS/ 2324
Rule: EPA 6850, DoD QSM Water

- Workorder: 1933152 [ENV_LVL4]
- Workorder: 1933786 [ENV_LVL4]
- Workorder: 1934085 [ENV_LVL4]
- Workorder: 1934086 [ENV_LVL4]
- Workorder: 1934088 [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	687318	CCV for HBN 253208 [ELMS/2324]				CCV	3		E685041C3Q	5311		12/9/2019	
2	687319	LCS for HBN 253208 [ELMS/2324]				LCS	3		E6850Q413Q	5311		12/9/2019	
3	687320	RLYS for HBN 253208 [ELMS/2324]				RLYS	3		E685041C3Q	5311		12/9/2019	
4	687321	ICS for HBN 253208 [ELMS/2324]				ICS	3		E6850..D3Q	5311		12/9/2019	
5	687322	LMB for HBN 253208 [ELMS/2324]				LMB	3		E6850Q413Q	5311		12/9/2019	
6	1933152001	LH18/24-SP650_112019_AIX Water				SAMPLE	3	1933152001-A	E6850Q41.3	5480	12/18/2019	12/9/2019	
7	687323	LH18/24-SP650...(1933152001MS)				MS	3		E6850Q413Q	5311		12/9/2019	
8	687324	LH18/24-SP650...(1933152001MSD)				MSD	3		E6850Q413Q	5311		12/9/2019	
9	1933786001	LH18/24-SP650_112619_AIX				SAMPLE	3	1933786001-A	E6850Q41.3	5480	12/24/2019	12/16/2019	
10	1934085001	LH18/24-SP650_120319_AIX				SAMPLE	3	1934085001-A	E6850Q41.3	5480	12/31/2019	12/18/2019	
11	1934086001	LH18/24-SP140_120319				SAMPLE	3	1934086001-A	E6850Q41.3	5480	12/31/2019	12/18/2019	
12	1934088001	LH18/24-SP650_120319_AIX				SAMPLE	3	1934088001-A	E6850Q41.3	5480	12/31/2019	12/18/2019	
13	687325	CCV for HBN 253208 [ELMS/2324]				CCV	3		E685041C3Q	5311		12/9/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #()'s: 1933152 (001); 1933786 (001); 1934085 (001); 1934086 (001); 1934088 (001)
 ELMS Batch/HBN ID: 2324 (253208)
 Prep Date: 12/08/2019 Analysis Date: 12/08/2019 Analyst: Tom Bosch
 Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
 Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\DEC\08DEC19D.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 687319; Target = 3.0µg/L. ASTM type II water was used for LMB 687322.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on sample 1933152001 (Client ID's: LH18/24-SP650_AIX Water). 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 1934086001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD (687323/24) failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\DEC\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\3208DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 687320) is reported from the analysis of the Laboratory Control Sample (LCS – 687319) 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).

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	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2324 HBN: 253208</u> <u>1934086 / 1934088</u>		
Sample Set IDs if Applicable: <u>1933152 / 1933786 / 1934085</u>		
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



AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: Refer to SDS for complete safety information

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



Signal Word: None

Component	SRM #	Prepared Concentration (µg/mL)
ClO ₄ Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is $\pm 0.24\%$.

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 $\pm 0.5\%$ 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



Certificate of Analysis



ISO Guide 34 Reference Material

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



S 36748

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

Product Name: Perchlorate IC Standard

Description:

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

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

Solvent: water (low TOC, < 50 ppb)

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

Traceability:

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

Estimation of Uncertainties:

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

Homogeneity:

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

Intended Use:

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

Instructions for Use:

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

Hazards:

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

Expiration of Certification:

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



ISO 9001 Registered Quality System – TUV USA

Page 1 of 2



Certificate of Analysis

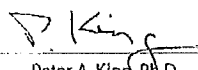


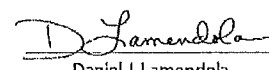
ISO Guide 34 Reference Material

Product Number: ICC-013 Lot Issue Date: 29-Feb 2016
 Lot Number: CP-0860 Expiration Date: 31-Mar 2020

Maintenance of Certification:

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


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


 Daniel J. Lamendola
 Director of QA/RA



ISO 9001 Registered Quality System – TUV USA

Page 2 of 2



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis



Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

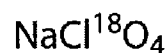
Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl*O4

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

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

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

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)

CIL subscribes to the following standards for different products: ISO Guide 34, ISO/IEC 17025, ISO 13485 and cGMP as appropriate.



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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	
#*	687318	CCV@25	Vial 71	1	Control	1	1.69605e6	7.373	26.83661
#*	687319	QC@3.0	Vial 72	1	Control	2	2.01272e5	7.322	3.16765
#*	687321	ICS@3.0	Vial 73	1	Control	3	1.15555e5	7.255	2.71754
#*	687322	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1933152001		Vial 75	1	Sample	5	6.68714e5	7.233	11.40769
#*	687323	331521S	Vial 76	1	Sample	6	8.19147e5	7.331	13.73971
#*	687324	331521D	Vial 77	1	Sample	7	8.20045e5	7.281	12.87113
#*	1933786001		Vial 78	1	Sample	8	6.28422e4	7.290	8.96014e-1
#*	1934085001		Vial 79	1	Sample	9	7.76702e4	7.271	1.30616
#*	1934086001	1K	Vial 80	1	Sample	10	6.52914e5	7.541	1.06845e4
#*	1934088001		Vial 81	1	Sample	11	8.35067e4	7.206	1.23378
*	687325	CCV@25	Vial 71	1	Control	12	1.56876e6	7.401	26.26666

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
#*	687318	CCV@25	Vial 71	1	Control	1	2.14319e5	7.415	5.00000
#*	687319	QC@3.0	Vial 72	1	Control	2	2.33945e5	7.349	5.00000
#*	687321	ICS@3.0	Vial 73	1	Control	3	1.56222e5	7.280	5.00000
#*	687322	LMB	Vial 74	1	Control	4	2.16883e5	7.417	5.00000
#*	1933152001		Vial 75	1	Sample	5	2.11754e5	7.253	5.00000
#*	687323	331521S	Vial 76	1	Sample	6	2.13383e5	7.356	5.00000
#*	687324	331521D	Vial 77	1	Sample	7	2.28828e5	7.301	5.00000
#*	1933786001		Vial 78	1	Sample	8	2.44931e5	7.312	5.00000
#*	1934085001		Vial 79	1	Sample	9	2.13009e5	7.296	5.00000
#*	1934086001	1K	Vial 80	1	Sample	10	2.21359e5	7.561	5000.00000
#*	1934088001		Vial 81	1	Sample	11	2.41676e5	7.223	5.00000
*	687325	CCV@25	Vial 71	1	Control	12	2.03012e5	7.417	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
#*	687318	CCV@25	Vial 71	1	Control	1	5.12256e5	7.390	26.62112
#*	687319	QC@3.0	Vial 72	1	Control	2	6.70814e4	7.342	3.37306
#*	687321	ICS@3.0	Vial 73	1	Control	3	4.41800e4	7.280	3.32517
#*	687322	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1933152001		Vial 75	1	Sample	5	2.33281e5	7.255	12.89143
#*	687323	331521S	Vial 76	1	Sample	6	2.85504e5	7.349	15.51969
#*	687324	331521D	Vial 77	1	Sample	7	2.84040e5	7.294	14.45077
#*	1933786001		Vial 78	1	Sample	8	2.43896e4	7.313	1.07465
#*	1934085001		Vial 79	1	Sample	9	3.07397e4	7.291	1.62821
#*	1934086001	1K	Vial 80	1	Sample	10	1.97618e5	7.553	1.05214e4
#*	1934088001		Vial 81	1	Sample	11	3.11607e4	7.206	1.43824
*	687325	CCV@25	Vial 71	1	Control	12	4.80251e5	7.415	26.37250

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	687318	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	687319	QC@3.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	687321	ICS@3.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	687322	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1933152001		CLO4-AQN	1	Sample	
6	Vial 76	687323	331521S	CLO4-AQN	1	Sample	
7	Vial 77	687324	331521D	CLO4-AQN	1	Sample	
8	Vial 78	1933786001		CLO4-AQN	1	Sample	
9	Vial 79	1934085001		CLO4-AQN	1	Sample	
10	Vial 80	1934086001	1K	CLO4-AQN	1	Sample	
11	Vial 81	1934088001		CLO4-AQN	1	Sample	
12	Vial 71	687325	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD01.D

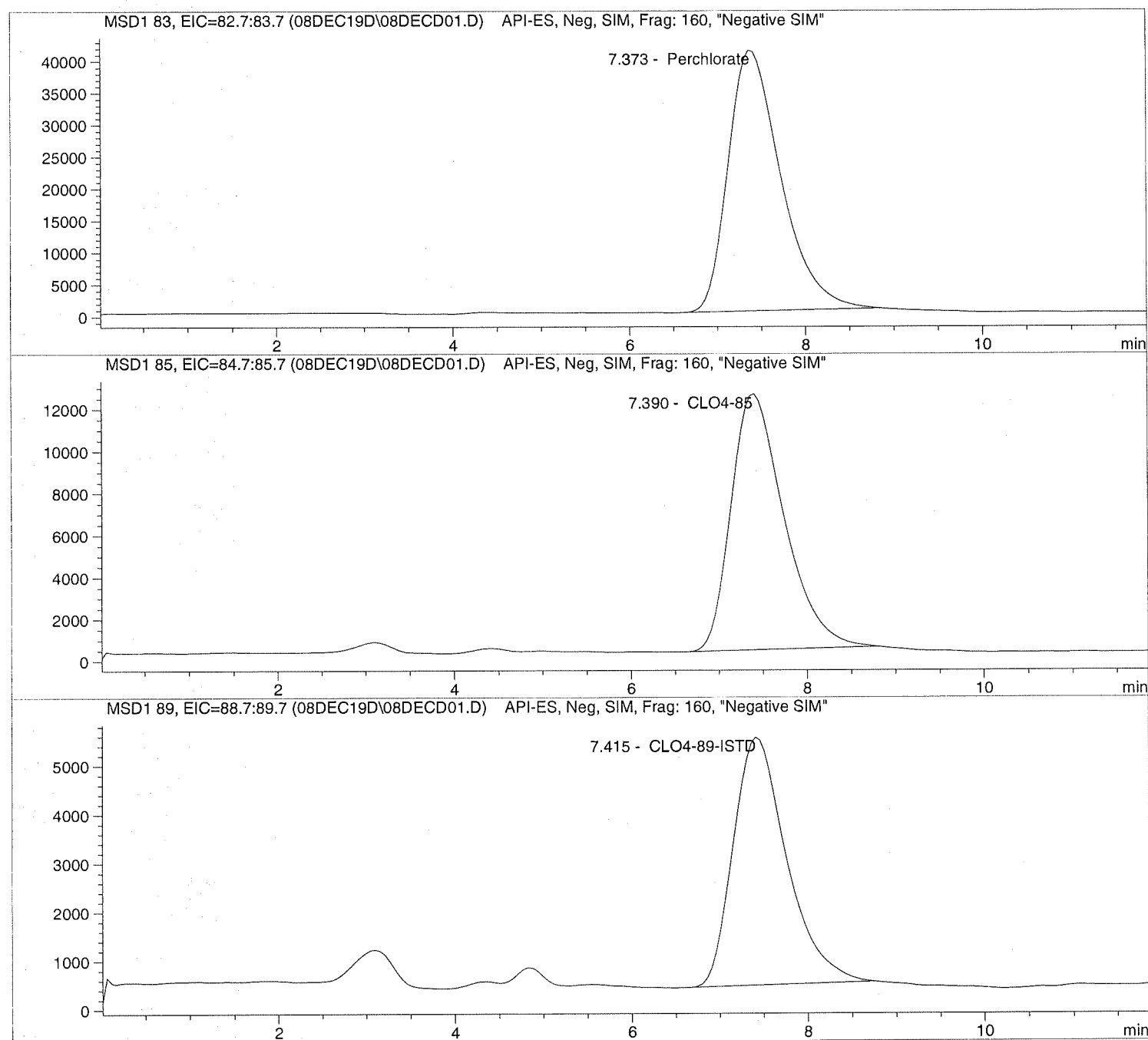
Sample Name: 687318 CCV@25

Injection Date: 12/08/2019 13:20:07
Sample Name: 687318 CCV@25
Acq Operator: TNB

Seq Line: 1
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 35 μ l

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\08DEC19D\08DECD01.D Sample Name: 687318 CCV@25

```

=====
Injection Date: 12/08/2019 13:20:07      Seq Line: 1
Sample Name: 687318 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
=====

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Perchlorate analysis

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=====
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
=====

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LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.373	PBA	1696047.9	26.8366	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.390	PBA	512255.8	26.6211	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.415	PBA	214319.2	5.0000	CLO4-89-ISTD

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*** End of Report ***
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```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD02.D

Sample Name: 687319 QC@3.0

Injection Date: 12/08/2019 13:38:13

Seq Line: 2

Sample Name: 687319 QC@3.0

Location: Vial 72

Acq Operator: TNB

Inj. No.: 1

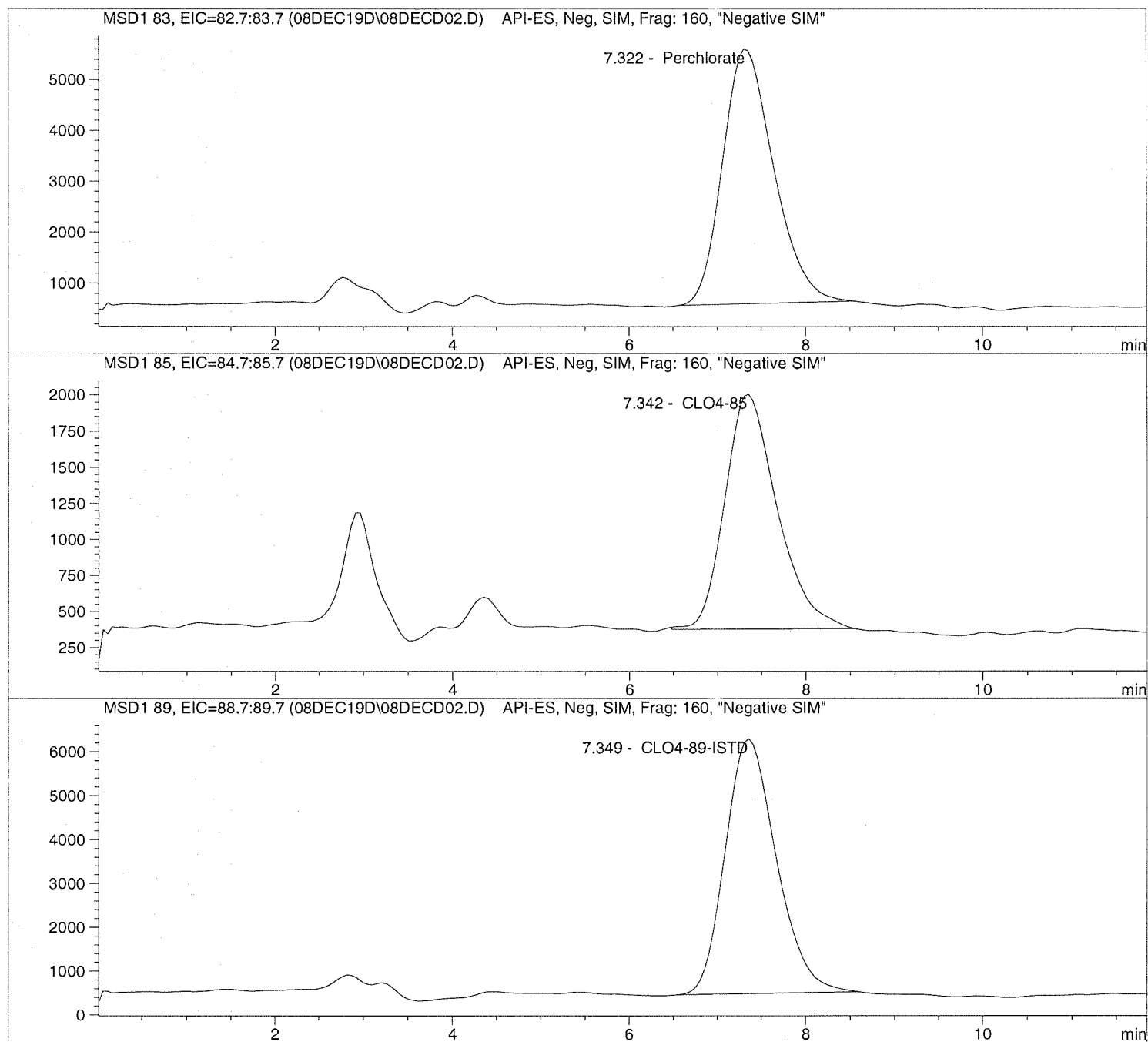
Inj. Vol.: 35 µl

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\08DEC19D\08DECD02.D Sample Name: 687319 QC@3.0

```

=====
Injection Date: 12/08/2019 13:38:13      Seq Line:          2
Sample Name:   687319 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

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=====
                          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
=====

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                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.322	PBA	201271.8	3.1677	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.342	BBA	67081.4	3.3731	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.349	PBA	233945.4	5.0000	CLO4-89-ISTD

```

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*** End of Report ***
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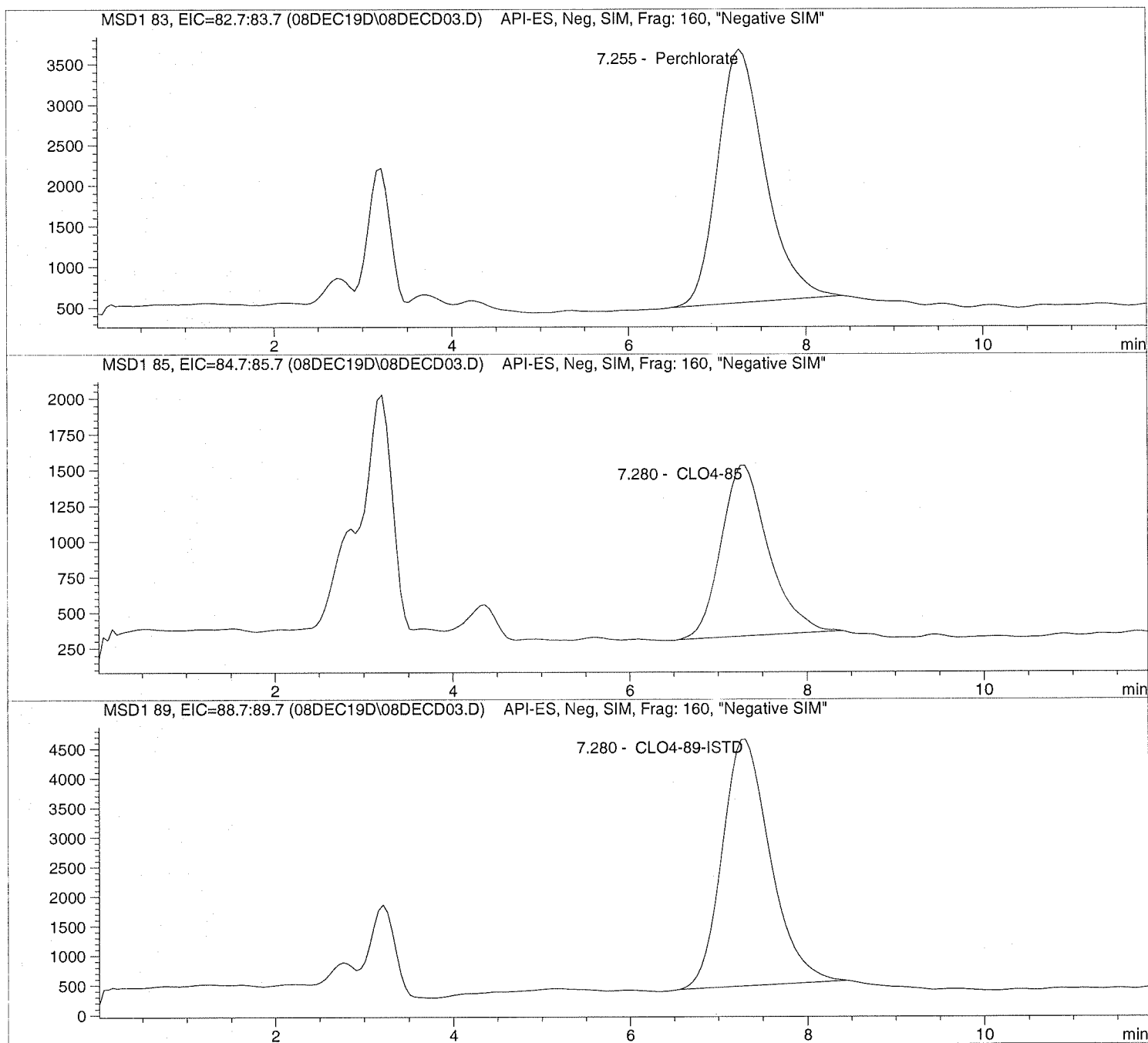
```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD03.D Sample Name: 687321 ICS@3.0

=====
Injection Date: 12/08/2019 13:52:08 Seq Line: 3
Sample Name: 687321 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\08DEC19D\08DECD03.D Sample Name: 687321 ICS@3.0

```

=====
Injection Date: 12/08/2019 13:52:08      Seq Line:          3
Sample Name:    687321 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
=====

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Perchlorate analysis

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Sample Information
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```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 3.000
=====

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LCMS Results
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```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.255	BBA	115555.3	2.7175	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.280	PBA	44180.0	3.3252	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.280	PBA	156222.3	5.0000	CLO4-89-ISTD

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*** End of Report ***
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```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD04.D

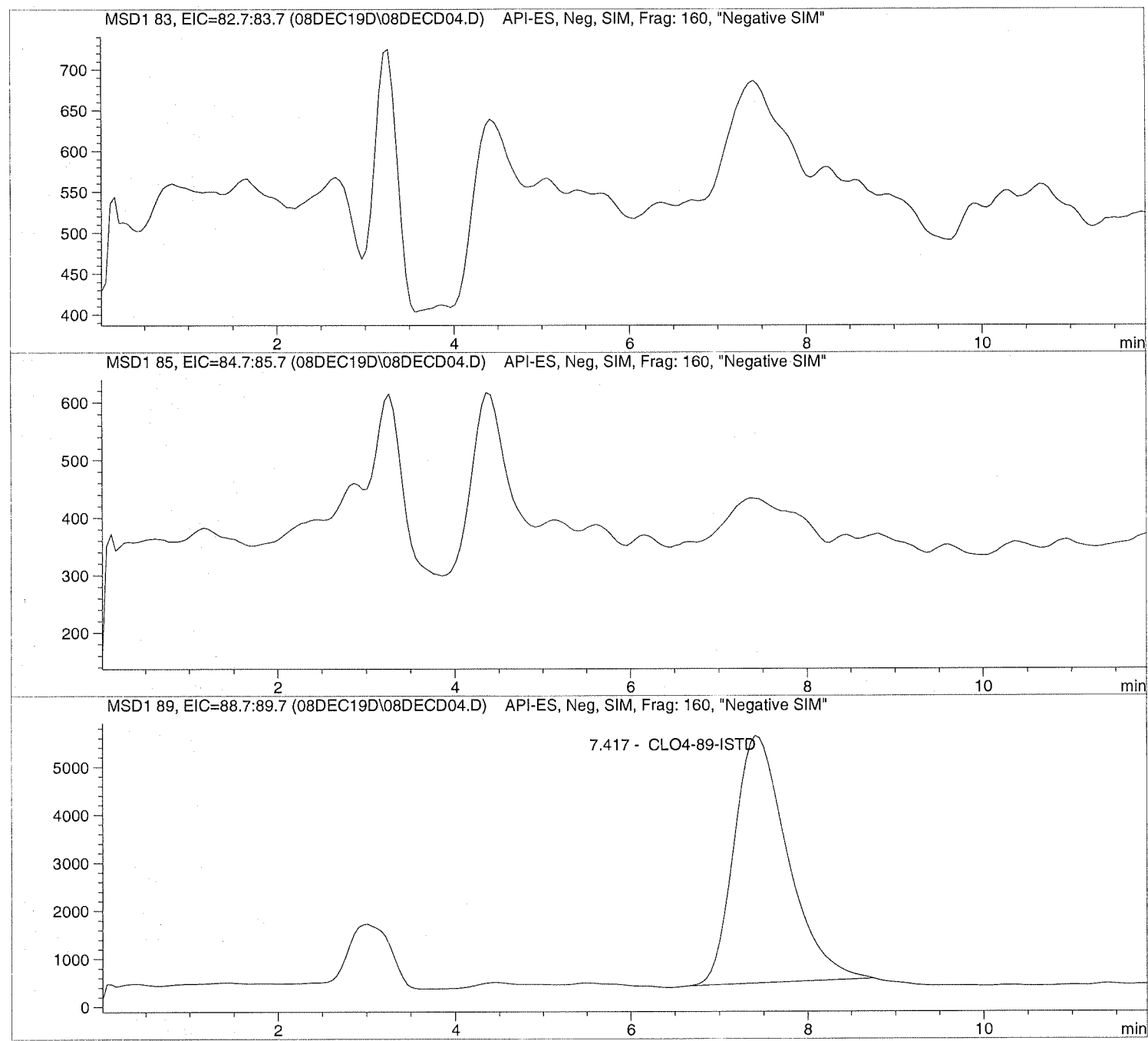
Sample Name: 687322 LMB

=====
Injection Date: 12/08/2019 14:06:04
Sample Name: 687322 LMB
Acq Operator: TNB

=====
Seq Line: 4
Location: Vial 74
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\08DEC19D\08DECD04.D

Sample Name: 687322 LMB

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=====
Injection Date: 12/08/2019 14:06:04      Seq Line:          4
Sample Name:    687322 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
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Perchlorate analysis

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Sample Information
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```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
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=====
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
7.417	PBA	216882.7	5.0000	CLO4-89-ISTD

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*** End of Report ***
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```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD05.D

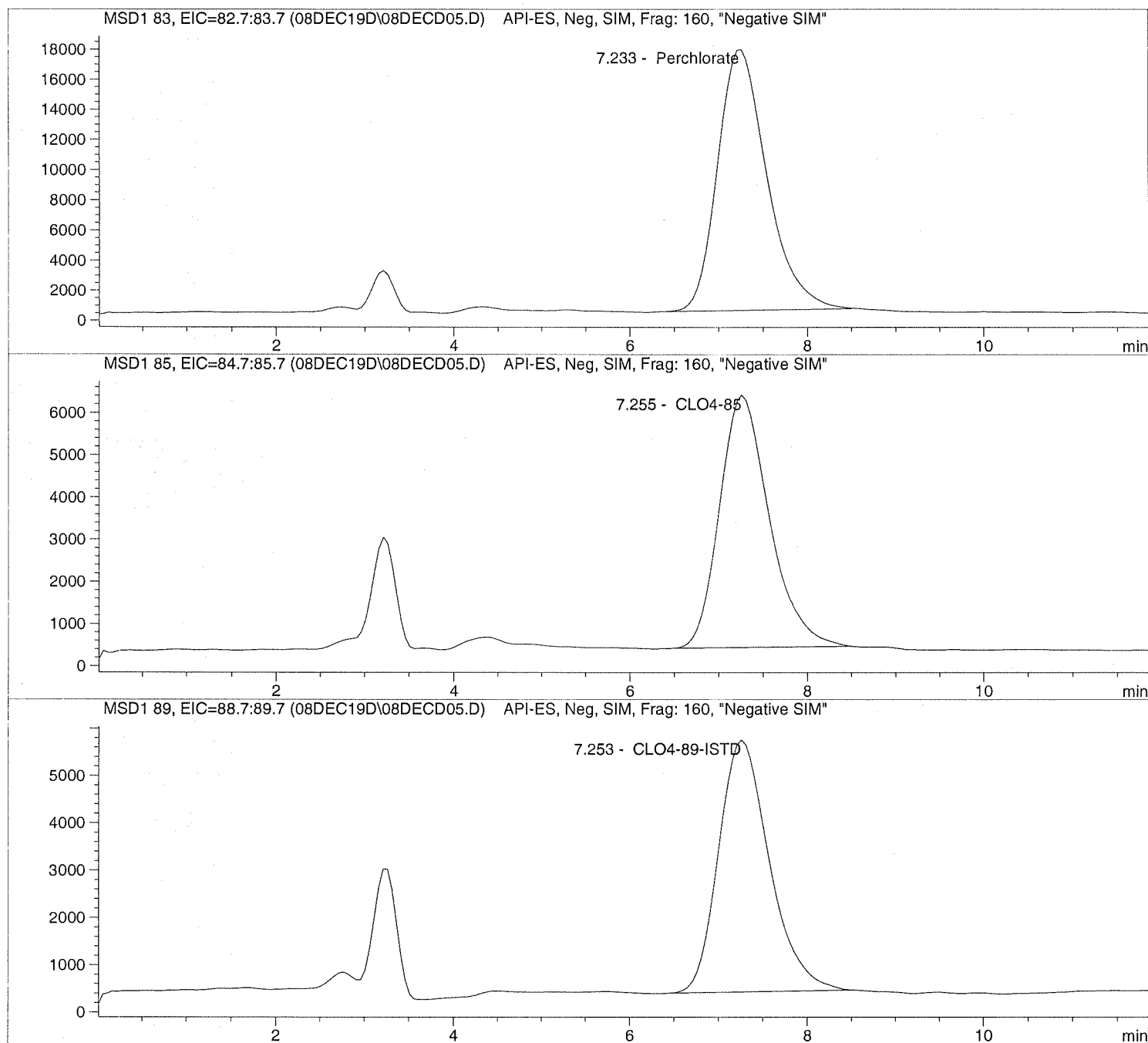
Sample Name: 1933152001

Injection Date: 12/08/2019 14:20:08
Sample Name: 1933152001
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 35 μ l

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\08DEC19D\08DECD05.D

Sample Name: 1933152001

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=====
Injection Date: 12/08/2019 14:20:08      Seq Line:          5
Sample Name:    1933152001              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
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Perchlorate analysis

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=====
                          Sample Information
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```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
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                          LCMS Results
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```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.233	PBA	668714.5	11.4077	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.255	PBA	233281.0	12.8914	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.253	PBA	211754.2	5.0000	CLO4-89-ISTD

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*** End of Report ***
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```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD06.D

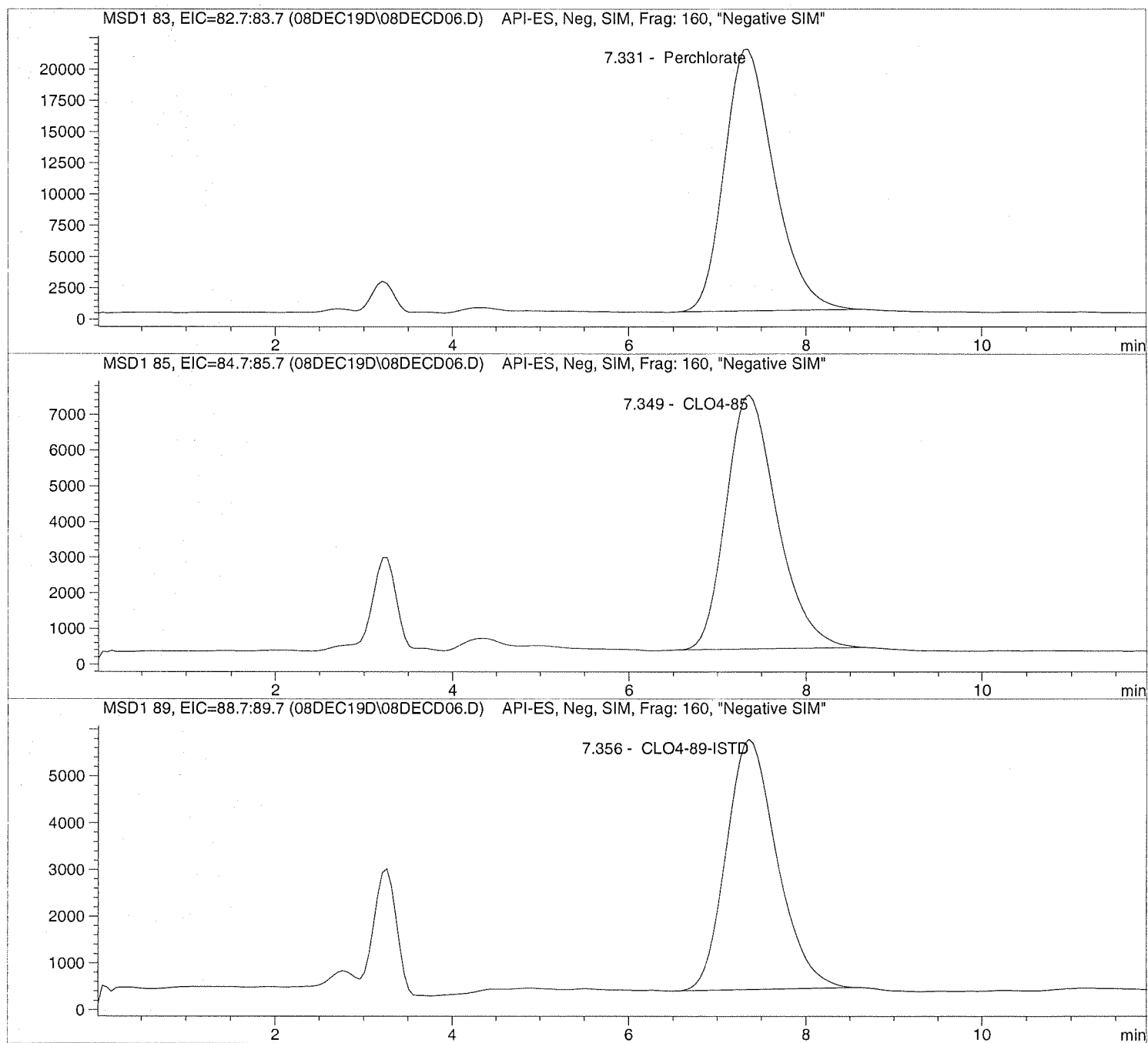
Sample Name: 687323 331521S

=====
Injection Date: 12/08/2019 14:34:02
Sample Name: 687323 331521S
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
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\08DEC19D\08DECD06.D Sample Name: 687323 331521S

```

=====
Injection Date: 12/08/2019 14:34:02      Seq Line:          6
Sample Name:   687323 331521S           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
=====

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Perchlorate analysis

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=====
                          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
7.331	PBA	819146.8	13.7397	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.349	PBA	285503.6	15.5197	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.356	PBA	213383.5	5.0000	CLO4-89-ISTD

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*** End of Report ***
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```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD07.D

Sample Name: 687324 331521D

Injection Date: 12/08/2019 14:48:08

Seq Line: 7

Sample Name: 687324 331521D

Location: Vial 77

Acq Operator: TNB

Inj. No.: 1

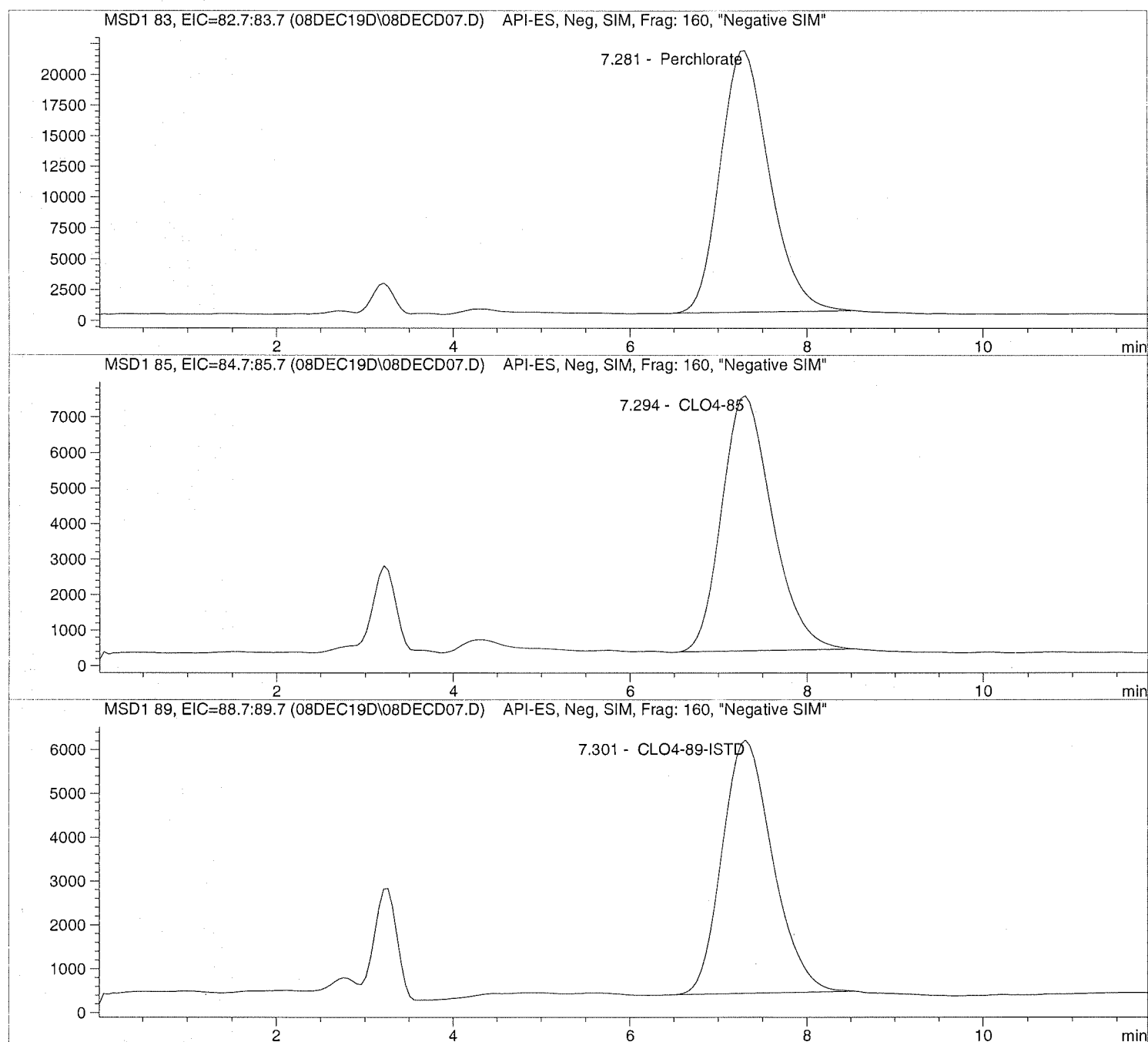
Inj. Vol.: 35 µl

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\08DEC19D\08DECD07.D Sample Name: 687324 331521D

```

=====
Injection Date: 12/08/2019 14:48:08      Seq Line: 7
Sample Name: 687324 331521D             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
=====

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```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.281	PBA	820045.2	12.8711	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.294	PBA	284039.7	14.4508	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.301	PBA	228828.1	5.0000	CLO4-89-ISTD

```

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*** End of Report ***
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```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD08.D

Sample Name: 1933786001

Injection Date: 12/08/2019 15:02:01

Seq Line: 8

Sample Name: 1933786001

Location: Vial 78

Acq Operator: TNB

Inj. No.: 1

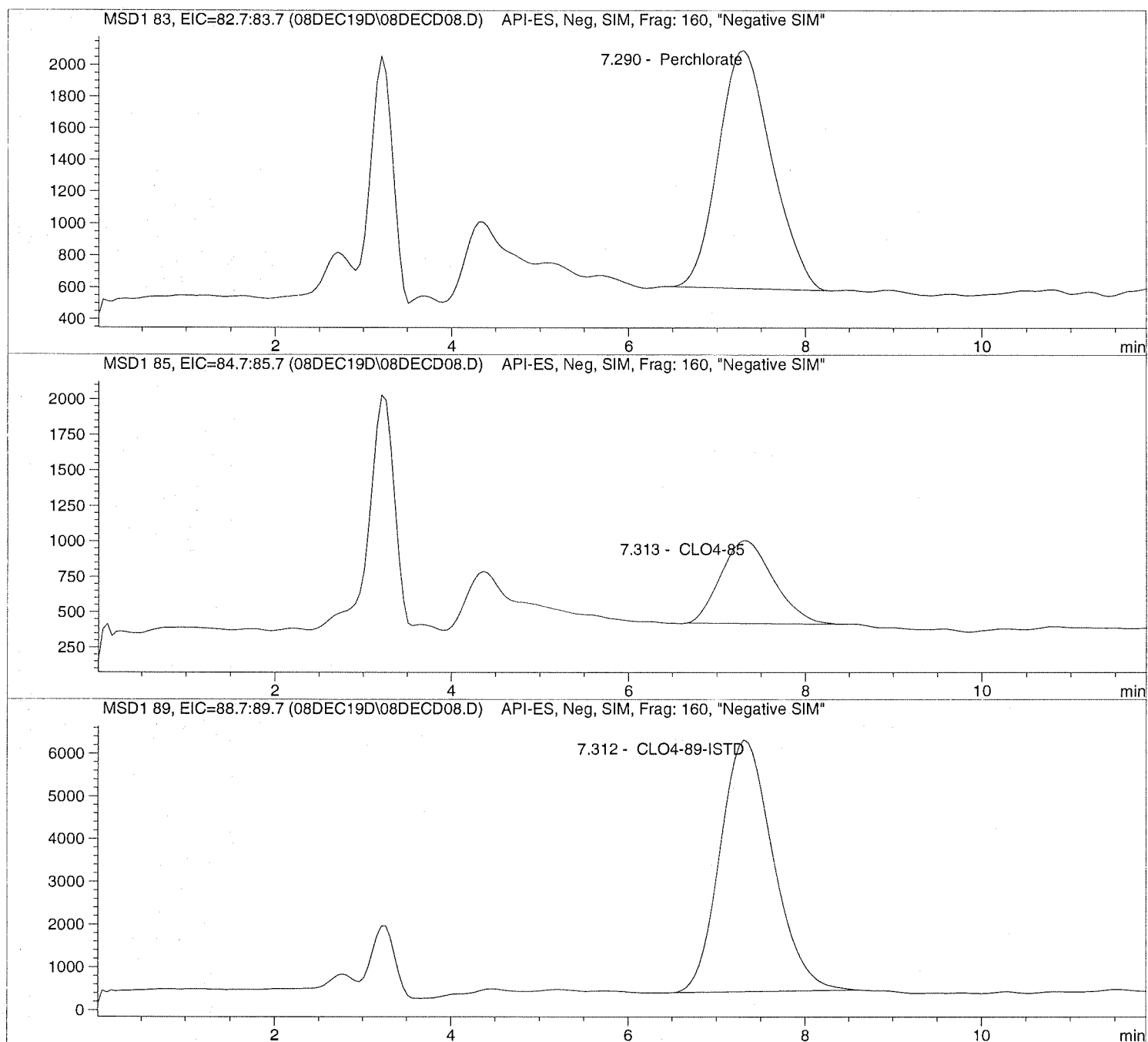
Inj. Vol.: 35 µl

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\08DEC19D\08DECD08.D Sample Name: 1933786001

```

=====
Injection Date: 12/08/2019 15:02:01      Seq Line:      8
Sample Name:    1933786001                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
7.290	PBA	62842.2	0.8960	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.313	PBA	24389.6	1.0747	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.312	PBA	244930.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD09.D

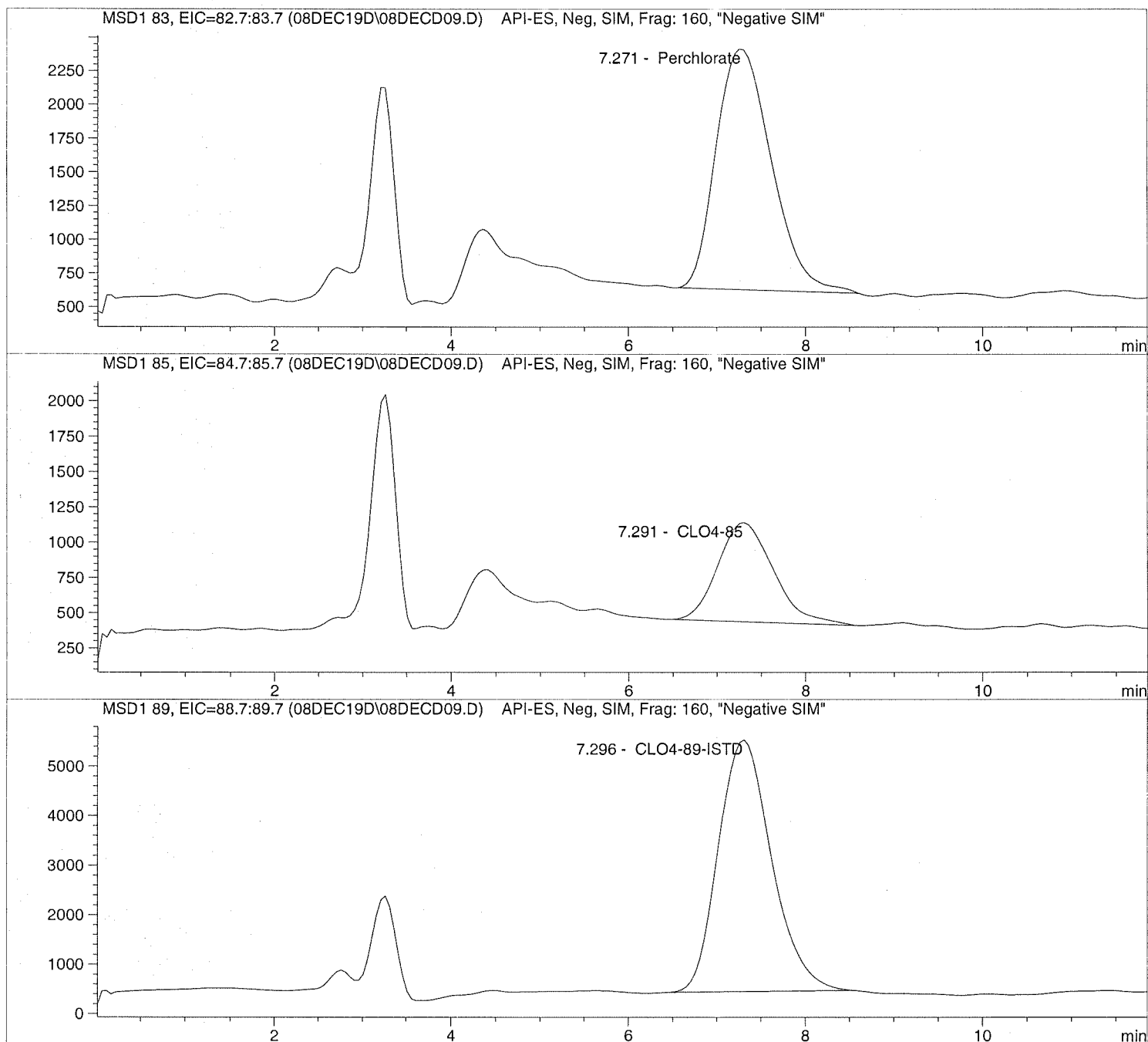
Sample Name: 1934085001

Injection Date: 12/08/2019 15:15:52
Sample Name: 1934085001
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 35 μ l

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\08DEC19D\08DECD09.D Sample Name: 1934085001

```

=====
Injection Date: 12/08/2019 15:15:52      Seq Line:          9
Sample Name:   1934085001                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
7.271	PBA	77670.2	1.3062	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.291	PBA	30739.7	1.6282	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.296	PBA	213008.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD10.D

Sample Name: 1934086001 1K

Injection Date: 12/08/2019 15:29:50

Seq Line: 10

Sample Name: 1934086001 1K

Location: Vial 80

Acq Operator: TNB

Inj. No.: 1

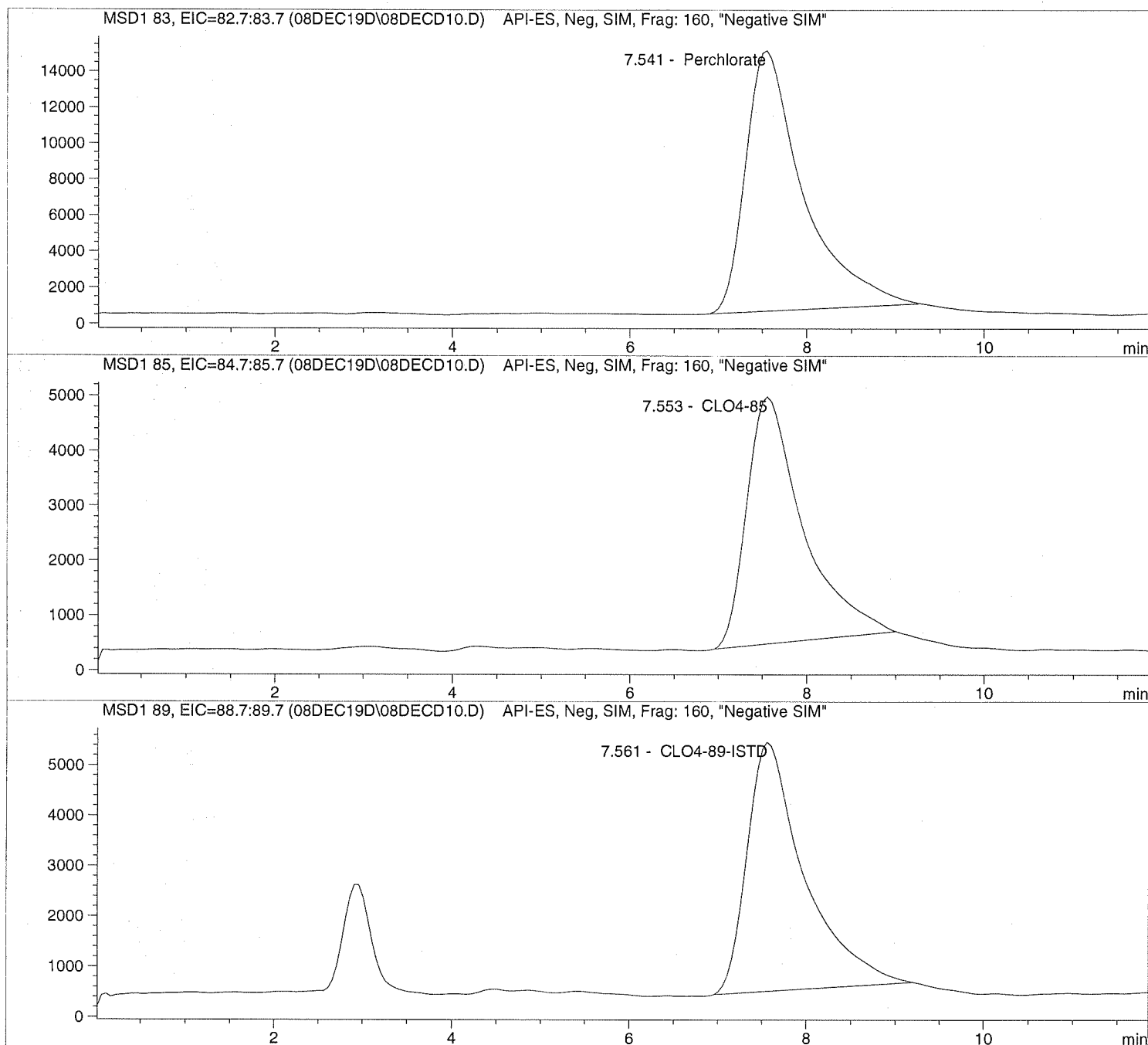
Inj. Vol.: 35 μ l

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\08DEC19D\08DECD10.D Sample Name: 1934086001 1K

```

=====
Injection Date: 12/08/2019 15:29:50      Seq Line: 10
Sample Name: 1934086001 1K              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: 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
7.541	PBA	652913.9	10684.5187	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.553	PBA	197617.5	10521.3847	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.561	PBA	221358.6	5000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD11.D

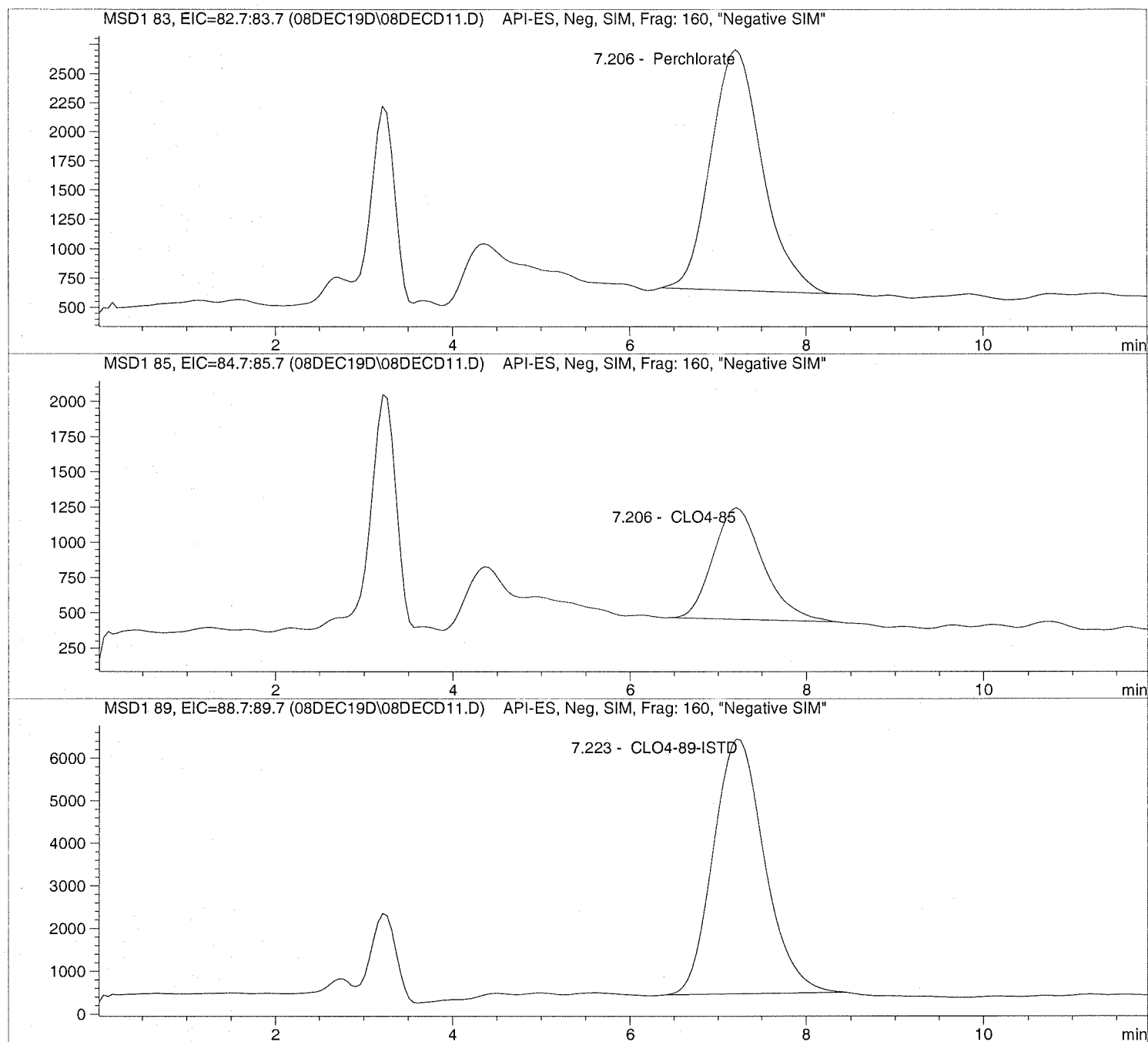
Sample Name: 1934088001

=====
Injection Date: 12/08/2019 15:43:41
Sample Name: 1934088001
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
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\08DEC19D\08DECD11.D Sample Name: 1934088001

```

=====
Injection Date: 12/08/2019 15:43:41      Seq Line:          11
Sample Name:   1934088001                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:       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
7.206	PBA	83506.7	1.2338	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.206	PBA	31160.7	1.4382	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.223	PBA	241675.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD12.D

Sample Name: 687325 CCV@25

Injection Date: 12/08/2019 15:57:34

Seq Line: 12

Sample Name: 687325 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

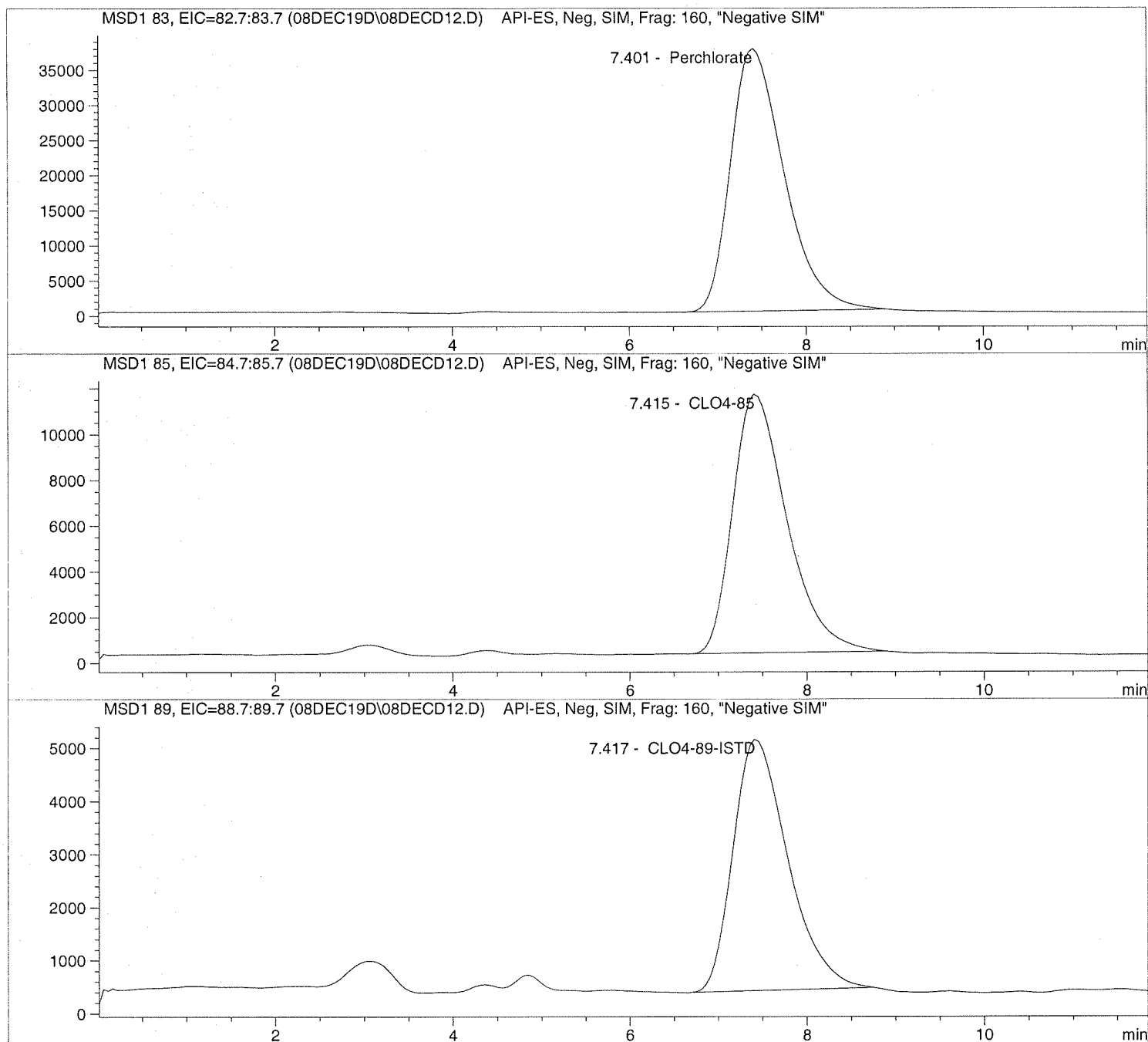
Inj. Vol.: 35 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis





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 (Amt) (some peaks differ, see below)

Recalibration Settings:
Average Response      :      Average all calibrations
Average Retention Time:      Floating Average New 75%

```

Calibration Report Options :

```

Printout of recalibrations within a sequence:
  Calibration Table after Recalibration
  Normal Report after Recalibration
If the sequence is done with bracketing:
  Results of first cycle (ending previous bracket)

```

Default Sample ISTD Information (if not set in sample table):

ISTD ISTD Amount Name

#

```

-----|-----|-----
  1      5.00000  CLO4-89-ISTD

```

Signal 1: MSD1 83, EIC=82.7:83.7

Signal 2: MSD1 85, EIC=84.7:85.7

Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Lvl	Sig	Amount	Area	Amt/Area	Ref	Grp	Name
7.750	1	3	1.00000	5.39218e4	1.85454e-5	1		Perchlorate
		4	2.00000	1.32825e5	1.50574e-5			
		5	5.00000	2.76271e5	1.80982e-5			
		6	10.00000	5.61298e5	1.78159e-5			
		7	25.00000	1.51820e6	1.64669e-5			
		8	50.00000	3.31156e6	1.50986e-5			
		9	75.00000	5.23914e6	1.43153e-5			
7.767	3	3	5.00000	2.14568e5	2.33026e-5	+I1		CLO4-89-ISTD
		4	5.00000	2.04758e5	2.44190e-5			
		5	5.00000	2.13407e5	2.34294e-5			
		6	5.00000	2.09246e5	2.38953e-5			
		7	5.00000	2.07403e5	2.41077e-5			
		8	5.00000	2.02929e5	2.46391e-5			
		9	5.00000	1.97933e5	2.52611e-5			
7.778	2	3	1.00000	1.70436e4	5.86732e-5	1		CLO4-85
		4	2.00000	4.20754e4	4.75337e-5			
		5	5.00000	9.24707e4	5.40712e-5			
		6	10.00000	1.68622e5	5.93041e-5			
		7	25.00000	4.63724e5	5.39114e-5			
		8	50.00000	9.95933e5	5.02042e-5			

Method C:\HPCHEM\1\METHODS\CLO4-DP3.M

RetTime [min]	Lvl Sig	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

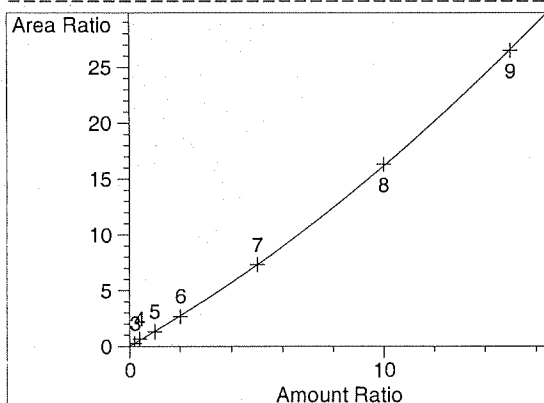
Time Window : From 3.581 min To 11.896 min
 Curve Type : Linear
 Origin : Included
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1
 Level 8 : 1
 Level 9 : 1

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

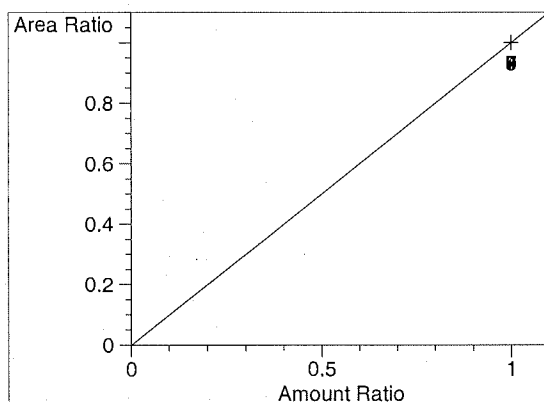
=====
 Peak Sum Table
 =====

No Entries in table
 =====

=====
 Calibration Curves
 =====


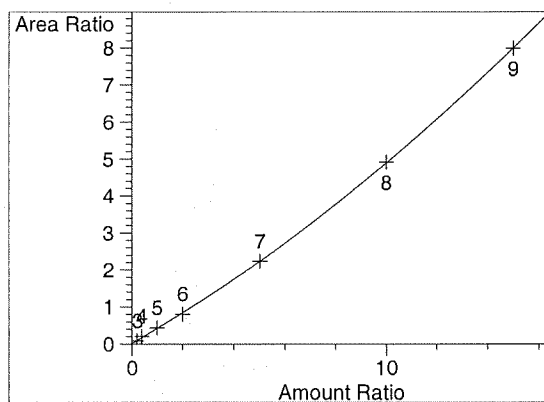
Calibration Level Weights:

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



Calibration Level Weights:

Level 3	: 1
Level 4	: 1
Level 5	: 1
Level 6	: 1
Level 7	: 1
Level 8	: 1
Level 9	: 1



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\20SEP19\20SEPI03.D

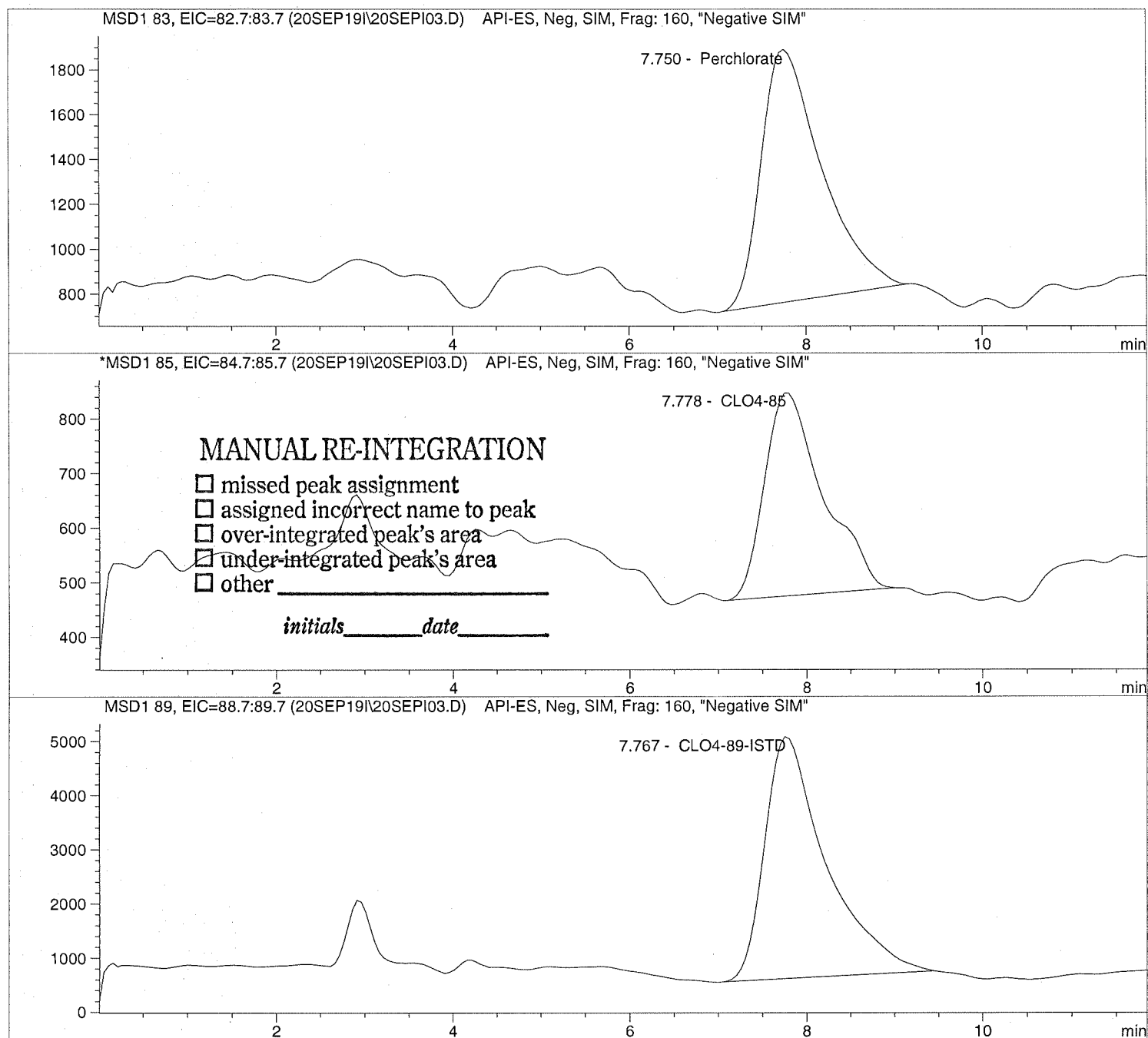
Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05
 Sample Name: CLO4@ 1.0ug/L
 Acq Operator: TNB

Seq Line: 3
 Location: Vial 73
 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

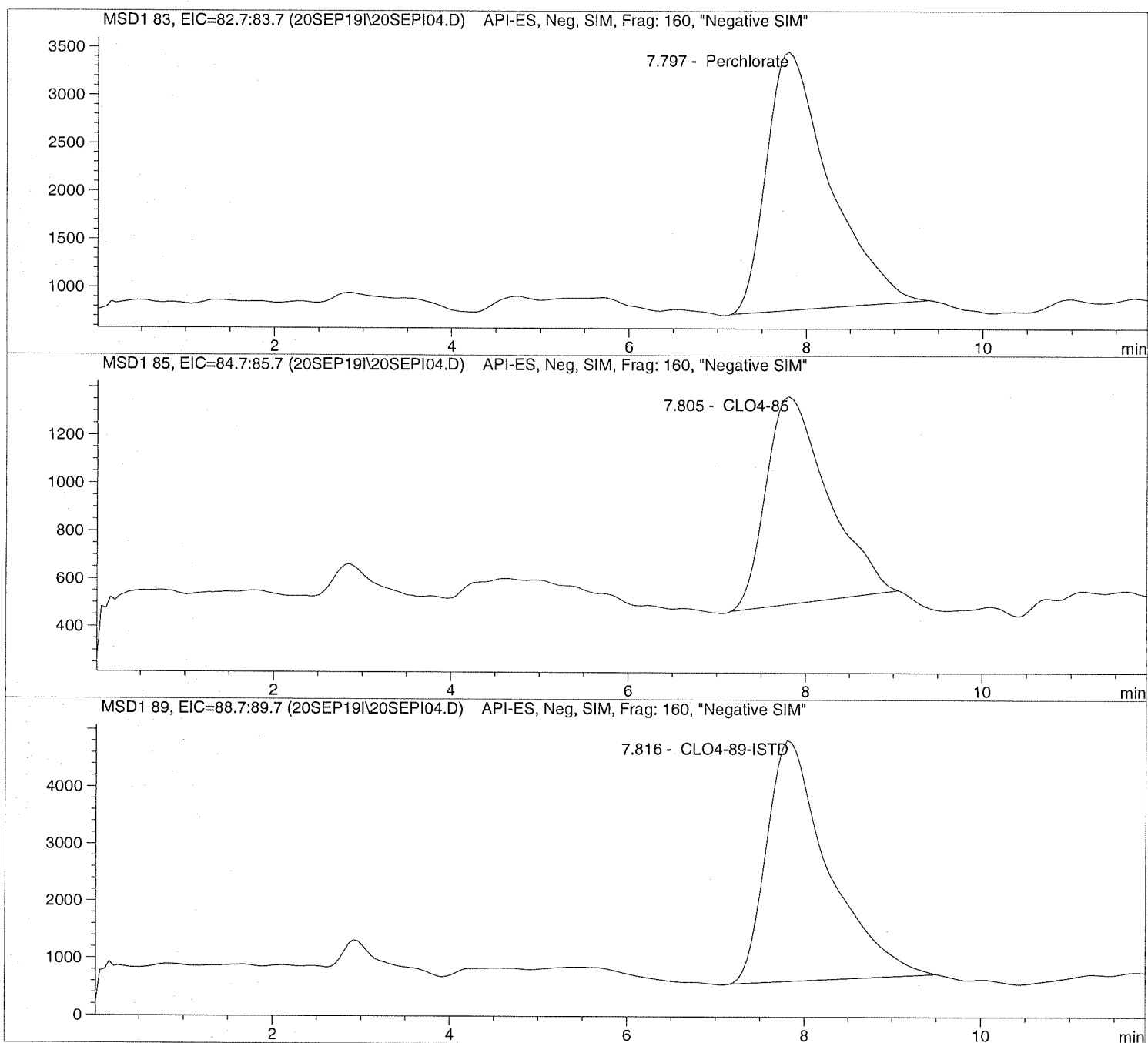
Inj. Vol.: 30 µl

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\20SEP19\20SEPI05.D

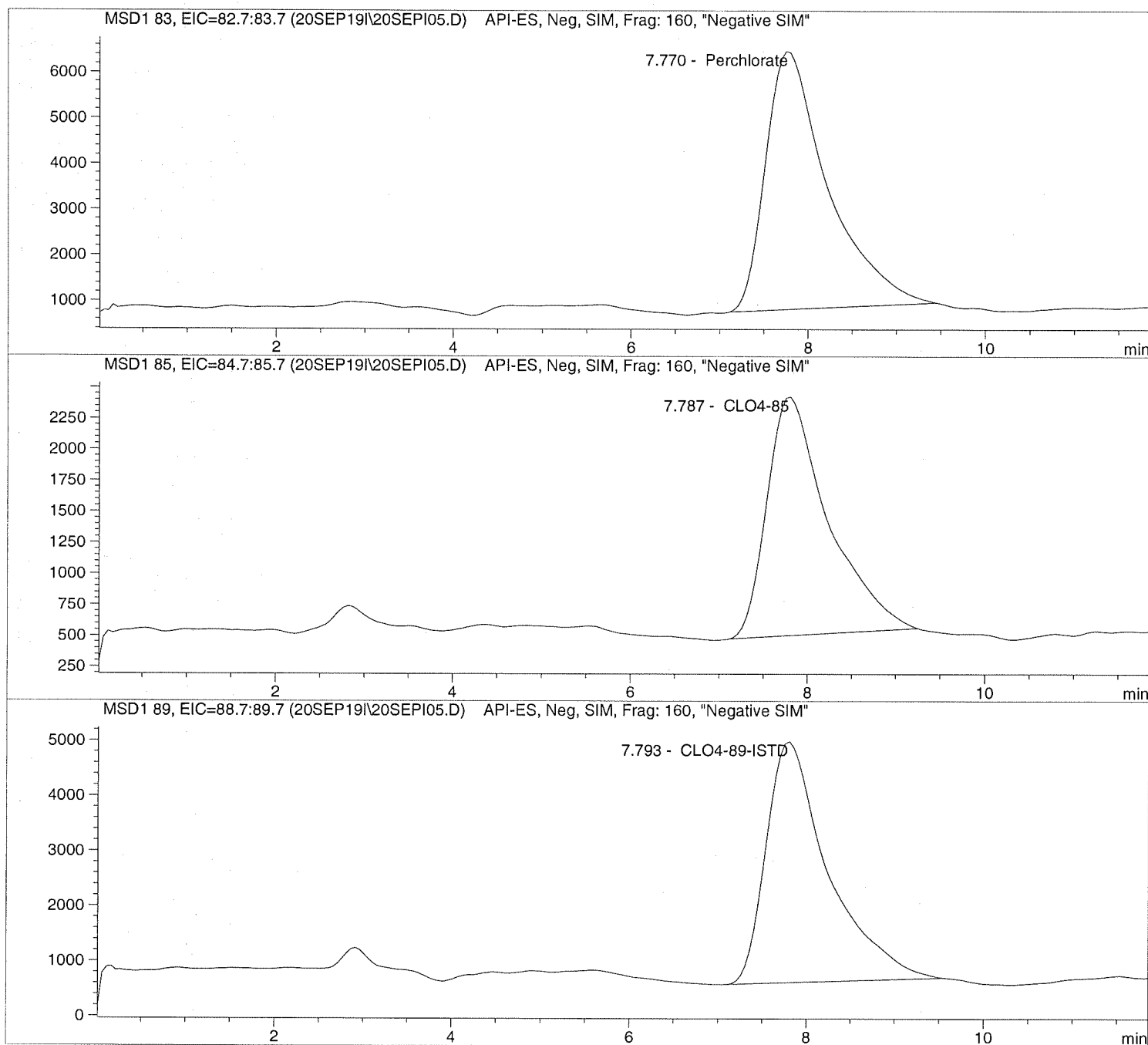
Sample Name: CLO4@ 5.0ug/L

Injection Date: 9/20/2019 09:51:49
Sample Name: CLO4@ 5.0ug/L
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 30 μ l

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

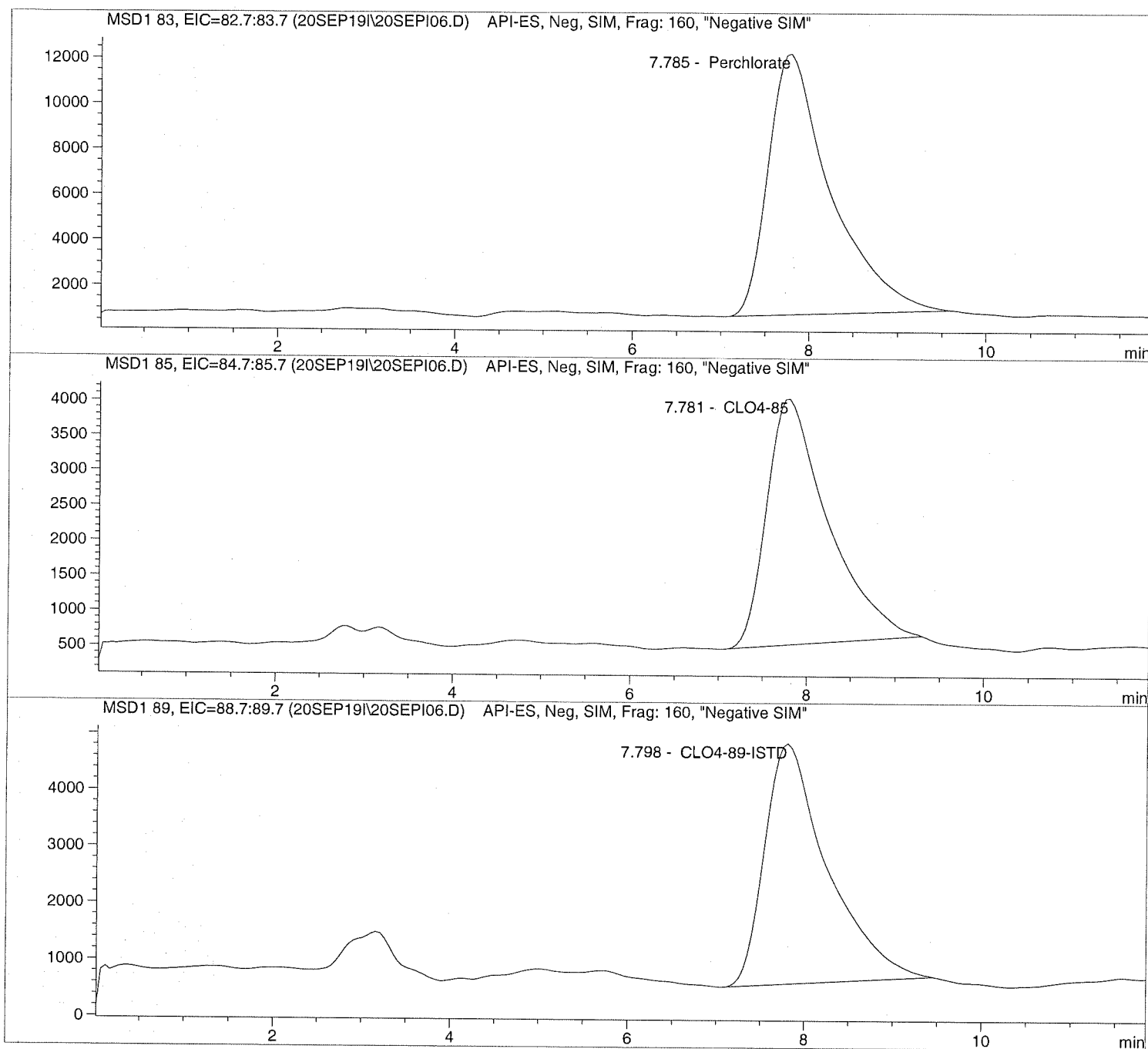
Sample Name: CLO4@ 10.ug/L

=====
Injection Date: 9/20/2019 10:05:36
Sample Name: CLO4@ 10.ug/L
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
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

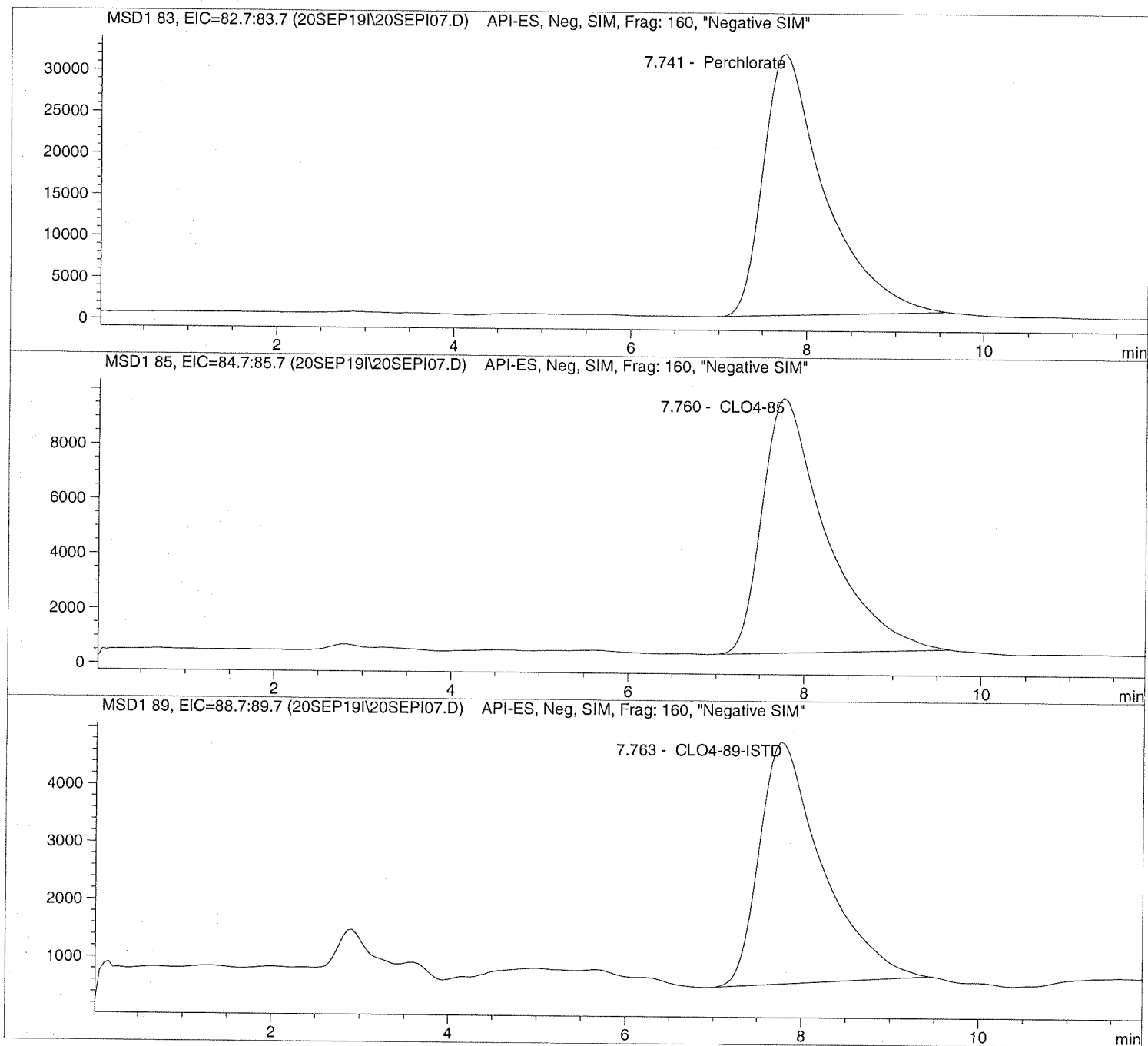
Inj. Vol.: 30 µl

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

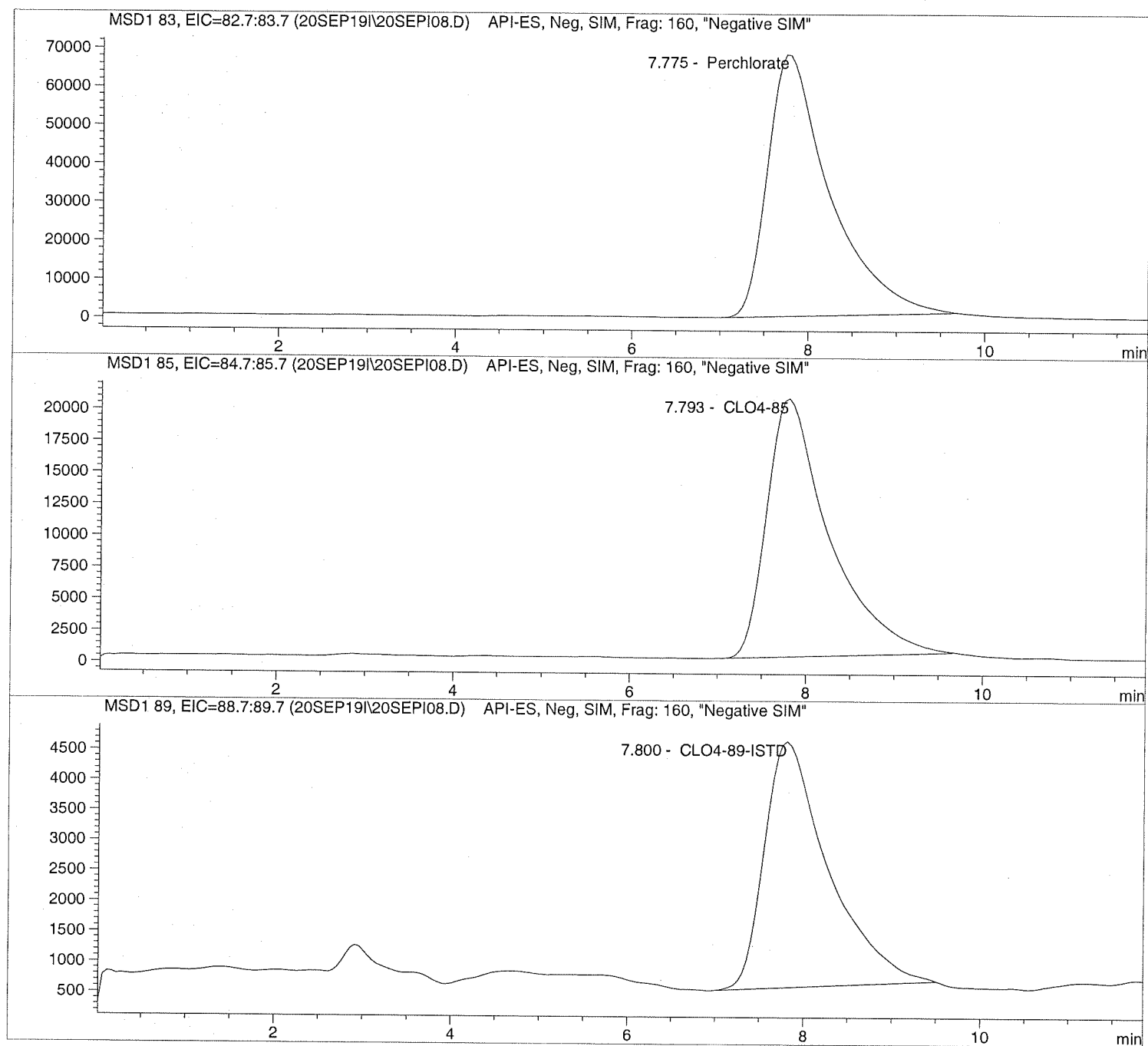
Inj. Vol.: 30 µl

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

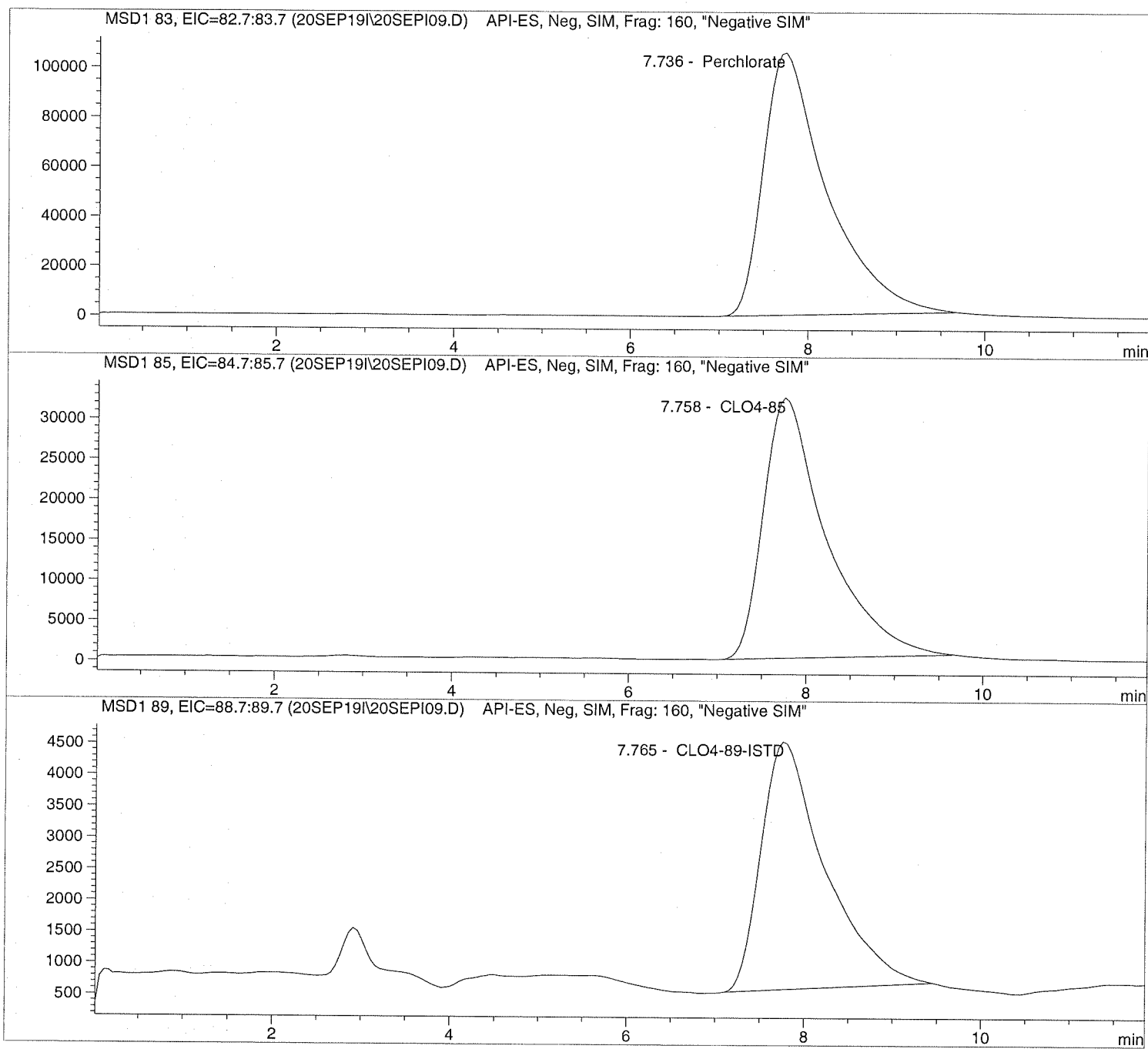
Sample Name: CLO4@ 75.ug/L

=====
Injection Date: 9/20/2019 10:47:05
Sample Name: CLO4@ 75.ug/L
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
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

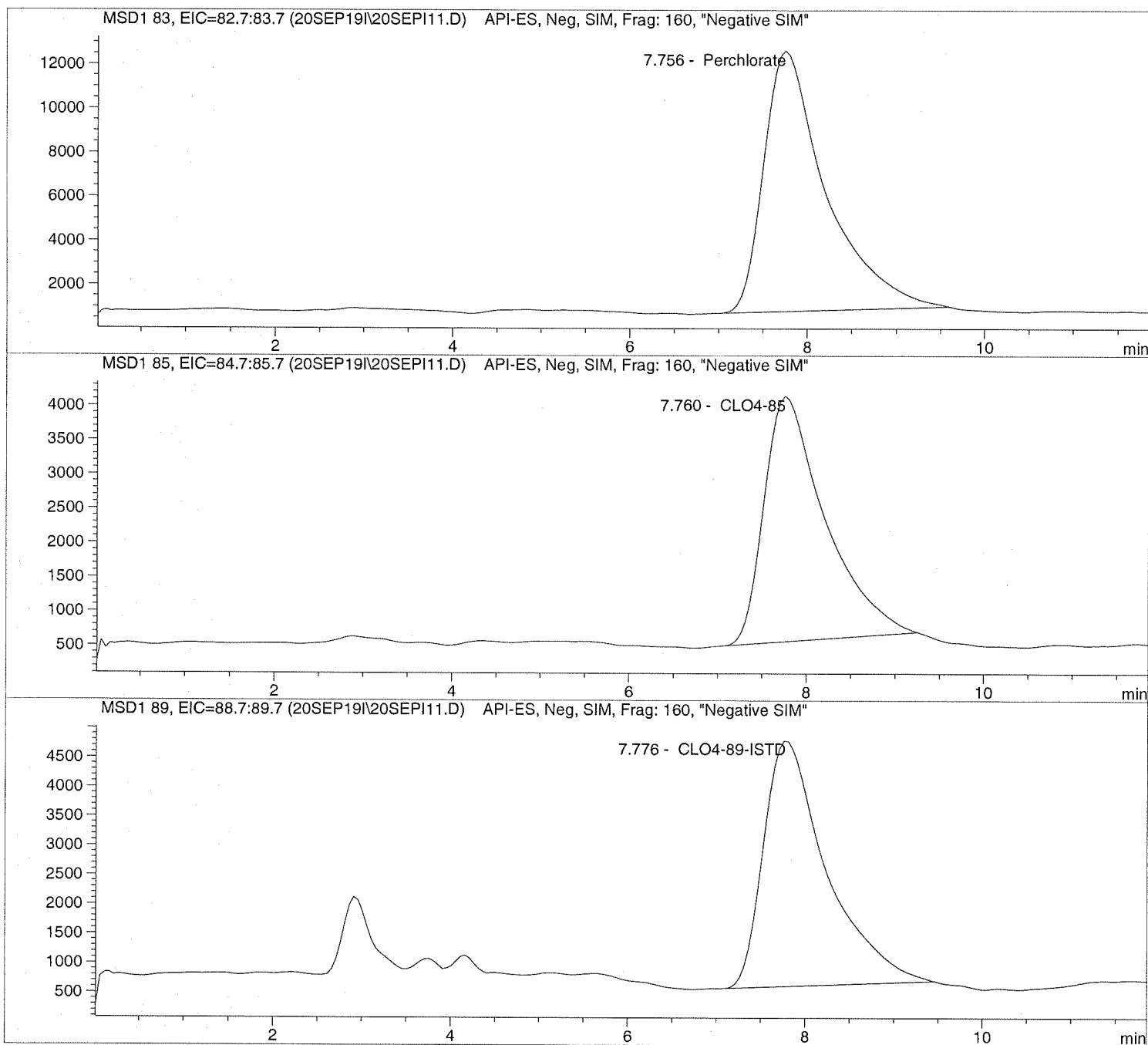
Sample Name: ICAL Verf@10ug/L

=====
Injection Date: 9/20/2019 11:14:45
Sample Name: ICAL Verf@10ug/L
Acq Operator: TNB

Seq Line: 11
Location: Vial 80
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\20SEP19\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05

Seq Line: 3

Sample Name: CLO4@ 1.0ug/L

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

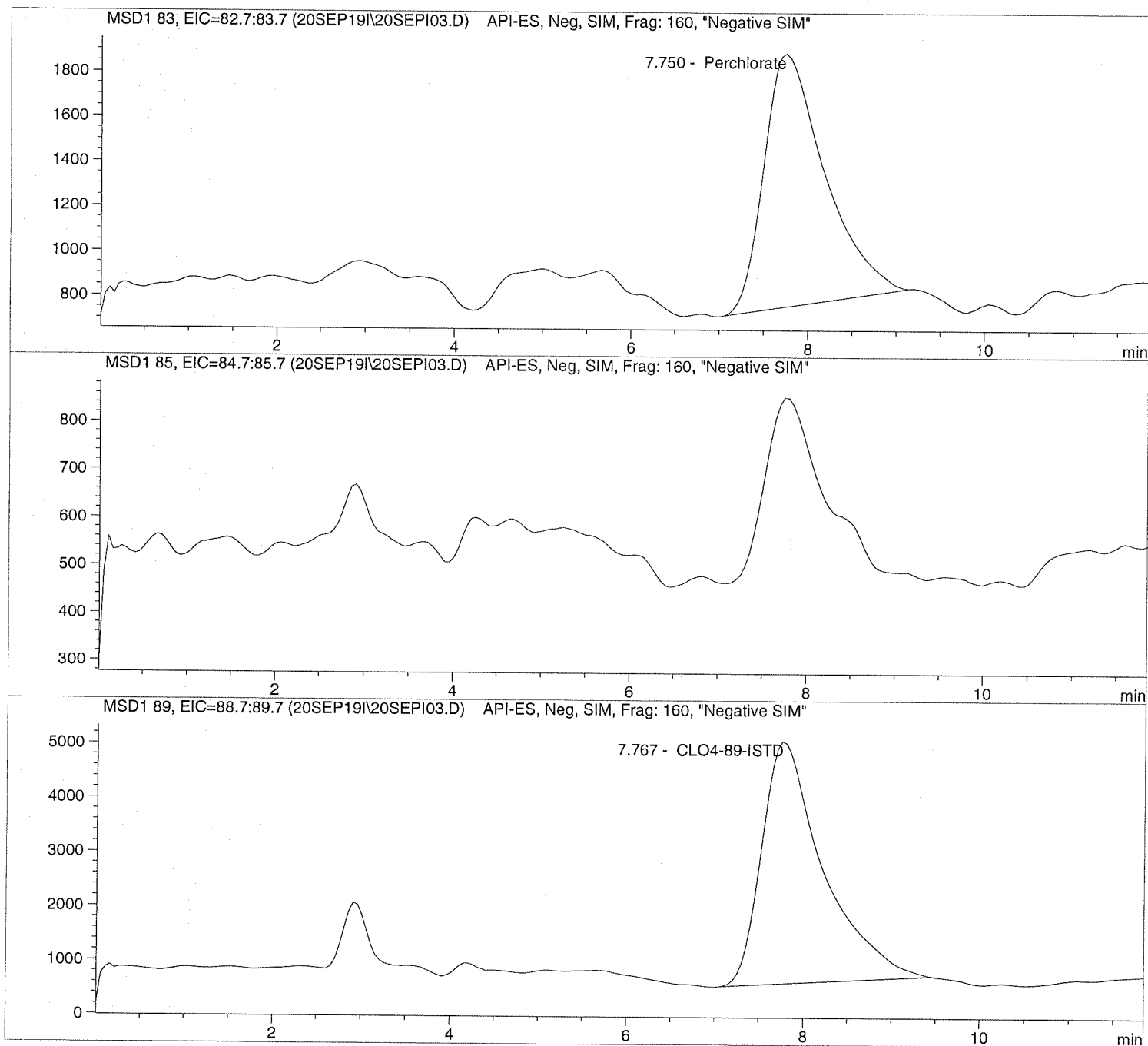
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line: 3
Sample Name:    CLO4@ 1.0ug/L           Location:  Vial 73
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:27:11
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```



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

December 10, 2019

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

Work Order: **HS19120109**

Laboratory Results for: **Longhorn GW Treatment Plant Monthly Influent Samples**

Dear Marcia,

ALS Environmental received 1 sample(s) on Dec 04, 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,

A handwritten signature in black ink, appearing to read 'Raj. P. Modashia', enclosed in a circular scribble.

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
Work Order: HS19120109

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120109-01	LH18/24-SP140_120319	Water		03-Dec-2019 14:00	04-Dec-2019 09:13	<input type="checkbox"/>

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
Work Order: HS19120109

CASE NARRATIVE**Work Order Comments**

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

Metals by Method SW6020**Batch ID: 148236****Sample ID: HS19120107-01MS**

- MS and MSD are for an unrelated sample

Sample ID: HS19120107-01MSD

- MSD is for an unrelated sample
-

WetChemistry by Method SW7196**Batch ID: R351814**

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

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Monthly Influent Samples
 Sample ID: LH18/24-SP140_120319
 Collection Date: 03-Dec-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19120109
 Lab ID:HS19120109-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		Method:SW6020				Prep:SW3010A / 04-Dec-2019		Analyst: JC
Selenium	0.00126	J	0.00110	0.00250	0.00500	mg/L	1	04-Dec-2019 22:40
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	04-Dec-2019 22:40
HEXAVALENT CHROMIUM BY SW7196A		Method:SW7196						Analyst: MZD
Chromium, Hexavalent	0.0100	U	0.00600	0.0100	0.0100	mg/L	1	04-Dec-2019 12:34
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	10-Dec-2019 09:45

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19120109

Batch ID: 148236 **Start Date:** 04 Dec 2019 11:00 **End Date:** 04 Dec 2019 15:00
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19120109-01		10 (mL)	10 (mL)	1

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19120109

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 148236 (0)		Test Name : METALS BY ICPMS BY SW6020A			Matrix: Water	
HS19120109-01	LH18/24-SP140_120319	03 Dec 2019 14:00		04 Dec 2019 14:00	04 Dec 2019 22:40	1
Batch ID: R351814 (0)		Test Name : HEXAVALENT CHROMIUM BY SW7196A			Matrix: Water	
HS19120109-01	LH18/24-SP140_120319	03 Dec 2019 14:00			04 Dec 2019 12:34	1
Batch ID: R352119 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Water	
HS19120109-01	LH18/24-SP140_120319	03 Dec 2019 14:00			10 Dec 2019 09:45	1

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19120109

QC BATCH REPORT

Batch ID: 148236 (0)		Instrument: ICPMS04		Method: METALS BY ICPMS BY SW6020A						
MBLK	Sample ID: MBLK-148236	Units: mg/L		Analysis Date: 04-Dec-2019 22:25						
Client ID:	Run ID: ICPMS04_351809	SeqNo: 5374351		PrepDate: 04-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
LCS	Sample ID: LCS-148236	Units: mg/L		Analysis Date: 04-Dec-2019 22:27						
Client ID:	Run ID: ICPMS04_351809	SeqNo: 5374352		PrepDate: 04-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.04753	0.00500	0.05	0	95.1	80 - 120				
Silver	0.0428	0.00500	0.05	0	85.6	85 - 116				
MS	Sample ID: HS19120107-01MS	Units: mg/L		Analysis Date: 04-Dec-2019 22:34						
Client ID:	Run ID: ICPMS04_351809	SeqNo: 5374355		PrepDate: 04-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.04817	0.00500	0.05	0.000497	95.3	80 - 120				
Silver	0.04269	0.00500	0.05	0.000006	85.4	85 - 116				
MSD	Sample ID: HS19120107-01MSD	Units: mg/L		Analysis Date: 04-Dec-2019 22:36						
Client ID:	Run ID: ICPMS04_351809	SeqNo: 5374356		PrepDate: 04-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.04364	0.00500	0.05	0.000497	86.3	80 - 120	0.04817	9.86	20	
Silver	0.03877	0.00500	0.05	0.000006	77.5	85 - 116	0.04269	9.63	20	S
PDS	Sample ID: HS19120107-01PDS	Units: mg/L		Analysis Date: 04-Dec-2019 22:38						
Client ID:	Run ID: ICPMS04_351809	SeqNo: 5374357		PrepDate: 04-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.101	0.00500	0.1	0.000497	101	80 - 120				
Silver	0.08632	0.00500	0.1	0.000006	86.3	80 - 120				

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19120109

QC BATCH REPORT

Batch ID: 148236 (0)		Instrument: ICPMS04		Method: METALS BY ICPMS BY SW6020A						
SD	Sample ID: HS19120107-01SD	Units: mg/L			Analysis Date: 04-Dec-2019 22:31					
Client ID:	Run ID: ICPMS04_351809	SeqNo: 5374354	PrepDate: 04-Dec-2019	DF: 5						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	Limit	Qual
Selenium	0.0125	0.0250					0.000497	0	10	U
Silver	0.00250	0.0250					0.000006	0	10	U

The following samples were analyzed in this batch: HS19120109-01

ALS Houston, US

Date: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19120109

QC BATCH REPORT

Batch ID: R351814 (0)		Instrument: UV-2450		Method: HEXAVALENT CHROMIUM BY SW7196A						
MBLK	Sample ID: MBLK-351814	Units: mg/L		Analysis Date: 04-Dec-2019 12:34						
Client ID:	Run ID: UV-2450_351814	SeqNo: 5374440		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chromium, Hexavalent	0.0100	0.0100							U	
LCS	Sample ID: LCS-351814	Units: mg/L		Analysis Date: 04-Dec-2019 12:34						
Client ID:	Run ID: UV-2450_351814	SeqNo: 5374441		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chromium, Hexavalent	0.261	0.0100	0.25	0	104	90 - 111				
MS	Sample ID: HS19120107-01MS	Units: mg/L		Analysis Date: 04-Dec-2019 12:34						
Client ID:	Run ID: UV-2450_351814	SeqNo: 5374442		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chromium, Hexavalent	0.274	0.0100	0.25	0	110	90 - 111				
MSD	Sample ID: HS19120107-01MSD	Units: mg/L		Analysis Date: 04-Dec-2019 12:34						
Client ID:	Run ID: UV-2450_351814	SeqNo: 5374443		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chromium, Hexavalent	0.268	0.0100	0.25	0	107	90 - 111	0.274	2.21	20	

The following samples were analyzed in this batch: HS19120109-01

ALS Houston, US

Date: 10-Dec-19

Client:	Bhate Environmental Associates, Inc.	QUALIFIERS, ACRONYMS, UNITS
Project:	Longhorn GW Treatment Plant Monthly Influent Samples	
WorkOrder:	HS19120109	

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 Quantitation 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: 10-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
Work Order: HS19120109

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19120109-01	LH18/24-SP140_120319	Login	12/4/2019 11:02:35 AM	PMG	Sub
HS19120109-01	LH18/24-SP140_120319	Login	12/4/2019 11:02:35 AM	PMG	WET188
HS19120109-01	LH18/24-SP140_120319	Login	12/4/2019 11:02:35 AM	PMG	MET096

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19120109

Date/Time Received: **04-Dec-2019 09:13**
 Received by: **PMG**

Checklist completed by: Paresh M. Giga 4-Dec-2019
 eSignature Date

Reviewed by: RJ Modashia 4-Dec-2019
 eSignature Date

Matrices: **Water**

Carrier name: **FedEx**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes No Not Present
- Chain of custody present? Yes No 1 Page(s)
- Chain of custody signed when relinquished and received? Yes No COC IDs:None
- Samplers name present on COC? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s): 1.6c U/C IR25
 Cooler(s)/Kit(s): 44851
 Date/Time sample(s) sent to storage: 12/4/19 11:10

- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH acceptable upon receipt? Yes No N/A
- pH adjusted? Yes No N/A

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:
 Contacted By: Regarding:


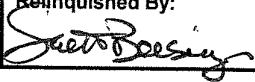
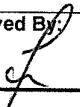
Comments:

Corrective Action:


CHAIN OF CUSTODY

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

Page 1 of 1

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS			Project No. NWO1312.0150.0 16.0001			Analyses										HS19120109 Bhate Environmental Associates, Inc. Longhorn GW Treatment Plant Monthly Influent Sample						
Job: GROUNDWATER TREATMENT PLANT MONTHLY INFLUENT SAMPLES						MS / MSD	No. OF CONTAINERS	SILVER & SELENIUM	HEXAVALENT CHROMIUM	PERCHLORATE											Remarks (Preservatives, etc.) Lab I.D.#	
Prepared By: Scott Beesinger			P.O. Number																			
Field Sample I.D.			Sample Matrix		Date / Time																	
LH18/24-SP140_120319			Water		12/03/19 / 14:00		1	X											HNO3			
LH18/24-SP140_120319			Water		12/03/19 / 14:00		2		X	X											NONE	
Additional Remarks: STANDARD TURN AROUND TIME																						
Relinquished By: 		Date 12/03/19	Time 14:30	Received By: 		Date 12/4/19	Time 09:13	Relinquished By:			Date	Time	Received By:		Date	Time						
For Lab Use Only																						
Received At Lab By:			Date	Time	Airbill No.		Opened By:			Date	Time	Temp of Container	Seal No.	Condition								
Remarks:																						

44851 ok.
 1.60
 #25
 1150.00


 <p>10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887</p>	<p><i>44951</i></p>	Date: <i>12/3</i>	<p>CUSTODY SEAL</p>	<p>Seal Broken By: <i>[Signature]</i></p>
		Name: <i>S</i>		
		Company: <i>S</i>	<p><i>12/19</i></p>	

FedEx
 TRK# 4809 7830 4806
 0221

WED - 04 DEC 10:30A
 PRIORITY OVERNIGHT

AB SGRA

77099
 TX-US
 IAH



1/1800/05A2



Case Narrative

Method: 6850

Analysis: Perchlorate

Analysis SOP: LC-MS-CLO4

ALS WO ID(s): 1933152; 1933786; 1934085;
1934086; 1934088

Client: ALS Laboratories (Houston, TX)

Matrix: Water

ELMS Batch (HBN): 2324 (253208)

General Set Information: There were five 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. 50 μL 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 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1934086001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 687322) was less than 1/2 the CRDL. The recovery for the LCS (687319) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on sample 1933152001 (Client ID: LH18/24-SP650_AIX Water). 3.0 μ L of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The MS/MSD (687323/24) failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

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

NC/CAR(s): NA

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

where: A = Analyte concentration from the standard curve (μ g/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 – 687320) is reported from the analysis of the Laboratory Control Sample (LCS – 687319) at a level of 3.0 μ g/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).

Thomas Bosch December 09, 2019
Analyst Date



ANALYTICAL REPORT

Report Date: December 09, 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: **34-1934086**

Project ID: HS19120109

Purchase Order: HS19120109

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP140_120319	1934086001	12/03/19	12/05/19	

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

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Environmental 

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER



ANALYTICAL REPORT

Workorder: **34-1934086**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: LH18/24-SP140_120319	Sampling Site: NA	Collected: 12/03/2019				
Lab ID: 1934086001	Media: 125 mL Nalgene	Received: 12/05/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2324 (HBN: 253208) Analyzed: 12/08/2019 15:29	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	11000	1000	2000	4000	1000	

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

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 12/09/2019 13:27	/S/ Stephen Brose 12/09/2019 14:23

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.alssl.com



ANALYTICAL REPORT

Workorder: 34-1934086

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: 1934086
Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2324 (HBN: 253208)
Analyzed By: Thomas Bosch

Blank

LMB: 687322 Analyzed: 12/08/2019 14:06 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 687319 Analyzed: 12/08/2019 13:38 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.17	3.00	106	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1933152001 Analyzed: 12/08/2019 14:20 Dilution: 1 Units: ug/L		MS: 687323 Analyzed: 12/08/2019 14:34 Dilution: 1 Units: ug/L				MSD: 687324 Analyzed: 12/08/2019 14:48 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	11.0	13.7	3	# 77.7	78.8 123.8	12.9	# 48.8	6.53	0.0 20.0

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

Analyst	Peer Review
/S/ Thomas Bosch 12/09/2019 13:31	/S/ Stephen Brose 12/09/2019 14:23

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



1934086

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

18698/#2

SAMPLING STATE: Dept of Defense

COC ID: 12768

SUBCONTRACT TO:

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

1934086

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19120109
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS19120109-01	LH18/24-SP140_120319	Water	03 Dec 2019 14:00
	SUB_Perch-6850			12 Dec 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____

Date/Time: 12/4/19 18:00

Received By: [Signature]

Date/Time: 12/5/19 0952

Cooler ID(s): _____

Temperature(s): _____

CHAIN OF CUSTODY



ALS Environmental
CHAIN-OF-CUSTODY

Project / Job / Task: HS19120109		Split:	Workorder ID: 1934086	Level: ENV_LVL4	Requested Analysis	
Client: ALS Environmental (Houston)			Account: 8101	Type: 125Poly		
Comments:						
Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Count
1	12/03/2019 14:00	LH18/24-SP140_120319	1934086001		Water	1
2						
3						
4						
5						
6						
7						
8						
9						
10						

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY				SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY			
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location	Prepared / Analyzed by:	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
<i>Julie W...</i>	12/05/2019 09:52	ALS Sample Receiving	Storage Login				
<i>R-33-1</i>	12-8-19 12:40	<i>LEB</i>	<i>Storage</i>				
		<i>CLOH T. Bond analysis</i>	<i>CLOH analysis</i>				

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: <u>ALS Houston</u>		Project/Task/Site: <u>HS 19120109</u>							
Date/Time of Receipt: <u>12/05/19 0952</u>		Number of Coolers Received: <u>1 1934086</u>							
Condition of Coolers: <u>Acceptable</u> /Unacceptable		Temperature Control: <u>Present</u> /Not Included							
Cooler Custody Seals: <u>Present</u> /Absent/NA		Location Temp Taken: <u>Control</u> /Between Samples							
Container Custody Seals: <u>Intact</u> /Broken/NA		Are all temperatures within project specific guidelines? Yes/No/NA							
Ice Present: <u>Yes</u> /No/NA		VOA Headspace Present? Yes/No/NA							
Container Custody Seals: Present/ <u>Absent</u> /NA									
Intact/Broken/ <u>NA</u>									
<u>Frozen</u> /Melted/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	<u>Good</u>	<u>2</u> °C	4		7		°C	
	2		°C	5		8		°C	
3		°C	6		9		°C		
Taken By: <u>[Signature]</u>		Signature		<u>Rebecca Wise</u>		Printed Name		<u>12/05/19</u>	
								Date	

CLIENT-RELATED INFORMATION

<input type="checkbox"/> Missing Cooler	<input type="checkbox"/> Missing Samples/Bottles	<input type="checkbox"/> Incorrect Preservation	<input type="checkbox"/> Insufficient Sample Volume
<input type="checkbox"/> Cooler Conditions	<input type="checkbox"/> Broken/Leaking Samples	<input type="checkbox"/> pH Criteria Not Met	<input type="checkbox"/> Chain of Custody Problems
<input type="checkbox"/> Missing Paperwork	<input type="checkbox"/> Incorrect Bottle Type	<input type="checkbox"/> Residual Chlorine Present	<input type="checkbox"/> Other:
<input type="checkbox"/> Missing/Incorrect Bottle Labels	<input type="checkbox"/> Cooler Temperatures Out of Range	<input type="checkbox"/> 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: _____ Returned to Sample Receipt by: _____ Date: _____
Printed Name Signature



Form 493499-494 RT Exp 07/93 00

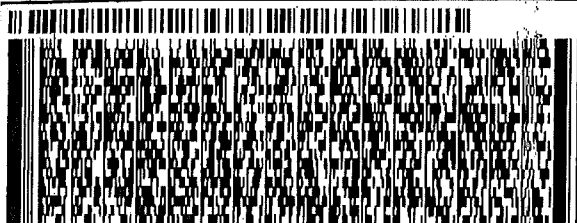
ORIGIN ID: 86RA (281) 590-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 04DEC19
ACTWT: 10.90 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) 288-7700
REF: HS19120107/0109/0110 - RJ

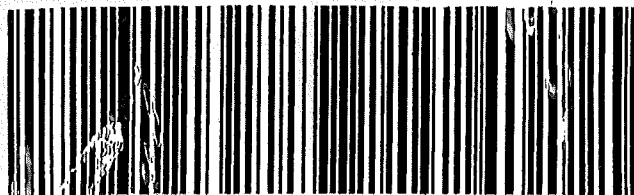


TRK# 1251 0292 5618
0201

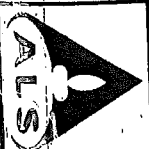
THU - 05 DEC 10:30A
PRIORITY OVERNIGHT

AX BTFA

84123
UT-US SLC



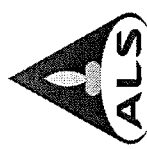
NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel: +1 281 590 5656
Fax: +1 281 590 5687

Date: _____
Name: _____
Company: _____





Batch Worklist

HBN: 253208



Instrument: WP
Status: WP

Created: 12/8/2019 13:11
Analyst: T. Bosch

Batch: ELMS/ 2324
Rule: EPA 6850, DoD QSM Water

- Workorder: 1933152 [ENV_LVL4]
- Workorder: 1933786 [ENV_LVL4]
- Workorder: 1934085 [ENV_LVL4]
- Workorder: 1934086 [ENV_LVL4]
- Workorder: 1934088 [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	687318	CCV for HBN 253208 [ELMS/2324]				CCV	3		E685041C3Q	5311		12/9/2019	
2	687319	LCS for HBN 253208 [ELMS/2324]				LCS	3		E6850Q413Q	5311		12/9/2019	
3	687320	RLYS for HBN 253208 [ELMS/2324]				RLYS	3		E685041C3Q	5311		12/9/2019	
4	687321	ICS for HBN 253208 [ELMS/2324]				ICS	3		E6850..D3Q	5311		12/9/2019	
5	687322	LMB for HBN 253208 [ELMS/2324]				LMB	3		E6850Q413Q	5311		12/9/2019	
6	1933152001	LH18/24-SP650_112019_AIX Water				SAMPLE	3	1933152001-A	E6850Q41.3	5480	12/18/2019	12/9/2019	
7	687323	LH18/24-SP650...(1933152001MS)				MS	3		E6850Q413Q	5311		12/9/2019	
8	687324	LH18/24-SP65...(1933152001MSD)				MSD	3		E6850Q413Q	5311		12/9/2019	
9	1933786001	LH18/24-SP650_112619_AIX				SAMPLE	3	1933786001-A	E6850Q41.3	5480	12/24/2019	12/16/2019	
10	1934085001	LH18/24-SP650_120319_AIX				SAMPLE	3	1934085001-A	E6850Q41.3	5480	12/31/2019	12/18/2019	
11	1934086001	LH18/24-SP140_120319				SAMPLE	3	1934086001-A	E6850Q41.3	5480	12/31/2019	12/18/2019	
12	1934088001	LH18/24-SP650_120319_AIX				SAMPLE	3	1934088001-A	E6850Q41.3	5480	12/31/2019	12/18/2019	
13	687325	CCV for HBN 253208 [ELMS/2324]				CCV	3		E685041C3Q	5311		12/9/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #()'s: 1933152 (001); 1933786 (001); 1934085 (001); 1934086 (001); 1934088 (001)
 ELMS Batch/HBN ID: 2324 (253208)
 Prep Date: 12/08/2019 Analysis Date: 12/08/2019 Analyst: Tom Bosch
 Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
 Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\DEC\08DEC19D.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 687319; Target = 3.0µg/L. ASTM type II water was used for LMB 687322.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on sample 1933152001 (Client ID's: LH18/24-SP650_AIX Water). 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 1934086001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD (687323/24) failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\DEC\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\3208DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 687320) is reported from the analysis of the Laboratory Control Sample (LCS – 687319) 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).

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	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2324 HBN: 253208</u> <u>1934086 / 1934088</u>		
Sample Set IDs if Applicable: <u>1933152 / 1933786 / 1934085</u>		
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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www.AccuStandard.com

CERTIFICATE OF ANALYSIS



AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: Refer to SDS for complete safety information

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



Signal Word: None

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



Certificate of Analysis



ISO Guide 34 Reference Material

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



S 36748

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

Product Name: Perchlorate IC Standard

Description:

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

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

Solvent: water (low TOC, < 50 ppb)

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

Traceability:

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

Estimation of Uncertainties:

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

Homogeneity:

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

Intended Use:

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

Instructions for Use:

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

Hazards:

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

Expiration of Certification:

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



ISO 9001 Registered Quality System – TUV USA

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Certificate of Analysis

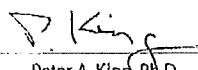


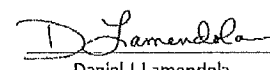
ISO Guide 34 Reference Material

Product Number: ICC-013 Lot Issue Date: 29-Feb 2016
 Lot Number: CP-0860 Expiration Date: 31-Mar 2020

Maintenance of Certification:

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


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


 Daniel J. Lamendola
 Director of QA/RA



ISO 9001 Registered Quality System – TUV USA

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis



Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

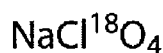
Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl*O4

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

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

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

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)

CIL subscribes to the following standards for different products: ISO Guide 34, ISO/IEC 17025, ISO 13485 and cGMP as appropriate.



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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	
#*	687318	CCV@25	Vial 71	1	Control	1	1.69605e6	7.373	26.83661
#*	687319	QC@3.0	Vial 72	1	Control	2	2.01272e5	7.322	3.16765
#*	687321	ICS@3.0	Vial 73	1	Control	3	1.15555e5	7.255	2.71754
#*	687322	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1933152001		Vial 75	1	Sample	5	6.68714e5	7.233	11.40769
#*	687323	331521S	Vial 76	1	Sample	6	8.19147e5	7.331	13.73971
#*	687324	331521D	Vial 77	1	Sample	7	8.20045e5	7.281	12.87113
#*	1933786001		Vial 78	1	Sample	8	6.28422e4	7.290	8.96014e-1
#*	1934085001		Vial 79	1	Sample	9	7.76702e4	7.271	1.30616
#*	1934086001	1K	Vial 80	1	Sample	10	6.52914e5	7.541	1.06845e4
#*	1934088001		Vial 81	1	Sample	11	8.35067e4	7.206	1.23378
*	687325	CCV@25	Vial 71	1	Control	12	1.56876e6	7.401	26.26666

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
#*	687318	CCV@25	Vial 71	1	Control	1	2.14319e5	7.415	5.00000
#*	687319	QC@3.0	Vial 72	1	Control	2	2.33945e5	7.349	5.00000
#*	687321	ICS@3.0	Vial 73	1	Control	3	1.56222e5	7.280	5.00000
#*	687322	LMB	Vial 74	1	Control	4	2.16883e5	7.417	5.00000
#*	1933152001		Vial 75	1	Sample	5	2.11754e5	7.253	5.00000
#*	687323	331521S	Vial 76	1	Sample	6	2.13383e5	7.356	5.00000
#*	687324	331521D	Vial 77	1	Sample	7	2.28828e5	7.301	5.00000
#*	1933786001		Vial 78	1	Sample	8	2.44931e5	7.312	5.00000
#*	1934085001		Vial 79	1	Sample	9	2.13009e5	7.296	5.00000
#*	1934086001	1K	Vial 80	1	Sample	10	2.21359e5	7.561	5000.00000
#*	1934088001		Vial 81	1	Sample	11	2.41676e5	7.223	5.00000
*	687325	CCV@25	Vial 71	1	Control	12	2.03012e5	7.417	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
#*	687318	CCV@25	Vial 71	1	Control	1	5.12256e5	7.390	26.62112
#*	687319	QC@3.0	Vial 72	1	Control	2	6.70814e4	7.342	3.37306
#*	687321	ICS@3.0	Vial 73	1	Control	3	4.41800e4	7.280	3.32517
#*	687322	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1933152001		Vial 75	1	Sample	5	2.33281e5	7.255	12.89143
#*	687323	331521S	Vial 76	1	Sample	6	2.85504e5	7.349	15.51969
#*	687324	331521D	Vial 77	1	Sample	7	2.84040e5	7.294	14.45077
#*	1933786001		Vial 78	1	Sample	8	2.43896e4	7.313	1.07465
#*	1934085001		Vial 79	1	Sample	9	3.07397e4	7.291	1.62821
#*	1934086001	1K	Vial 80	1	Sample	10	1.97618e5	7.553	1.05214e4
#*	1934088001		Vial 81	1	Sample	11	3.11607e4	7.206	1.43824
*	687325	CCV@25	Vial 71	1	Control	12	4.80251e5	7.415	26.37250

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

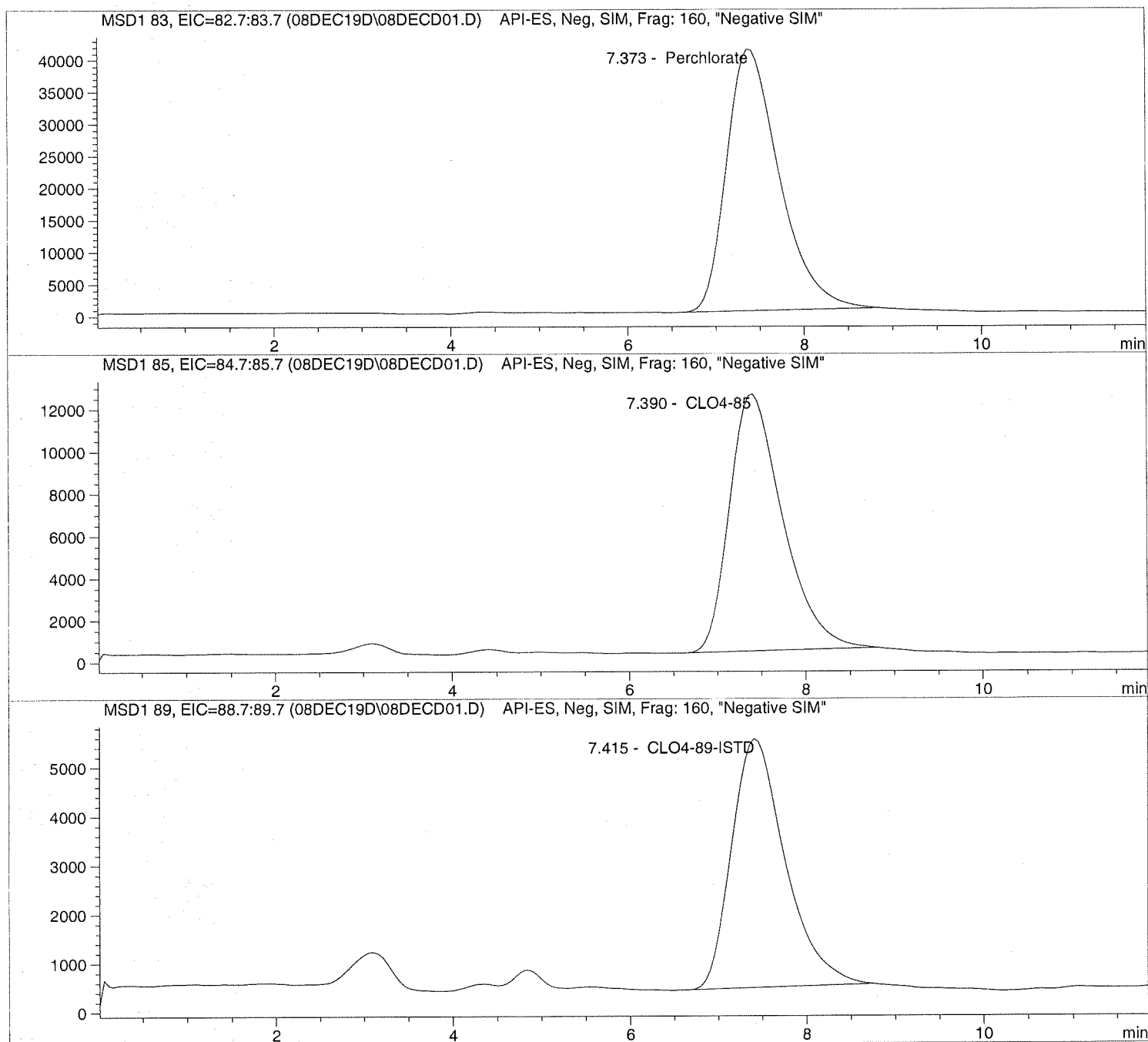
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	687318	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	687319	QC@3.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	687321	ICS@3.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	687322	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1933152001		CLO4-AQN	1	Sample	
6	Vial 76	687323	331521S	CLO4-AQN	1	Sample	
7	Vial 77	687324	331521D	CLO4-AQN	1	Sample	
8	Vial 78	1933786001		CLO4-AQN	1	Sample	
9	Vial 79	1934085001		CLO4-AQN	1	Sample	
10	Vial 80	1934086001	1K	CLO4-AQN	1	Sample	
11	Vial 81	1934088001		CLO4-AQN	1	Sample	
12	Vial 71	687325	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD01.D Sample Name: 687318 CCV@25

```
=====
Injection Date: 12/08/2019 13:20:07      Seq Line: 1
Sample Name:    687318   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\08DEC19D\08DECD01.D Sample Name: 687318 CCV@25

```
=====
Injection Date: 12/08/2019 13:20:07      Seq Line: 1
Sample Name:    687318 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
7.373	PBA	1696047.9	26.8366	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.390	PBA	512255.8	26.6211	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.415	PBA	214319.2	5.0000	CLO4-89-ISTD

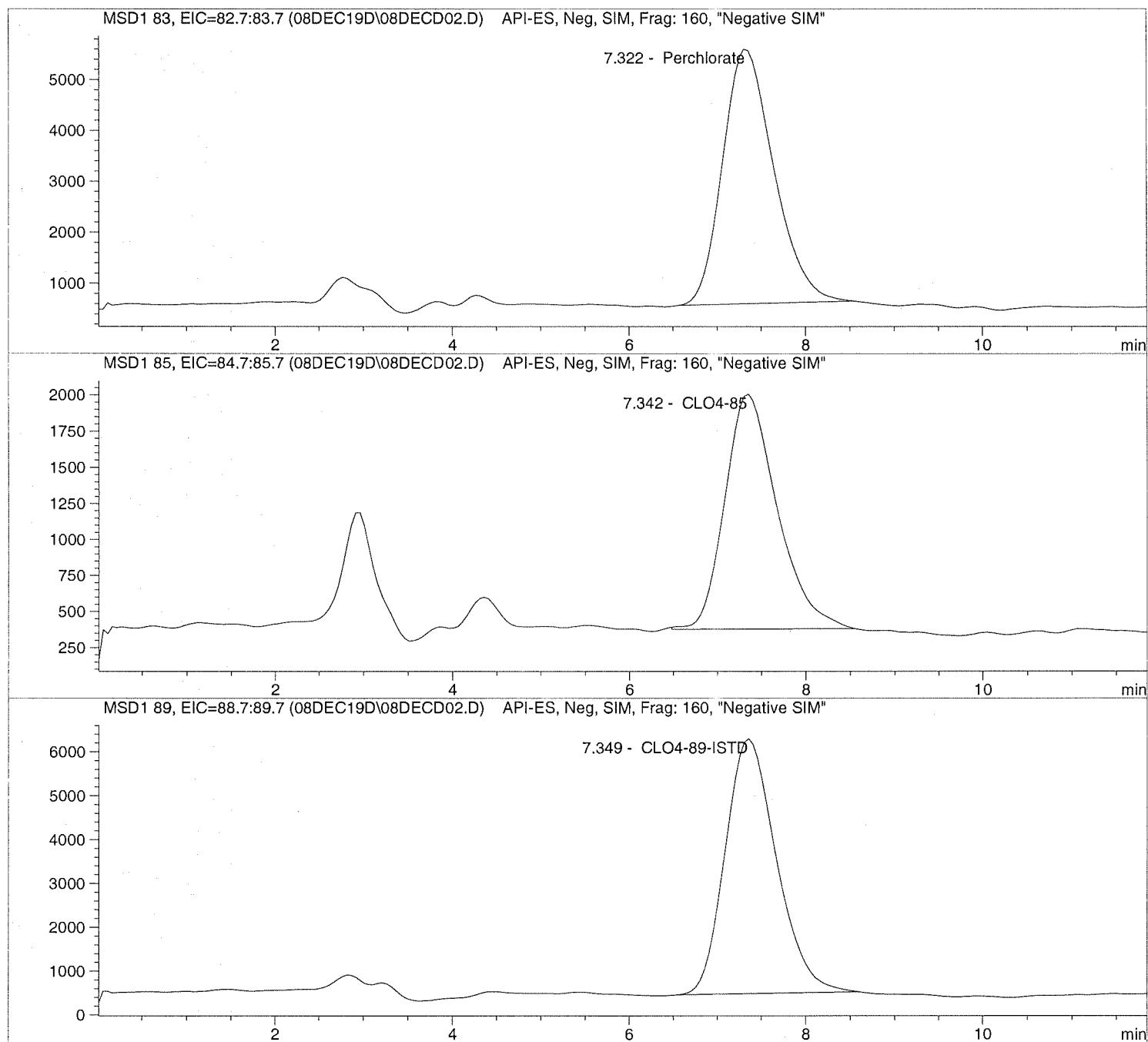
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD02.D Sample Name: 687319 QC@3.0

```
=====
Injection Date: 12/08/2019 13:38:13      Seq Line:          2
Sample Name:    687319   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\08DEC19D\08DECD02.D Sample Name: 687319 QC@3.0

```

=====
Injection Date: 12/08/2019 13:38:13      Seq Line:          2
Sample Name:    687319 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
7.322	PBA	201271.8	3.1677	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.342	BBA	67081.4	3.3731	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.349	PBA	233945.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

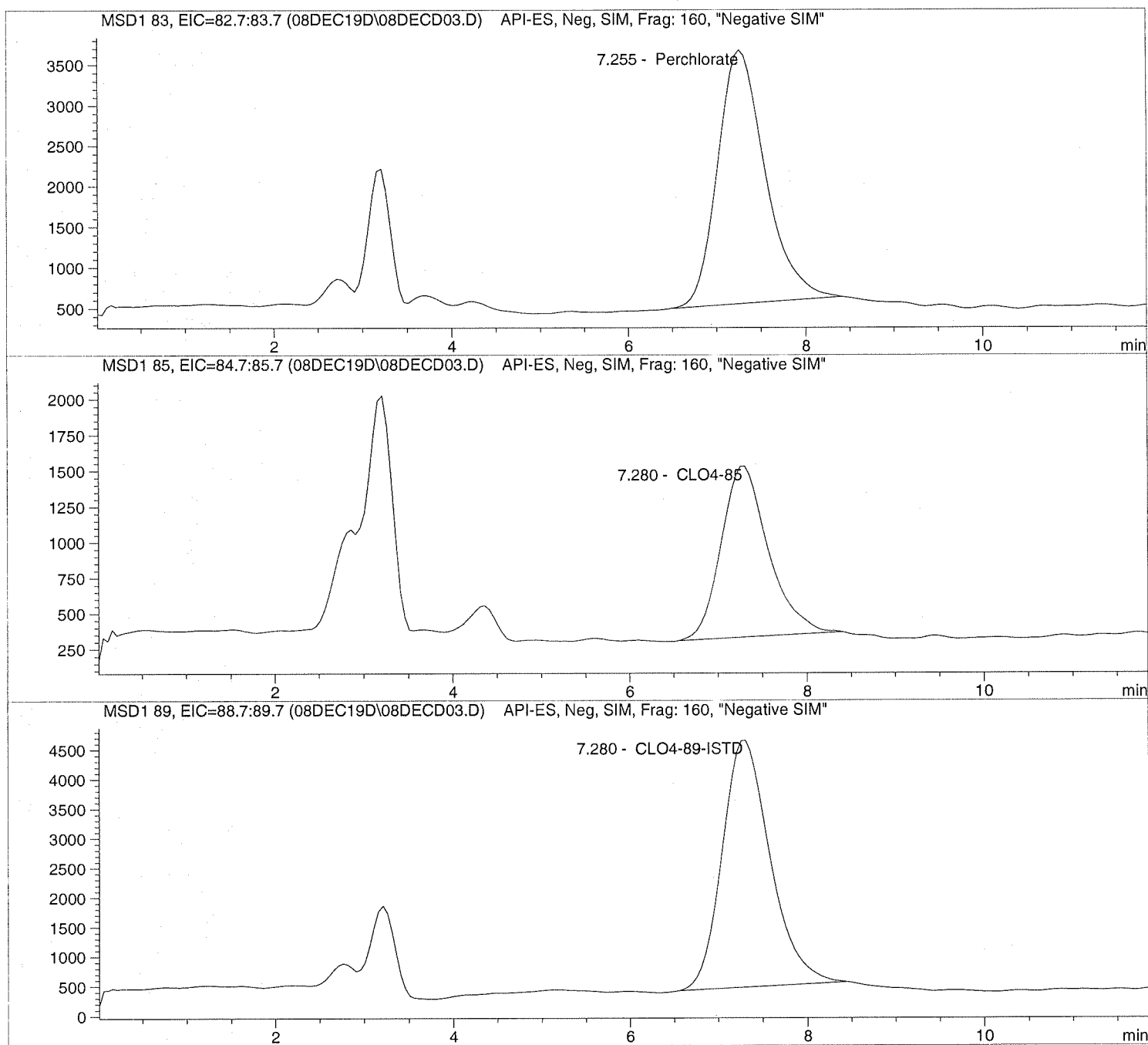
```


Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD03.D Sample Name: 687321 ICS@3.0

```
=====
Injection Date: 12/08/2019 13:52:08      Seq Line:          3
Sample Name:    687321 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\08DEC19D\08DECD03.D Sample Name: 687321 ICS@3.0

```

=====
Injection Date: 12/08/2019 13:52:08      Seq Line:          3
Sample Name:    687321 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
7.255	BBA	115555.3	2.7175	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.280	PBA	44180.0	3.3252	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.280	PBA	156222.3	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD04.D

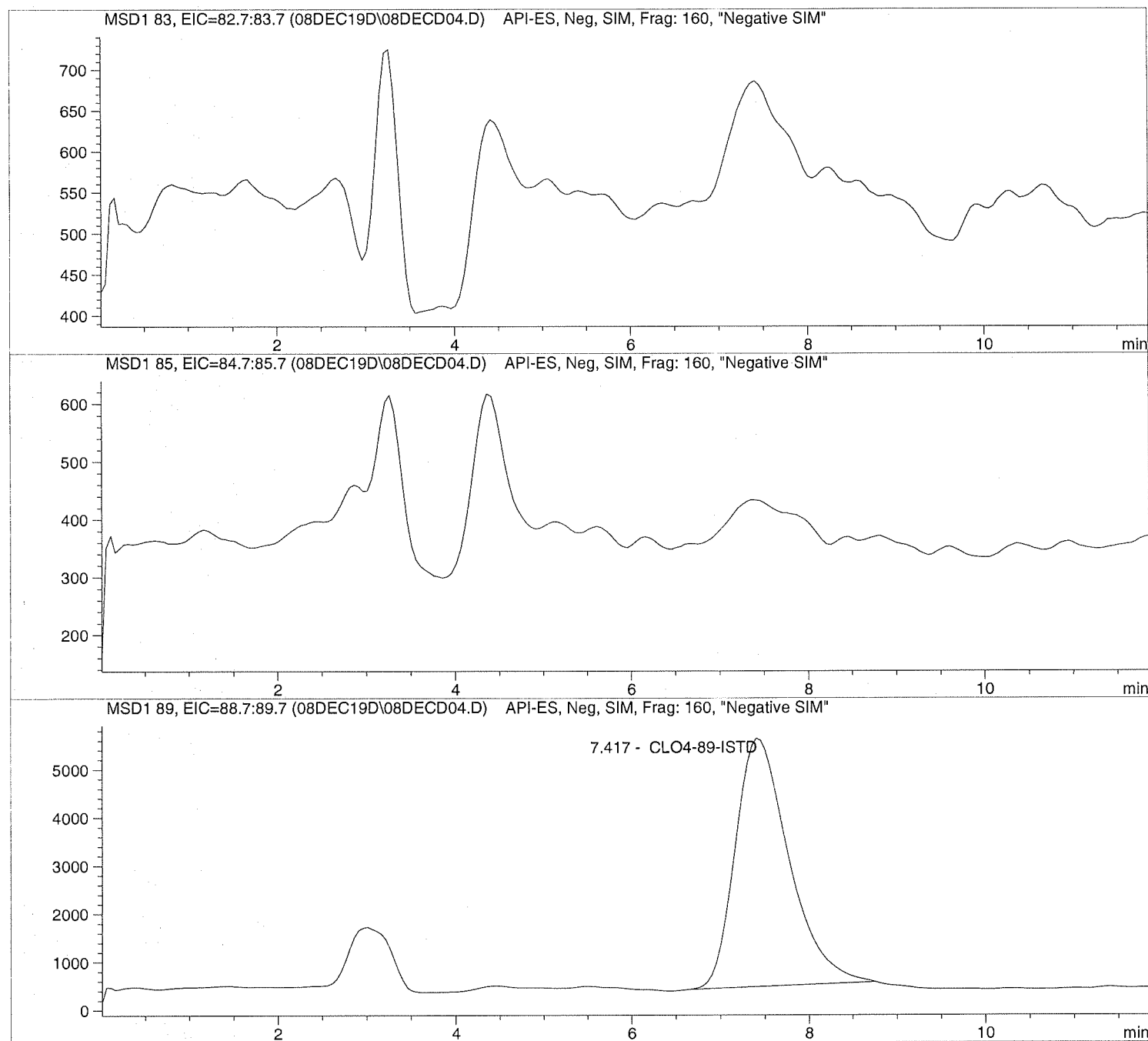
Sample Name: 687322 LMB

=====
Injection Date: 12/08/2019 14:06:04
Sample Name: 687322 LMB
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
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\08DEC19D\08DECD04.D Sample Name: 687322 LMB

```

=====
Injection Date: 12/08/2019 14:06:04      Seq Line:          4
Sample Name:    687322 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
7.417	PBA	216882.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD05.D

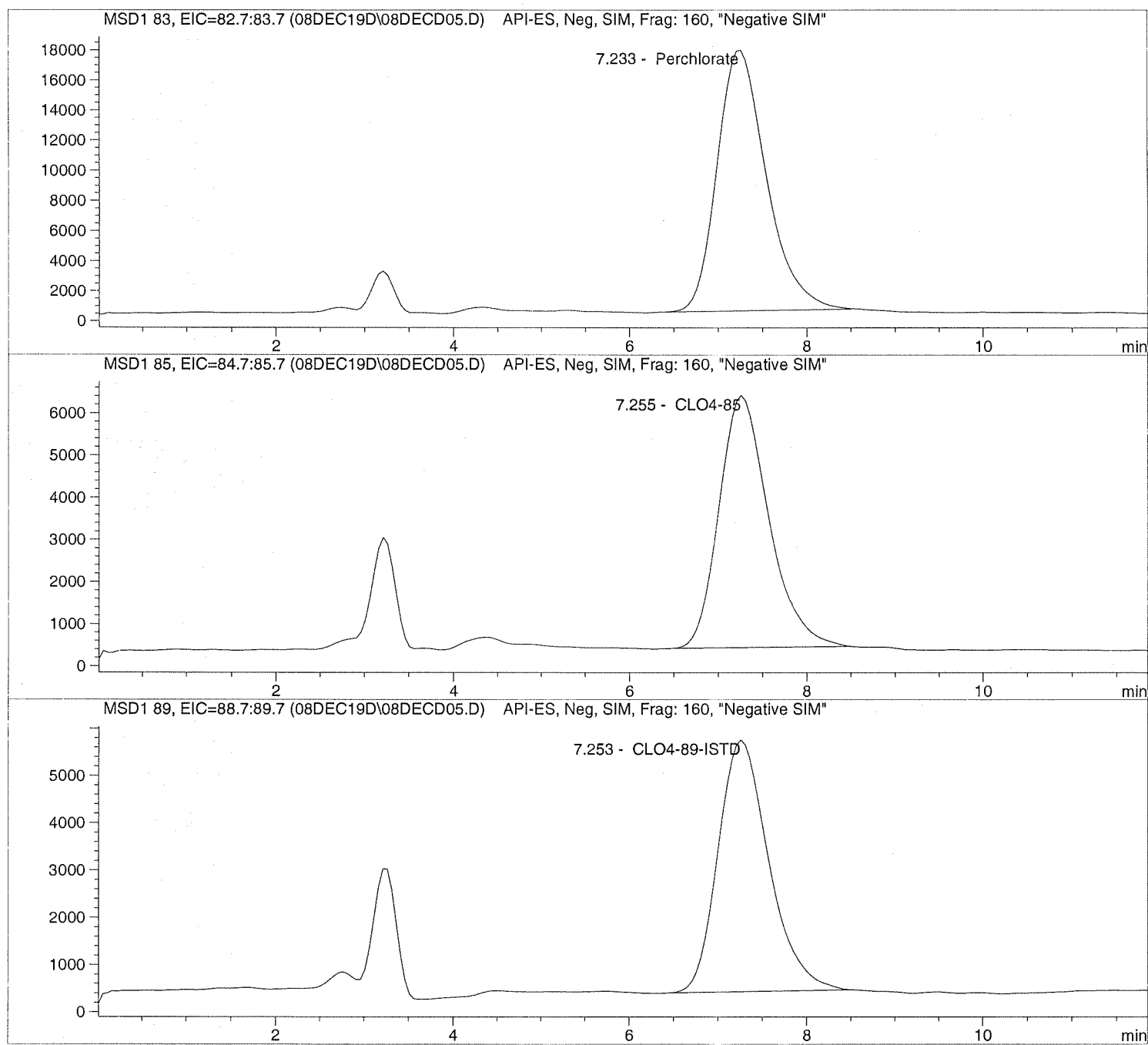
Sample Name: 1933152001

=====
Injection Date: 12/08/2019 14:20:08
Sample Name: 1933152001
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 35 μ l

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\08DEC19D\08DECD05.D

Sample Name: 1933152001

```

=====
Injection Date: 12/08/2019 14:20:08      Seq Line:      5
Sample Name:   1933152001                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
7.233	PBA	668714.5	11.4077	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.255	PBA	233281.0	12.8914	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.253	PBA	211754.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD06.D

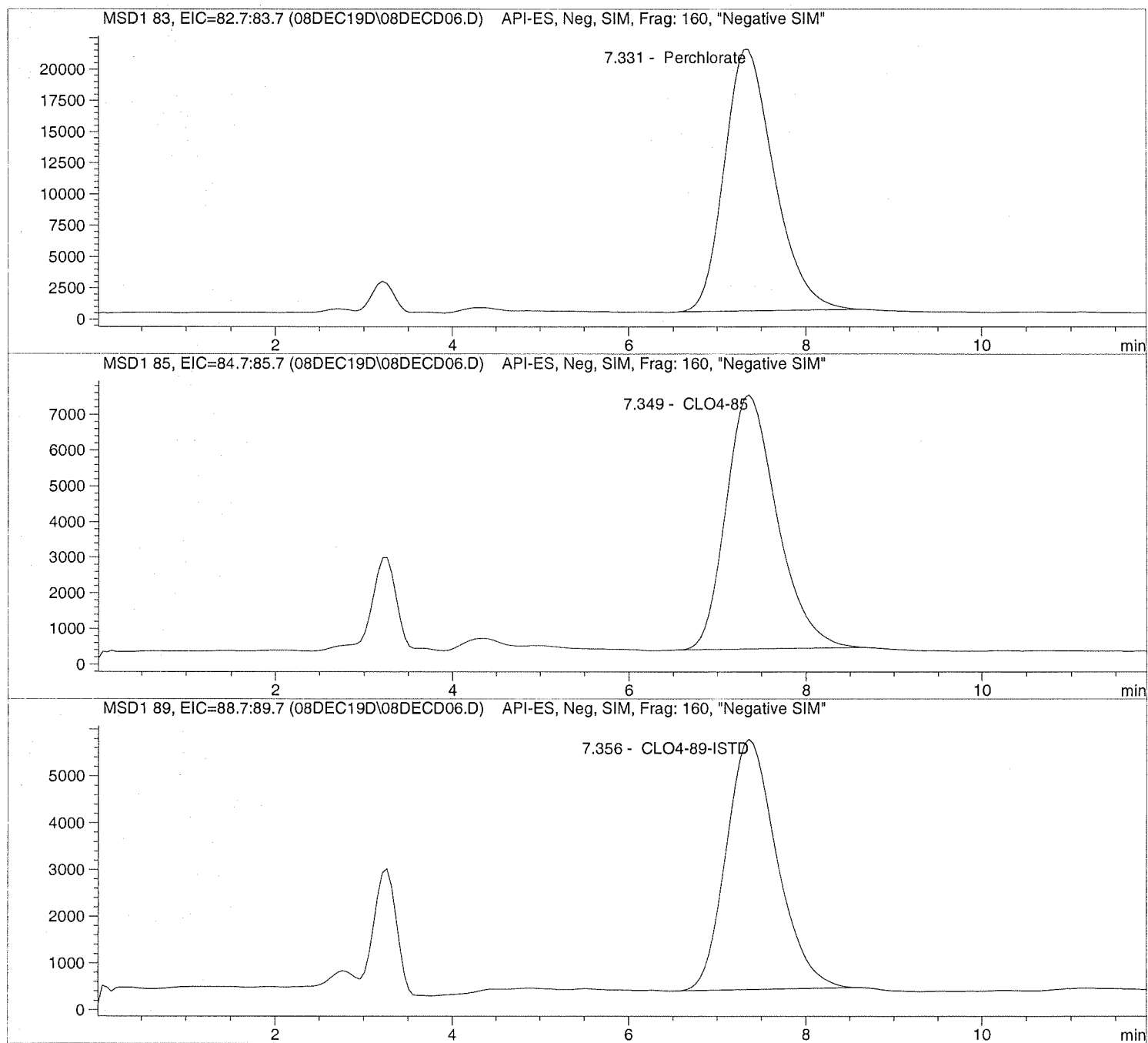
Sample Name: 687323 331521S

Injection Date: 12/08/2019 14:34:02
Sample Name: 687323 331521S
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
Inj. No.: 1
Inj. Vol.: 35 μ l

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\08DEC19D\08DECD06.D Sample Name: 687323 331521S

=====
 Injection Date: 12/08/2019 14:34:02 Seq Line: 6
 Sample Name: 687323 331521S 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
7.331	PBA	819146.8	13.7397	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.349	PBA	285503.6	15.5197	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.356	PBA	213383.5	5.0000	CLO4-89-ISTD

=====
 *** End of Report ***
 =====

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD07.D

Sample Name: 687324 331521D

Injection Date: 12/08/2019 14:48:08

Seq Line: 7

Sample Name: 687324 331521D

Location: Vial 77

Acq Operator: TNB

Inj. No.: 1

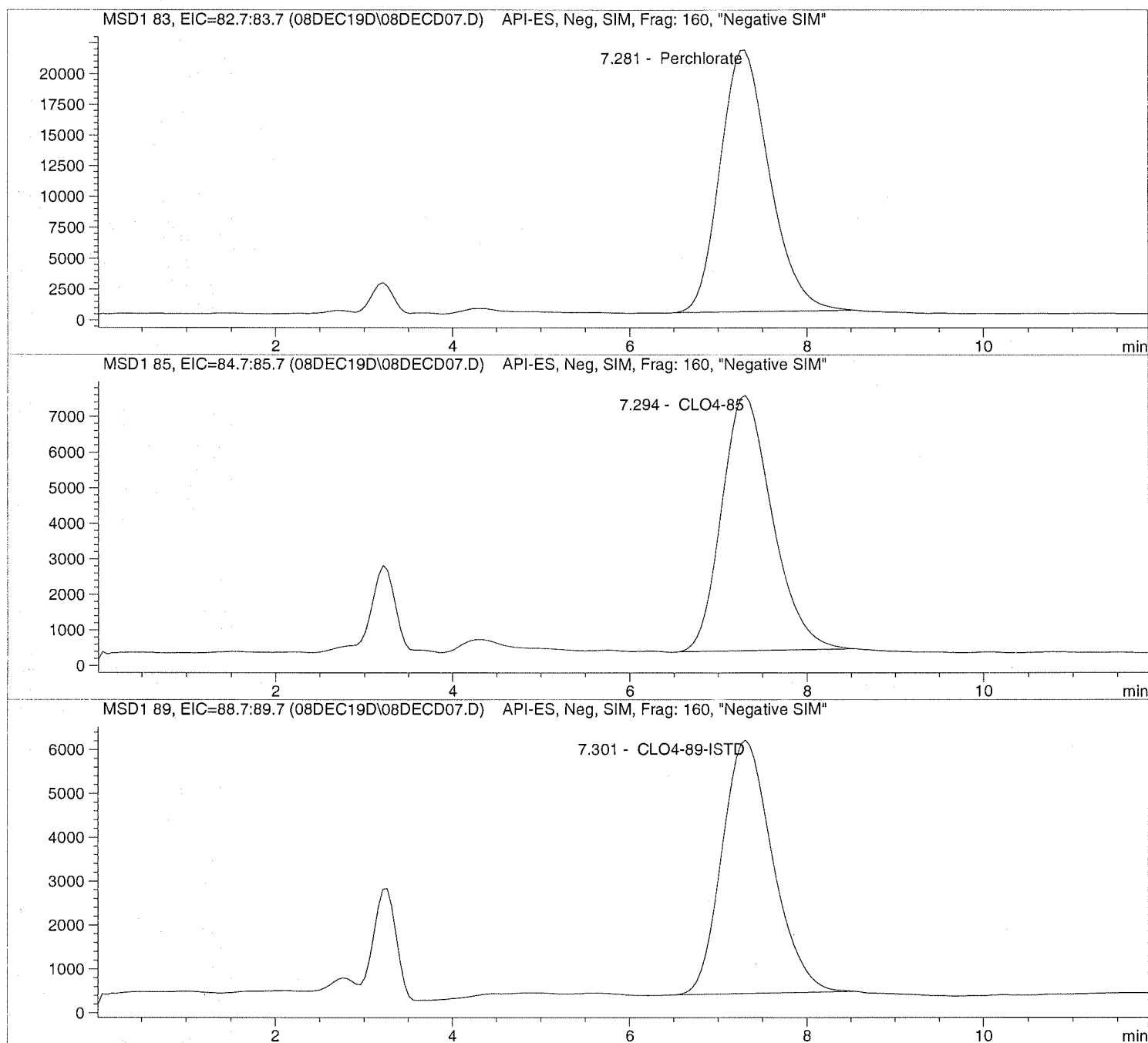
Inj. Vol.: 35 μ l

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\08DEC19D\08DECD07.D Sample Name: 687324 331521D

```

=====
Injection Date: 12/08/2019 14:48:08      Seq Line:                 7
Sample Name:    687324 331521D            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
7.281	PBA	820045.2	12.8711	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.294	PBA	284039.7	14.4508	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.301	PBA	228828.1	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD08.D

Sample Name: 1933786001

Injection Date: 12/08/2019 15:02:01

Seq Line: 8

Sample Name: 1933786001

Location: Vial 78

Acq Operator: TNB

Inj. No.: 1

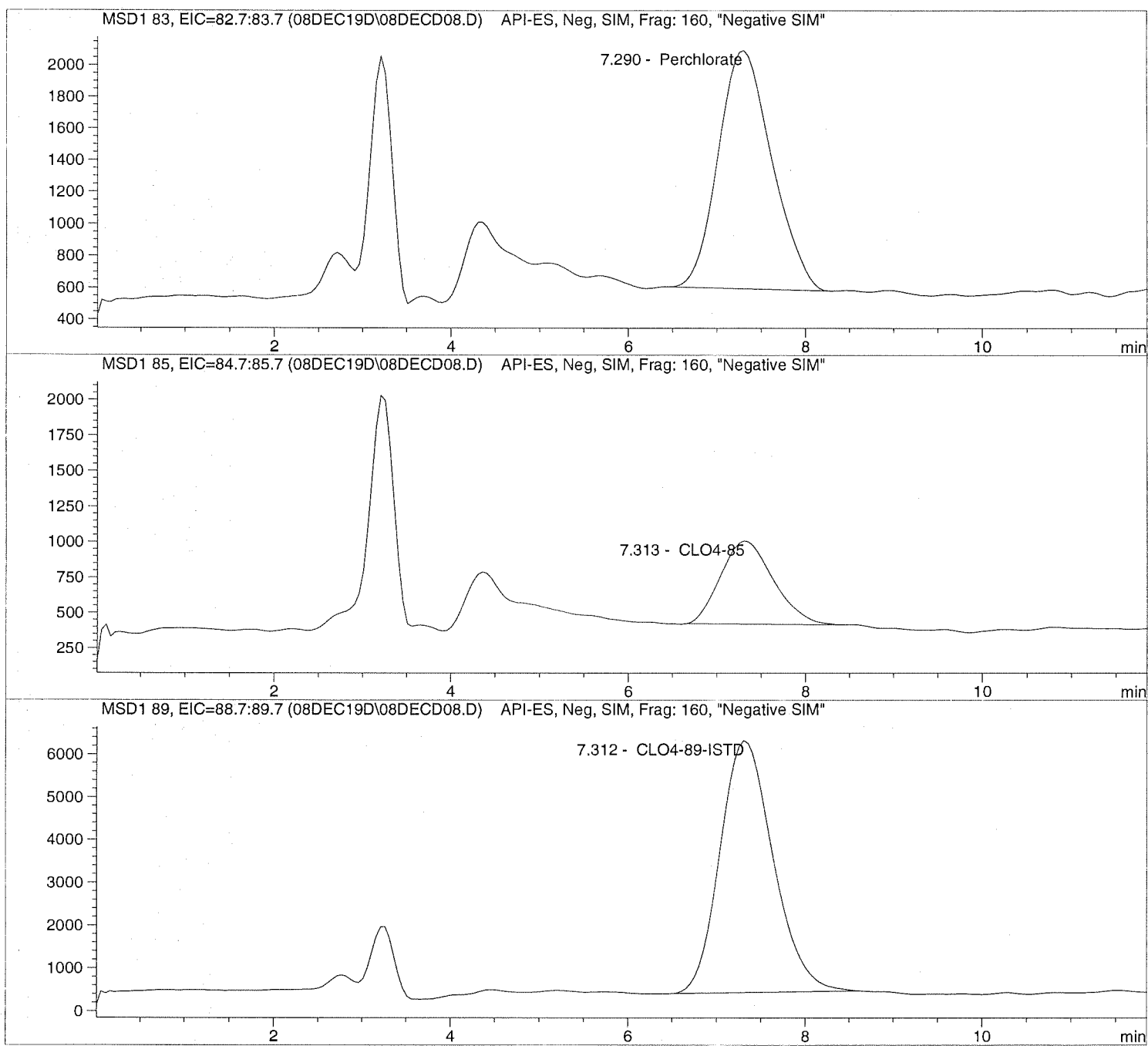
Inj. Vol.: 35 μ l

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\08DEC19D\08DECD08.D

Sample Name: 1933786001

```

=====
Injection Date: 12/08/2019 15:02:01      Seq Line:      8
Sample Name:   1933786001                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
7.290	PBA	62842.2	0.8960	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.313	PBA	24389.6	1.0747	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.312	PBA	244930.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD09.D

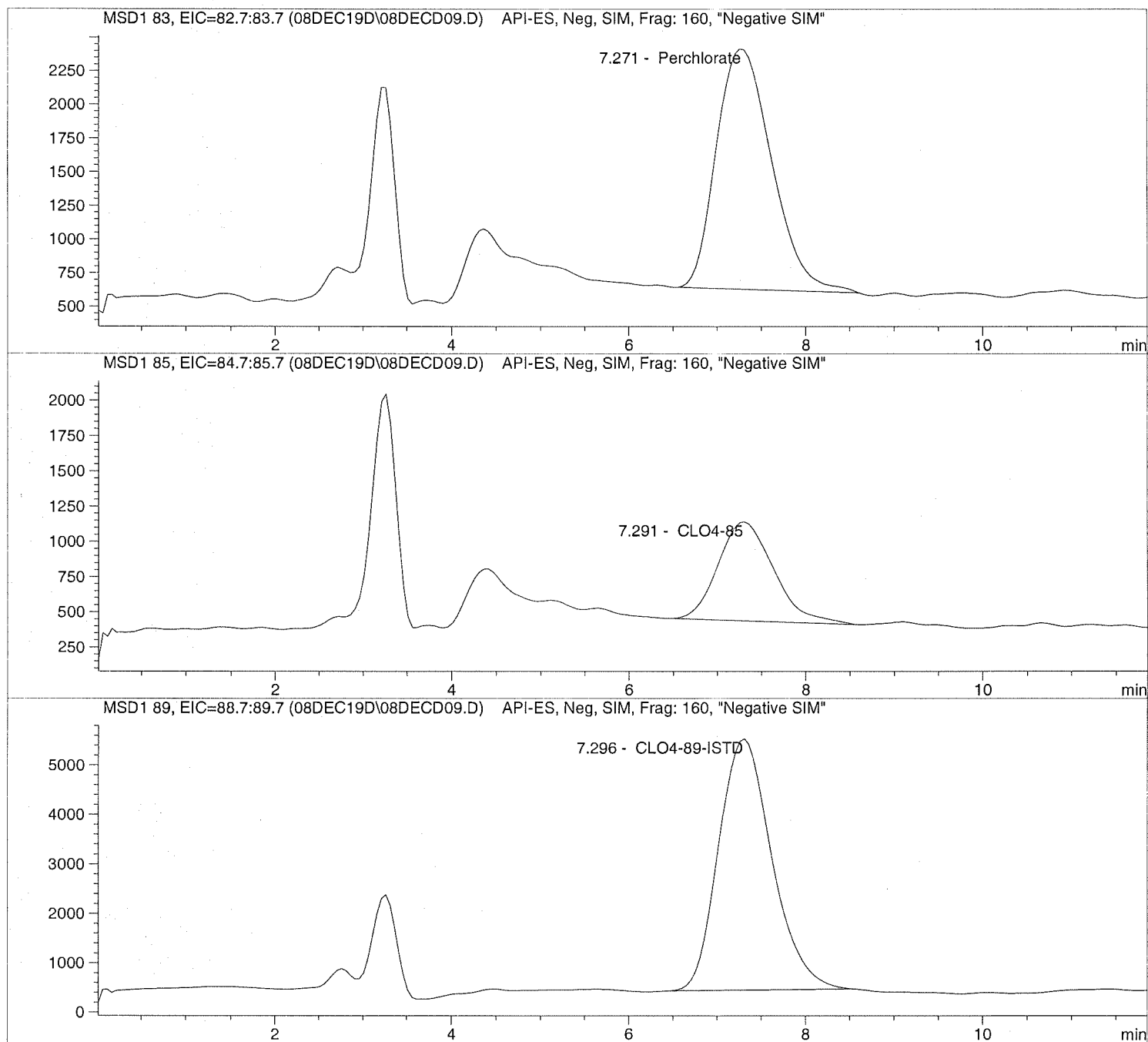
Sample Name: 1934085001

Injection Date: 12/08/2019 15:15:52
Sample Name: 1934085001
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 35 μ l

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\08DEC19D\08DECD09.D

Sample Name: 1934085001

```

=====
Injection Date: 12/08/2019 15:15:52      Seq Line:          9
Sample Name:   1934085001                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
7.271	PBA	77670.2	1.3062	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.291	PBA	30739.7	1.6282	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.296	PBA	213008.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD10.D

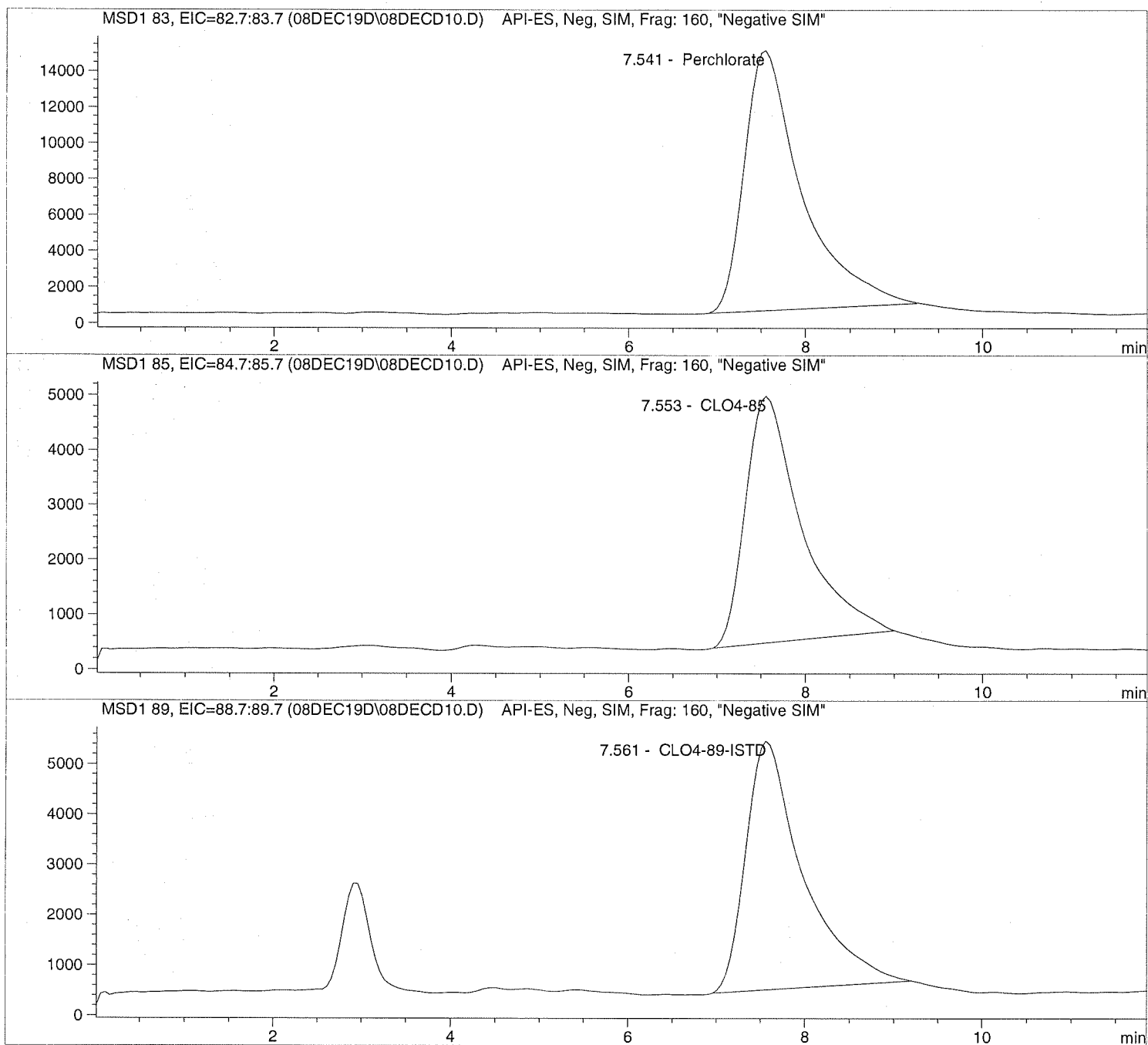
Sample Name: 1934086001 1K

Injection Date: 12/08/2019 15:29:50
Sample Name: 1934086001 1K
Acq Operator: TNB

Seq Line: 10
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 35 μ l

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\08DEC19D\08DECD10.D Sample Name: 1934086001 1K

```

=====
Injection Date: 12/08/2019 15:29:50      Seq Line:      10
Sample Name:   1934086001 1K             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:      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
7.541	PBA	652913.9	10684.5187	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.553	PBA	197617.5	10521.3847	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.561	PBA	221358.6	5000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD11.D

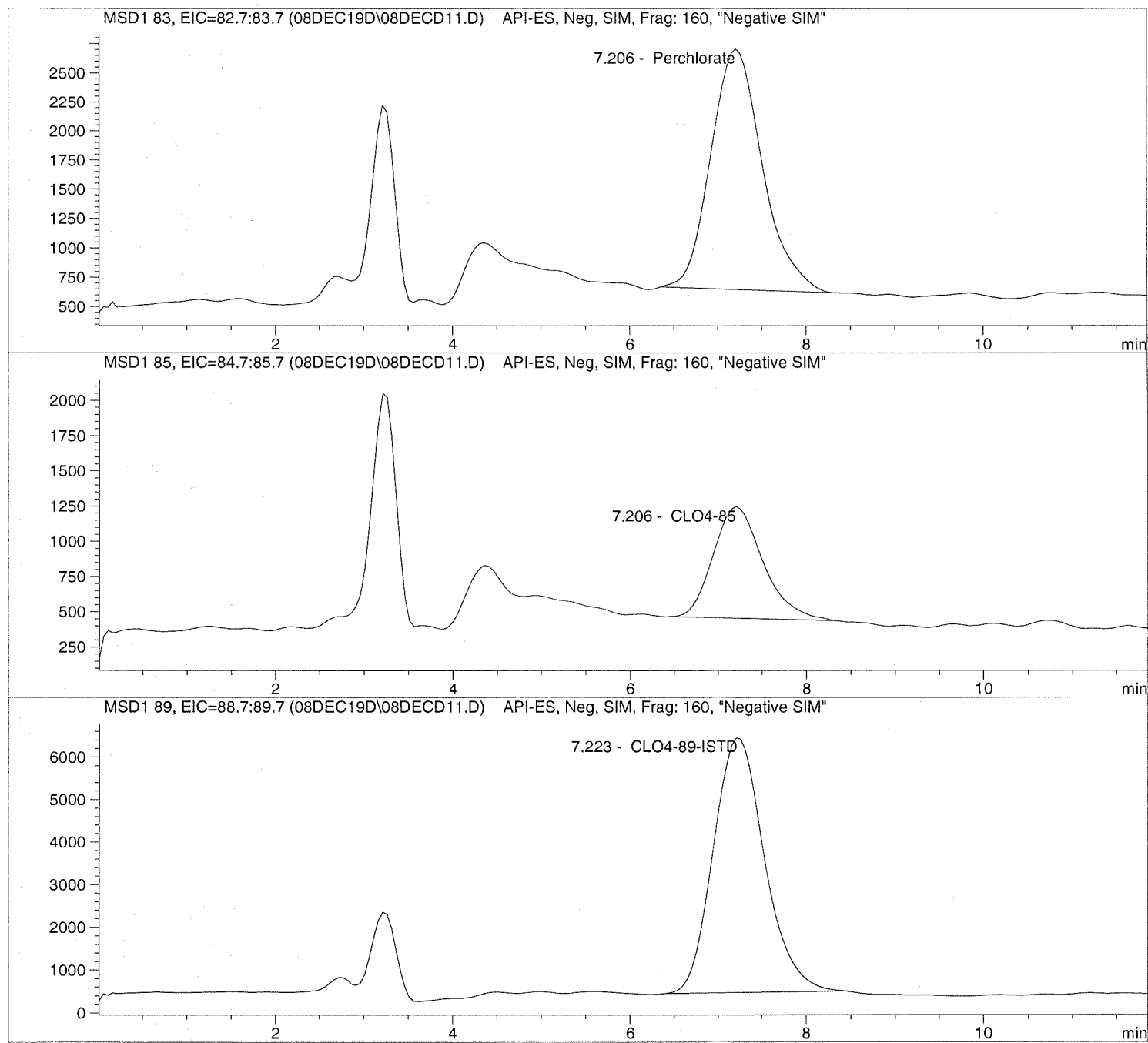
Sample Name: 1934088001

Injection Date: 12/08/2019 15:43:41
Sample Name: 1934088001
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
Inj. No.: 1
Inj. Vol.: 35 μ l

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\08DEC19D\08DECD11.D

Sample Name: 1934088001

```

=====
Injection Date: 12/08/2019 15:43:41      Seq Line:          11
Sample Name:    1934088001                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:       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
7.206	PBA	83506.7	1.2338	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.206	PBA	31160.7	1.4382	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.223	PBA	241675.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD12.D

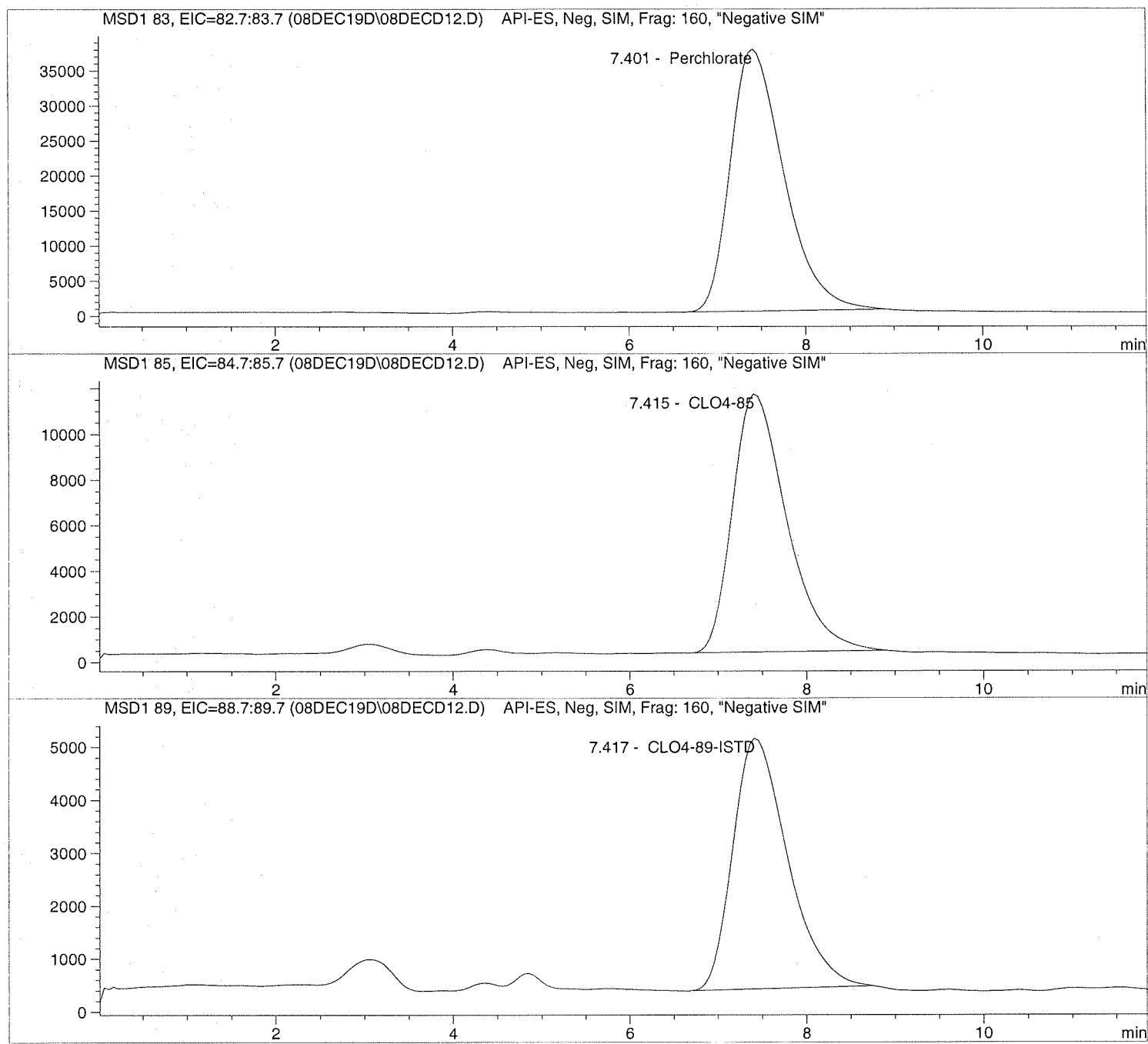
Sample Name: 687325 CCV@25

Injection Date: 12/08/2019 15:57:34
Sample Name: 687325 CCV@25
Acq Operator: TNB

Seq Line: 12
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 35 μ l

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\08DEC19D\08DECD12.D Sample Name: 687325 CCV@25

```

=====
Injection Date: 12/08/2019 15:57:34      Seq Line:          12
Sample Name:   687325   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
7.401	PBA	1568763.4	26.2667	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.415	PBA	480251.1	26.3725	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.417	PBA	203011.5	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

**Initial
Calibration**

```

=====
                        Calibration Table
=====

```

Perchlorate

```

Calib. Data Modified   :      9/23/2019 12:20:59 PM

Calculate              :      Internal Standard
Based on              :      Peak Area

Rel. Reference Window :      20.000 %
Abs. Reference Window :      0.000 min
Rel. Non-ref. Window  :      20.000 %
Abs. Non-ref. Window  :      0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks    :      not reported
Partial Calibration    :      No recalibration if peaks missing

Curve Type            :      Quadratic (some peaks differ, see below)
Origin                :      Ignored (some peaks differ, see below)
Weight                :      Linear (Amt) (some peaks differ, see below)

Recalibration Settings:
Average Response      :      Average all calibrations
Average Retention Time:      Floating Average New 75%

```

Calibration Report Options :

```

Printout of recalibrations within a sequence:
  Calibration Table after Recalibration
  Normal Report after Recalibration
If the sequence is done with bracketing:
  Results of first cycle (ending previous bracket)

```

Default Sample ISTD Information (if not set in sample table):

```

ISTD  ISTD Amount  Name
#
-----|-----|-----
  1      5.00000  CLO4-89-ISTD

```

```

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

```

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref	Grp Name
7.750	1 3	1.00000	5.39218e4	1.85454e-5	1	Perchlorate
	4	2.00000	1.32825e5	1.50574e-5		
	5	5.00000	2.76271e5	1.80982e-5		
	6	10.00000	5.61298e5	1.78159e-5		
	7	25.00000	1.51820e6	1.64669e-5		
	8	50.00000	3.31156e6	1.50986e-5		
	9	75.00000	5.23914e6	1.43153e-5		
7.767	3 3	5.00000	2.14568e5	2.33026e-5	+I1	CLO4-89-ISTD
	4	5.00000	2.04758e5	2.44190e-5		
	5	5.00000	2.13407e5	2.34294e-5		
	6	5.00000	2.09246e5	2.38953e-5		
	7	5.00000	2.07403e5	2.41077e-5		
	8	5.00000	2.02929e5	2.46391e-5		
	9	5.00000	1.97933e5	2.52611e-5		
7.778	2 3	1.00000	1.70436e4	5.86732e-5	1	CLO4-85
	4	2.00000	4.20754e4	4.75337e-5		
	5	5.00000	9.24707e4	5.40712e-5		
	6	10.00000	1.68622e5	5.93041e-5		
	7	25.00000	4.63724e5	5.39114e-5		
	8	50.00000	9.95933e5	5.02042e-5		

RetTime [min]	Lvl Sig	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: CL04-89-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

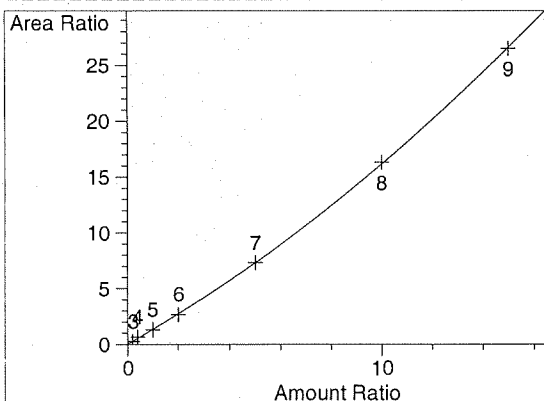
Compound: CL04-85

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

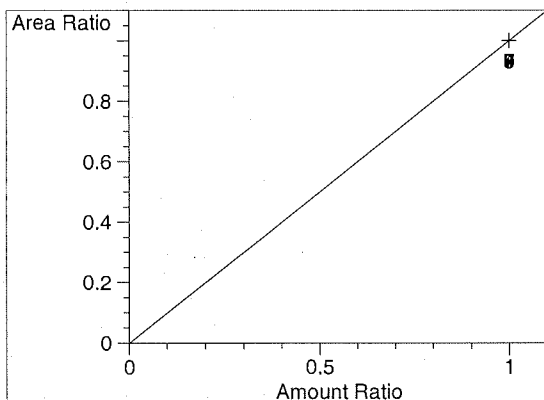
=====
 Peak Sum Table
 =====

No Entries in table
 =====

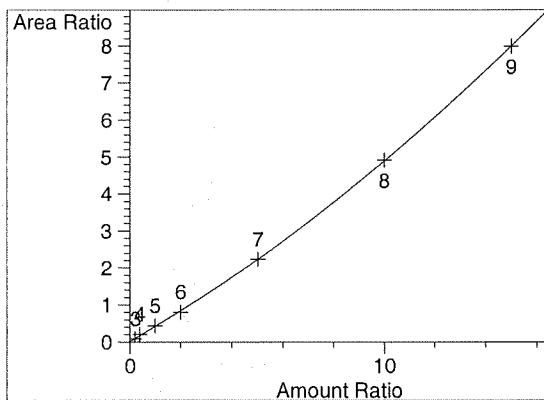
=====
 Calibration Curves
 =====



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\20SEP19\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

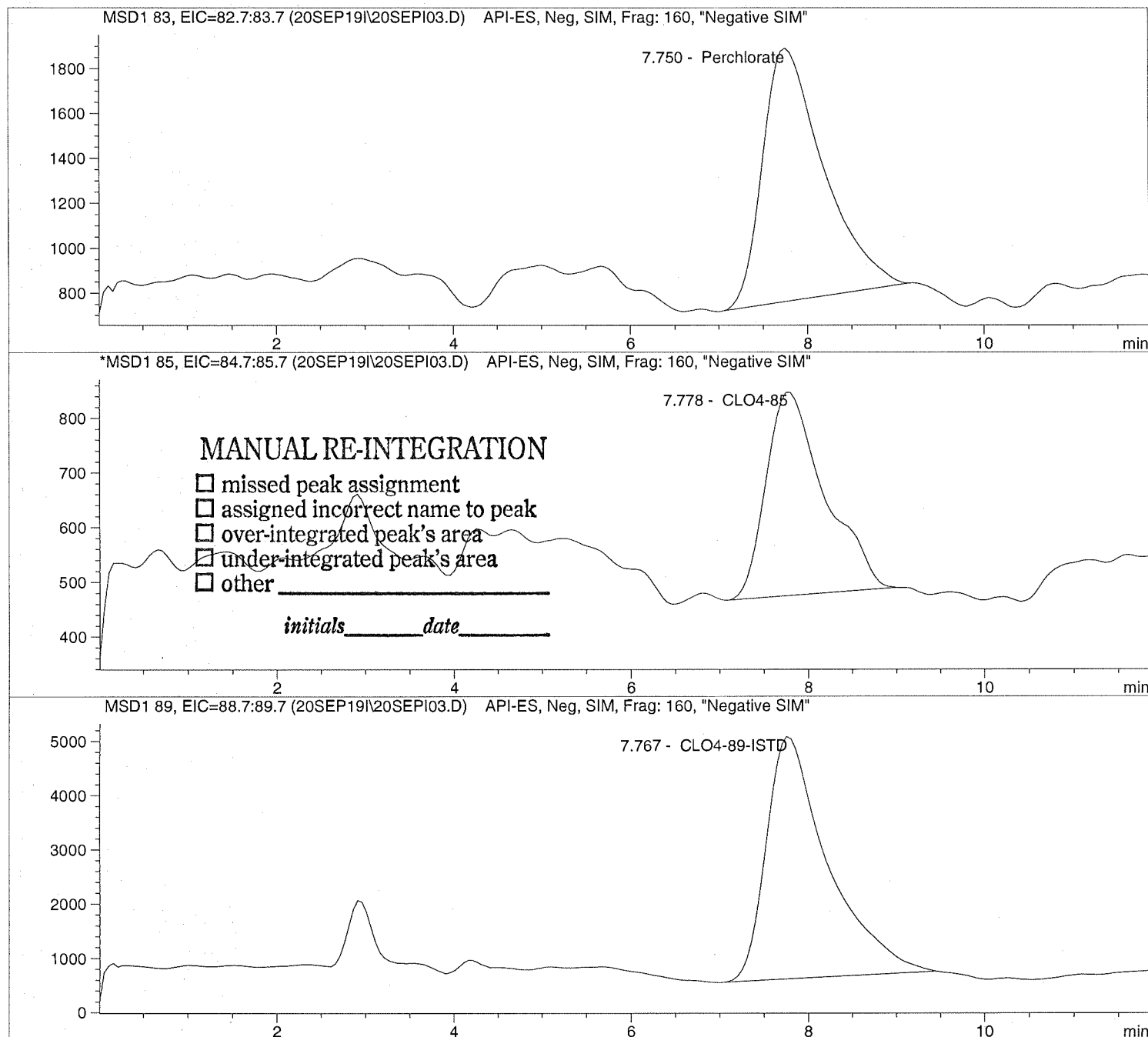
Inj. Vol.: 30 µl

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

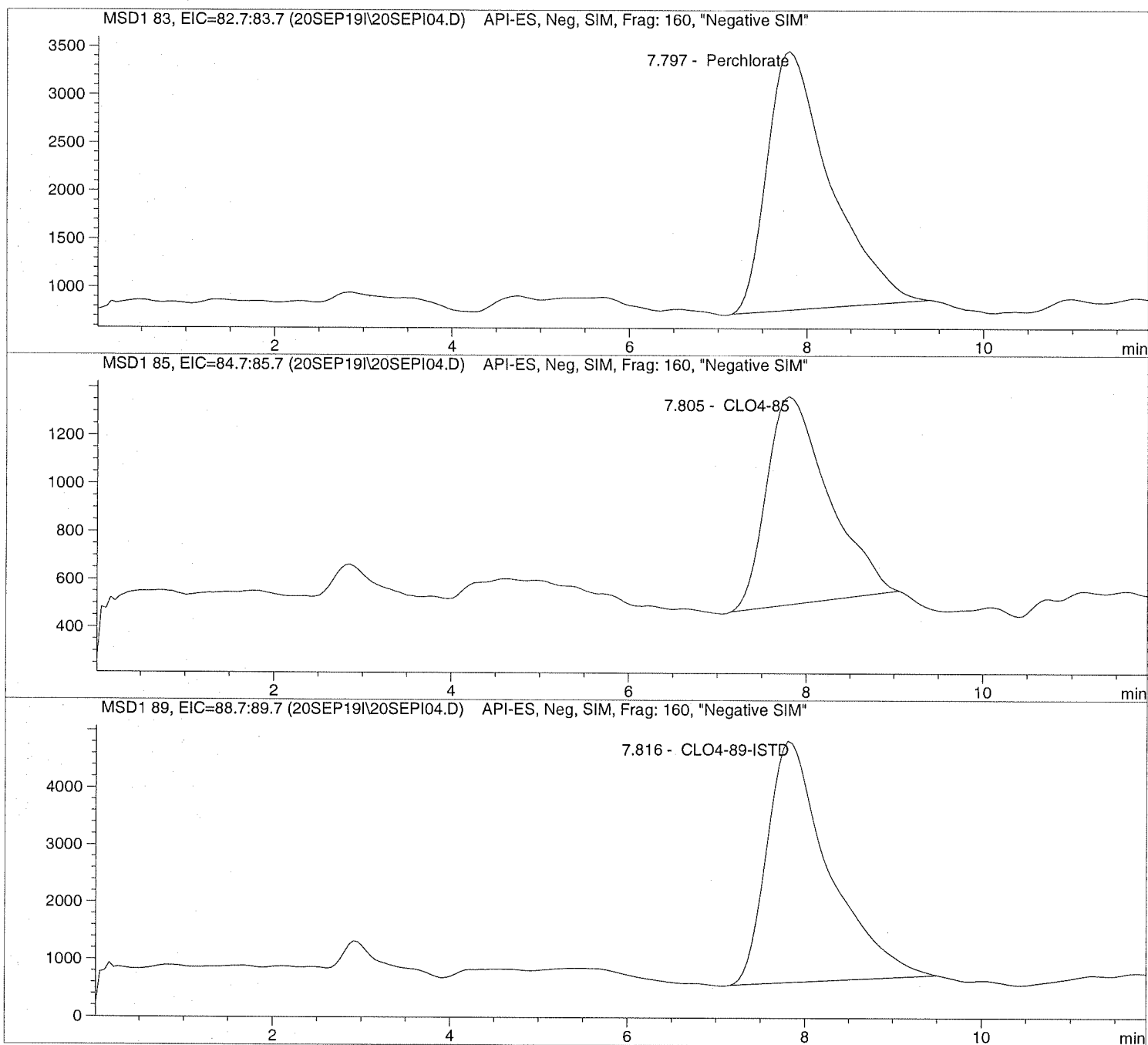
Sample Name: CLO4@ 2.0ug/L

=====
Injection Date: 9/20/2019 09:37:58
Sample Name: CLO4@ 2.0ug/L
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
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

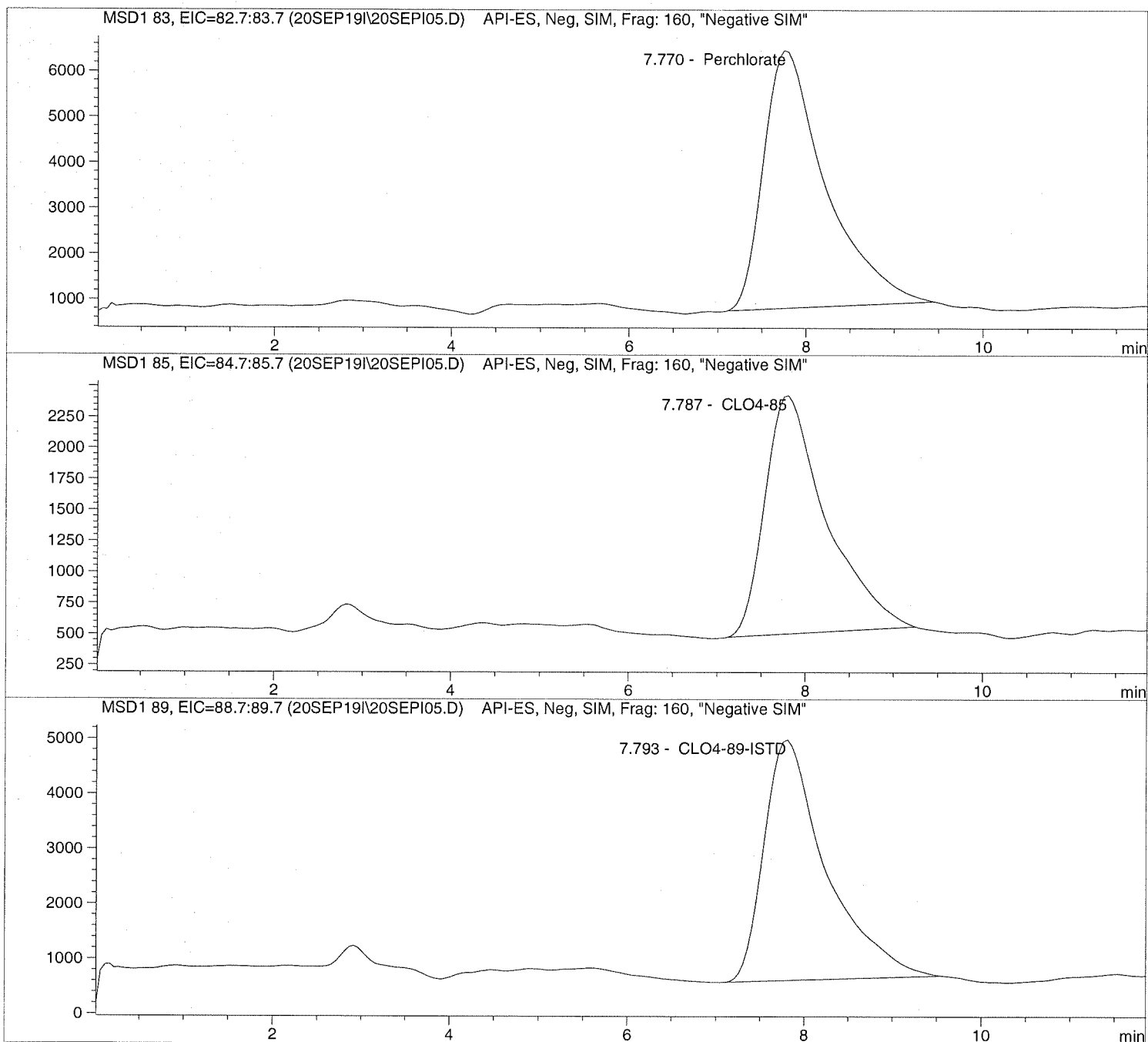
Inj. Vol.: 30 μ l

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\20SEP19\20SEPI06.D

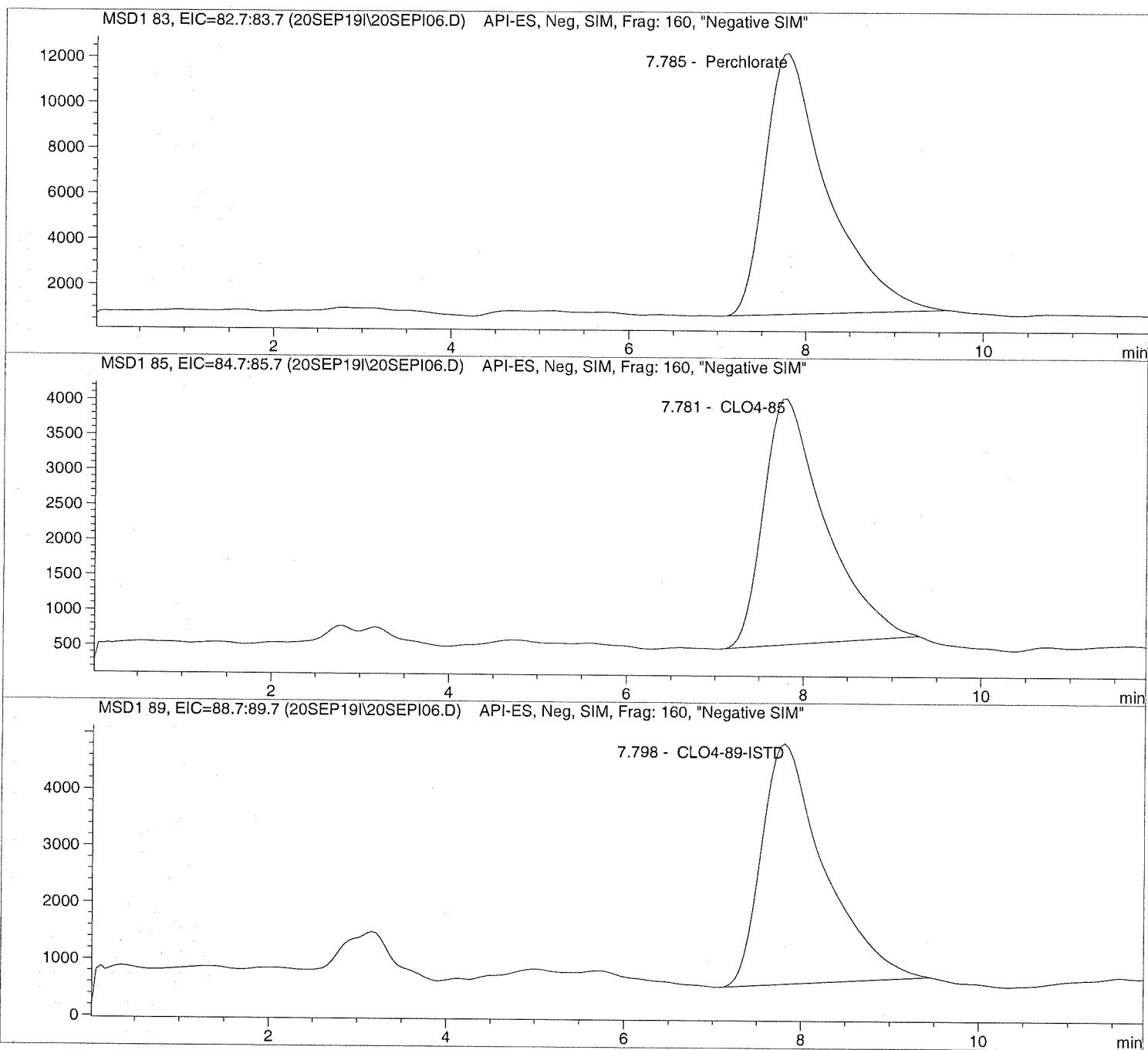
Sample Name: CLO4@ 10.ug/L

=====
Injection Date: 9/20/2019 10:05:36
Sample Name: CLO4@ 10.ug/L
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
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

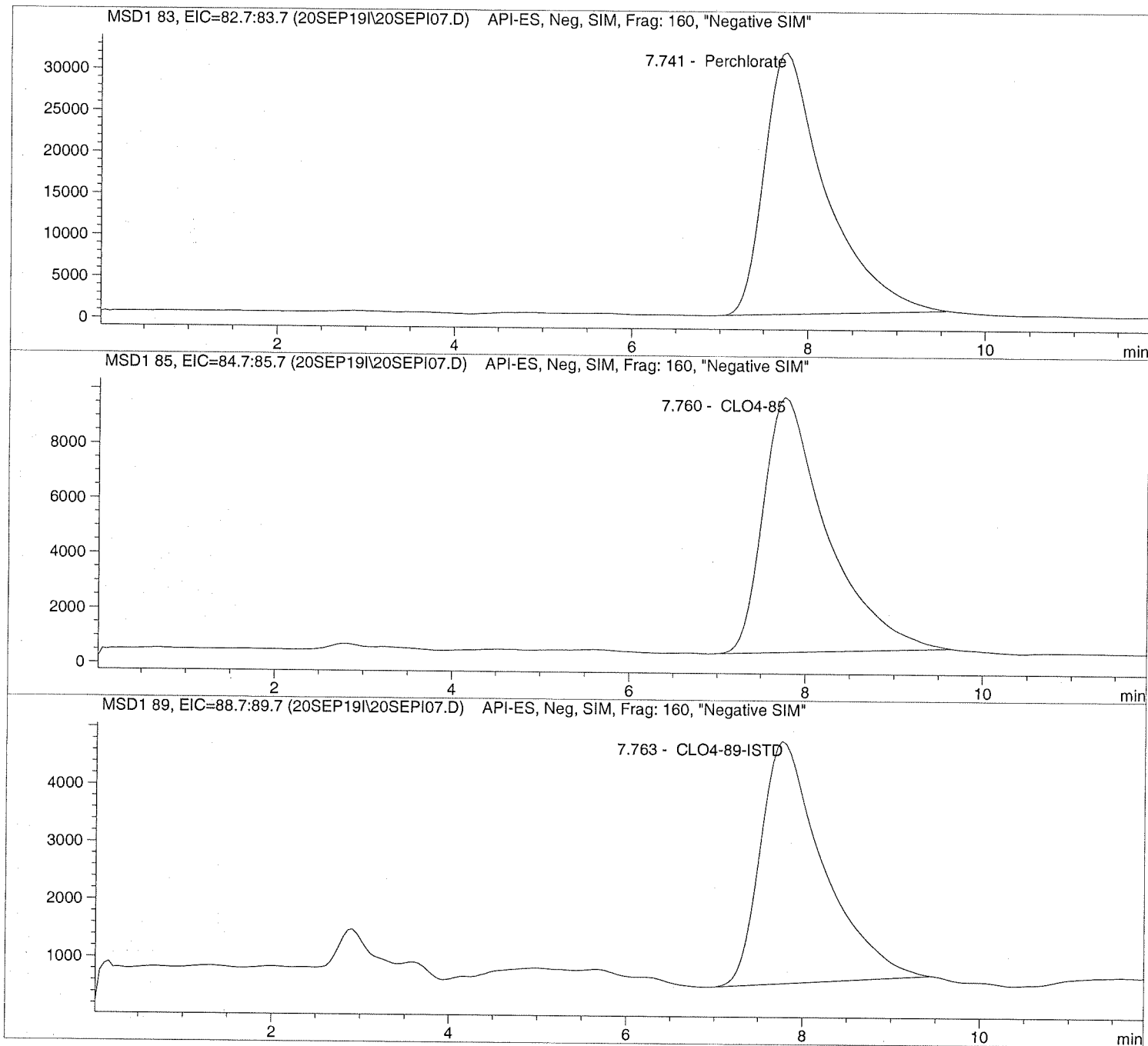
Inj. Vol.: 30 µl

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\20SEP19\20SEPI08.D

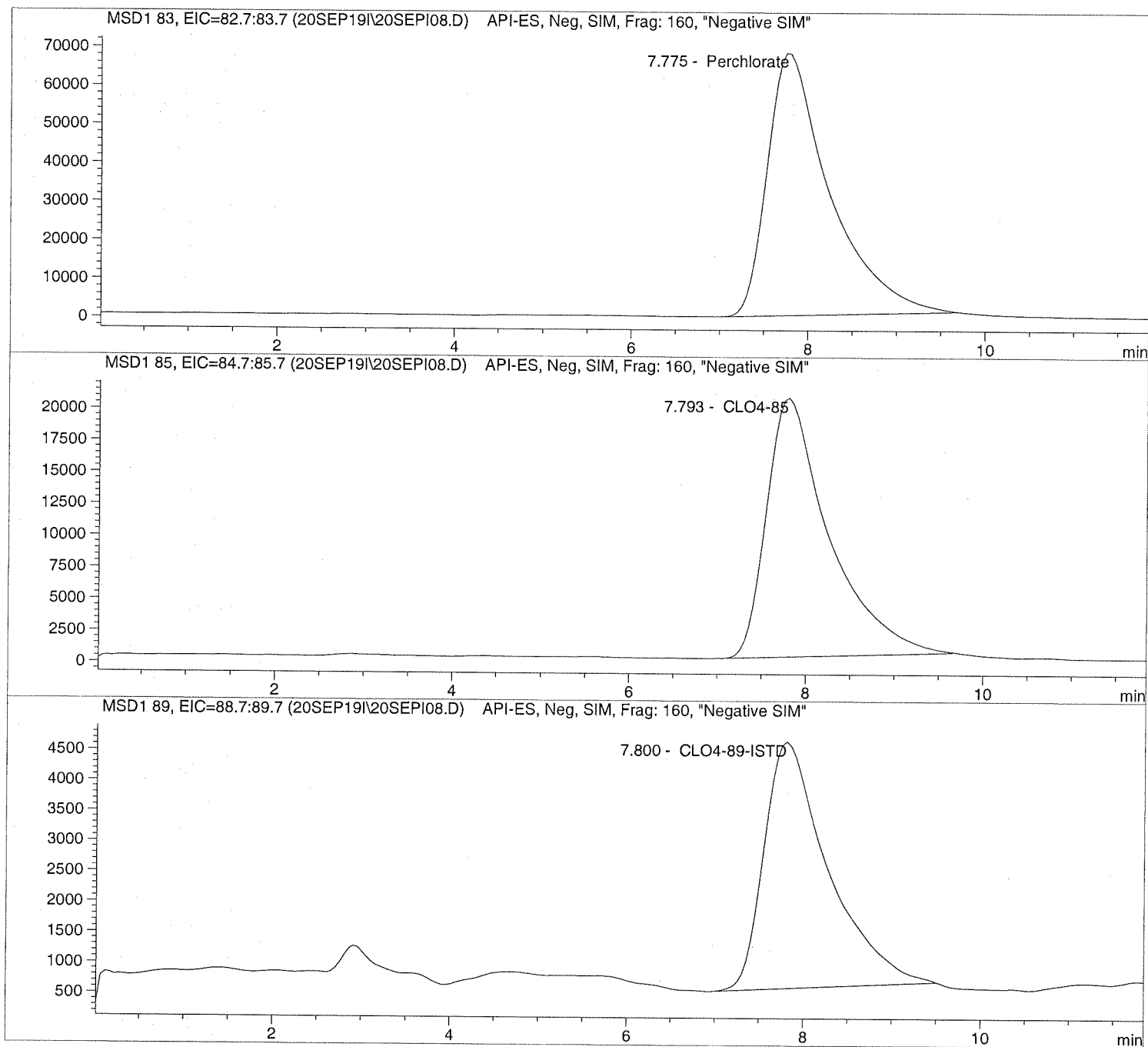
Sample Name: CLO4@ 50.ug/L

=====
Injection Date: 9/20/2019 10:33:18
Sample Name: CLO4@ 50.ug/L
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
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

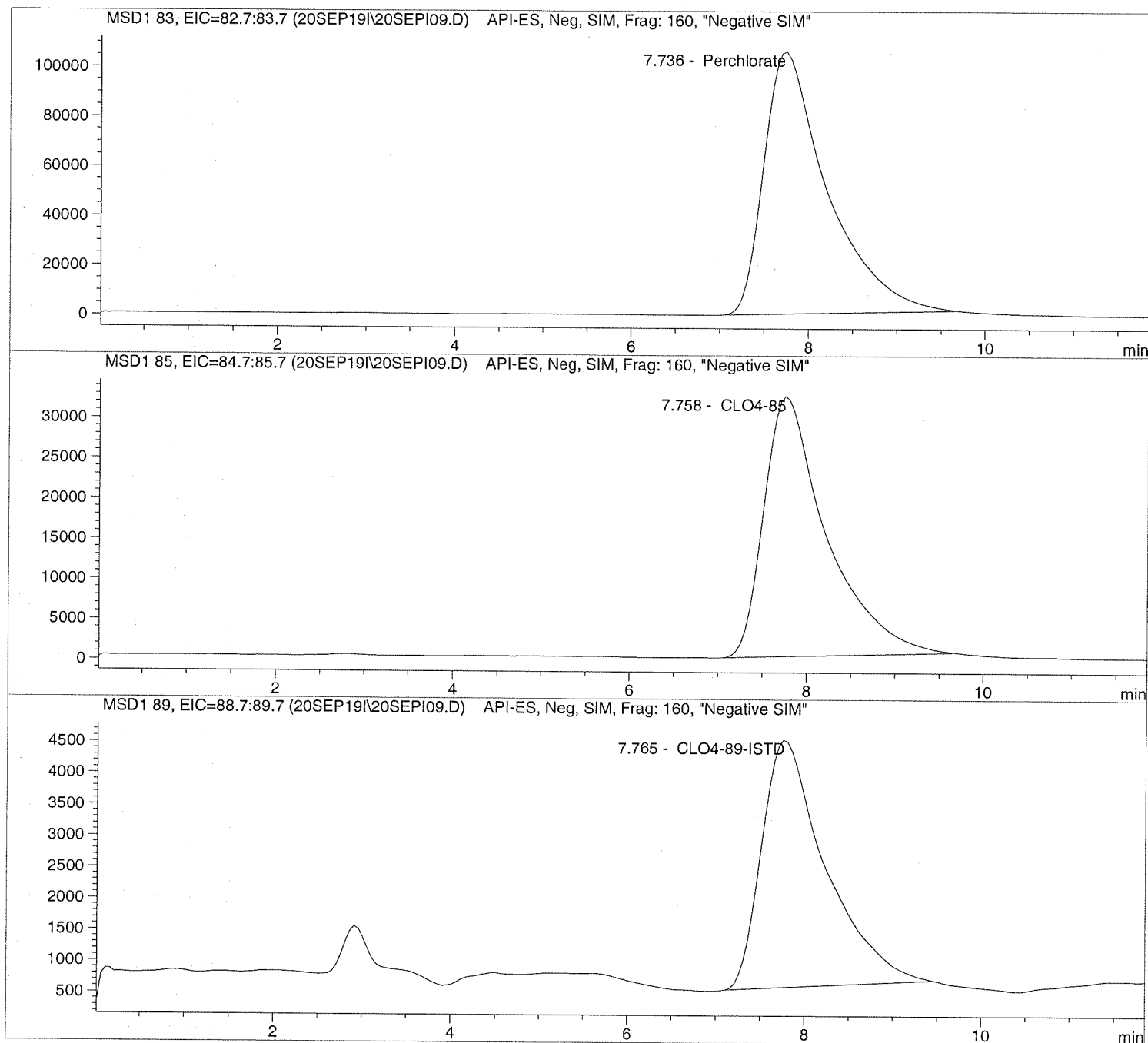
Inj. Vol.: 30 µl

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

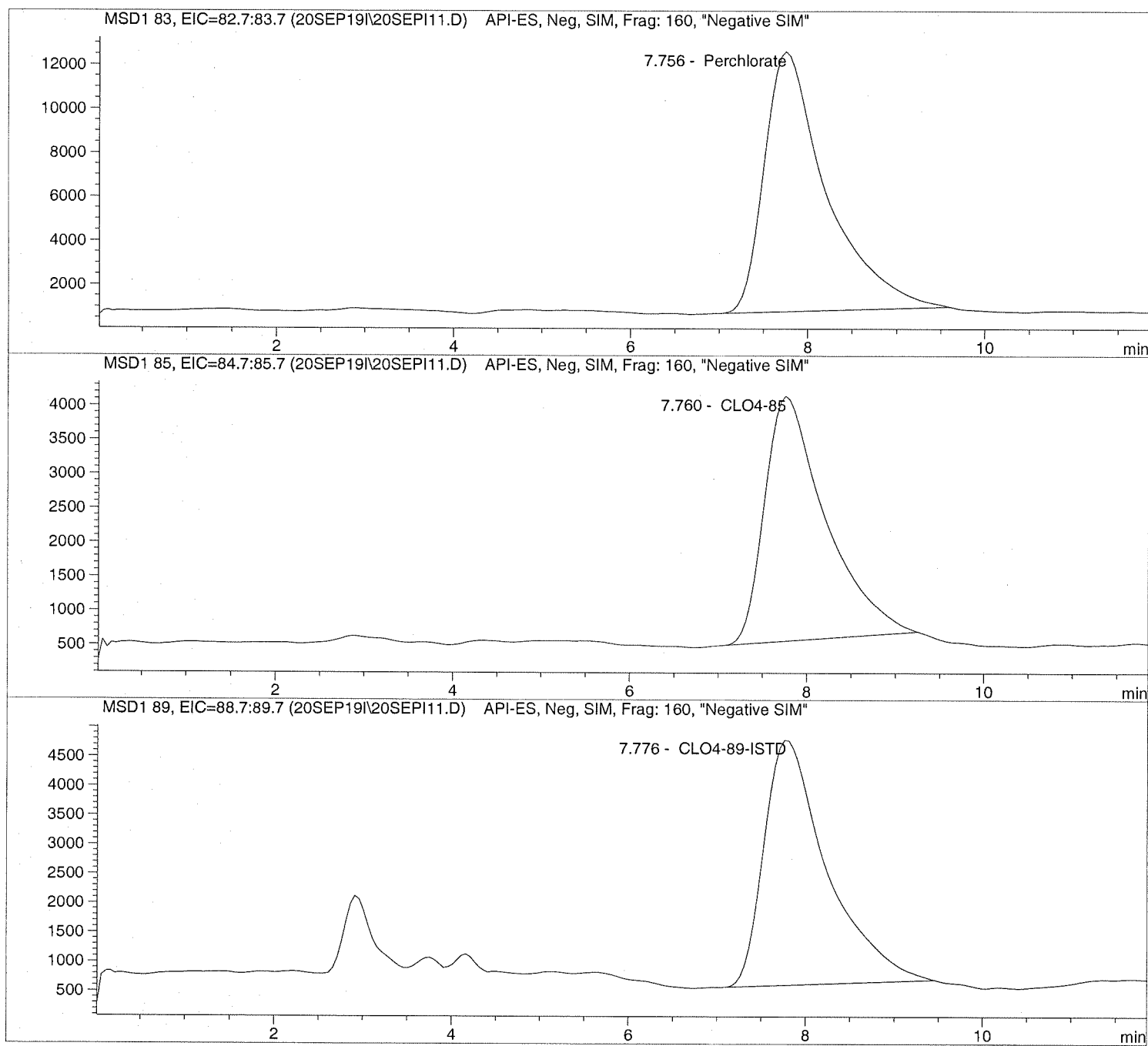
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



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

```

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

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 10.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.756	PBA	574879.4	10.1185	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	171000.4	9.7904	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.776	PBA	206243.3	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05

Seq Line: 3

Sample Name: CLO4@ 1.0ug/L

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

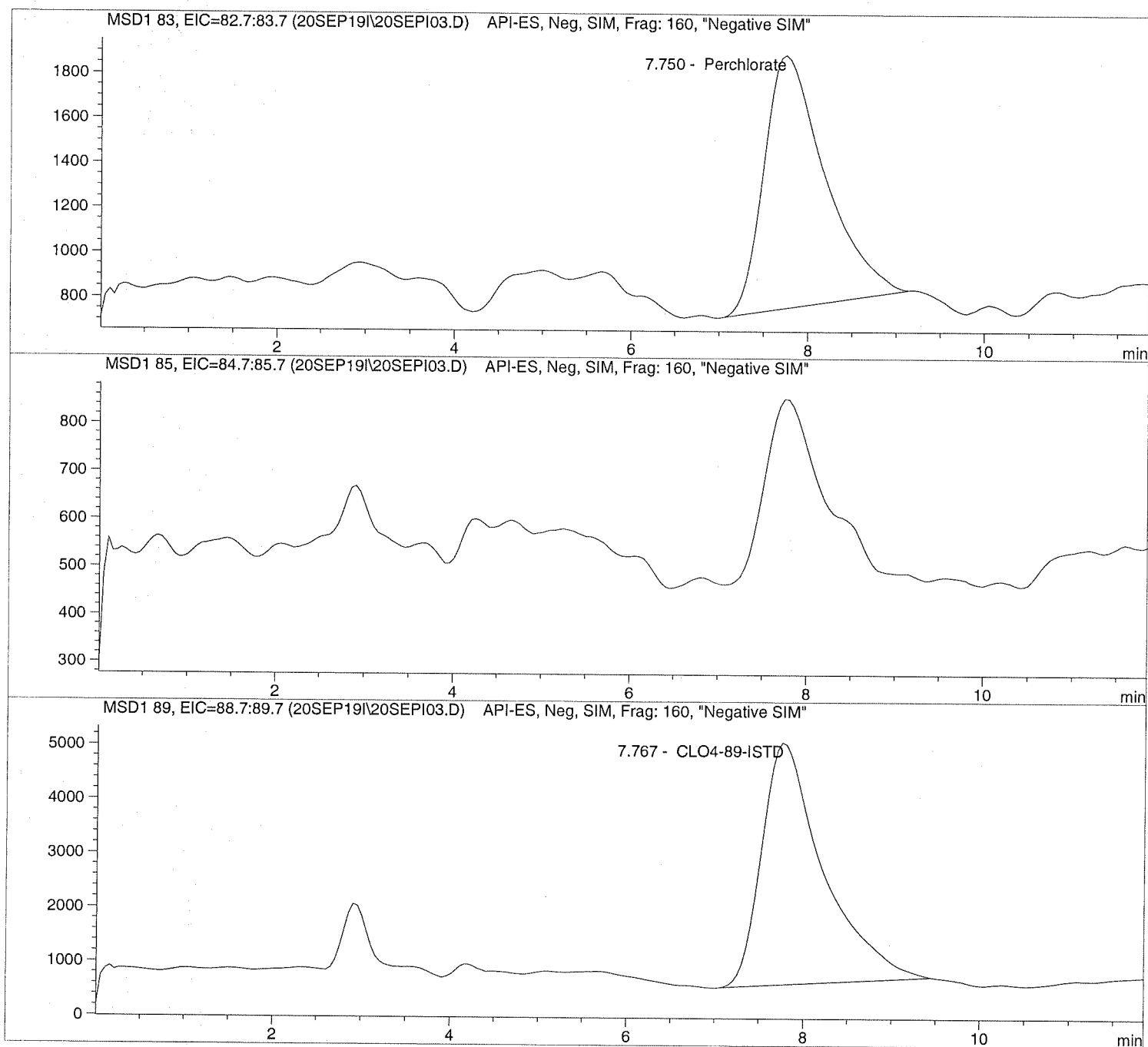
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line:      3
Sample Name:   CLO4@ 1.0ug/L           Location:      Vial 73
Acq Operator:  TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:27:11
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

*** End of Report ***



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

December 13, 2019

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

Work Order: **HS19120110**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Dec 04, 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,

A handwritten signature in black ink, appearing to read 'Raj. P. Modashia', enclosed in a circular scribble.

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US

Date: 13-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19120110

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120110-01	LH18/24-SP650_120319	Water		03-Dec-2019 14:00	04-Dec-2019 09:13	<input type="checkbox"/>
HS19120110-02	LH18/24-SP650_120319_AIX	Water		03-Dec-2019 14:00	04-Dec-2019 09:13	<input type="checkbox"/>

ALS Houston, US

Date: 13-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19120110

CASE NARRATIVE

Work Order Comments

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

WetChemistry by Method E350.3**Batch ID: R351939**

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

WetChemistry by Method E365.3**Batch ID: R351887**

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

ALS Houston, US

Date: 13-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Weekly Samples
 Sample ID: LH18/24-SP650_120319
 Collection Date: 03-Dec-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19120110
 Lab ID:HS19120110-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)								Analyst: MZD
	Method:E350.3							
Nitrogen, Ammonia (As N)	3.9	a	0.20	0.10	0.20	mg/L	1	06-Dec-2019 11:30
ORTHO PHOSPHATE (PO4) AS P BY E365.3								Analyst: KVL
	Method:E365.3							
Phosphorus, Total Orthophosphate (As P)	0.733	a	0.0100	0.0250	0.0250	mg/L	1	05-Dec-2019 13:00
SUBCONTRACT ANALYSIS - TOC ANALYSIS								Analyst: SUBK
	Method:NA							
Subcontract Analysis	See Attached		0	0		NA	1	13-Dec-2019 15:32

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

ALS Houston, US

Date: 13-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Weekly Samples
 Sample ID: LH18/24-SP650_120319_AIX
 Collection Date: 03-Dec-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19120110
 Lab ID:HS19120110-02
 Matrix:Water

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	10-Dec-2019 09:45

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

ALS Houston, US

Date: 13-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19120110

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R351887 (0)		Test Name : ORTHO PHOSPHATE (PO4) AS P BY E365.3			Matrix: Water	
HS19120110-01	LH18/24-SP650_120319	03 Dec 2019 14:00			05 Dec 2019 13:00	1
Batch ID: R351939 (0)		Test Name : AMMONIA AS N BY E350.3(ISE)			Matrix: Water	
HS19120110-01	LH18/24-SP650_120319	03 Dec 2019 14:00			06 Dec 2019 11:30	1
Batch ID: R352119 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Water	
HS19120110-02	LH18/24-SP650_120319_AIX	03 Dec 2019 14:00			10 Dec 2019 09:45	1
Batch ID: R352478 (0)		Test Name : SUBCONTRACT ANALYSIS - TOC ANALYSIS			Matrix: Water	
HS19120110-01	LH18/24-SP650_120319	03 Dec 2019 14:00			13 Dec 2019 15:32	1

ALS Houston, US

Date: 13-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19120110

QC BATCH REPORT

Batch ID: R351887 (0)		Instrument: UV-2450		Method: ORTHO PHOSPHATE (PO4) AS P BY E365.3						
MBLK	Sample ID: MBLK-351887	Units: mg/L		Analysis Date: 05-Dec-2019 13:00						
Client ID:	Run ID: UV-2450_351887	SeqNo: 5375879		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.0250	0.0250							U	
LCS	Sample ID: LCS-351887	Units: mg/L		Analysis Date: 05-Dec-2019 13:00						
Client ID:	Run ID: UV-2450_351887	SeqNo: 5375880		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.233	0.0250	0.25	0	93.2	85 - 115				
MS	Sample ID: HS19120110-01MS	Units: mg/L		Analysis Date: 05-Dec-2019 13:00						
Client ID: LH18/24-SP650_120319	Run ID: UV-2450_351887	SeqNo: 5375881		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.939	0.0250	0.25	0.733	82.4	80 - 120				
MSD	Sample ID: HS19120110-01MSD	Units: mg/L		Analysis Date: 05-Dec-2019 13:00						
Client ID: LH18/24-SP650_120319	Run ID: UV-2450_351887	SeqNo: 5375882		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.942	0.0250	0.25	0.733	83.6	80 - 120	0.939	0.319	20	

The following samples were analyzed in this batch:

ALS Houston, US

Date: 13-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19120110

QC BATCH REPORT

Batch ID: R351939 (0)		Instrument: WetChem_HS		Method: AMMONIA AS N BY E350.3(ISE)						
MBLK	Sample ID: MBLK-351939	Units: mg/L			Analysis Date: 06-Dec-2019 11:30					
Client ID:	Run ID: WetChem_HS_351939	SeqNo: 5377168			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Nitrogen, Ammonia (As N)	0.10	0.20							U	
LCS	Sample ID: LCS-351939	Units: mg/L			Analysis Date: 06-Dec-2019 11:30					
Client ID:	Run ID: WetChem_HS_351939	SeqNo: 5377169			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Nitrogen, Ammonia (As N)	9.8	0.20	10	0	98.0	80 - 120				
MS	Sample ID: HS19120058-01MS	Units: mg/L			Analysis Date: 06-Dec-2019 11:30					
Client ID:	Run ID: WetChem_HS_351939	SeqNo: 5377171			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Nitrogen, Ammonia (As N)	9.694	0.20	10	0.181	95.1	80 - 120				
MSD	Sample ID: HS19120058-01MSD	Units: mg/L			Analysis Date: 06-Dec-2019 11:30					
Client ID:	Run ID: WetChem_HS_351939	SeqNo: 5377172			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Nitrogen, Ammonia (As N)	10	0.20	10	0.181	98.2	80 - 120	9.694	3.11	20	

The following samples were analyzed in this batch: HS19120110-01

ALS Houston, US

Date: 13-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19120110

**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 Quantitation 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: 13-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19120110

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19120110-01	LH18/24-SP650_120319	Login	12/4/2019 11:14:18 AM	PMG	WET060
HS19120110-01	LH18/24-SP650_120319	Login	12/4/2019 11:14:18 AM	PMG	WET060
HS19120110-01	LH18/24-SP650_120319	Login	12/4/2019 11:14:18 AM	PMG	Sub
HS19120110-02	LH18/24-SP650_120319_AIX	Login	12/4/2019 11:14:18 AM	PMG	Sub

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19120110

Date/Time Received: **04-Dec-2019 09:13**
 Received by: **PMG**

Checklist completed by: Paresh M. Giga 4-Dec-2019
 eSignature Date

Reviewed by: RJ Modashia 4-Dec-2019
 eSignature Date

Matrices: **Water**

Carrier name: **FedEx**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes No Not Present
- Chain of custody present? Yes No 1 Page(s)
- Chain of custody signed when relinquished and received? Yes No COC IDs:None
- Samplers name present on COC? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s): 1.6c U/C IR25
 Cooler(s)/Kit(s): 44851
 Date/Time sample(s) sent to storage: 12/4/19 11:25

- 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:


CHAIN OF CUSTODY

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

Page 1 of 1

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS			Project No. NWO1312.0150.0 16.0001			Analyses										HS19120110 Bhate Environmental Associates, Inc. Longhorn GW Treatment Plant Weekly Samples 						
Job: GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES					MS / MSD	No. OF CONTAINERS	AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE											Remarks (Preservatives, etc.)	Lab I.D.#
Prepared By: Scott Beesinger			P.O. Number																			
Field Sample I.D.	Sample Matrix	Date / Time																				
LH18/24-SP650_120319	Water	12/03/19 / 14:00	3	X	X												H2SO4					
LH18/24-SP650_120319	Water	12/03/19 / 14:00	1					X									NONE					
LH18/24-SP650_203619_AIX	Water	12/03/19 / 14:00	1							X							NONE					
Additional Remarks: Standard TAT on all parameters																						
Relinquished By: <i>Scott Beesinger</i>	Date 12/03/19	Time 14:30	Received By: <i>[Signature]</i>	Date 12/4/19	Time 09:13	Relinquished By:	Date	Time	Received By:	Date	Time											
For Lab Use Only																						
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition													
Remarks:																						

44851
 610.
 1.60
 +25
 C/F = 6.00

 <p>10450 Stanciff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5837</p>	<p>44951</p>	Date: 12/3	Time: 1430	<p>Seal Broken By:</p> <p>2/1/99</p>
		Name: Scott B. S. N. G. R.		
		Company: B. H. T. Y.		

FedEx
TRK# 4809 7830 4806
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PRIORITY OVERNIGHT

AB SGRA

77099
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December 13, 2019

Analytical Report for Service Request No: K1911347

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

RE: HS19120110

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory December 05, 2019. For your reference, these analyses have been assigned our service request number **K1911347**.

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy
Project Manager



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Acronyms

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

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.pjllabs.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/analyte is offered by that state.



Case Narrative

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



Client: ALS Environmental - US
Project: HS19120110
Sample Matrix: Water

Service Request: K1911347
Date Received: 12/05/2019

CASE NARRATIVE

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

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 12/05/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by

Kelley Avejoy

Date

12/13/2019



Chain of Custody

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Subcontract Chain of Custody

SAMPLING STATE: Dept of Defense

COC ID: 12771

SUBCONTRACT TO:

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

Phone: +1 360 501 3312

K1911347

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19120110
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19120110-01	LH18/24-SP650_120319	Water	03 Dec 2019 14:00
TOC Analysis for DOD Level IV			12 Dec 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: *JM*
 Received By: *RJ Modashia ALS Kelso*
 Cooler ID(s): _____

Date/Time: *12.4.19 18:00*
 Date/Time: *12/5/19 10:10*
 Temperature(s): _____

RIGHT SOLUTIONS | RIGHT PARTNER



PC KL

Cooler Receipt and Preservation Form

Client ALS-Houston Service Request K19 11347
Received: 12/5/19 Opened: 12/5/19 By: KM Unloaded: 12/5/19 By: dk

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

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp/Blank	Corrected Temp/Blank	Corr. Factor	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
<u>0.1</u>	<u>0.3</u>	<u>3.1</u>	<u>3.3</u>	<u>10.2</u>	<u>385</u>		<u>125102925548</u>		

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

RUSH



General Chemistry

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www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: ALS Environmental - US
Project: HS19120110
Sample Matrix: Water
Analysis Method: SM 5310 C
Prep Method: None

Service Request: K1911347
Date Collected: 12/3/19
Date Received: 12/5/19
Units: mg/L
Basis: NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_120319	K1911347-001	1.50	0.50	0.20	0.07	1	12/11/19 02:07	
Method Blank	K1911347-MB	ND U	0.50	0.20	0.07	1	12/11/19 06:51	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19120110
Sample Matrix: Water

Service Request: K1911347
Date Collected: 12/03/19
Date Received: 12/05/19
Date Analyzed: 12/11/19

Replicate Sample Summary
General Chemistry Parameters

Sample Name: LH18/24-SP650_120319
Lab Code: K1911347-001

Units: mg/L
Basis: NA

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>LOQ</u>	<u>LOD</u>	<u>MDL</u>	<u>Sample Result</u>	<u>Duplicate Sample K1911347-001DUP Result</u>	<u>Average</u>	<u>RPD</u>	<u>RPD Limit</u>
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	1.50	1.47	1.48	2	10

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

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

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

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19120110
Sample Matrix: Water

Service Request: K1911347
Date Analyzed: 12/11/19
Date Extracted: NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method: SM 5310 C
Prep Method: None

Units: mg/L
Basis: NA
Analysis Lot: 662863

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1911347-LCS	26.0	25.0	104	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19120110

Service Request: K1911347

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C

Units: mg/L

	Analysis		Date	True	Measured	Percent	Acceptance Limits
	Lot	Lab Code	Analyzed	Value	Value	Recovery	
CCV1	662863	KQ1918365-01	12/11/19 01:38	25.0	24.7	99	90-110
CCV2	662863	KQ1918365-02	12/11/19 06:21	25.0	24.8	99	90-110
CCV3	662863	KQ1918365-03	12/11/19 11:04	25.0	24.3	97	90-110
CCV4	662863	KQ1918365-04	12/11/19 15:34	25.0	24.3	97	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19120110

Service Request: K1911347

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	662863	KQ1918365-05	12/11/19 01:53	0.50	0.20	0.07	0.34	J
CCB2	662863	KQ1918365-06	12/11/19 06:36	0.50	0.20	0.07	0.12	J
CCB3	662863	KQ1918365-07	12/11/19 11:19	0.50	0.20	0.07	ND	U
CCB4	662863	KQ1918365-08	12/11/19 15:48	0.50	0.20	0.07	ND	U



Raw Data

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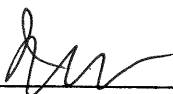
Work Request # ^{Original} () KP11349, 11272, 11347, 11350, 11351, 11369, 11399, 11413, 11350, 11351, 11399,
 Tier: I II IV II II II II II II II II
 Date Analyzed: 12/10/19
 Analyst: BCP Run # 662862
 Analysis: TOC/DOC 662863
662864

**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: K1911350-8/8d, 11350-9/9d, 11350-2/2d, 11351-1/1d, 11413-1/1d, 11350-1/1d, 11350-3/3d, 11350-6/6d, report a high % RPP. However, these samples are less than 5x the MRL.

Final Approved by:  Date: 12/13/19
DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 662863 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
K1911272-003	Carbon, Total Organic	N/A		Water	8.42 mg/L	10 mL	842 mg/L	100	7	50			12/11/19 03:32:00	N	II
K1911272-004	Carbon, Total Organic	N/A		Water	9.20 mg/L	10 mL	920 mg/L	100	7	50			12/11/19 04:00:00	N	II
K1911347-001	Carbon, Total Organic	N/A		Water	1.50 mg/L	10 mL	1.50 mg/L	1	0.07	0.50			12/11/19 02:07:00	N	IV
K1911350-001	Carbon, Total Organic	N/A		Water	0.64 mg/L	10 mL	0.64 mg/L	1	0.07	0.50			12/11/19 05:24:00	N	II
K1911350-002	Carbon, Total Organic	N/A		Water	0.78 mg/L	10 mL	0.78 mg/L	1	0.07	0.50			12/11/19 07:20:00	N	II
K1911350-003	Carbon, Total Organic	N/A		Water	0.72 mg/L	10 mL	0.72 mg/L	1	0.07	0.50			12/11/19 07:48:00	N	II
K1911350-004	Carbon, Total Organic	N/A		Water	-0.03 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 08:16:00	N	II
K1911350-005	Carbon, Total Organic	N/A		Water	0.06 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 08:44:00	N	II
K1911350-006	Carbon, Total Organic	N/A		Water	0.43 mg/L	10 mL	0.43 mg/L	J 1	0.07	0.50			12/11/19 09:12:00	N	II
K1911350-007	Carbon, Total Organic	N/A		Water	0.01 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 09:40:00	N	II
K1911350-008	Carbon, Total Organic	N/A		Water	0.12 mg/L	10 mL	0.12 mg/L	J 1	0.07	0.50			12/11/19 10:08:00	N	II
K1911350-009	Carbon, Total Organic	N/A		Water	0.15 mg/L	10 mL	0.15 mg/L	J 1	0.07	0.50			12/11/19 10:36:00	N	II
K1911350-010	Carbon, Total Organic	N/A		Water	0.11 mg/L	10 mL	0.11 mg/L	J 1	0.07	0.50			12/11/19 11:34:00	N	II
K1911351-001	Carbon, Total Organic	N/A		Water	0.25 mg/L	10 mL	0.25 mg/L	J 1	0.07	0.50			12/11/19 12:02:00	N	II
K1911351-002	Carbon, Total Organic	N/A		Water	0.17 mg/L	10 mL	0.17 mg/L	J 1	0.07	0.50			12/11/19 12:30:00	N	II
K1911369-001	Carbon, Total Organic	N/A		Water	0.03 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 03:04:00	N	II
K1911399-001	Carbon, Total Organic	N/A		Water	3.96 mg/L	10 mL	3.96 mg/L	1	0.07	0.50			12/11/19 04:28:00	N	II
K1911399-003	Carbon, Total Organic	N/A		Water	2.78 mg/L	10 mL	2.78 mg/L	1	0.07	0.50			12/11/19 04:56:00	N	II
K1911413-001	Carbon, Total Organic	N/A		Water	0.93 mg/L	10 mL	0.93 mg/L	1	0.07	0.50			12/11/19 02:36:00	N	II
KQ1918365-01	Carbon, Total Organic	CCV		Water	24.69 mg/L	10 mL	24.7 mg/L	1					12/11/19 01:38:00	N	IV
KQ1918365-02	Carbon, Total Organic	CCV		Water	24.82 mg/L	10 mL	24.8 mg/L	1					12/11/19 06:21:00	N	IV
KQ1918365-03	Carbon, Total Organic	CCV		Water	24.28 mg/L	10 mL	24.3 mg/L	1					12/11/19 11:04:00	N	IV
KQ1918365-04	Carbon, Total Organic	CCV		Water	24.30 mg/L	10 mL	24.3 mg/L	1					12/11/19 15:34:00	N	IV
KQ1918365-05	Carbon, Total Organic	CCB		Water	0.34 mg/L	10 mL	0.34 mg/L	J 1	0.07	0.50			12/11/19 01:53:00	N	IV
KQ1918365-06	Carbon, Total Organic	CCB		Water	0.12 mg/L	10 mL	0.12 mg/L	J 1	0.07	0.50			12/11/19 06:36:00	N	IV
KQ1918365-07	Carbon, Total Organic	CCB		Water	0.02 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 11:19:00	N	IV
KQ1918365-08	Carbon, Total Organic	CCB		Water	-0.11 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 15:48:00	N	IV
KQ1918365-09	Carbon, Total Organic	MB		Water	-0.16 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 06:51:00	N	IV
KQ1918365-10	Carbon, Total Organic	LCS		Water	26.01 mg/L	10 mL	26.0 mg/L	1	0.07	0.50	104		12/11/19 07:05:00	N	IV
KQ1918365-11	Carbon, Total Organic	MS	K1911350-001	Water	26.74 mg/L	10 mL	26.7 mg/L	1	0.07	0.50	104		12/11/19 05:52:00	N	II
KQ1918365-12	Carbon, Total Organic	DUP	K1911347-001	Water	1.47 mg/L	10 mL	1.47 mg/L	1	0.07	0.50		2	12/11/19 02:07:00	N	IV
KQ1918365-13	Carbon, Total Organic	DUP	K1911350-007	Water	0.03 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	12/11/19 09:40:00	N	II
KQ1918365-14	Carbon, Total Organic	DUP	K1911350-008	Water	0.23 mg/L	10 mL	0.23 mg/L	J 1	0.07	0.50		63*	12/11/19 10:08:00	N	II
KQ1918365-15	Carbon, Total Organic	DUP	K1911350-009	Water	0.18 mg/L	10 mL	0.18 mg/L	J 1	0.07	0.50		17*	12/11/19 10:36:00	N	II
KQ1918365-16	Carbon, Total Organic	DUP	K1911350-010	Water	0.13 mg/L	10 mL	0.13 mg/L	J 1	0.07	0.50		22*	12/11/19 11:34:00	N	II
KQ1918365-17	Carbon, Total Organic	DUP	K1911350-002	Water	0.68 mg/L	10 mL	0.68 mg/L	1	0.07	0.50		13*	12/11/19 07:20:00	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: 662863 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
KQ1918365-18	Carbon, Total Organic	DUP	K1911350-001	Water	0.64 mg/L	10 mL	0.64 mg/L	1	0.07	0.50		<1	12/11/19 05:24:00	N	II
KQ1918365-19	Carbon, Total Organic	DUP	K1911350-003	Water	0.70 mg/L	10 mL	0.70 mg/L	1	0.07	0.50		4	12/11/19 07:48:00	N	II
KQ1918365-20	Carbon, Total Organic	DUP	K1911350-004	Water	-0.02 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	12/11/19 08:16:00	N	II
KQ1918365-21	Carbon, Total Organic	DUP	K1911350-005	Water	0.05 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	12/11/19 08:44:00	N	II
KQ1918365-22	Carbon, Total Organic	DUP	K1911350-006	Water	0.40 mg/L	10 mL	0.40 mg/L	J 1	0.07	0.50		8	12/11/19 09:12:00	N	II
KQ1918365-23	Carbon, Total Organic	DUP	K1911351-001	Water	0.20 mg/L	10 mL	0.20 mg/L	J 1	0.07	0.50		22*	12/11/19 12:02:00	N	II
KQ1918365-24	Carbon, Total Organic	DUP	K1911351-002	Water	0.19 mg/L	10 mL	0.19 mg/L	J 1	0.07	0.50		9	12/11/19 12:30:00	N	II
KQ1918365-25	Carbon, Total Organic	DUP	K1911272-003	Water	8.53 mg/L	10 mL	853 mg/L	100	7	50		1	12/11/19 03:32:00	N	II
KQ1918365-26	Carbon, Total Organic	DUP	K1911369-001	Water	0.02 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	12/11/19 03:04:00	N	II
KQ1918365-27	Carbon, Total Organic	DUP	K1911272-004	Water	9.19 mg/L	10 mL	919 mg/L	100	7	50		<1	12/11/19 04:00:00	N	II
KQ1918365-28	Carbon, Total Organic	DUP	K1911399-001	Water	3.81 mg/L	10 mL	3.81 mg/L	1	0.07	0.50		4	12/11/19 04:28:00	N	II
KQ1918365-29	Carbon, Total Organic	DUP	K1911399-003	Water	2.71 mg/L	10 mL	2.71 mg/L	1	0.07	0.50		3	12/11/19 04:56:00	N	II
KQ1918365-30	Carbon, Total Organic	DUP	K1911413-001	Water	0.82 mg/L	10 mL	0.82 mg/L	1	0.07	0.50		12*	12/11/19 02:36:00	N	II

BD 12/13/19

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

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 662864 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
K1911350-001	Carbon, Dissolved Organic (DOC)	N/A		Water	0.29 mg/L	10 mL	0.29 mg/L	J 1	0.07	0.50			12/11/19 13:13:00	N	II
K1911350-002	Carbon, Dissolved Organic (DOC)	N/A		Water	0.53 mg/L	10 mL	0.53 mg/L	1	0.07	0.50			12/11/19 14:10:00	N	II
K1911350-003	Carbon, Dissolved Organic (DOC)	N/A		Water	0.54 mg/L	10 mL	0.54 mg/L	1	0.07	0.50			12/11/19 14:38:00	N	II
K1911350-004	Carbon, Dissolved Organic (DOC)	N/A		Water	-0.17 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 15:06:00	N	II
K1911350-005	Carbon, Dissolved Organic (DOC)	N/A		Water	-0.11 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 16:33:00	N	II
K1911350-006	Carbon, Dissolved Organic (DOC)	N/A		Water	0.09 mg/L	10 mL	0.09 mg/L	J 1	0.07	0.50			12/11/19 17:01:00	N	II
K1911350-007	Carbon, Dissolved Organic (DOC)	N/A		Water	-0.25 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 17:29:00	N	II
K1911350-008	Carbon, Dissolved Organic (DOC)	N/A		Water	-0.11 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 17:57:00	N	II
K1911350-009	Carbon, Dissolved Organic (DOC)	N/A		Water	-0.10 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 18:25:00	N	II
K1911350-010	Carbon, Dissolved Organic (DOC)	N/A		Water	-0.17 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 18:53:00	N	II
K1911351-001	Carbon, Dissolved Organic (DOC)	N/A		Water	0.07 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 19:21:00	N	II
K1911351-002	Carbon, Dissolved Organic (DOC)	N/A		Water	0.02 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 19:49:00	N	II
K1911399-002	Carbon, Dissolved Organic (DOC)	N/A		Water	3.07 mg/L	10 mL	3.07 mg/L	1	0.07	0.50			12/11/19 20:47:00	N	II
K1911399-004	Carbon, Dissolved Organic (DOC)	N/A		Water	2.06 mg/L	10 mL	2.06 mg/L	1	0.07	0.50			12/11/19 21:15:00	N	II
KQ1918377-01	Carbon, Dissolved Organic (DOC)	CCV		Water	24.28 mg/L	10 mL	24.3 mg/L	1					12/11/19 11:04:00	N	II
KQ1918377-02	Carbon, Dissolved Organic (DOC)	CCV		Water	24.30 mg/L	10 mL	24.3 mg/L	1					12/11/19 15:34:00	N	II
KQ1918377-03	Carbon, Dissolved Organic (DOC)	CCV		Water	24.25 mg/L	10 mL	24.3 mg/L	1					12/11/19 20:17:00	N	II
KQ1918377-04	Carbon, Dissolved Organic (DOC)	CCV		Water	24.45 mg/L	10 mL	24.5 mg/L	1					12/11/19 21:43:00	N	II
KQ1918377-05	Carbon, Dissolved Organic (DOC)	CCB		Water	0.02 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 11:19:00	N	II
KQ1918377-06	Carbon, Dissolved Organic (DOC)	CCB		Water	-0.11 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 15:48:00	N	II
KQ1918377-07	Carbon, Dissolved Organic (DOC)	CCB		Water	-0.27 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 20:32:00	N	II
KQ1918377-08	Carbon, Dissolved Organic (DOC)	CCB		Water	-0.29 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 21:58:00	N	II
KQ1918377-09	Carbon, Dissolved Organic (DOC)	MB		Water	-0.29 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			12/11/19 16:03:00	N	II

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



Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 662864 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
KQ1918377-10	Carbon, Dissolved Organic (DOC)	LCS		Water	25.45 mg/L	10 mL	25.5 mg/L	1	0.07	0.50	102		12/11/19 16:18:00	N	II
KQ1918377-11	Carbon, Dissolved Organic (DOC)	MS	K1911350-001	Water	26.65 mg/L	10 mL	26.7 mg/L	1	0.07	0.50	105		12/11/19 13:41:00	N	II
KQ1918377-12	Carbon, Dissolved Organic (DOC)	DUP	K1911350-008	Water	-0.18 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	12/11/19 17:57:00	N	II
KQ1918377-13	Carbon, Dissolved Organic (DOC)	DUP	K1911350-009	Water	-0.14 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	12/11/19 18:25:00	N	II
KQ1918377-14	Carbon, Dissolved Organic (DOC)	DUP	K1911350-010	Water	-0.12 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	12/11/19 18:53:00	N	II
KQ1918377-15	Carbon, Dissolved Organic (DOC)	DUP	K1911350-001	Water	0.25 mg/L	10 mL	0.25 mg/L	J 1	0.07	0.50		17*	12/11/19 13:13:00	N	II
KQ1918377-16	Carbon, Dissolved Organic (DOC)	DUP	K1911350-002	Water	0.57 mg/L	10 mL	0.57 mg/L	1	0.07	0.50		7	12/11/19 14:10:00	N	II
KQ1918377-17	Carbon, Dissolved Organic (DOC)	DUP	K1911350-007	Water	-0.25 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	12/11/19 17:29:00	N	II
KQ1918377-18	Carbon, Dissolved Organic (DOC)	DUP	K1911350-003	Water	0.42 mg/L	10 mL	0.42 mg/L	J 1	0.07	0.50		23*	12/11/19 14:38:00	N	II
KQ1918377-19	Carbon, Dissolved Organic (DOC)	DUP	K1911350-004	Water	-0.19 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	12/11/19 15:06:00	N	II
KQ1918377-20	Carbon, Dissolved Organic (DOC)	DUP	K1911350-005	Water	-0.13 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	12/11/19 16:33:00	N	II
KQ1918377-21	Carbon, Dissolved Organic (DOC)	DUP	K1911350-006	Water	0.14 mg/L	10 mL	0.14 mg/L	J 1	0.07	0.50		43*	12/11/19 17:01:00	N	II
KQ1918377-22	Carbon, Dissolved Organic (DOC)	DUP	K1911351-001	Water	0.05 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	12/11/19 19:21:00	N	II
KQ1918377-23	Carbon, Dissolved Organic (DOC)	DUP	K1911351-002	Water	0.01 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	12/11/19 19:49:00	N	II
KQ1918377-24	Carbon, Dissolved Organic (DOC)	DUP	K1911399-002	Water	3.11 mg/L	10 mL	3.11 mg/L	1	0.07	0.50		1	12/11/19 20:47:00	N	II
KQ1918377-25	Carbon, Dissolved Organic (DOC)	DUP	K1911399-004	Water	2.00 mg/L	10 mL	2.00 mg/L	1	0.07	0.50		3	12/11/19 21:15:00	N	II

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

0.734			OBSERVATIONS	9	ABOVE
0.424	0.424		STD Deviation	0.25811	0.4241
0.635			AVERAGE	0.31813	ABOVE
0.409	0.409		UCL	0.57625	0.4093
0.138	0.138		LCL	0.06002	0.1383
0.318	0.318	0.318 #DIV/0!			0.3181
0.182	0.182				0.1816
0.022			OBSERVATIONS	5	BELOW
0.000			STD Deviation	0.10693	BELOW
			AVERAGE	0.29428	BELOW
			UCL	0.40121	BELOW
			LCL	0.18735	BELOW
					BELOW
			OBSERVATIONS	1	BELOW
			STD Deviation	#DIV/0!	BELOW
			AVERAGE	0.31810	BELOW
			UCL	#DIV/0!	BELOW
			LCL	#DIV/0!	BELOW
					BELOW
			OBSERVATIONS	0	BELOW
			STD Deviation	#DIV/0!	BELOW
			AVERAGE	#DIV/0!	BELOW
					BELOW
					BELOW
					BELOW
					BELOW
					BELOW
					BELOW

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	K1911350-009.02d	1	0.150	0.2943	-0.1447	-0.14468	<0.5	12/11/2019
27	K1911350-010.02	1	0.128	0.2943	-0.1663	-0.16628	<0.5	12/11/2019
28	K1911350-010.02d	1	0.171	0.2943	-0.1230	-0.12298	<0.5	12/11/2019
29	K1911351-001.02	1	0.363	0.2943	0.0686	0.06862	<0.5	12/11/2019
30	K1911351-001.02d	1	0.345	0.2943	0.0502	0.05022	<0.5	12/11/2019
31	K1911351-002.02	1	0.317	0.2943	0.0228	0.02282	<0.5	12/11/2019
32	K1911351-002.02d	1	0.299	0.2943	0.0050	0.00502	<0.5	12/11/2019
33	ccv	1	24.545	0.2943	24.2511	24.25112	24.3	12/11/2019
34	ccb	1	0.022	0.2943	-0.2720	-0.27198	<0.5	12/11/2019
35	K1911399-002	1	3.367	0.2943	3.0724	3.07242	3.1	12/11/2019
36	K1911399-002d	1	3.409	0.2943	3.1148	3.11482	3.1	12/11/2019
37	K1911399-004	1	2.351	0.2943	2.0570	2.05702	2.1	12/11/2019
38	K1911399-004d	1	2.295	0.2943	2.0005	2.00052	2.0	12/11/2019
39	ccv	1	24.745	0.2943	24.4502	24.45022	24.5	12/11/2019
40	ccb	1	0.000	0.2943	-0.2943	-0.29428	<0.5	12/11/2019
41		1		0.0000	0.0000	0	<0.5	
42		1		0.0000	0.0000	0	<0.5	
43		1		0.0000	0.0000	0	<0.5	
44		1		0.0000	0.0000	0	<0.5	
45		1		0.0000	0.0000	0	<0.5	
46		1		0.0000	0.0000	0	<0.5	
47		1		0.0000	0.0000	0	<0.5	
48		1		0.0000	0.0000	0	<0.5	
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By: <i>BCV</i>	Date Analyzed: <i>12/10/19</i>
Reviewed By: <i>JAN</i>	Date Reviewed: <i>12/13/19</i>

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	24.578	0.2943	24.2836	24.28362	24.3	12/11/2019
3	ccb	1	0.318	0.2943	0.0238	0.02382	<0.5	12/11/2019
4	K1911350-001.02	1	0.588	0.2943	0.2932	0.29322	<0.5	12/11/2019
5	K1911350-001.02d	1	0.542	0.2943	0.2481	0.24812	<0.5	12/11/2019
6	K1911350-001.02 ms	1	26.945	0.2943	26.6503	26.65032	26.65	12/11/2019
7	K1911350-002.02	1	0.821	0.2943	0.5271	0.52712	0.5	12/11/2019
8	K1911350-002.02d	1	0.861	0.2943	0.5670	0.56702	1	12/11/2019
9	K1911350-003.02	1	0.830	0.2943	0.5355	0.53552	0.54	12/11/2019
10	K1911350-003.02d	1	0.719	0.2943	0.4243	0.42432	<0.5	12/11/2019
11	K1911350-004.02	1	0.121	0.2943	-0.1738	-0.17378	<0.5	12/11/2019
12	K1911350-004.02d	1	0.105	0.2943	-0.1890	-0.18898	<0.5	12/11/2019
13	ccv	1	24.595	0.2943	24.3006	24.30062	24.30	12/11/2019
14	ccb	1	0.182	0.2943	-0.1127	-0.11268	<0.5	12/11/2019
15	mb	1	0.000	0.2943	-0.2943	-0.29428	<0.5	12/11/2019
16	lcs	1	25.745	0.2943	25.4510	25.45102	25.5	12/11/2019
17	K1911350-005.02	1	0.183	0.2943	-0.1118	-0.11178	<0.5	12/11/2019
18	K1911350-005.02d	1	0.159	0.2943	-0.1349	-0.13488	<0.5	12/11/2019
19	K1911350-006.02	1	0.385	0.2943	0.0906	0.09062	<0.5	12/11/2019
20	K1911350-006.02d	1	0.435	0.2943	0.1405	0.14052	<0.5	12/11/2019
21	K1911350-007.02	1	0.046	0.2943	-0.2485	-0.24848	<0.5	12/11/2019
22	K1911350-007.02d	1	0.040	0.2943	-0.2544	-0.25438	<0.5	12/11/2019
23	K1911350-008.02	1	0.181	0.2943	-0.1130	-0.11298	<0.5	12/11/2019
24	K1911350-008.02d	1	0.109	0.2943	-0.1849	-0.18488	<0.5	12/11/2019
25	K1911350-009.02	1	0.196	0.2943	-0.0981	-0.09808	<0.5	12/11/2019

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)

Analyzed By: <i>BWB</i>	Date Analyzed: <i>12/10/19</i>
Reviewed By: <i>[Signature]</i>	Date Reviewed: <i>12/15/19</i>

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	K1911350-002	1	0.978	0.2943	0.6839	0.68392	0.68	12/11/2019
27	K1911350-003	1	1.017	0.2943	0.7230	0.72302	0.72	12/11/2019
28	K1911350-003	1	0.991	0.2943	0.6967	0.69672	0.7	12/11/2019
29	K1911350-004	1	0.264	0.2943	-0.0301	-0.03008	<0.5	12/11/2019
30	K1911350-004	1	0.273	0.2943	-0.0217	-0.02168	<0.5	12/11/2019
31	K1911350-005	1	0.351	0.2943	0.0564	0.05642	<0.5	12/11/2019
32	K1911350-005	1	0.342	0.2943	0.0473	0.04732	<0.5	12/11/2019
33	K1911350-006	1	0.723	0.2943	0.4290	0.42902	<0.5	12/11/2019
34	K1911350-006	1	0.690	0.2943	0.3957	0.39572	<0.5	12/11/2019
35	K1911350-007	1	0.303	0.2943	0.0085	0.00852	<0.5	12/11/2019
36	K1911350-007	1	0.327	0.2943	0.0326	0.03262	<0.5	12/11/2019
37	K1911350-008	1	0.414	0.2943	0.1196	0.11962	<0.5	12/11/2019
38	K1911350-008	1	0.525	0.2943	0.2306	0.23062	<0.5	12/11/2019
39	K1911350-009	1	0.446	0.2943	0.1516	0.15162	<0.5	12/11/2019
40	K1911350-009	1	0.474	0.2943	0.1794	0.17942	<0.5	12/11/2019
41	ccv	1	24.578	0.2943	24.2836	24.28362	24.3	12/11/2019
42	ccb	1	0.318	0.2943	0.0238	0.02382	<0.5	12/11/2019
43	K1911350-010	1	0.401	0.2943	0.1065	0.10652	<0.5	12/11/2019
44	K1911350-010	1	0.427	0.2943	0.1330	0.13302	<0.5	12/11/2019
45	K1911351-001	1	0.542	0.2943	0.2473	0.24732	<0.5	12/11/2019
46	K1911351-001	1	0.493	0.2943	0.1986	0.19862	<0.5	12/11/2019
47	K1911351-002	1	0.468	0.2943	0.1732	0.17322	<0.5	12/11/2019
48	K1911351-002	1	0.484	0.2943	0.1893	0.18932	<0.5	12/11/2019
49	ccv	1	24.595	0.2943	24.3006	24.30062	24.3	12/11/2019
50	ccb	1	0.182	0.2943	-0.1127	-0.11268	<0.5	12/11/2019

Analyzed By: <i>BCP</i>	Date Analyzed: <i>12/10/19</i>
Reviewed By: <i>JAN</i>	Date Reviewed: <i>12/13/19</i>

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	24.985	0.2943	24.6911	24.69112	24.7	12/11/2019
3	ccb	1	0.635	0.2943	0.3409	0.34092	<0.5	12/11/2019
4	K1911347-001	1	1.792	0.2943	1.4979	1.49792	1.5	12/11/2019
5	K1911347-001	1	1.764	0.2943	1.4694	1.46942	1.5	12/11/2019
6	K1911413-001	1	1.222	0.2943	0.9275	0.92752	0.93	12/11/2019
7	K1911413-001	1	1.114	0.2943	0.8198	0.81982	0.8	12/11/2019
8	K1911369-001	1	0.326	0.2943	0.0317	0.03172	<0.5	12/11/2019
9	K1911369-001	1	0.315	0.2943	0.0209	0.02092	<0.5	12/11/2019
10	K1911272-003	100	8.712	0.2943	8.4176	841.762	841.76	12/11/2019
11	K1911272-003	100	8.825	0.2943	8.5309	853.092	853.1	12/11/2019
12	K1911272-004	100	9.496	0.2943	9.2013	920.132	920.13	12/11/2019
13	K1911272-004	100	9.479	0.2943	9.1850	918.502	918.50	12/11/2019
14	K1911399-001	1	4.254	0.2943	3.9592	3.95922	3.96	12/11/2019
15	K1911399-001	1	4.102	0.2943	3.8072	3.80722	3.8	12/11/2019
16	K1911399-003	1	3.073	0.2943	2.7785	2.77852	2.8	12/11/2019
17	K1911399-003	1	3.001	0.2943	2.7067	2.70672	2.71	12/11/2019
18	K1911350-001	1	0.935	0.2943	0.6402	0.64022	0.6	12/11/2019
19	K1911350-001	1	0.930	0.2943	0.6357	0.63572	0.6	12/11/2019
20	ms	1	27.038	0.2943	26.7437	26.74372	26.74	12/11/2019
21	ccv	1	25.117	0.2943	24.8224	24.82242	24.82	12/11/2019
22	ccb	1	0.409	0.2943	0.1150	0.11502	<0.5	12/11/2019
23	mb	1	0.138	0.2943	-0.1560	-0.15598	<0.5	12/11/2019
24	lcs	1	26.304	0.2943	26.0099	26.00992	26.01	12/11/2019
25	K1911350-002	1	1.070	0.2943	0.7753	0.77532	0.78	12/11/2019

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)

Analyzed By: <i>VCP</i>	Date Analyzed: 12/10/19
Reviewed By:	Date Reviewed:

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	24.897	0.2943	24.6026	24.60262	24.6	12/10/2019
3	ccb	1	0.734	0.2943	0.4400	0.44002	<0.5	12/10/2019
4	mb	1	0.424	0.2943	0.1298	0.12982	<0.5	12/10/2019
5	lcs	1	26.204	0.2943	25.9097	25.90972	25.9	12/10/2019
6	K1911349-001	1	0.958	0.2943	0.6637	0.66372	0.66	12/10/2019
7	K1911349-001	1	0.954	0.2943	0.6595	0.65952	0.7	12/10/2019
8	ms	1	27.650	0.2943	27.3556	27.35562	27	12/10/2019
9	K1911349-002	1	1.038	0.2943	0.7437	0.74372	0.74	12/10/2019
10	K1911349-002	1	1.001	0.2943	0.7068	0.70682	0.71	12/10/2019
11	K1911349-003	1	1.000	0.2943	0.7054	0.70542	0.7	12/11/2019
12	K1911349-003	1	0.970	0.2943	0.6759	0.67592	0.68	12/11/2019
13	K1911349-004	1	2.747	0.2943	2.4529	2.45292	2.45	12/11/2019
14	K1911349-004	1	2.753	0.2943	2.4583	2.45832	2.46	12/11/2019
15	K1911349-005	50	3.285	0.2943	2.9909	149.546	149.5	12/11/2019
16	K1911349-005	50	3.327	0.2943	3.0324	151.621	151.6	12/11/2019
17	ccv	1	24.985	0.2943	24.6911	24.69112	24.69	12/11/2019
18	ccb	1	0.635	0.2943	0.3409	0.34092	<0.5	12/11/2019
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)

Analyzed By: <i>[Signature]</i>	Date Analyzed: 12/10/19	date	time
Reviewed By: <i>[Signature]</i>	Date Reviewed: 12/12/19		

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

TOC: 662863
 662863
 DOC: 662869

Schedule: 12102019b

Version: 4

Instrument: Fusion1

Last Saved by: Fusion1 (Fusion1)

Last Saved on: 2019/12/10 17:48 - Tuesday

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)	10	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	K1911349-001.13	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1911349-001.13 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
5	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K1911349-002.13	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1911349-003.13	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K1911349-004.13	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1911349-005.13 50x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1911347-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1911413-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1911369-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1911272-003.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1911272-004.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1911399-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1911399-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1911350-001.06	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1911350-001.06 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
19	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
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	K1911350-002.06	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1911350-003.06	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1911350-004.06	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1911350-005.06	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1911350-006.06	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1911350-007.06	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1911350-008.06	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1911350-009.06	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	K1911350-010.06	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1911351-001.06	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K1911351-002.06	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	FB 12/10/19	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
33	Sample	K1911350-001.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K1911350-001.02 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
35	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
36	Sample	K1911350-002.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1911350-003.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K1911350-004.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

Printed on: December 12, 2019 09:24:45

Schedule: 12102019b

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	K1911350-005.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K1911350-006.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K1911350-007.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	K1911350-008.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	K1911350-009.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K1911350-010.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K1911351-001.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	K1911351-002.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
48	Sample	K1911399-002.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	K1911399-004.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

Fusion Report - 12102019b

Tuesday, December 10, 2019 05:35 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/12/12 09:24 -
Thursday

Report Summary Information

Company Location: Gen Chem Lab
Schedule Name: 12102019b
Instrument Name: Fusion1
Report Version: 1 of 1
Report Creation by Operators (schedule version): Fusion1 (Fusion1) (v1)
Fusion1 (Fusion1) (v4)
Comment:

Engine Version: 1.1.5.1
Firmware Version: 1.2.0696
Connection: RS232 COM1

Report Results

Sample Type: Clean							From Schedule Version 1
Pos	Analysis Type	Sample ID			Start Time		
◆ (clean)		Clean			2019/12/10 17:35		
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	IC Clean	13.75	18.00	4.26	49.59	05:22	
2	TC Clean	7.68	11.46	3.79	50.02	04:03	
3	TC Clean	3.21	7.04	3.83	50.16	03:50	
4	TC Clean	2.58	6.25	3.67	50.02	03:53	

Sample Type: Clean							From Schedule Version 4
Pos	Analysis Type	Sample ID			Start Time		
◆ (clean)		Clean			2019/12/10 17:57		
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	IC Clean	1.03	4.70	3.67	49.69	05:22	
2	TC Clean	7.31	11.08	3.77	49.94	04:01	
3	TC Clean	3.39	7.30	3.90	49.95	03:44	
4	TC Clean	1.61	5.47	3.86	50.11	03:46	

Sample Type: Clean							From Schedule Version 4
Pos	Analysis Type	Sample ID			Start Time		
♦ (clean)		Clean			2019/12/10 18:19		
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	IC Clean	0.89	4.54	3.65	49.63	05:12	
2	TC Clean	7.84	11.73	3.89	50.10	04:02	
3	TC Clean	3.18	6.96	3.78	50.13	03:43	
4	TC Clean	3.54	7.48	3.94	50.09	03:44	

Sample Type: Blank (Creating v1328)							From Schedule Version 4
Pos	Analysis Type	Sample ID			Start Time		
♦ (blank)		Reagent/Acid Blank			2019/12/10 18:40		
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	IC Clean	0.65	4.44	3.79	49.51	05:12	
2	TC Clean	8.10	12.06	3.97	50.09	04:04	
3	TC Clean	4.36	8.39	4.03	50.10	03:53	
4	TC Clean	3.83	7.95	4.12	50.03	03:51	
5	Reagent Blank	16.69	20.59	3.89	50.01	05:03	
6	Acid Blank	2.17	6.08	3.92	49.47	05:27	

Sample Type: Sample							From Schedule Version 4	
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
♦ D	TOC	RB	0.7443 ppm	0.6014 ppm	80.8000%	2019/12/10 19:14		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3653	23.6532	27.18	31.16	3.98	50.11	10:29
2	TOC	1.0359	10.3591	18.16	22.12	3.96	50.17	10:28
3	TOC	0.6601	6.6009	15.61	19.52	3.91	50.15	10:28
4	TOC	0.6464	6.4639	15.51	19.21	3.69	50.16	10:27
5	TOC	0.5497	5.4975	14.86	18.65	3.79	50.15	10:26
6	TOC	0.5132	5.1321	14.61	18.42	3.81	50.13	10:27
7	TOC	0.4893	4.8935	14.45	18.10	3.65	50.16	10:28

8	TOC	0.4260	4.2600	14.02	17.77	3.75	50.15	10:28
9	TOC	0.3840	3.8401	13.73	17.53	3.80	50.14	10:26
10	TOC	0.3727	3.7267	13.66	17.31	3.65	50.14	10:27
Dilution		Blank Contribution		Method	Calibration			
1:10		(TC) 11.1273 (IC) (v1328)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 4

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)	24.8969 ppm (PASS)	0.0000 ppm	0%	2019/12/10 21:35	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.8969	248.9687	178.46	182.06	3.60	50.13	10:31
Completion State		Success Action		Method	Calibration		STD Conc - Pos B			
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)		50 ppmC			

Sample Type: Check Standard --> CCB From Schedule Version 4

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)	0.7343 ppm (PASS)	0.0000 ppm	0%	2019/12/10 21:50	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.7343	7.3432	14.45	18.15	3.70	50.17	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 4

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
♦ 1	TOC	MB1	0.4241 ppm	0.0000 ppm	0.0000%	2019/12/10 22:04		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4241	4.2409	14.01	17.73	3.73	50.14	10:29
Dilution		Blank Contribution		Method	Calibration			
1:10		(TC) 11.1273 (IC) (v1328)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			

Sample Type: Check Standard --> LCS										From Schedule Version 4	
Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time		
♦	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	26.2040 ppm (PASS)	0.0000 ppm	0%	2019/12/10 22:19	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time	
C	TOC	25.0 ppm	1	26.2040	262.0405	187.33	191.10	3.76	50.13	10:33	
Completion State		Success Action		Method		Calibration		STD Conc - Pos C			
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		25 ppmC			

Sample Type: Sample										From Schedule Version 4	
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time					
♦	2	TOC	ICS	0.6868 ppm	0.0000 ppm	0.0000%	2019/12/10 22:34				
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time			
1	TOC	0.6868	6.8676	15.79	19.49	3.70	50.11	10:29			
Dilution		Blank Contribution		Method		Calibration					
1:10		(TC) 11.1273 (IC) (v1328)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)					
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time					
♦	3	TOC	K1911349-001.13	0.9559 ppm	0.0029 ppm	0.3100%	2019/12/10 22:49				
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time			
1	TOC	0.9580	9.5797	17.63	21.38	3.75	50.12	10:29			
2	TOC	0.9538	9.5385	17.60	21.40	3.80	50.12	10:26			
Dilution		Blank Contribution		Method		Calibration					
1:10		(TC) 11.1273 (IC) (v1328)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)					
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time					
♦	4	TOC	K1911349-001.13 ms	27.6499 ppm	0.0000 ppm	0.0000%	2019/12/10 23:17				
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time			
1	TOC	27.6499	276.4987	198.81	202.48	3.66	50.13	10:31			
Dilution		Blank Contribution		Method		Calibration					
1:10		(TC) 11.1273 (IC) (v1328)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)					
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time					

◆	5	TOC	RB	0.4108 ppm	0.0000 ppm	0.0000%	2019/12/10 23:31
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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4108	4.1083	13.92	17.68	3.77	50.14	10:28

Dilution 1:10
Blank Contribution (TC) 11.1273 (IC) (v1328)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	6	TOC	K1911349-002.13	1.0196 ppm	0.0260 ppm	2.5500%	2019/12/10 23:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0380	10.3797	18.17	21.87	3.70	50.10	10:30
2	TOC	1.0011	10.0114	17.92	21.53	3.61	50.11	10:25

Dilution 1:10
Blank Contribution (TC) 11.1273 (IC) (v1328)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	7	TOC	K1911349-003.13	0.9849 ppm	0.0208 ppm	2.1200%	2019/12/11 00:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9997	9.9966	17.91	21.78	3.87	50.15	10:30
2	TOC	0.9702	9.7020	17.71	21.58	3.87	50.11	10:25

Dilution 1:10
Blank Contribution (TC) 11.1273 (IC) (v1328)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	8	TOC	K1911349-004.13	2.7499 ppm	0.0039 ppm	0.1400%	2019/12/11 00:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7472	27.4718	29.78	33.43	3.66	50.12	10:29
2	TOC	2.7526	27.5263	29.81	33.38	3.57	50.16	10:30

Dilution 1:10
Blank Contribution (TC) 11.1273 (IC) (v1328)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	9	TOC	K1911349-005.13 50x	3.3060 ppm	0.0294 ppm	0.8900%	2019/12/11 01:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2852	32.8519	33.43	37.28	3.85	50.11	10:32
2	TOC	3.3267	33.2673	33.71	37.32	3.61	50.16	10:30

Dilution **Blank Contribution** **Method** **Calibration**

1:10 (TC) 11.1273 (IC) CAS_salt_010711 CAS_salt_010711
(v1328) (v4) (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 4

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)	24.9854 ppm (PASS)	0.0000 ppm	0%	2019/12/11 01:38

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9854	249.8541	179.06	182.98	3.92	50.14	10:34

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

Sample Type: Check Standard --> CCB

From Schedule Version 4

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)	0.6352 ppm (PASS)	0.0000 ppm	0%	2019/12/11 01:53

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.6352	6.3517	13.77	17.47	3.70	50.14	10:30

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

Sample Type: Sample

From Schedule Version 4

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 10	TOC	K1911347-001.01	1.7780 ppm	0.0202 ppm	1.1400%	2019/12/11 02:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7922	17.9225	23.29	27.08	3.79	50.10	10:26
2	TOC	1.7637	17.6367	23.10	26.83	3.73	50.14	10:27

Dilution 1:10
Blank Contribution (TC) 11.1273 (IC) (v1328)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 11	TOC	K1911413-001.01	1.1680 ppm	0.0761 ppm	6.5200%	2019/12/11 02:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2218	12.2182	19.42	23.13	3.71	50.12	10:26
2	TOC	1.1141	11.1413	18.69	22.42	3.73	50.11	10:28

Dilution 1:10 **Blank Contribution** (TC) 11.1273 (IC) (v1328) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
12	TOC	K1911369-001.01	0.3206 ppm	0.0076 ppm	2.3700%	2019/12/11 03:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3260	3.2597	13.34	17.11	3.77	50.13	10:27
2	TOC	0.3152	3.1522	13.27	17.05	3.78	50.12	10:27

Dilution 1:10 **Blank Contribution** (TC) 11.1273 (IC) (v1328) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
13	TOC	K1911272-003.01 100x	8.7685 ppm	0.0801 ppm	0.9100%	2019/12/11 03:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.7119	87.1187	70.26	73.91	3.65	50.13	10:28
2	TOC	8.8252	88.2516	71.03	74.86	3.82	50.11	10:29

Dilution 1:10 **Blank Contribution** (TC) 11.1273 (IC) (v1328) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
14	TOC	K1911272-004.01 100x	9.4874 ppm	0.0116 ppm	0.1200%	2019/12/11 04:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.4956	94.9561	75.58	79.37	3.78	50.12	10:30
2	TOC	9.4793	94.7926	75.47	79.14	3.67	50.14	10:25

Dilution 1:10 **Blank Contribution** (TC) 11.1273 (IC) (v1328) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
15	TOC	K1911399-001.01	4.1775 ppm	0.1075 ppm	2.5700%	2019/12/11 04:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2535	42.5352	40.00	43.88	3.88	50.11	10:29
2	TOC	4.1015	41.0149	38.97	42.66	3.69	50.15	10:26

Dilution 1:10 **Blank Contribution** (TC) 11.1273 (IC) **Method** CAS_salt_010711 **Calibration** CAS_salt_010711

(v1328)

(v4)

(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
16	TOC	K1911399-003.01	3.0369 ppm	0.0507 ppm	1.6700%	2019/12/11 04:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.0728	30.7275	31.99	35.76	3.77	50.11	10:29
2	TOC	3.0010	30.0101	31.50	35.23	3.73	50.12	10:25

Dilution 1:10 **Blank Contribution** (TC) 11.1273 (IC) (v1328) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
17	TOC	K1911350-001.06	0.9323 ppm	0.0032 ppm	0.3500%	2019/12/11 05:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9345	9.3455	17.47	21.22	3.75	50.12	10:30
2	TOC	0.9300	9.2998	17.44	21.06	3.62	50.15	10:27

Dilution 1:10 **Blank Contribution** (TC) 11.1273 (IC) (v1328) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
18	TOC	K1911350-001.06 ms	27.0380 ppm	0.0000 ppm	0.0000%	2019/12/11 05:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.0380	270.3805	194.66	198.40	3.74	50.13	10:31

Dilution 1:10 **Blank Contribution** (TC) 11.1273 (IC) (v1328) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
19	TOC	RB	0.2766 ppm	0.0000 ppm	0.0000%	2019/12/11 06:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2766	2.7662	13.00	16.79	3.78	50.12	10:29

Dilution 1:10 **Blank Contribution** (TC) 11.1273 (IC) (v1328) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 4

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.1167 ppm	0.0000 ppm	0%	2019/12/11 06:21

(PASS)										
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.1167	251.1668	179.95	183.59	3.64	50.12	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 4

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)	0.4093 ppm (PASS)	0.0000 ppm	0%	2019/12/11 06:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.4093	4.0933	12.24	16.21	3.97	50.13	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 4

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 20	TOC	MB2	0.1383 ppm	0.0000 ppm	0.0000%	2019/12/11 06:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1383	1.3828	12.07	15.87	3.81	50.12	10:33

Dilution		Blank Contribution		Method		Calibration	
1:10		(TC) 11.1273 (IC) (v1328)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)	

Sample Type: Check Standard --> LCS From Schedule Version 4

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	26.3042 ppm (PASS)	0.0000 ppm	0%	2019/12/11 07:05

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	26.3042	263.0422	188.01	191.80	3.78	50.12	10:34

Completion State		Success Action		Method		Calibration		STD Conc - Pos C		
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Success - Criteria met.

Do Nothing

CAS_salt_010711 (v4)

CAS_salt_010711 (v30)

25 ppmC

Sample Type: Sample

From Schedule Version 4

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
21	TOC	K1911350-002.06	1.0239 ppm	0.0647 ppm	6.3200%	2019/12/11 07:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0696	10.6964	18.39	22.22	3.83	50.12	10:26
2	TOC	0.9782	9.7816	17.77	21.71	3.94	50.12	10:25

Dilution

1:10

Blank Contribution

(TC) 11.1273 (IC) (v1328)

Method

CAS_salt_010711 (v4)

Calibration

CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
22	TOC	K1911350-003.06	1.0042 ppm	0.0186 ppm	1.8600%	2019/12/11 07:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0173	10.1734	18.03	21.76	3.73	50.10	10:27
2	TOC	0.9910	9.9097	17.85	21.45	3.60	50.11	10:27

Dilution

1:10

Blank Contribution

(TC) 11.1273 (IC) (v1328)

Method

CAS_salt_010711 (v4)

Calibration

CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
23	TOC	K1911350-004.06	0.2684 ppm	0.0059 ppm	2.2100%	2019/12/11 08:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2642	2.6424	12.92	16.69	3.77	50.11	10:29
2	TOC	0.2726	2.7264	12.98	16.77	3.79	50.16	10:25

Dilution

1:10

Blank Contribution

(TC) 11.1273 (IC) (v1328)

Method

CAS_salt_010711 (v4)

Calibration

CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
24	TOC	K1911350-005.06	0.3462 ppm	0.0065 ppm	1.8700%	2019/12/11 08:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3507	3.5072	13.51	17.47	3.96	50.11	10:26
2	TOC	0.3416	3.4159	13.45	17.18	3.74	50.14	10:26

Dilution

1:10

Blank Contribution

(TC) 11.1273 (IC) (v1328)

Method

CAS_salt_010711 (v4)

Calibration

CAS_salt_010711 (v30)

Analysis	Std. Dev.

Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
25	TOC	K1911350-006.06	0.7066 ppm	0.0235 ppm	3.3300%	2019/12/11 09:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7233	7.2329	16.04	19.87	3.84	50.09	10:27
2	TOC	0.6900	6.9000	15.81	19.55	3.73	50.12	10:24

Dilution 1:10 **Blank Contribution** (TC) 11.1273 (IC) (v1328) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
26	TOC	K1911350-007.06	0.3148 ppm	0.0170 ppm	5.3900%	2019/12/11 09:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3028	3.0284	13.18	17.17	3.98	50.11	10:31
2	TOC	0.3269	3.2685	13.35	16.97	3.62	50.12	10:26

Dilution 1:10 **Blank Contribution** (TC) 11.1273 (IC) (v1328) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
27	TOC	K1911350-008.06	0.4694 ppm	0.0784 ppm	16.7100%	2019/12/11 10:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4139	4.1392	13.94	17.72	3.79	50.14	10:27
2	TOC	0.5249	5.2485	14.69	18.63	3.94	50.12	10:28

Dilution 1:10 **Blank Contribution** (TC) 11.1273 (IC) (v1328) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
28	TOC	K1911350-009.06	0.4598 ppm	0.0197 ppm	4.2800%	2019/12/11 10:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4459	4.4589	14.15	17.88	3.72	50.14	10:29
2	TOC	0.4737	4.7373	14.34	18.08	3.74	50.11	10:26

Dilution 1:10 **Blank Contribution** (TC) 11.1273 (IC) (v1328) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 4

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)	24.5779 ppm (PASS)	0.0000 ppm	0%	2019/12/11 11:04

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5779	245.7793	176.30	179.99	3.70	50.17	10:31
Completion State		Success Action		Method		Calibration		STD Conc - Pos B		
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		50 ppmC		

Sample Type: Check Standard --> CCB From Schedule Version 4

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)	0.3181 ppm (PASS)	0.0000 ppm	0%	2019/12/11 11:19

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.3181	3.1814	11.62	15.38	3.76	50.12	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 4

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 29	TOC	K1911350-010.06	0.4141 ppm	0.0188 ppm	4.5300%	2019/12/11 11:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4008	4.0081	13.85	17.63	3.78	50.11	10:32
2	TOC	0.4273	4.2733	14.03	17.78	3.75	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 11.1273 (IC) (v1328)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 30	TOC	K1911351-001.06	0.5173 ppm	0.0345 ppm	6.6700%	2019/12/11 12:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5416	5.4165	14.80	18.33	3.52	50.15	10:28
2	TOC	0.4929	4.9288	14.47	18.08	3.61	50.12	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 11.1273 (IC) (v1328)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 31	TOC	K1911351-002.06	0.4756 ppm	0.0114 ppm	2.3900%	2019/12/11 12:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4675	4.6754	14.30	17.87	3.57	50.13	10:25
2	TOC	0.4836	4.8360	14.41	18.13	3.72	50.11	10:26

Dilution 1:10
Blank Contribution (TC) 11.1273 (IC) (v1328)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
32	TOC	FB 12/10/19	0.0000 ppm	0.0000 ppm	0.0000%	2019/12/11 12:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	10.77	14.26	3.48	50.13	10:31

Dilution 1:10
Blank Contribution (TC) 11.1273 (IC) (v1328)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
33	TOC	K1911350-001.02 doc	0.5649 ppm	0.0319 ppm	5.6400%	2019/12/11 13:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5875	5.8746	15.11	18.81	3.70	50.11	10:28
2	TOC	0.5424	5.4238	14.81	18.29	3.48	50.14	10:27

Dilution 1:10
Blank Contribution (TC) 11.1273 (IC) (v1328)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
34	TOC	K1911350-001.02 ms doc	26.9446 ppm	0.0000 ppm	0.0000%	2019/12/11 13:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.9446	269.4465	194.03	197.73	3.71	50.11	10:29

Dilution 1:10
Blank Contribution (TC) 11.1273 (IC) (v1328)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
35	TOC	RB	0.0307 ppm	0.0000 ppm	0.0000%	2019/12/11 13:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0307	0.3074	11.34	14.88	3.54	50.12	10:30

Dilution 1:10
Blank Contribution (TC) 11.1273 (IC) (v1328)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis	Sample ID	Result (ppmC)	Std. Dev.	RSD	Start Time
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	Type			(ppmC)				
◆ 36	TOC	K1911350-002.02 doc	0.8414 ppm	0.0282 ppm	3.3600%	2019/12/11 14:10		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8214	8.2141	16.70	20.27	3.57	50.10	10:26
2	TOC	0.8613	8.6133	16.97	20.48	3.51	50.13	10:29
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 11.1273 (IC) (v1328)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
◆ 37	TOC	K1911350-003.02 doc	0.7742 ppm	0.0786 ppm	10.1600%	2019/12/11 14:38		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8298	8.2980	16.76	20.35	3.59	50.12	10:32
2	TOC	0.7186	7.1858	16.00	19.62	3.62	50.11	10:26
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 11.1273 (IC) (v1328)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
◆ 38	TOC	K1911350-004.02 doc	0.1129 ppm	0.0107 ppm	9.5100%	2019/12/11 15:06		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1205	1.2046	11.94	15.61	3.67	50.11	10:30
2	TOC	0.1053	1.0528	11.84	15.45	3.61	50.12	10:24
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 11.1273 (IC) (v1328)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 4

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)	24.5949 ppm (PASS)	0.0000 ppm	0%	2019/12/11 15:34	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5949	245.9487	176.41	179.97	3.56	50.09	10:33
<u>Completion State</u>		<u>Success Action</u>		<u>Method</u>	<u>Calibration</u>		<u>STD Conc - Pos B</u>			
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)		50 ppmC			

Sample Type: Check Standard --> CCB

From Schedule Version 4

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)	0.1816 ppm (PASS)	0.0000 ppm	0%	2019/12/11 15:48

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.1816	1.8157	10.70	14.32	3.63	50.08	10:31

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

Sample Type: Sample From Schedule Version 4

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/12/11 16:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	10.19	13.76	3.56	50.09	10:32

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 11.1273 (IC) (v1328)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 4

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	25.7453 ppm (PASS)	0.0000 ppm	0%	2019/12/11 16:18

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.7453	257.4529	184.22	187.97	3.75	50.07	10:29

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

Sample Type: Sample From Schedule Version 4

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 40	TOC	K1911350-005.02 doc	0.1709 ppm	0.0164 ppm	9.5700%	2019/12/11 16:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1825	1.8248	12.37	16.23	3.87	50.09	10:30

2	TOC	0.1594	1.5935	12.21	15.84	3.63	50.06	10:27
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 11.1273 (IC) (v1328)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
<u>Pos</u>	<u>Analysis Type</u>	<u>Sample ID</u>	<u>Result (ppmC)</u>	<u>Std. Dev. (ppmC)</u>	<u>RSD</u>	<u>Start Time</u>		
41	TOC	K1911350-006.02 doc	0.4099 ppm	0.0353 ppm	8.6200%	2019/12/11 17:01		
<u>Rep #</u>	<u>Base Analysis Type</u>	<u>ppm</u>	<u>µg</u>	<u>Adjusted (Abs)</u>	<u>NDIR (Abs)</u>	<u>Baseline (Abs)</u>	<u>Pressure (psig)</u>	<u>Run Time</u>
1	TOC	0.3849	3.8490	13.74	17.50	3.76	50.06	10:27
2	TOC	0.4348	4.3484	14.08	17.79	3.71	50.07	10:27
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 11.1273 (IC) (v1328)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
<u>Pos</u>	<u>Analysis Type</u>	<u>Sample ID</u>	<u>Result (ppmC)</u>	<u>Std. Dev. (ppmC)</u>	<u>RSD</u>	<u>Start Time</u>		
42	TOC	K1911350-007.02 doc	0.0428 ppm	0.0042 ppm	9.7300%	2019/12/11 17:29		
<u>Rep #</u>	<u>Base Analysis Type</u>	<u>ppm</u>	<u>µg</u>	<u>Adjusted (Abs)</u>	<u>NDIR (Abs)</u>	<u>Baseline (Abs)</u>	<u>Pressure (psig)</u>	<u>Run Time</u>
1	TOC	0.0458	0.4577	11.44	15.18	3.75	50.06	10:27
2	TOC	0.0399	0.3987	11.40	15.01	3.61	50.09	10:24
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 11.1273 (IC) (v1328)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
<u>Pos</u>	<u>Analysis Type</u>	<u>Sample ID</u>	<u>Result (ppmC)</u>	<u>Std. Dev. (ppmC)</u>	<u>RSD</u>	<u>Start Time</u>		
43	TOC	K1911350-008.02 doc	0.1454 ppm	0.0508 ppm	34.9700%	2019/12/11 17:57		
<u>Rep #</u>	<u>Base Analysis Type</u>	<u>ppm</u>	<u>µg</u>	<u>Adjusted (Abs)</u>	<u>NDIR (Abs)</u>	<u>Baseline (Abs)</u>	<u>Pressure (psig)</u>	<u>Run Time</u>
1	TOC	0.1813	1.8130	12.36	16.03	3.68	50.08	10:28
2	TOC	0.1094	1.0941	11.87	15.44	3.57	50.08	10:27
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 11.1273 (IC) (v1328)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
<u>Pos</u>	<u>Analysis Type</u>	<u>Sample ID</u>	<u>Result (ppmC)</u>	<u>Std. Dev. (ppmC)</u>	<u>RSD</u>	<u>Start Time</u>		
44	TOC	K1911350-009.02 doc	0.1729 ppm	0.0329 ppm	19.0400%	2019/12/11 18:25		
<u>Rep #</u>	<u>Base Analysis Type</u>	<u>ppm</u>	<u>µg</u>	<u>Adjusted (Abs)</u>	<u>NDIR (Abs)</u>	<u>Baseline (Abs)</u>	<u>Pressure (psig)</u>	<u>Run Time</u>
1	TOC	0.1962	1.9618	12.46	16.14	3.68	50.06	10:30
2	TOC	0.1496	1.4963	12.14	15.70	3.55	50.06	10:31
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 11.1273 (IC) (v1328)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
<u>Pos</u>	<u>Analysis Type</u>	<u>Sample ID</u>	<u>Result (ppmC)</u>	<u>Std. Dev. (ppmC)</u>	<u>RSD</u>	<u>Start Time</u>		

◆	45	TOC	K1911350-010.02 doc	0.1496 ppm	0.0306 ppm	20.4700%	2019/12/11 18:53		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	TOC	0.1280	1.2797	12.00	15.71	3.71	50.06	10:32	
2	TOC	0.1713	1.7128	12.29	15.89	3.60	50.07	10:24	
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>				
1:10		(TC) 11.1273 (IC) (v1328)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)				
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time			
◆	46	TOC	K1911351-001.02 doc	0.3537 ppm	0.0130 ppm	3.6800%	2019/12/11 19:21		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	TOC	0.3629	3.6295	13.59	17.24	3.65	50.06	10:26	
2	TOC	0.3445	3.4453	13.47	17.14	3.67	50.07	10:26	
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>				
1:10		(TC) 11.1273 (IC) (v1328)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)				
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time			
◆	47	TOC	K1911351-002.02 doc	0.3082 ppm	0.0126 ppm	4.0900%	2019/12/11 19:49		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	TOC	0.3171	3.1713	13.28	17.04	3.76	50.11	10:28	
2	TOC	0.2993	2.9931	13.16	16.71	3.55	50.07	10:29	
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>				
1:10		(TC) 11.1273 (IC) (v1328)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)				

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 4

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)	24.5454 ppm (PASS)	0.0000 ppm	0%	2019/12/11 20:17
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5454	245.4537	176.08	179.85	3.78	50.09	10:31
<u>Completion State</u>		<u>Success Action</u>		<u>Method</u>	<u>Calibration</u>	<u>STD Conc - Pos B</u>				
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC				

Sample Type: Check Standard --> CCB From Schedule Version 4

Concentration	Min / Max

Pos	BAT	(ppm)	Dil	Sample ID	(% dev)	Result	Std. Dev.	RSD	Start Time
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0223 ppm (PASS)	0.0000 ppm	0%	2019/12/11 20:32

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0223	0.2232	9.61	13.24	3.63	50.07	10:32

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

Sample Type: Sample From Schedule Version 4

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 48	TOC	K1911399-002.02 doc	3.3879 ppm	0.0300 ppm	0.8900%	2019/12/11 20:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3667	33.6666	33.98	37.74	3.76	50.07	10:27
2	TOC	3.4091	34.0908	34.27	37.97	3.71	50.07	10:24

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 11.1273 (IC) (v1328)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 49	TOC	K1911399-004.02 doc	2.3230 ppm	0.0400 ppm	1.7200%	2019/12/11 21:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3513	23.5133	27.09	30.79	3.70	50.07	10:28
2	TOC	2.2948	22.9476	26.70	30.34	3.63	50.07	10:29

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 11.1273 (IC) (v1328)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 4

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)	24.7445 ppm (PASS)	0.0000 ppm	0%	2019/12/11 21:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.7445	247.4455	177.43	181.02	3.59	50.06	10:32

<u>Completion State</u>	<u>Success Action</u>	<u>Method</u>	<u>Calibration</u>	<u>STD Conc - Pos B</u>
Success - Criteria	Do Nothing	CAS_salt_010711	CAS_salt_010711	50 ppmC

met.

(v4)

(v30)

Sample Type: Check Standard --> CCB

From Schedule Version 4

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%	2019/12/11 21:58

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	9.10	12.67	3.57	50.10	10:29

<u>Completion State</u>	<u>Success Action</u>	<u>Method</u>	<u>Calibration</u>	<u>STD Conc - Pos D</u>
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
v1327	4.7423	2.4450	0.0000	0.0000	0.0000	2019/12/10 14:33	Fusion1 (Fusion1)
v1328	5.5637	2.1660	0.0000	0.0000	0.0000	2019/12/10 19:14	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v30
 Calibration curve formula: TOC: $y = 6.788x + 9.463$
 Ver Creation: 2019/03/05 17:42
 r^2 value: TOC: $r^2 = 0.99963$
 Comment:
 Operator: Fusion1 (Fusion1)
 Basic Analysis Type: TOC

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12

25 ppm	183.3580	25.0000	2019/03/05 17:26
50 ppm	346.3230	50.0000	2019/03/05 17:40

Methods**Name: CAS_salt_010711 (TOC)**

Version: v4

Operator: Fusion1 (Fusion1)

Ver Creation: 2019/02/21 17:57

Comment:

Parameter	Value	Advanced Parameter	Value
SampleVolume	10.0 mL	NeedleRinseVolume	5.0 ml
Dilution	1:10	VialPrimeVolume	2.0 ml
AcidVolume	0.5 ml	ICSamplePrimeVolume	2.0 ml
ReagentVolume	2.0 ml	ICSpurgeRinseVolume	12.0 ml
UVReactorPrerinse	Off	BaselineStabilizeTime	0.70 min
UVReactorPrerinseVolume	5.0	DetectorPressureFlow	150 ml/min
NumberOfUVReactorPrerinses	1	SyringeSpeedWaste	10
ICSpurgeTime	1.00 mins	SyringeSpeedAcid	7
DetectorSweepFlow	500 ml/min	SyringeSpeedReagent	7
PreSpurgeTime	2.00 mins	SyringeSpeedDIWater	7
SystemFlow	500 ml/min	NDIRPressurization	60 psig
		SyringeSpeedSampleDispense	5
		SyringeSpeedSampleAspirate	4
		SyringeSpeedUVDispense	5
		SyringeSpeedUVAspirate	5
		SyringeSpeedICDispense	5
		SyringeSpeedICAspirate	5
		NDIRPressureStabilize	1.75 min
		SampleMixing	Off
		SampleMixingCycles	1
		SampleMixingVolume	10.0
		LowLevelFilterNDIR	Off

Acceptance / Approval**Electronic Signatures**

Report Version	User Name	Acceptance	Reason	Date
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Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/12/11 22:13

ALS Environmental

StarLIMS Run: 662862, 662863, 662864
 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-05-83E

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By: <i>PCP</i>	Date Analyzed: <i>12/10/19</i>
Reviewed By:	Date Reviewed:



Case Narrative

Method: 6850

Analysis: Perchlorate

Analysis SOP: LC-MS-CLO4

ALS WO ID(s): 1933152; 1933786; 1934085;
1934086; 1934088

Client: ALS Laboratories (Houston, TX)

Matrix: Water

ELMS Batch (HBN): 2324 (253208)

General Set Information: There were five 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. 50 μL 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 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1934086001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 687322) was less than 1/2 the CRDL. The recovery for the LCS (687319) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on sample 1933152001 (Client ID: LH18/24-SP650_AIX Water). 3.0 μ L of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The MS/MSD (687323/24) failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

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

NC/CAR(s): NA

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

where: A = Analyte concentration from the standard curve (μ g/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 – 687320) is reported from the analysis of the Laboratory Control Sample (LCS – 687319) at a level of 3.0 μ g/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).

Thomas Bosch December 09, 2019
Analyst Date



ANALYTICAL REPORT

Report Date: December 09, 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: **34-1934088**

Project ID: HS19120110

Purchase Order: HS19120110

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_120319_AIX	1934088001	12/03/19	12/05/19	

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ANALYTICAL REPORT

Workorder: **34-1934088**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: LH18/24-SP650_120319_AIX	Sampling Site: NA	Collected: 12/03/2019				
Lab ID: 1934088001	Media: 125 mL Nalgene	Received: 12/05/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2324 (HBN: 253208) Analyzed: 12/08/2019 15:43	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	1.2	1.0	2.0	4.0	1	J

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

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 12/09/2019 13:27	/S/ Stephen Brose 12/09/2019 14:23

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.alssl.com



ANALYTICAL REPORT

Workorder: 34-1934088

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: 1934088
Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2324 (HBN: 253208)
Analyzed By: Thomas Bosch

Blank

LMB: 687322 Analyzed: 12/08/2019 14:06 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 687319 Analyzed: 12/08/2019 13:38 Dilution: 1 Units: ug/L					
Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	3.17	3.00	106	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1933152001 Analyzed: 12/08/2019 14:20 Dilution: 1 Units: ug/L			MS: 687323 Analyzed: 12/08/2019 14:34 Dilution: 1 Units: ug/L				MSD: 687324 Analyzed: 12/08/2019 14:48 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Perchlorate	11.0	13.7	3	# 77.7	78.8 123.8	12.9	# 48.8	6.53	0.0 20.0	

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

Analyst	Peer Review
/S/ Thomas Bosch 12/09/2019 13:31	/S/ Stephen Brose 12/09/2019 14:23

Symbols and Definitions

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

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



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18628/#2

Subcontract Chain of Custody

SAMPLING STATE: Dept of Defense

COC ID: 12770

SUBCONTRACT TO:

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

Phone: +1 801 266 7700

1934088

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19120110
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS19120110-02	LH18/24-SP650_120319_AIX	Water	03 Dec 2019 14:00
		SUB_Perch-6850		12 Dec 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____
Received By: _____
Cooler ID(s): _____

Date/Time: 12/4/19 18:00
Date/Time: 12/5/19 0952
Temperature(s): _____



ALS Environmental
CHAIN-OF-CUSTODY

Project / Job / Task: HS19120110		Split:	Workorder ID: 1934088	Level: ENV_LVL4	Requested Analysis	
Client: ALS Environmental (Houston)			Account: 8101	Type: 125Poly		
Comments:						
Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Count
12/03/2019 14:00	LH18/24-SP650_120319_AIX	1934088001		Water	A	1
2						
3						
4						
5						
6						
7						
8						
9						
10						

EPA 8850.D.DD GSM

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY				SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY			
Reinquired By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location	Sample Prep / Analysis for: Prepared / Analyzed by:	Lab Notebook No.:	Date / Time:	Reason for Transfer / Storage Location
<i>Julie W...</i>	12/05/2019 09:52	ALS Sample Receiving	Sample Login				
<i>R-33-1</i>	12/05/2019 08:30	<i>TS</i>	Storage				
	12/08/19 12:40	<i>T. B...</i>	CLO4 - analyze				

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: <u>ALS Houston</u>		Project/Task/Site: <u>HS19120110</u>						
Date/Time of Receipt: <u>12/05/19 0952</u>		Number of Coolers Received: <u>1</u> <u>1934088</u>						
Condition of Coolers: <u>Acceptable</u> /Unacceptable		Temperature Control: <u>Present</u> /Not Included						
Cooler Custody Seals: <u>Present</u> /Absent/NA		Location Temp Taken: <u>Control</u> /Between Samples						
Container Custody Seals: <u>Intact</u> /Broken/NA		Are all temperatures within project specific guidelines? Yes/No/NA						
Ice Present: <u>Yes</u> /No/NA		VOA Headspace Present? Yes/No/NA						
pH Check Performed:		Total Phenolics Yes/No/NA	NO3/NO2 Yes/No/NA					
Metals Yes/No/NA		TPH - 418.1 Yes/No/NA	Oil & Grease Yes/No/NA					
Cyanide Yes/No/NA		COD Yes/No/NA	Total Phosphorous Yes/No/NA					
Sulfide Yes/No/NA		TKN Yes/No/NA	Gross A.B, Gamma Spec Yes/No/NA					
Ammonia Yes/No/NA								
Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.
1	<u>Good</u>	<u>2</u> °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C	6		°C	9		°C
Taken By: <u>[Signature]</u>		Printed Name: <u>Rebecca Wise</u>		Date: <u>12/05/19</u>				

CLIENT-RELATED INFORMATION

<input type="checkbox"/> Missing Cooler	<input type="checkbox"/> Missing Samples/Bottles	<input type="checkbox"/> Incorrect Preservation	<input type="checkbox"/> Insufficient Sample Volume
<input type="checkbox"/> Cooler Conditions	<input type="checkbox"/> Broken/Leaking Samples	<input type="checkbox"/> pH Criteria Not Met	<input type="checkbox"/> Chain of Custody Problems
<input type="checkbox"/> Missing Paperwork	<input type="checkbox"/> Incorrect Bottle Type	<input type="checkbox"/> Residual Chlorine Present	<input type="checkbox"/> Other:
<input type="checkbox"/> Missing/Incorrect Bottle Labels	<input type="checkbox"/> Cooler Temperatures Out of Range	<input type="checkbox"/> Head Space in Bottles	
BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:			
Client Notified? YES <input type="checkbox"/> NO <input type="checkbox"/>			

Response Required Within 24 Hours

PROJECT MANAGEMENT		
PROJECT MANAGER COMMENTS:		
ALS Project Manager: _____	Returned to Sample Receipt by: _____	Date: _____
<small>Printed Name</small>	<small>Signature</small>	



Post # 150423-434 INT 51P 0720 00

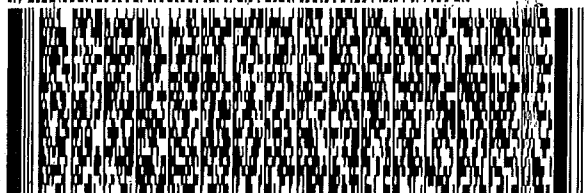
ORIGIN ID:SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 04DEC19
ACTWGT: 10.80 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: HS19120107/0109/0110 - RJ

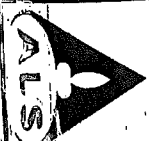
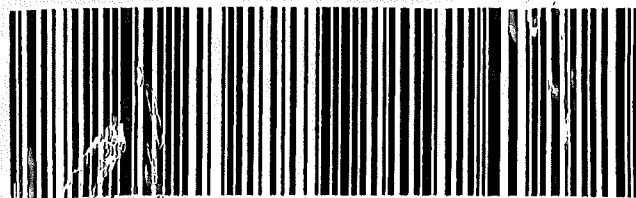


TRK# 1251 0292 5618
0201

THU - 05 DEC 10:30A
PRIORITY OVERNIGHT

AX BTFA

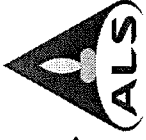
84123
UT-US SLC



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

Date:
Name:
Origin:





Batch Worklist

HBN: 253208

Instrument: WP
Status: WP

Created: 12/8/2019 13:11
Analyst: T. Bosch

Batch: ELMS/ 2324
Rule: EPA 6850, DoD QSM Water

Workorder: 1933152 [ENV_LVL4]
Workorder: 1933786 [ENV_LVL4]
Workorder: 1934085 [ENV_LVL4]
Workorder: 1934086 [ENV_LVL4]
Workorder: 1934088 [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	687318	CCV for HBN 253208 [ELMS/2324]				CCV	3		E685041C3Q	5311		12/9/2019	
2	687319	LCS for HBN 253208 [ELMS/2324]				LCS	3		E6850Q413Q	5311		12/9/2019	
3	687320	RLYS for HBN 253208 [ELMS/2324]				RLYS	3		E685041C3Q	5311		12/9/2019	
4	687321	ICS for HBN 253208 [ELMS/2324]				ICS	3		E6850..D3Q	5311		12/9/2019	
5	687322	LMB for HBN 253208 [ELMS/2324]				LMB	3		E6850Q413Q	5311		12/9/2019	
6	1933152001	LH18/24-SP650_112019_AIX Water				SAMPLE	3	1933152001-A	E6850Q41.3	5480	12/18/2019	12/9/2019	
7	687323	LH18/24-SP650...(1933152001MS)				MS	3		E6850Q413Q	5311		12/9/2019	
8	687324	LH18/24-SP65...(1933152001MSD)				MSD	3		E6850Q413Q	5311		12/9/2019	
9	1933786001	LH18/24-SP650_112619_AIX				SAMPLE	3	1933786001-A	E6850Q41.3	5480	12/24/2019	12/16/2019	
10	1934085001	LH18/24-SP650_120319_AIX				SAMPLE	3	1934085001-A	E6850Q41.3	5480	12/31/2019	12/18/2019	
11	1934086001	LH18/24-SP140_120319				SAMPLE	3	1934086001-A	E6850Q41.3	5480	12/31/2019	12/18/2019	
12	1934088001	LH18/24-SP650_120319_AIX				SAMPLE	3	1934088001-A	E6850Q41.3	5480	12/31/2019	12/18/2019	
13	687325	CCV for HBN 253208 [ELMS/2324]				CCV	3		E685041C3Q	5311		12/9/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #()'s: 1933152 (001); 1933786 (001); 1934085 (001); 1934086 (001); 1934088 (001)
 ELMS Batch/HBN ID: 2324 (253208)
 Prep Date: 12/08/2019 Analysis Date: 12/08/2019 Analyst: Tom Bosch
 Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
 Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\DEC\08DEC19D.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 687319; Target = 3.0µg/L. ASTM type II water was used for LMB 687322.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on sample 1933152001 (Client ID's: LH18/24-SP650_AIX Water). 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 1934086001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD (687323/24) failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\DEC\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\3208DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 687320) is reported from the analysis of the Laboratory Control Sample (LCS – 687319) 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).

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	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2324 HBN: 253208</u> <u>1934086 / 1934088</u>		
Sample Set IDs if Applicable: <u>1933152 / 1933786 / 1934085</u>		
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



AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: Refer to SDS for complete safety information

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



Signal Word: None

Component	SRM #	Prepared Concentration (µg/mL)
ClO ₄ Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is $\pm 0.24\%$.

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 $\pm 0.5\%$ 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



Certificate of Analysis



ISO Guide 34 Reference Material

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



S 36748

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

Product Name: Perchlorate IC Standard

Description:

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

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

Solvent: water (low TOC, < 50 ppb)

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

Traceability:

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

Estimation of Uncertainties:

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

Homogeneity:

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

Intended Use:

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

Instructions for Use:

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

Hazards:

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

Expiration of Certification:

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



ISO 9001 Registered Quality System – TUV USA

Page 1 of 2



Certificate of Analysis

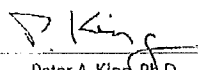


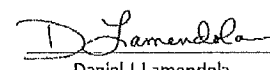
ISO Guide 34 Reference Material

Product Number: ICC-013 Lot Issue Date: 29-Feb 2016
 Lot Number: CP-0860 Expiration Date: 31-Mar 2020

Maintenance of Certification:

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


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


 Daniel J. Lamendola
 Director of QA/RA



ISO 9001 Registered Quality System – TUV USA

Page 2 of 2



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis



Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

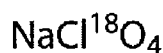
Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl*O4

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

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

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

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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	
#*	687318	CCV@25	Vial 71	1	Control	1	1.69605e6	7.373	26.83661
#*	687319	QC@3.0	Vial 72	1	Control	2	2.01272e5	7.322	3.16765
#*	687321	ICS@3.0	Vial 73	1	Control	3	1.15555e5	7.255	2.71754
#*	687322	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1933152001		Vial 75	1	Sample	5	6.68714e5	7.233	11.40769
#*	687323	331521S	Vial 76	1	Sample	6	8.19147e5	7.331	13.73971
#*	687324	331521D	Vial 77	1	Sample	7	8.20045e5	7.281	12.87113
#*	1933786001		Vial 78	1	Sample	8	6.28422e4	7.290	8.96014e-1
#*	1934085001		Vial 79	1	Sample	9	7.76702e4	7.271	1.30616
#*	1934086001	1K	Vial 80	1	Sample	10	6.52914e5	7.541	1.06845e4
#*	1934088001		Vial 81	1	Sample	11	8.35067e4	7.206	1.23378
*	687325	CCV@25	Vial 71	1	Control	12	1.56876e6	7.401	26.26666

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
#*	687318	CCV@25	Vial 71	1	Control	1	2.14319e5	7.415	5.00000
#*	687319	QC@3.0	Vial 72	1	Control	2	2.33945e5	7.349	5.00000
#*	687321	ICS@3.0	Vial 73	1	Control	3	1.56222e5	7.280	5.00000
#*	687322	LMB	Vial 74	1	Control	4	2.16883e5	7.417	5.00000
#*	1933152001		Vial 75	1	Sample	5	2.11754e5	7.253	5.00000
#*	687323	331521S	Vial 76	1	Sample	6	2.13383e5	7.356	5.00000
#*	687324	331521D	Vial 77	1	Sample	7	2.28828e5	7.301	5.00000
#*	1933786001		Vial 78	1	Sample	8	2.44931e5	7.312	5.00000
#*	1934085001		Vial 79	1	Sample	9	2.13009e5	7.296	5.00000
#*	1934086001	1K	Vial 80	1	Sample	10	2.21359e5	7.561	5000.00000
#*	1934088001		Vial 81	1	Sample	11	2.41676e5	7.223	5.00000
*	687325	CCV@25	Vial 71	1	Control	12	2.03012e5	7.417	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
#*	687318	CCV@25	Vial 71	1	Control	1	5.12256e5	7.390	26.62112
#*	687319	QC@3.0	Vial 72	1	Control	2	6.70814e4	7.342	3.37306
#*	687321	ICS@3.0	Vial 73	1	Control	3	4.41800e4	7.280	3.32517
#*	687322	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1933152001		Vial 75	1	Sample	5	2.33281e5	7.255	12.89143
#*	687323	331521S	Vial 76	1	Sample	6	2.85504e5	7.349	15.51969
#*	687324	331521D	Vial 77	1	Sample	7	2.84040e5	7.294	14.45077
#*	1933786001		Vial 78	1	Sample	8	2.43896e4	7.313	1.07465
#*	1934085001		Vial 79	1	Sample	9	3.07397e4	7.291	1.62821
#*	1934086001	1K	Vial 80	1	Sample	10	1.97618e5	7.553	1.05214e4
#*	1934088001		Vial 81	1	Sample	11	3.11607e4	7.206	1.43824
*	687325	CCV@25	Vial 71	1	Control	12	4.80251e5	7.415	26.37250

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	687318	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	687319	QC@3.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	687321	ICS@3.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	687322	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1933152001		CLO4-AQN	1	Sample	
6	Vial 76	687323	331521S	CLO4-AQN	1	Sample	
7	Vial 77	687324	331521D	CLO4-AQN	1	Sample	
8	Vial 78	1933786001		CLO4-AQN	1	Sample	
9	Vial 79	1934085001		CLO4-AQN	1	Sample	
10	Vial 80	1934086001	1K	CLO4-AQN	1	Sample	
11	Vial 81	1934088001		CLO4-AQN	1	Sample	
12	Vial 71	687325	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DEC01.D

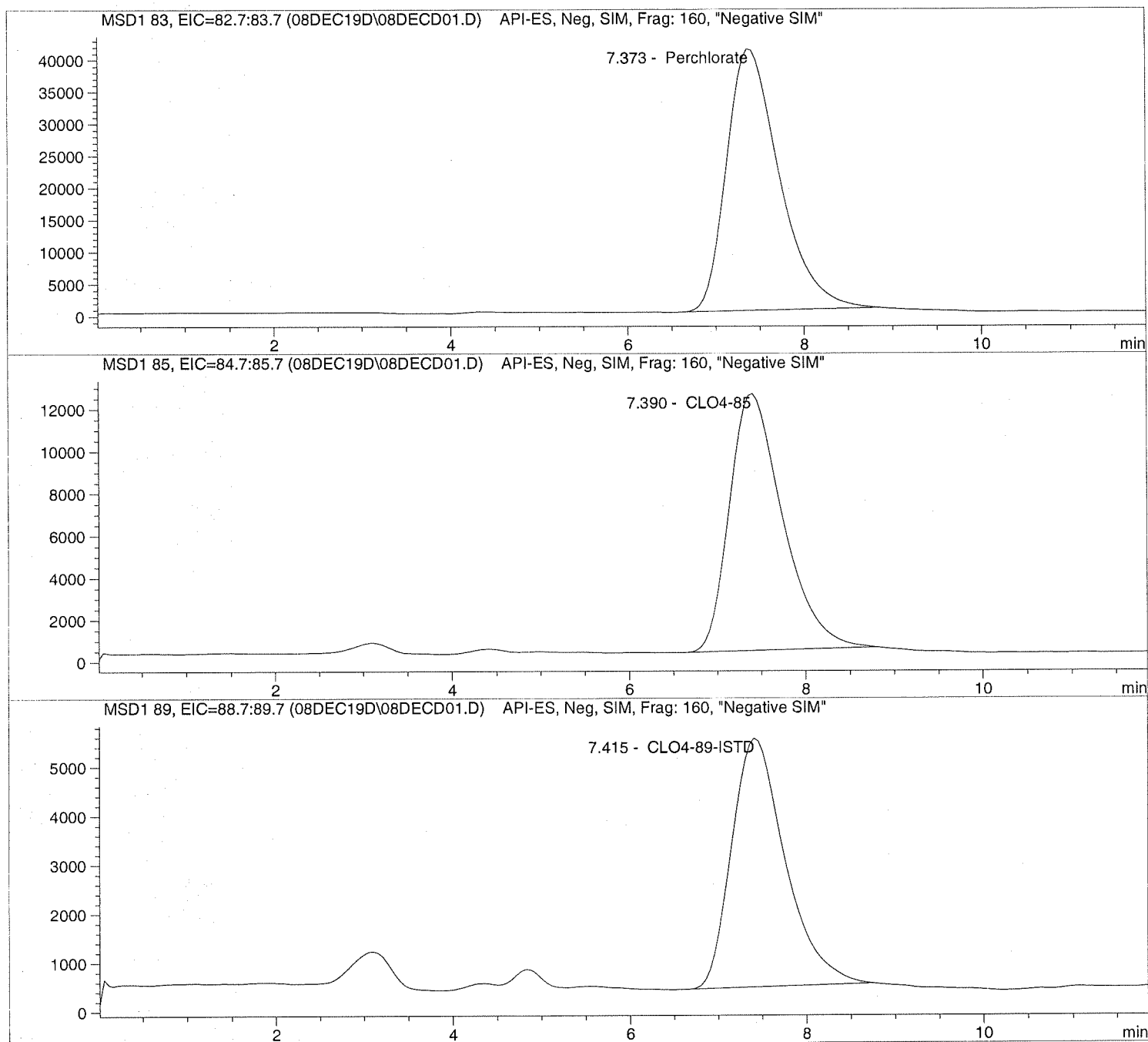
Sample Name: 687318 CCV@25

=====
Injection Date: 12/08/2019 13:20:07
Sample Name: 687318 CCV@25
Acq Operator: TNB

Seq Line: 1
Location: Vial 71
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\08DEC19D\08DECD01.D Sample Name: 687318 CCV@25

```

=====
Injection Date: 12/08/2019 13:20:07      Seq Line:          1
Sample Name:    687318 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
7.373	PBA	1696047.9	26.8366	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.390	PBA	512255.8	26.6211	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.415	PBA	214319.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

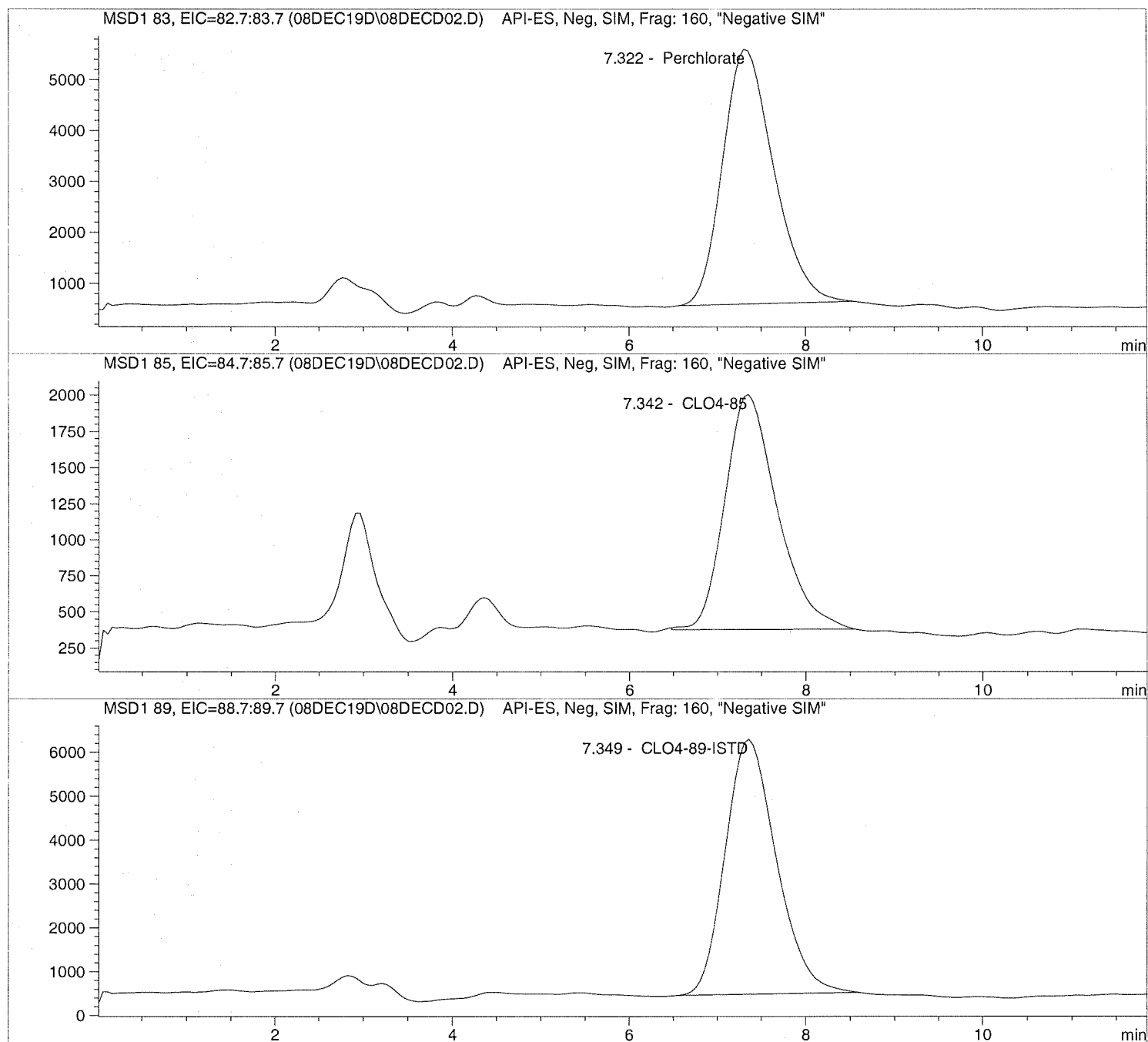
```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD02.D Sample Name: 687319 QC@3.0

=====
Injection Date: 12/08/2019 13:38:13 Seq Line: 2
Sample Name: 687319 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\08DEC19D\08DECD02.D Sample Name: 687319 QC@3.0

```

=====
Injection Date: 12/08/2019 13:38:13      Seq Line:          2
Sample Name:   687319 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
7.322	PBA	201271.8	3.1677	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.342	BBA	67081.4	3.3731	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.349	PBA	233945.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

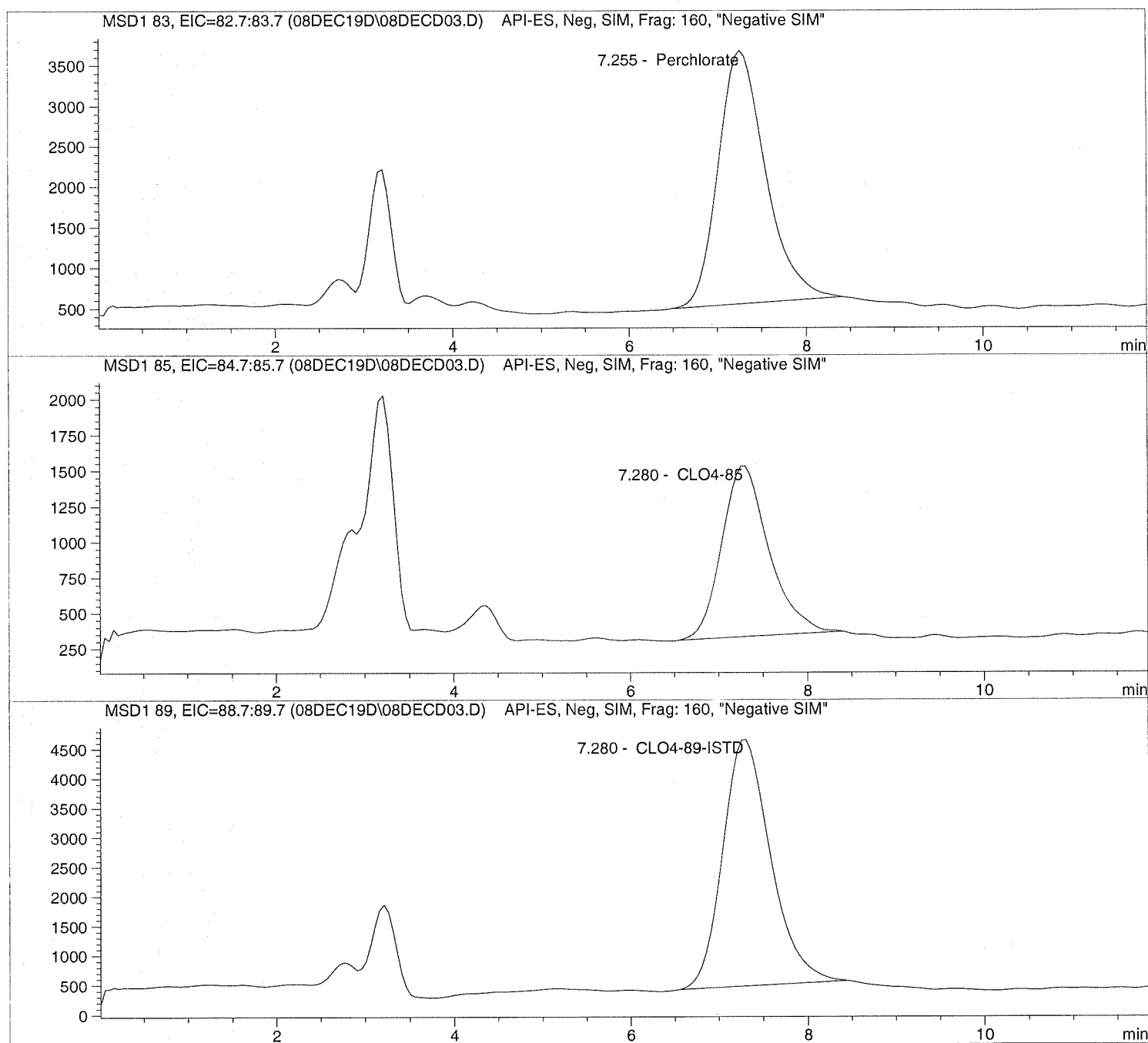
```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DEC03.D Sample Name: 687321 ICS@3.0

```
=====
Injection Date: 12/08/2019 13:52:08      Seq Line:      3
Sample Name:    687321 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\08DEC19D\08DECD03.D Sample Name: 687321 ICS@3.0

```

=====
Injection Date: 12/08/2019 13:52:08      Seq Line:          3
Sample Name:   687321 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
7.255	BBA	115555.3	2.7175	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.280	PBA	44180.0	3.3252	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.280	PBA	156222.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD04.D

Sample Name: 687322 LMB

Injection Date: 12/08/2019 14:06:04

Seq Line: 4

Sample Name: 687322 LMB

Location: Vial 74

Acq Operator: TNB

Inj. No.: 1

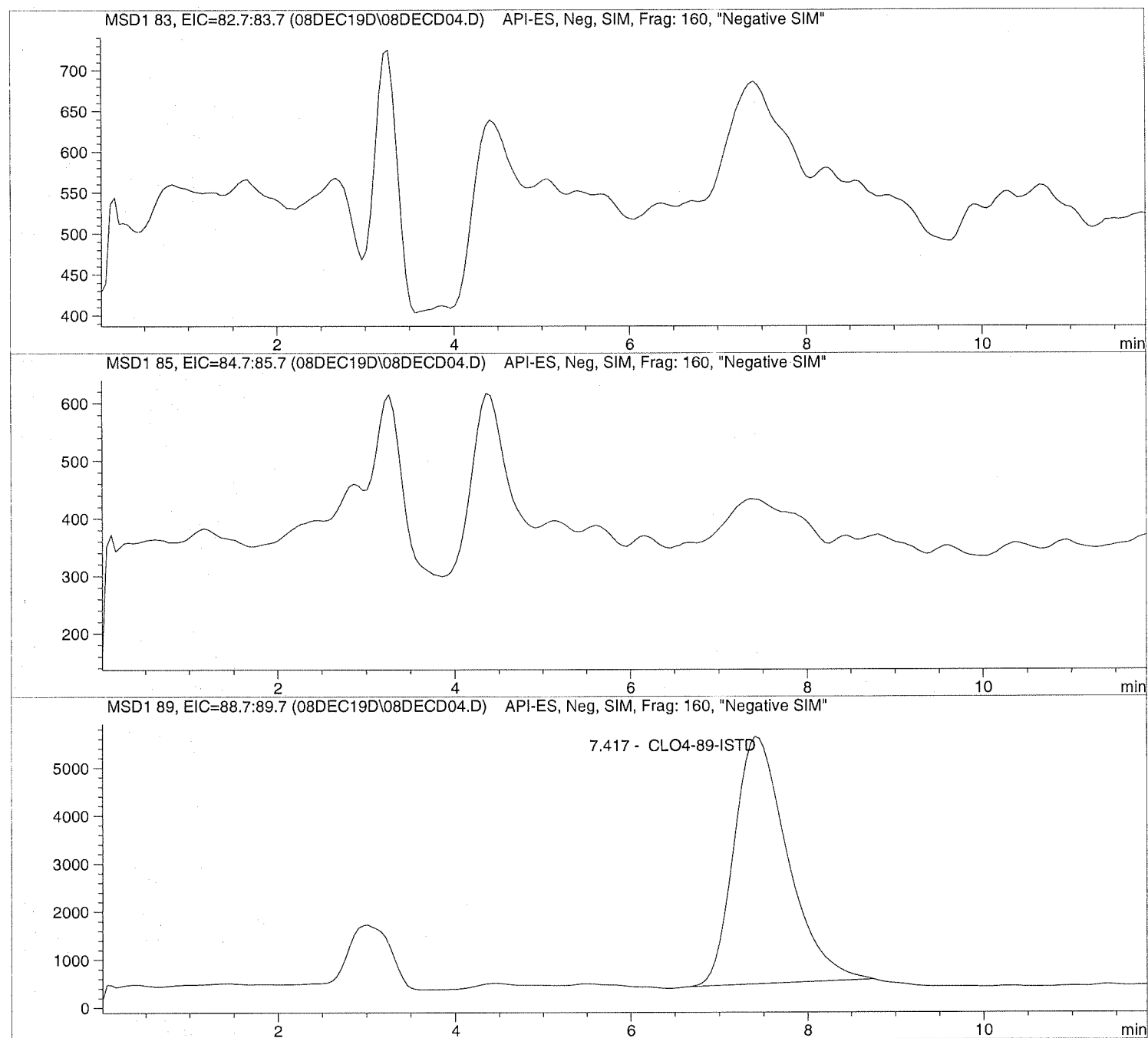
Inj. Vol.: 35 μ l

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\08DEC19D\08DECD04.D Sample Name: 687322 LMB

```

=====
Injection Date: 12/08/2019 14:06:04      Seq Line: 4
Sample Name: 687322 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
7.417	PBA	216882.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD05.D

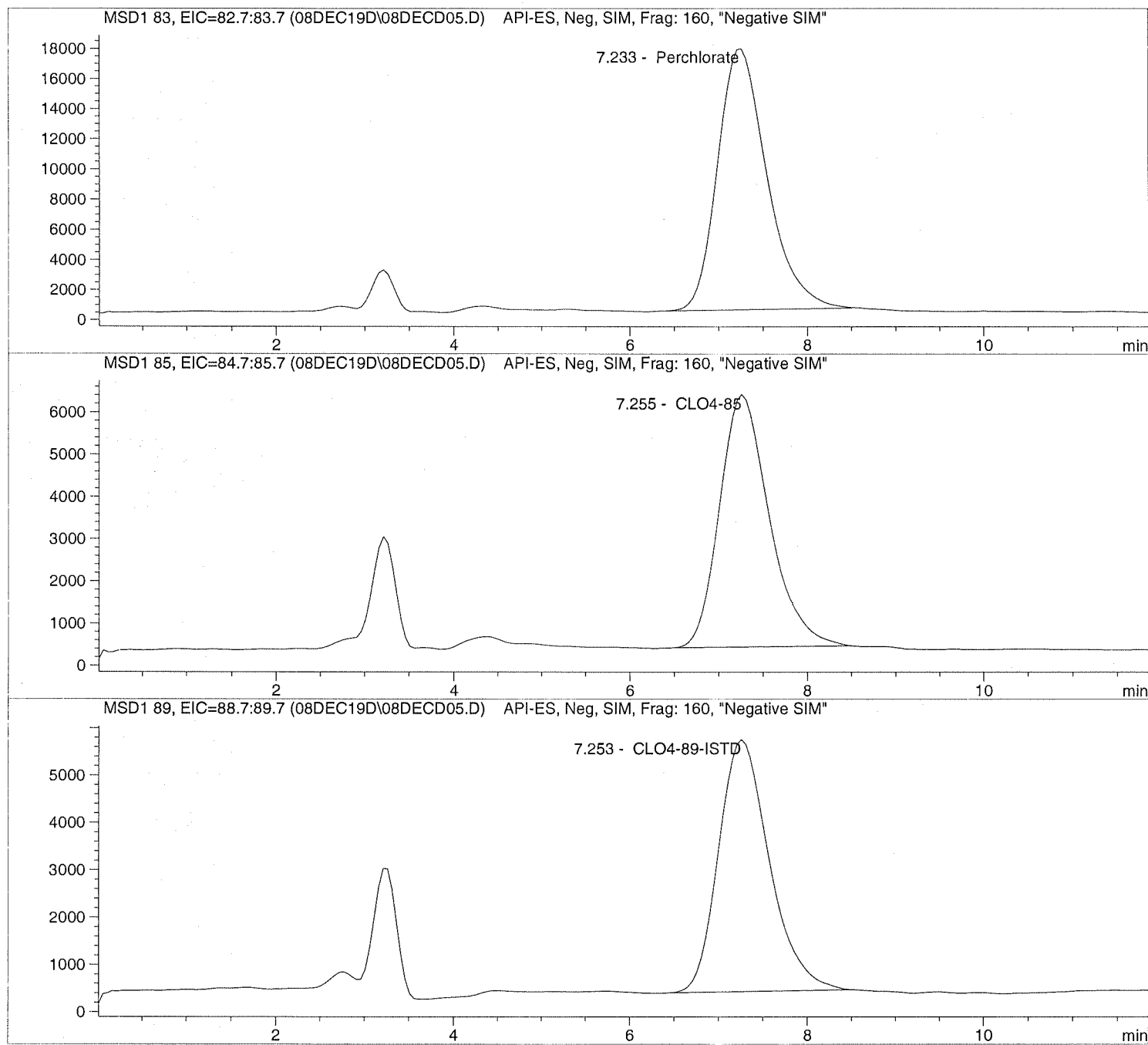
Sample Name: 1933152001

=====
Injection Date: 12/08/2019 14:20:08
Sample Name: 1933152001
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
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\08DEC19D\08DECD05.D

Sample Name: 1933152001

```

=====
Injection Date: 12/08/2019 14:20:08      Seq Line:          5
Sample Name:   1933152001                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
7.233	PBA	668714.5	11.4077	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.255	PBA	233281.0	12.8914	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.253	PBA	211754.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD06.D

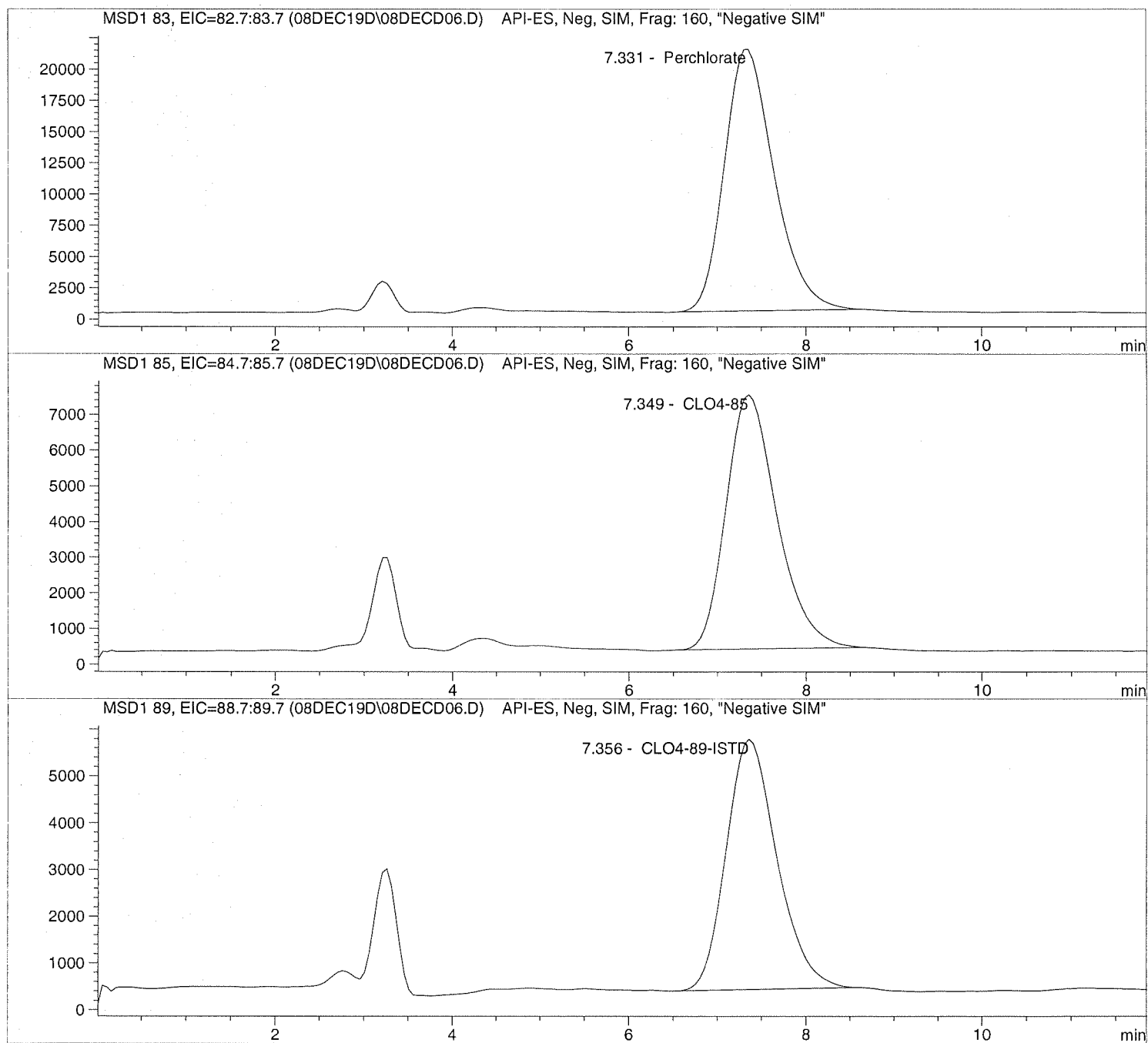
Sample Name: 687323 331521S

=====
Injection Date: 12/08/2019 14:34:02
Sample Name: 687323 331521S
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
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\08DEC19D\08DECD06.D Sample Name: 687323 331521S

```

=====
Injection Date: 12/08/2019 14:34:02      Seq Line: 6
Sample Name: 687323 331521S             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
7.331	PBA	819146.8	13.7397	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.349	PBA	285503.6	15.5197	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.356	PBA	213383.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD07.D

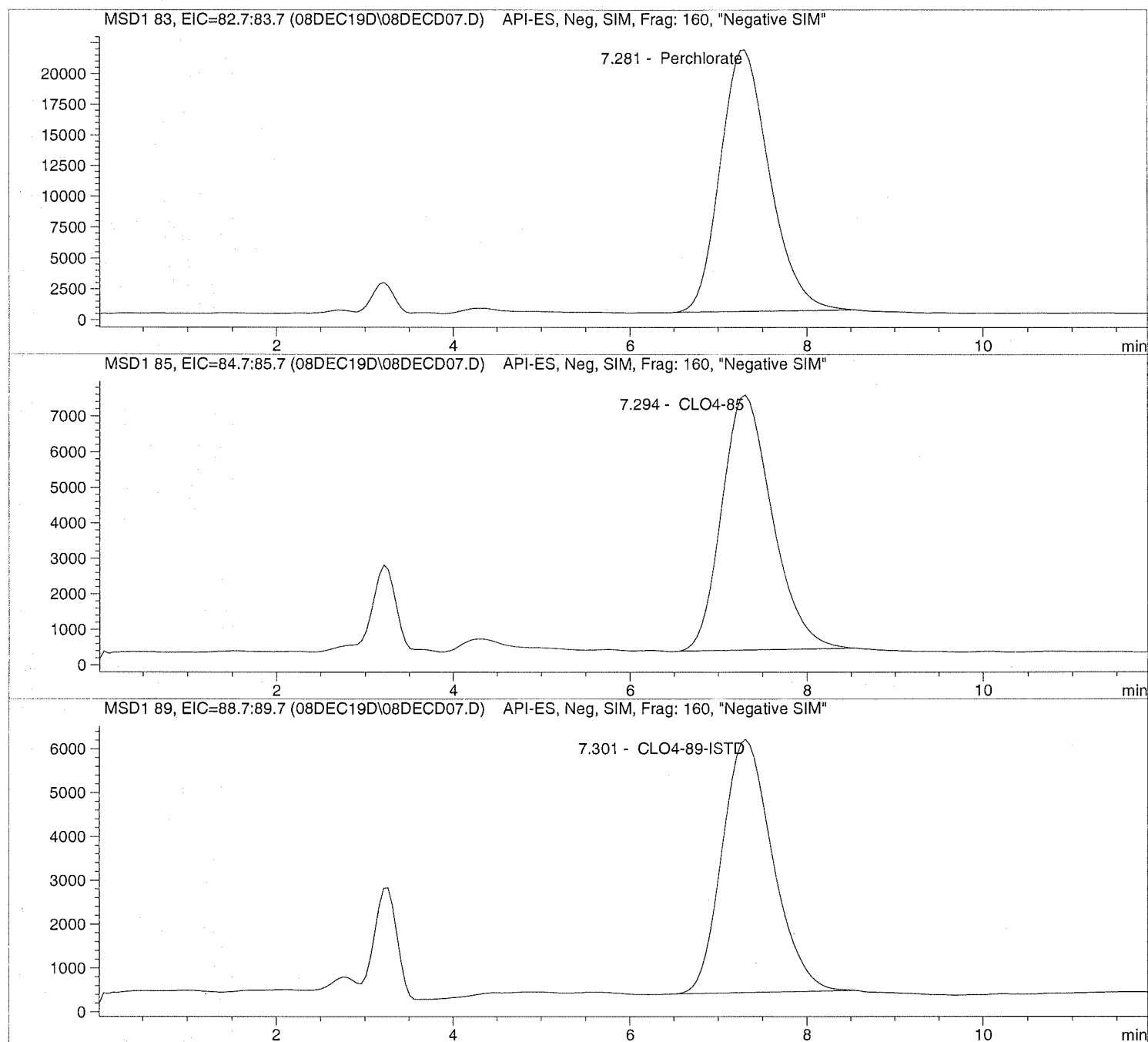
Sample Name: 687324 331521D

Injection Date: 12/08/2019 14:48:08
Sample Name: 687324 331521D
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 35 μ l

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\08DEC19D\08DECD07.D Sample Name: 687324 331521D

```

=====
Injection Date: 12/08/2019 14:48:08      Seq Line:          7
Sample Name:   687324 331521D           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
7.281	PBA	820045.2	12.8711	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.294	PBA	284039.7	14.4508	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.301	PBA	228828.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD08.D

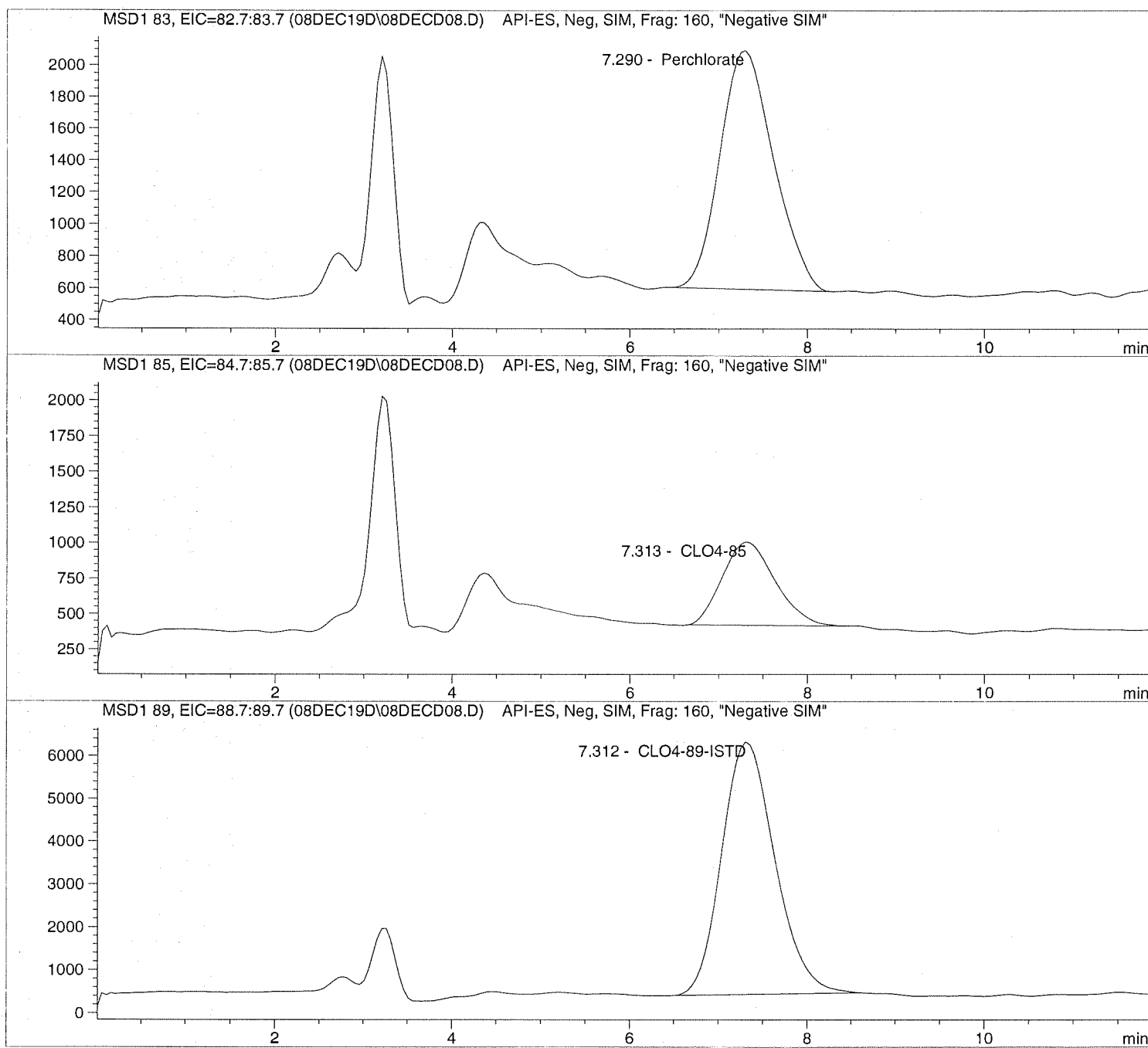
Sample Name: 1933786001

=====
Injection Date: 12/08/2019 15:02:01
Sample Name: 1933786001
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
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\08DEC19D\08DECD08.D Sample Name: 1933786001

```

=====
Injection Date: 12/08/2019 15:02:01      Seq Line:      8
Sample Name:    1933786001                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
7.290	PBA	62842.2	0.8960	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.313	PBA	24389.6	1.0747	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.312	PBA	244930.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD09.D

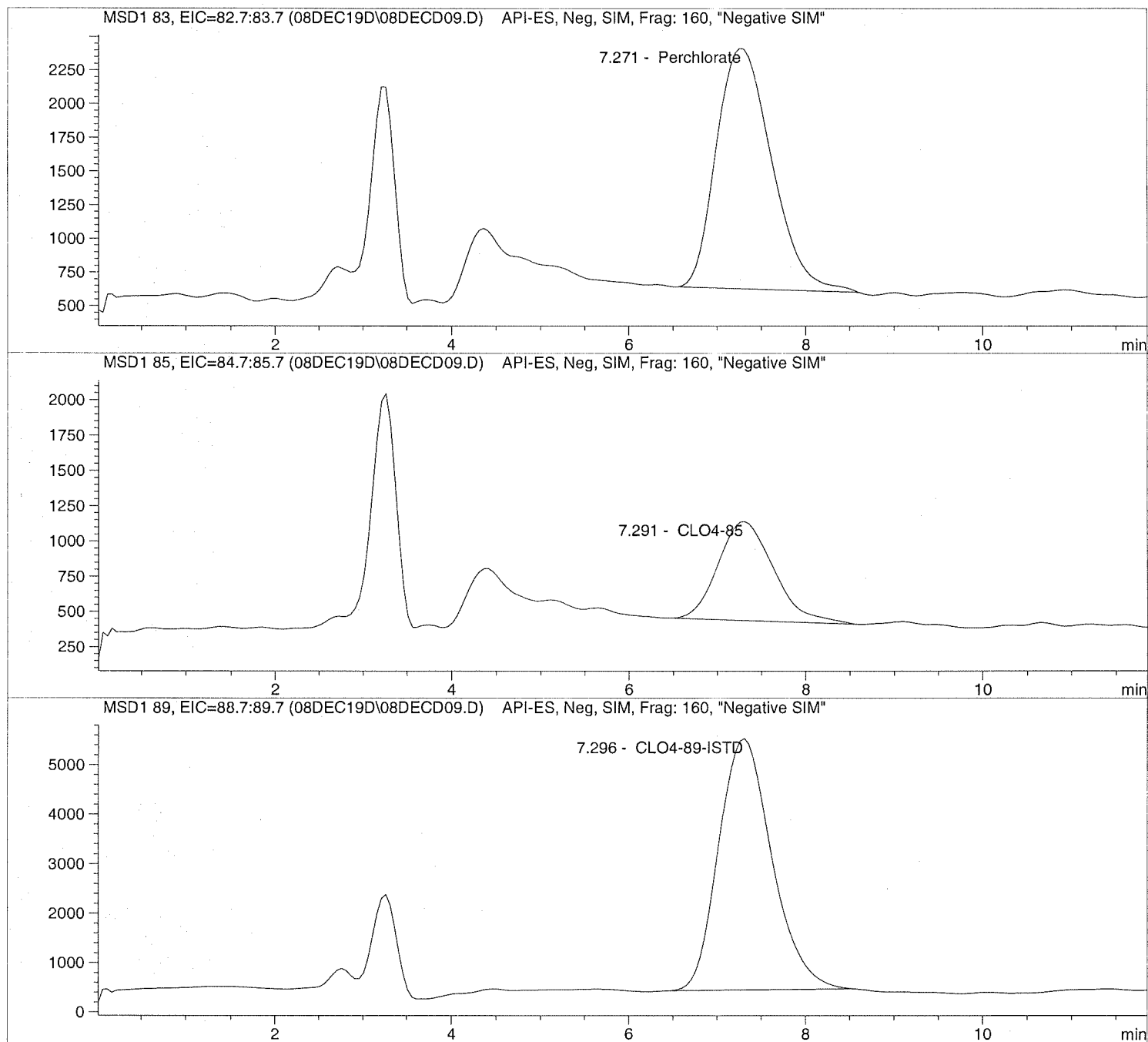
Sample Name: 1934085001

=====
Injection Date: 12/08/2019 15:15:52
Sample Name: 1934085001
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
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\08DEC19D\08DECD09.D Sample Name: 1934085001

```

=====
Injection Date: 12/08/2019 15:15:52      Seq Line:          9
Sample Name:    1934085001                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
7.271	PBA	77670.2	1.3062	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.291	PBA	30739.7	1.6282	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.296	PBA	213008.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DEC10.D

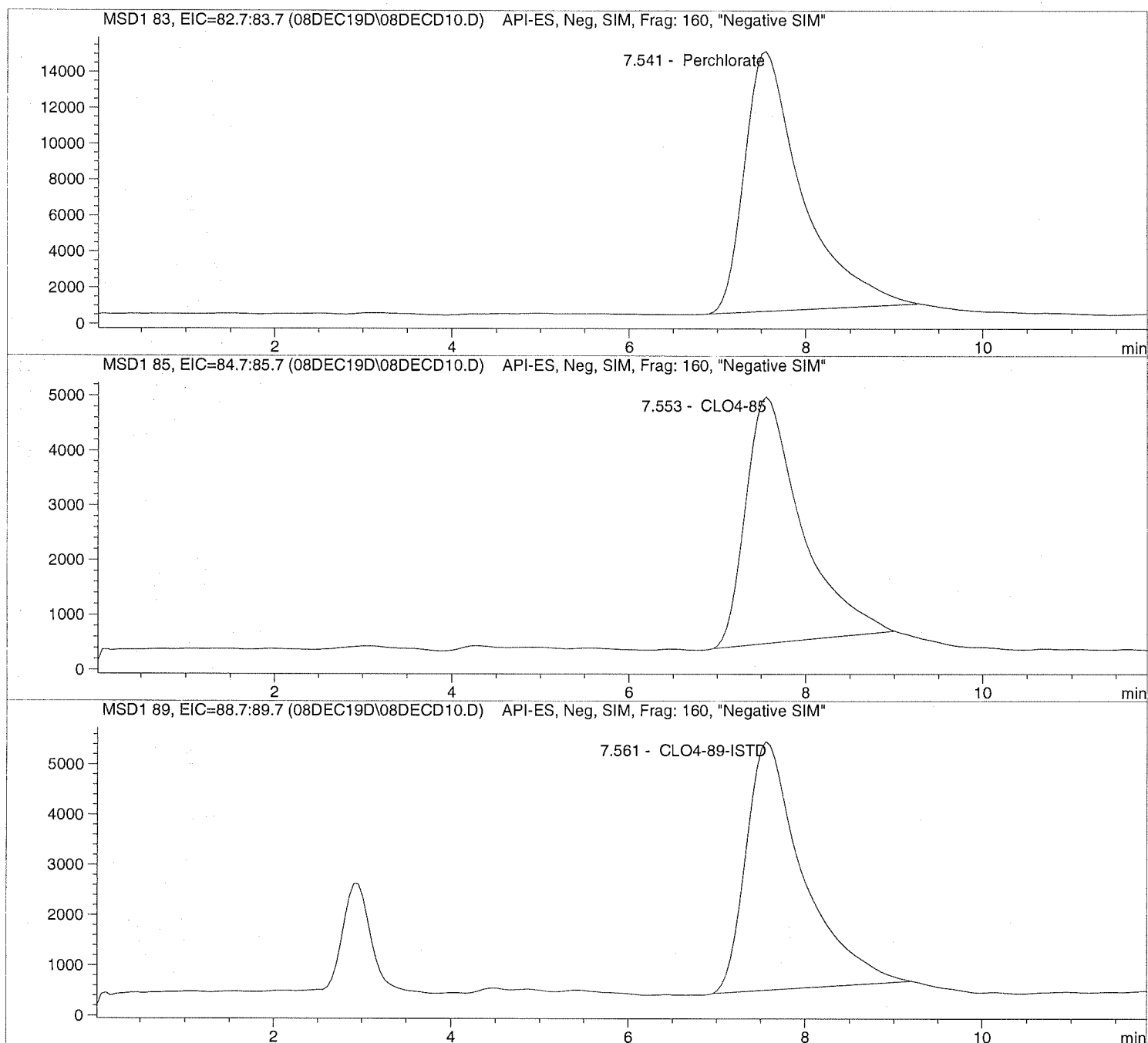
Sample Name: 1934086001 1K

=====
Injection Date: 12/08/2019 15:29:50
Sample Name: 1934086001 1K
Acq Operator: TNB

Seq Line: 10
Location: Vial 80
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\08DEC19D\08DECD10.D Sample Name: 1934086001 1K

```

=====
Injection Date: 12/08/2019 15:29:50      Seq Line: 10
Sample Name: 1934086001 1K              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: 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
7.541	PBA	652913.9	10684.5187	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.553	PBA	197617.5	10521.3847	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.561	PBA	221358.6	5000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD11.D

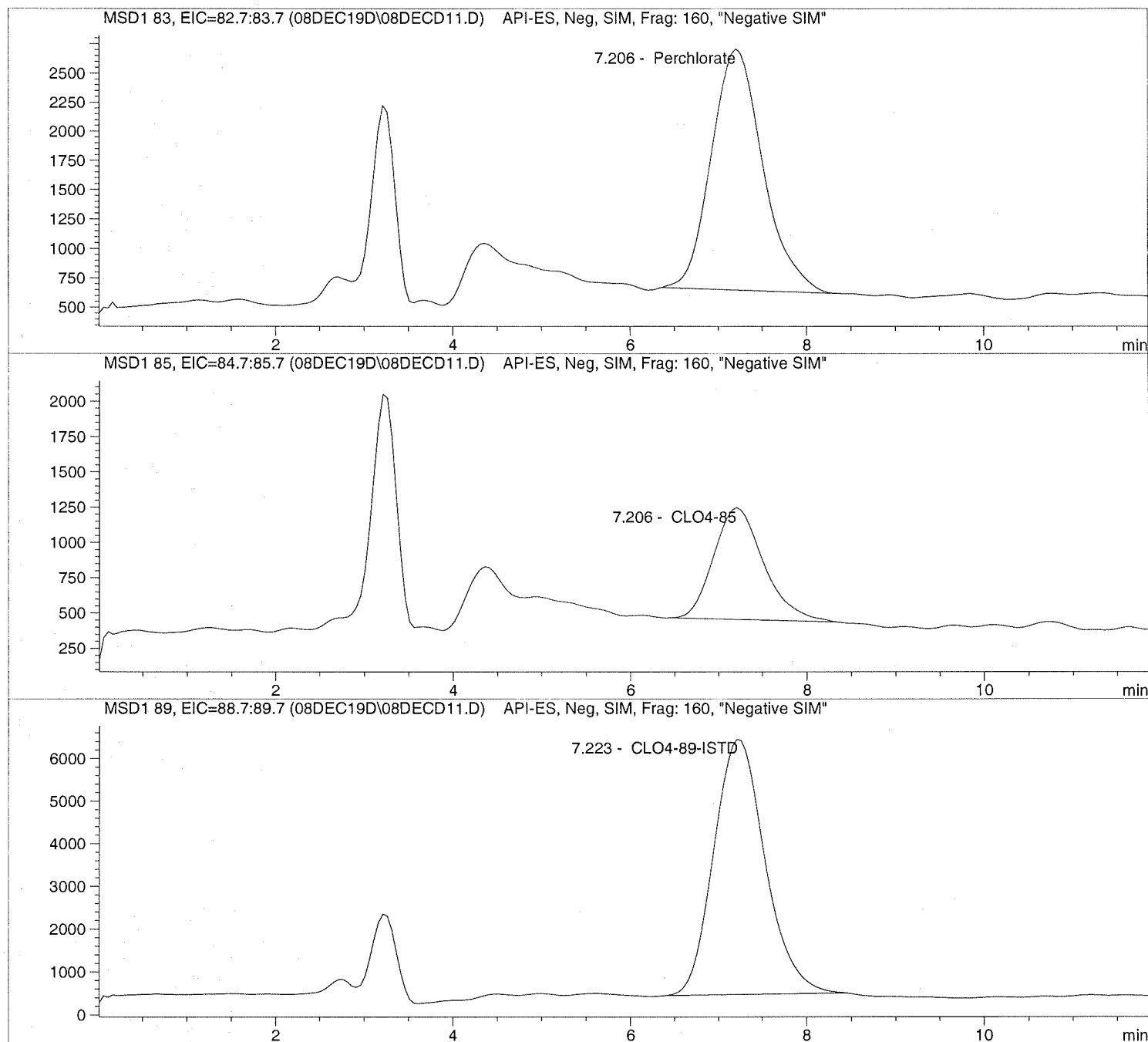
Sample Name: 1934088001

Injection Date: 12/08/2019 15:43:41
Sample Name: 1934088001
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
Inj. No.: 1
Inj. Vol.: 35 μ l

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\08DEC19D\08DECD11.D

Sample Name: 1934088001

```

=====
Injection Date: 12/08/2019 15:43:41      Seq Line:      11
Sample Name:   1934088001                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:      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
7.206	PBA	83506.7	1.2338	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.206	PBA	31160.7	1.4382	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.223	PBA	241675.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\08DEC19D\08DECD12.D

Sample Name: 687325 CCV@25

Injection Date: 12/08/2019 15:57:34

Seq Line: 12

Sample Name: 687325 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

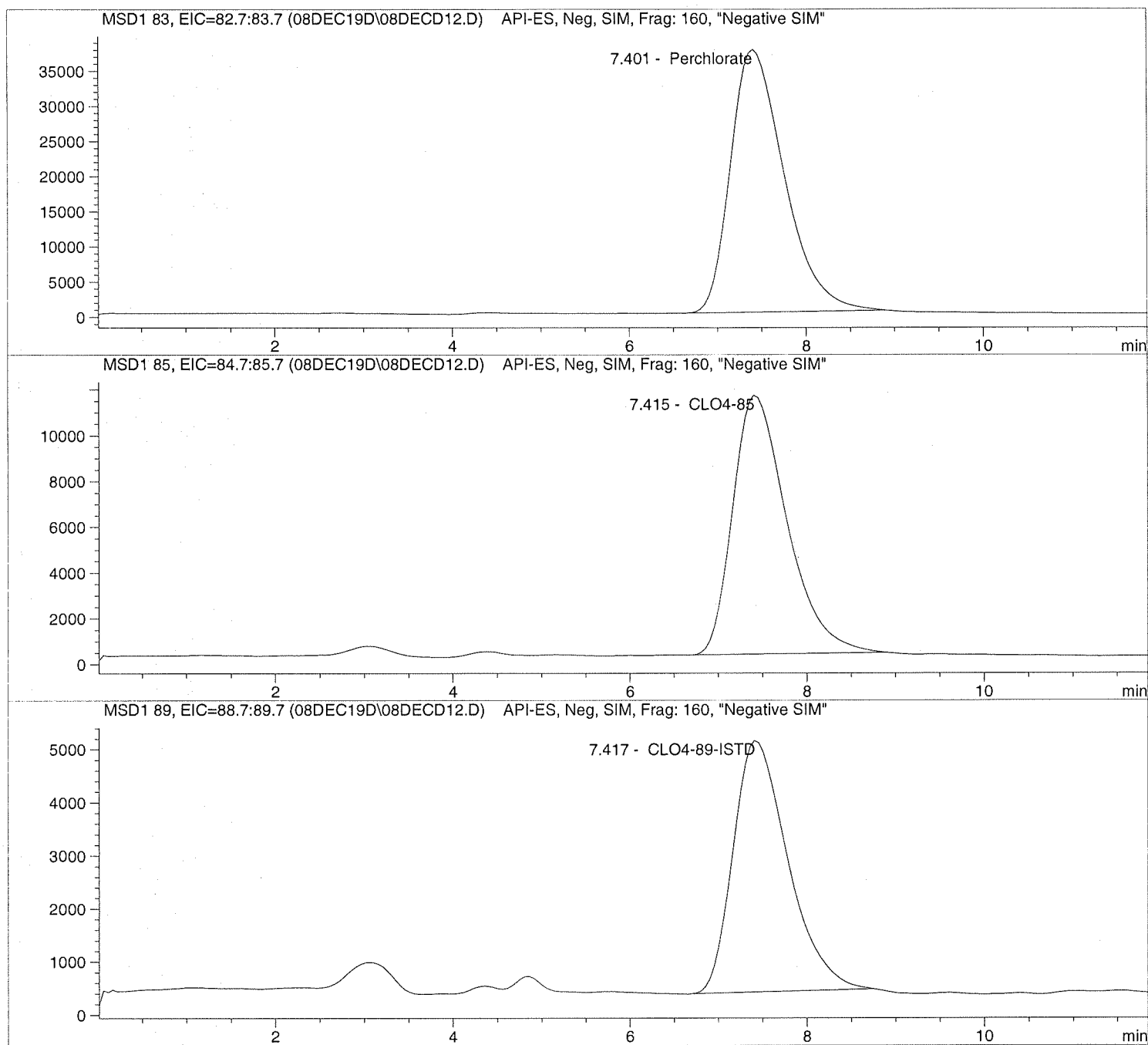
Inj. Vol.: 35 μ l

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\08DEC19D\08DECD12.D Sample Name: 687325 CCV@25

```

=====
Injection Date:   12/08/2019 15:57:34                    Seq Line:           12
Sample Name:     687325    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
7.401	PBA	1568763.4	26.2667	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.415	PBA	480251.1	26.3725	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.417	PBA	203011.5	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

=====
 Calibration Table
 =====

Perchlorate

Calib. Data Modified : 9/23/2019 12:20:59 PM

Calculate : Internal Standard
 Based on : Peak Area

Rel. Reference Window : 20.000 %
 Abs. Reference Window : 0.000 min
 Rel. Non-ref. Window : 20.000 %
 Abs. Non-ref. Window : 0.000 min

Use Multiplier & Dilution Factor with ISTDs
 Uncalibrated Peaks : not reported
 Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
 Origin : Ignored (some peaks differ, see below)
 Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
 Average Response : Average all calibrations
 Average Retention Time: Floating Average New 75%

Calibration Report Options :
 Printout of recalibrations within a sequence:
 Calibration Table after Recalibration
 Normal Report after Recalibration
 If the sequence is done with bracketing:
 Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
 Signal 2: MSD1 85, EIC=84.7:85.7
 Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	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 Sig	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: CL04-89-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

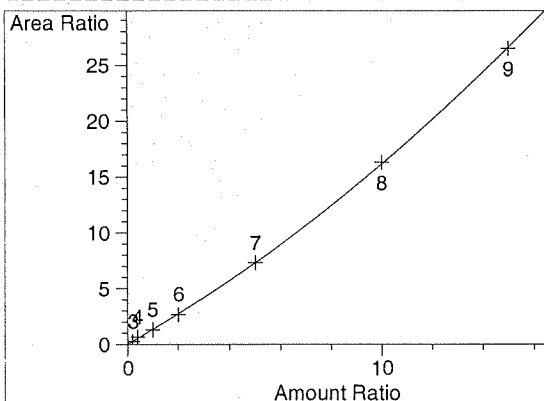
Compound: CL04-85

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

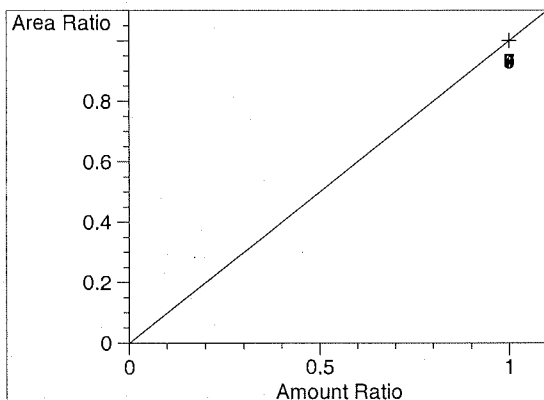
=====
 Peak Sum Table
 =====

No Entries in table
 =====

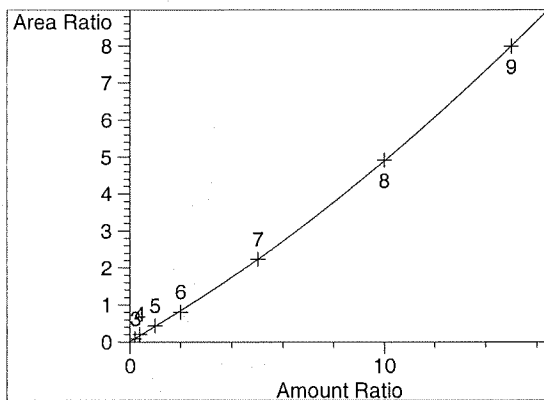
=====
 Calibration Curves
 =====



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\20SEP19\20SEPI03.D

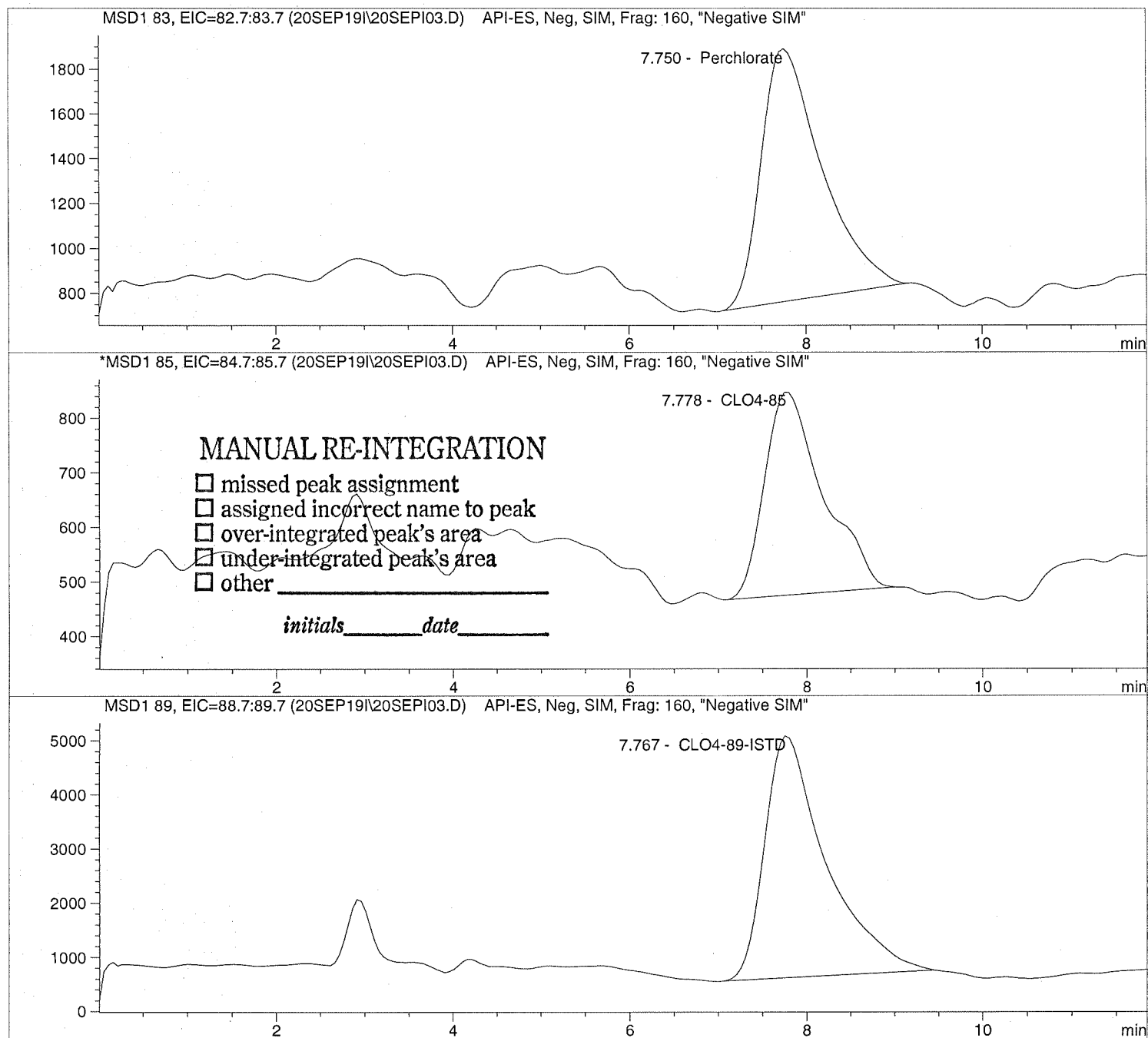
Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05
Sample Name: CLO4@ 1.0ug/L
Acq Operator: TNB

Seq Line: 3
Location: Vial 73
Inj. No.: 1
Inj. Vol.: 30 μ l

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

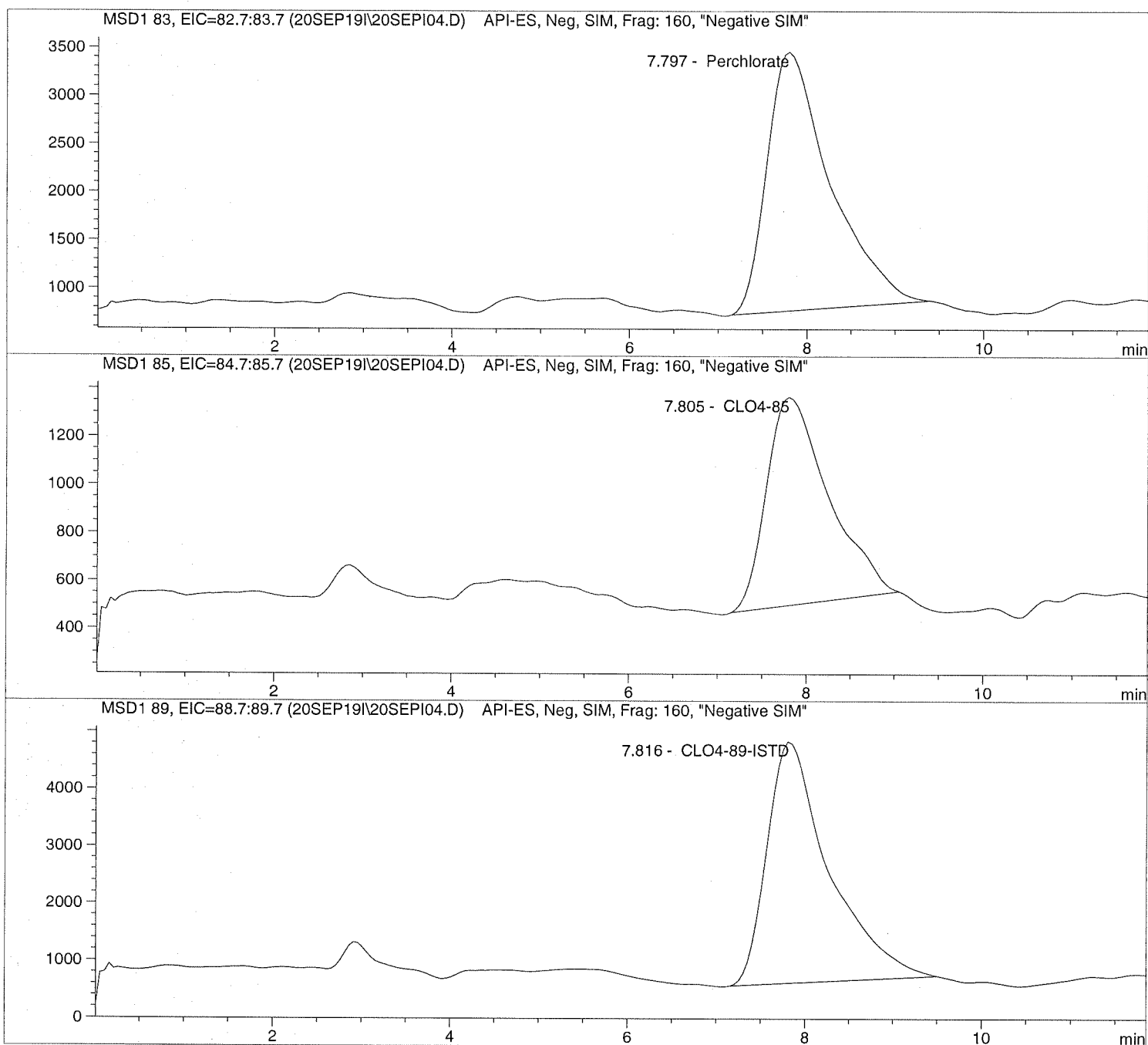
Sample Name: CLO4@ 2.0ug/L

Injection Date: 9/20/2019 09:37:58
Sample Name: CLO4@ 2.0ug/L
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
Inj. No.: 1
Inj. Vol.: 30 μ l

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\20SEP19\20SEPI05.D

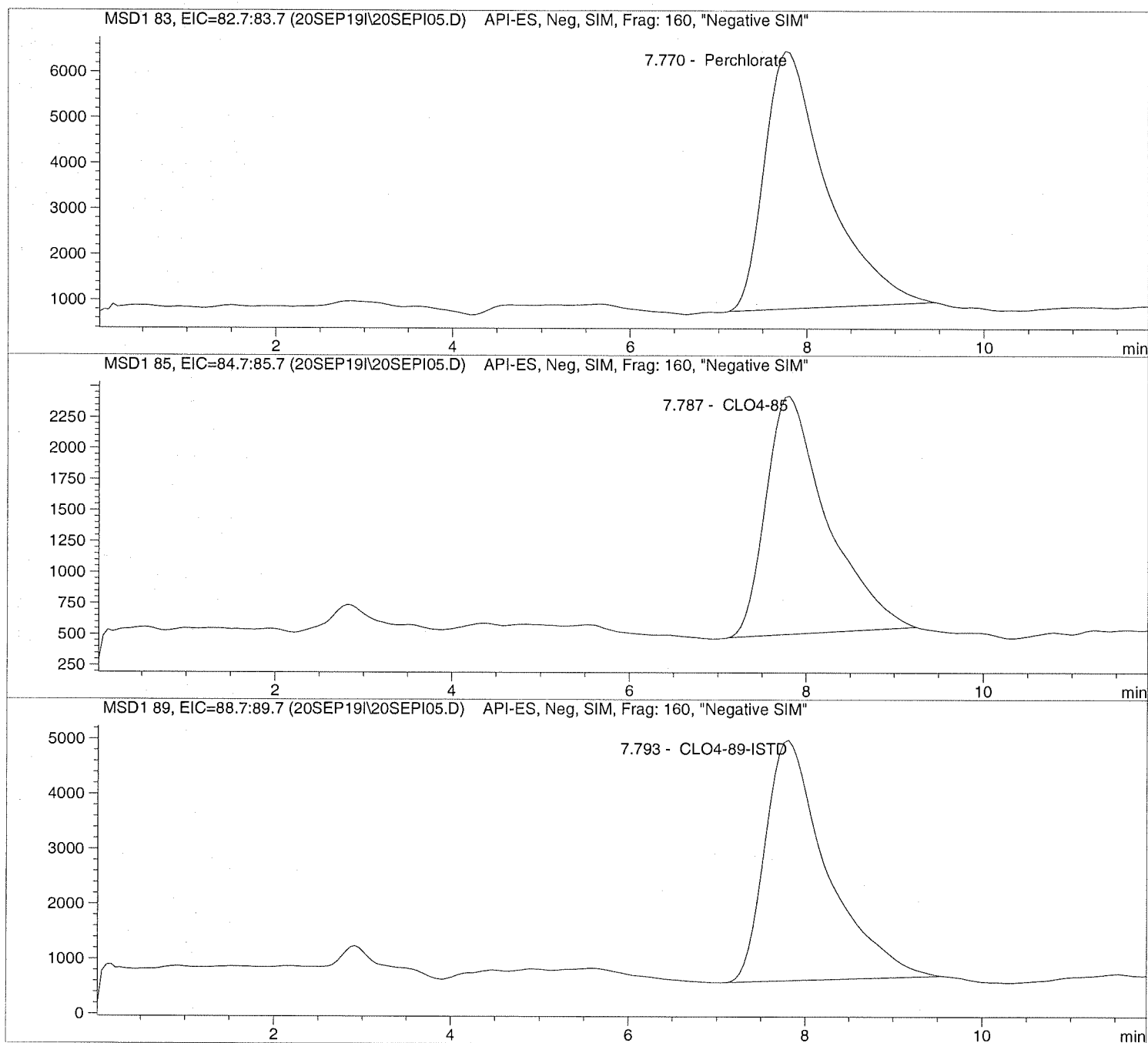
Sample Name: CLO4@ 5.0ug/L

Injection Date: 9/20/2019 09:51:49
Sample Name: CLO4@ 5.0ug/L
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
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\20SEP19\20SEPI06.D

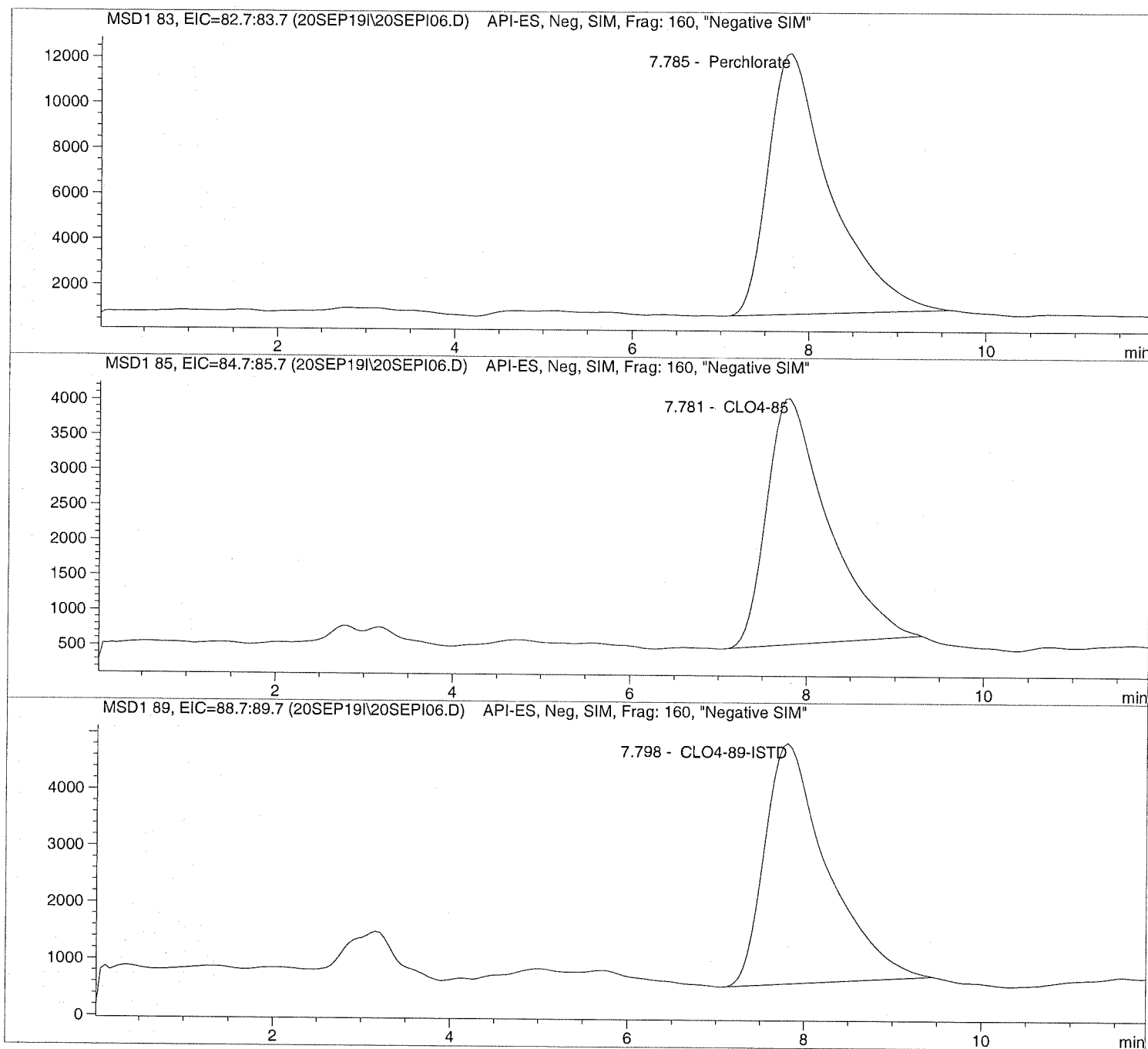
Sample Name: CLO4@ 10.ug/L

=====
Injection Date: 9/20/2019 10:05:36
Sample Name: CLO4@ 10.ug/L
Acq Operator: TNB

=====
Seq Line: 6
Location: Vial 76
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\20SEP19\20SEPI07.D

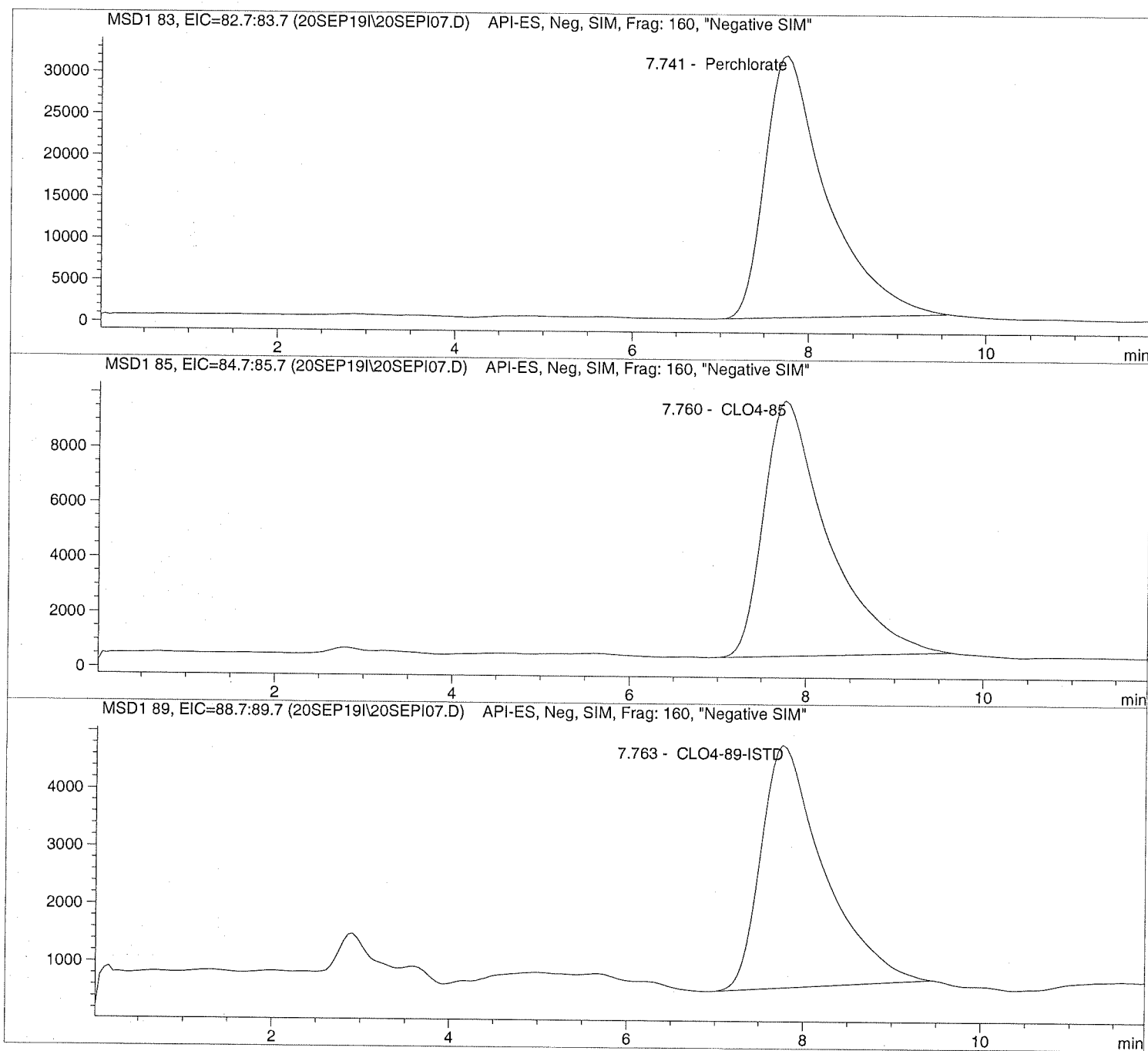
Sample Name: CLO4@ 25.ug/L

Injection Date: 9/20/2019 10:19:23
Sample Name: CLO4@ 25.ug/L
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
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

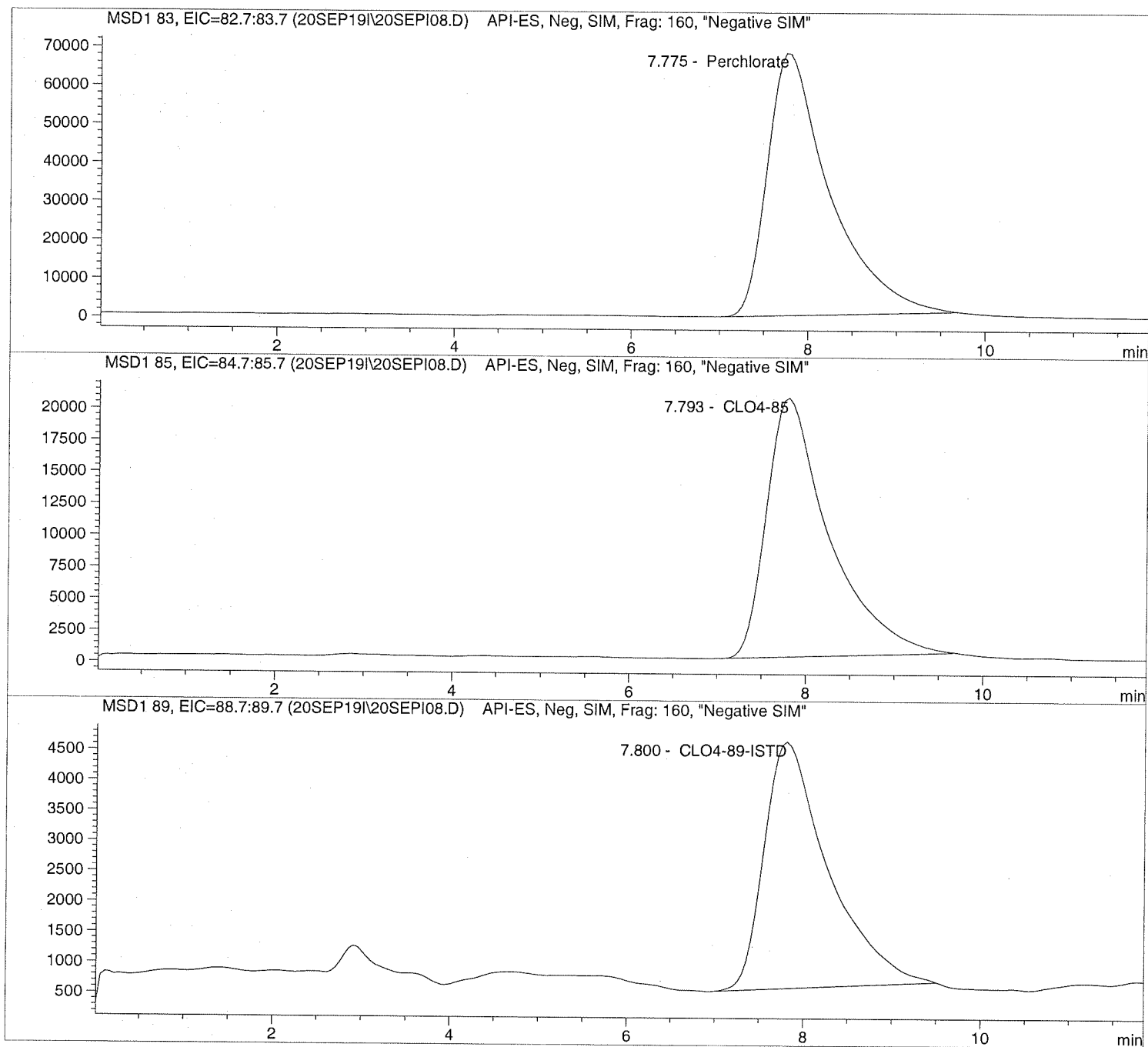
Sample Name: CLO4@ 50.ug/L

=====
Injection Date: 9/20/2019 10:33:18
Sample Name: CLO4@ 50.ug/L
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
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

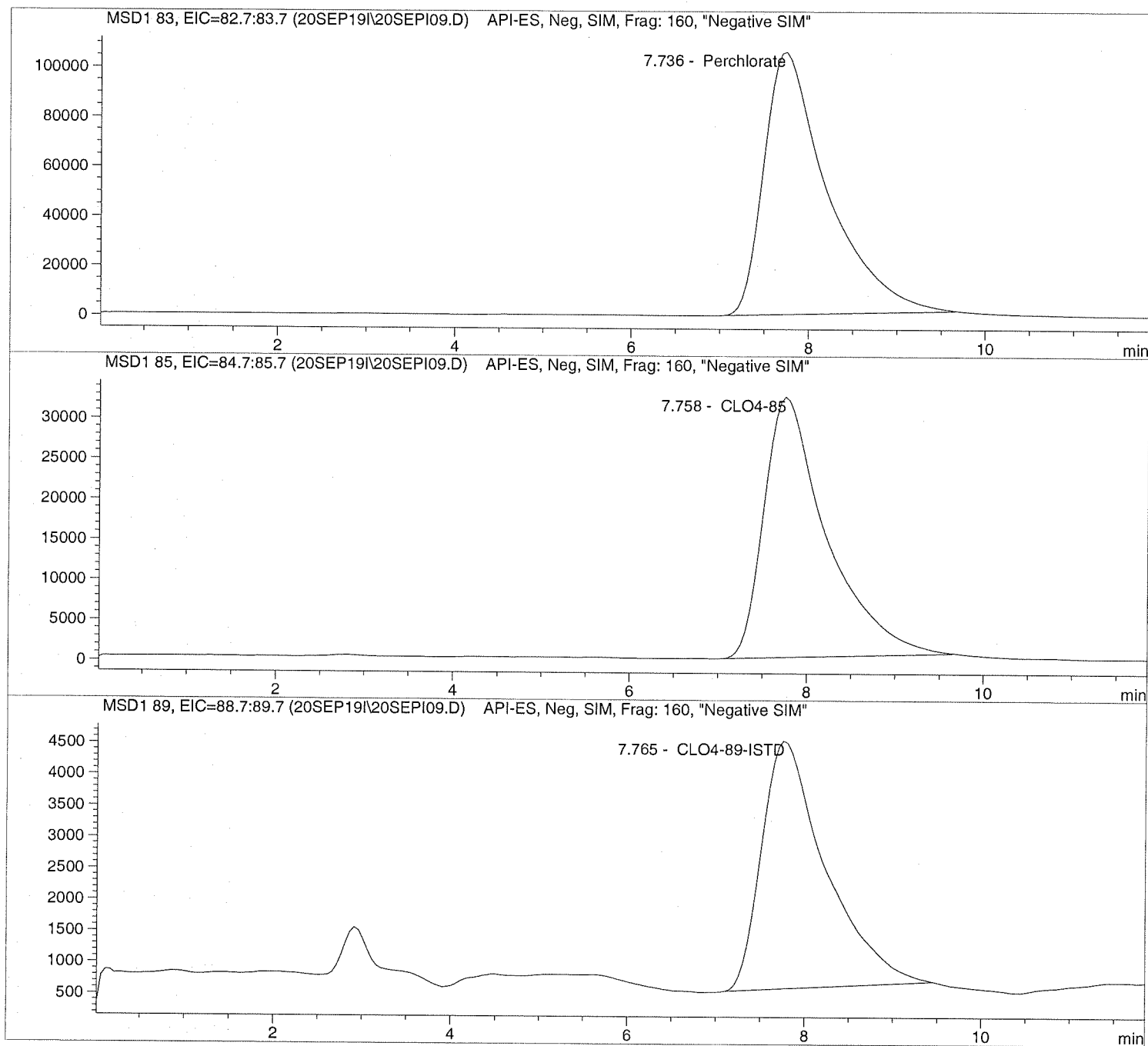
Sample Name: CLO4@ 75.ug/L

Injection Date: 9/20/2019 10:47:05
Sample Name: CLO4@ 75.ug/L
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
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\20SEP19\20SEPI11.D

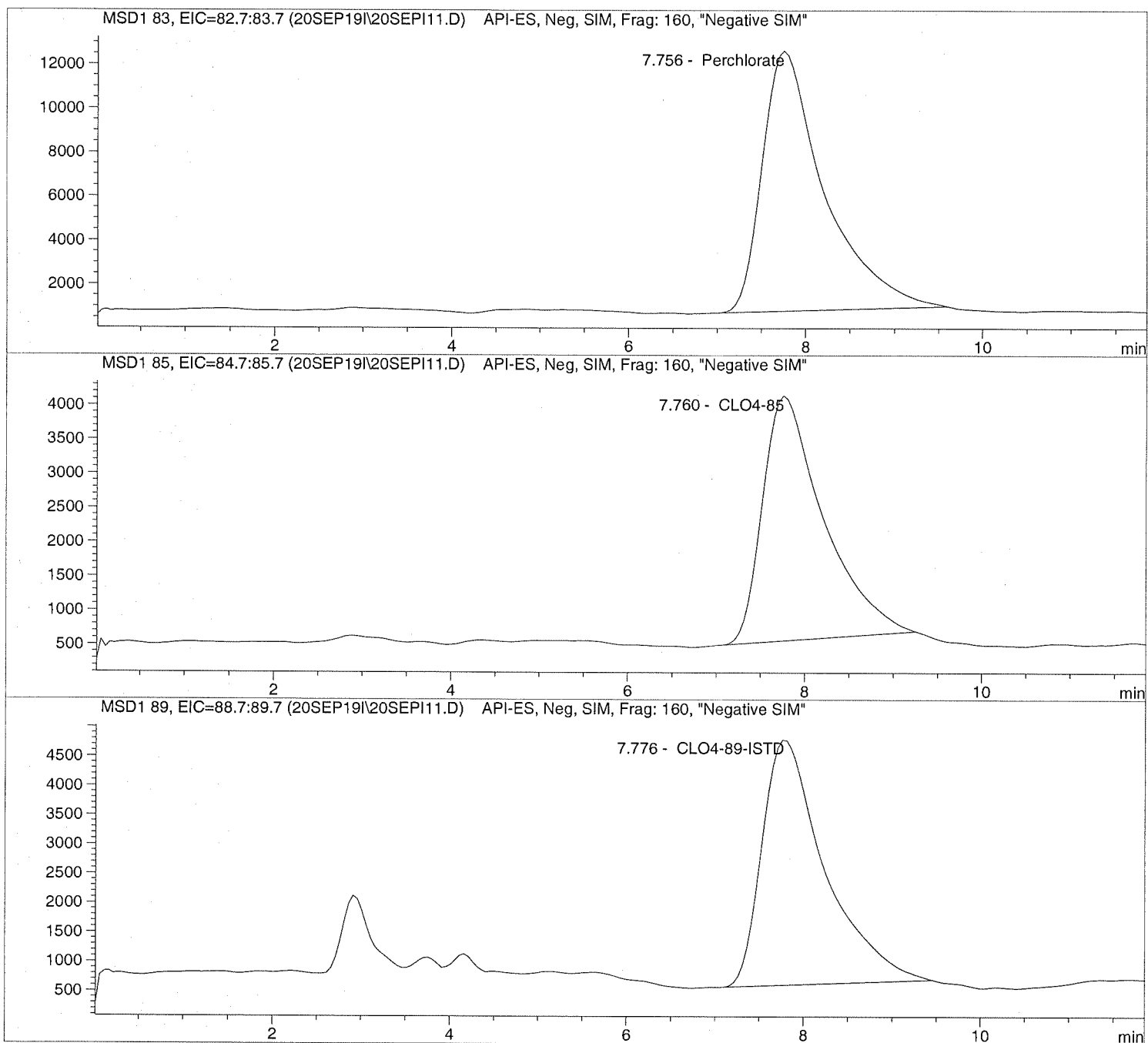
Sample Name: ICAL Verf@10ug/L

Injection Date: 9/20/2019 11:14:45
Sample Name: ICAL Verf@10ug/L
Acq Operator: TNB

Seq Line: 11
Location: Vial 80
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\20SEP19\20SEPI03.D

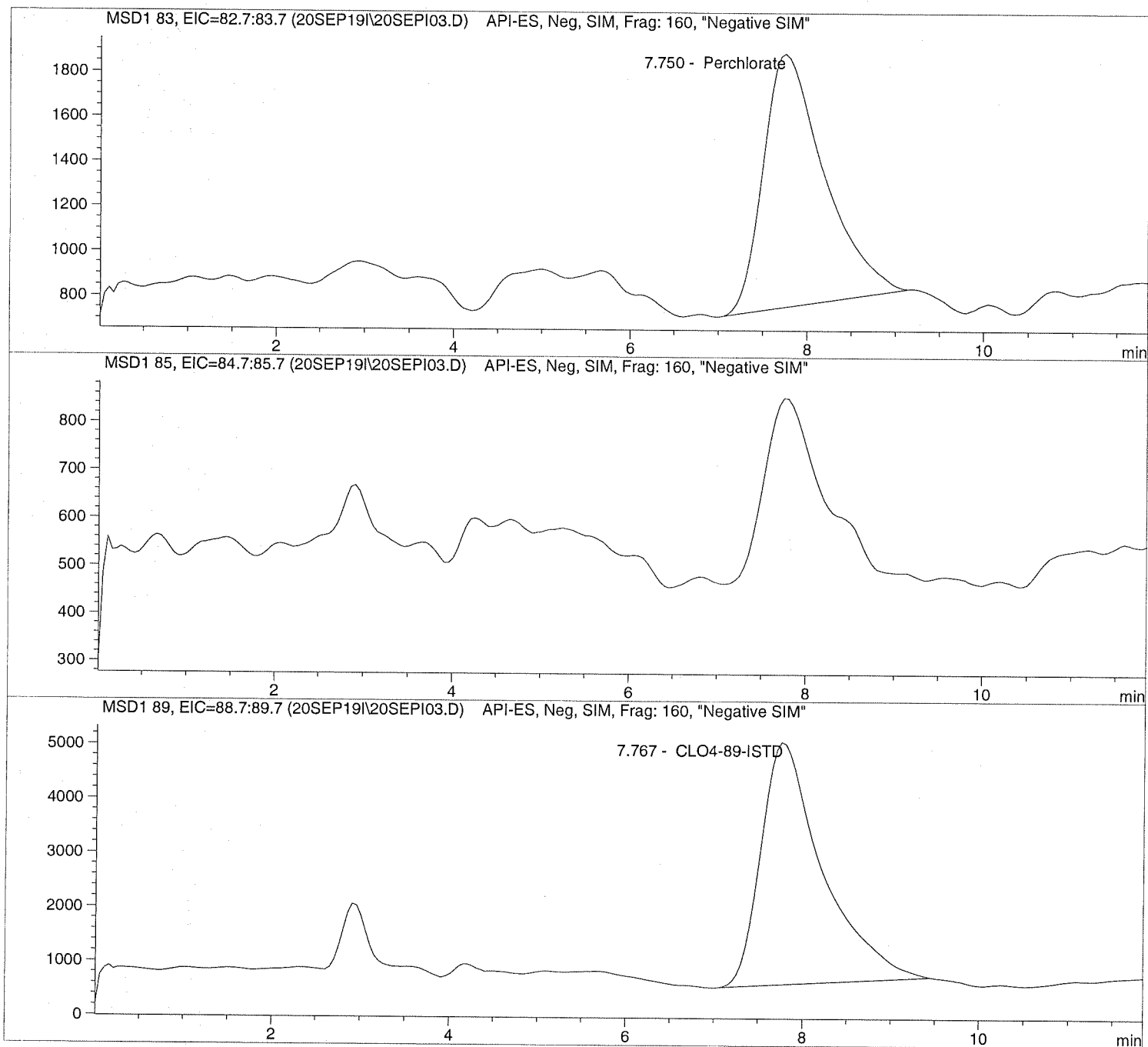
Sample Name: CLO4@ 1.0ug/L

=====
Injection Date: 9/20/2019 09:24:05
Sample Name: CLO4@ 1.0ug/L
Acq Operator: TNB

Seq Line: 3
Location: Vial 73
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line: 3
Sample Name:    CLO4@ 1.0ug/L           Location:  Vial 73
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:27:11
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:          Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:         1.000000
Dilution:           1.000000
Sample Amount:      1.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```




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

December 06, 2019

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

Work Order: **HS19120180**

Laboratory Results for: **Longhorn GW Treatment Plant Special Samples**

Dear Marcia,

ALS Environmental received 4 sample(s) on Dec 05, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

A handwritten signature in black ink, appearing to read 'Raj. P. Modashia', enclosed in a circular scribble.

Generated By: DAYNA.FISHER

RJ Modashia
Project Manager

ALS Houston, US

Date: 06-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
Work Order: HS19120180

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120180-01	LH18/24-SP650_120419_AIX	Water		04-Dec-2019 10:00	05-Dec-2019 09:15	<input type="checkbox"/>
HS19120180-02	LH18/24-SP650_120419_BIX	Water		04-Dec-2019 10:00	05-Dec-2019 09:15	<input type="checkbox"/>
HS19120180-03	INF Inlet_120419	Water		04-Dec-2019 10:00	05-Dec-2019 09:15	<input type="checkbox"/>
HS19120180-04	Trip Blank	Water	CG-101419 -04	04-Dec-2019 00:00	05-Dec-2019 09:15	<input type="checkbox"/>

ALS Houston, US

Date: 06-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
Work Order: HS19120180

CASE NARRATIVE**GCMS Volatiles by Method SW8260****Batch ID: R351907****Sample ID: CCV**

- 2-Butanone exceeded %D limits for CCV. Samples are ND fr this compound.
-

ALS Houston, US

Date: 06-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Special Samples
 Sample ID: LH18/24-SP650_120419_AIX
 Collection Date: 04-Dec-2019 10:00

ANALYTICAL REPORT
 WorkOrder:HS19120180
 Lab ID:HS19120180-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:37
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 13:37
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:37
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:37
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 13:37
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 13:37
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 13:37
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:37
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:37
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 13:37
1,2-Dichloroethane	1.5		0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:37
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 13:37
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 13:37
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 13:37
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:37
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	05-Dec-2019 13:37
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	05-Dec-2019 13:37
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 13:37
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	05-Dec-2019 13:37
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	05-Dec-2019 13:37
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:37
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 13:37
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:37
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:37
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 13:37
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 13:37
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	05-Dec-2019 13:37
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 13:37
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:37

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

ALS Houston, US

Date: 06-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Special Samples
 Sample ID: LH18/24-SP650_120419_AIX
 Collection Date: 04-Dec-2019 10:00

ANALYTICAL REPORT
 WorkOrder:HS19120180
 Lab ID:HS19120180-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
cis-1,2-Dichloroethene	55		0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	05-Dec-2019 13:37	
Methylene chloride	4.3		0.40	1.0	2.0	UG/L	1	05-Dec-2019 13:37	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
Trichloroethene	9.5		0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
Vinyl chloride	0.62	J	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:37	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>101</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>05-Dec-2019 13:37</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.2</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>05-Dec-2019 13:37</i>	
<i>Surr: Dibromofluoromethane</i>	<i>101</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>05-Dec-2019 13:37</i>	
<i>Surr: Toluene-d8</i>	<i>96.2</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>05-Dec-2019 13:37</i>	

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

ALS Houston, US

Date: 06-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Special Samples
 Sample ID: LH18/24-SP650_120419_BIX
 Collection Date: 04-Dec-2019 10:00

ANALYTICAL REPORT
 WorkOrder:HS19120180
 Lab ID:HS19120180-02
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
1,2-Dichloroethane	1.9		0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	05-Dec-2019 14:01	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
2-Hexanone	2.0	J	1.0	1.0	2.0	UG/L	1	05-Dec-2019 14:01	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	05-Dec-2019 14:01	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	05-Dec-2019 14:01	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	05-Dec-2019 14:01	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:01	

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

ALS Houston, US

Date: 06-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Special Samples
 Sample ID: LH18/24-SP650_120419_BIX
 Collection Date: 04-Dec-2019 10:00

ANALYTICAL REPORT
 WorkOrder:HS19120180
 Lab ID:HS19120180-02
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
cis-1,2-Dichloroethene	41		0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	05-Dec-2019 14:01	
Methylene chloride	7.0		0.40	1.0	2.0	UG/L	1	05-Dec-2019 14:01	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Trichloroethene	6.8		0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
Vinyl chloride	0.54	J	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:01	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>102</i>			0	<i>81-118</i>	%REC	<i>1</i>	<i>05-Dec-2019 14:01</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.8</i>			0	<i>85-114</i>	%REC	<i>1</i>	<i>05-Dec-2019 14:01</i>	
<i>Surr: Dibromofluoromethane</i>	<i>100</i>			0	<i>80-119</i>	%REC	<i>1</i>	<i>05-Dec-2019 14:01</i>	
<i>Surr: Toluene-d8</i>	<i>97.1</i>			0	<i>89-112</i>	%REC	<i>1</i>	<i>05-Dec-2019 14:01</i>	

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

ALS Houston, US

Date: 06-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Special Samples
 Sample ID: INF Inlet_120419
 Collection Date: 04-Dec-2019 10:00

ANALYTICAL REPORT
 WorkOrder:HS19120180
 Lab ID:HS19120180-03
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD		Method:SW8260							Analyst: PC
8260C									
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	05-Dec-2019 14:25	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	05-Dec-2019 14:25	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	05-Dec-2019 14:25	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	05-Dec-2019 14:25	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	05-Dec-2019 14:25	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:25	

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

ALS Houston, US

Date: 06-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Special Samples
 Sample ID: INF Inlet_120419
 Collection Date: 04-Dec-2019 10:00

ANALYTICAL REPORT
 WorkOrder:HS19120180
 Lab ID:HS19120180-03
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
cis-1,2-Dichloroethene	2.8		0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	05-Dec-2019 14:25	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	05-Dec-2019 14:25	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 14:25	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>101</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>05-Dec-2019 14:25</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.5</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>05-Dec-2019 14:25</i>	
<i>Surr: Dibromofluoromethane</i>	<i>99.0</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>05-Dec-2019 14:25</i>	
<i>Surr: Toluene-d8</i>	<i>96.1</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>05-Dec-2019 14:25</i>	

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

ALS Houston, US

Date: 06-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Special Samples
 Sample ID: Trip Blank
 Collection Date: 04-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19120180
 Lab ID:HS19120180-04
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:13
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 13:13
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:13
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:13
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 13:13
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 13:13
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 13:13
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:13
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:13
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 13:13
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:13
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 13:13
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 13:13
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 13:13
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:13
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	05-Dec-2019 13:13
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	05-Dec-2019 13:13
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 13:13
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	05-Dec-2019 13:13
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	05-Dec-2019 13:13
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	05-Dec-2019 13:13
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:13

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

ALS Houston, US

Date: 06-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Special Samples
 Sample ID: Trip Blank
 Collection Date: 04-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19120180
 Lab ID:HS19120180-04
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:13
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:13
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	05-Dec-2019 13:13
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	05-Dec-2019 13:13
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	05-Dec-2019 13:13
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:13
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:13
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	05-Dec-2019 13:13
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	05-Dec-2019 13:13
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>101</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>05-Dec-2019 13:13</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>98.3</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>05-Dec-2019 13:13</i>
<i>Surr: Dibromofluoromethane</i>	<i>99.5</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>05-Dec-2019 13:13</i>
<i>Surr: Toluene-d8</i>	<i>97.4</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>05-Dec-2019 13:13</i>

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

ALS Houston, US

Date: 06-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: HS19120180

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R351907 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19120180-01	LH18/24-SP650_120419_AIX	04 Dec 2019 10:00			05 Dec 2019 13:37	1
HS19120180-02	LH18/24-SP650_120419_BIX	04 Dec 2019 10:00			05 Dec 2019 14:01	1
HS19120180-03	INF Inlet_120419	04 Dec 2019 10:00			05 Dec 2019 14:25	1
HS19120180-04	Trip Blank	04 Dec 2019 00:00			05 Dec 2019 13:13	1

ALS Houston, US

Date: 06-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: HS19120180

QC BATCH REPORT

Batch ID: R351907 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191205	Units: UG/L			Analysis Date: 05-Dec-2019 12:49					
Client ID:	Run ID: VOA6_351907	SeqNo: 5376571	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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	50.05	1.0	50	0	100	81 - 118				
Surr: 4-Bromofluorobenzene	49.7	1.0	50	0	99.4	85 - 114				
Surr: Dibromofluoromethane	49.73	1.0	50	0	99.5	80 - 119				
Surr: Toluene-d8	47.33	1.0	50	0	94.7	89 - 112				

ALS Houston, US

Date: 06-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: HS19120180

QC BATCH REPORT

Batch ID: R351907 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191205	Units: UG/L			Analysis Date: 05-Dec-2019 12:01					
Client ID:	Run ID: VOA6_351907	SeqNo: 5376570	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	22.58	1.0	20	0	113	78 - 124				
1,1,1-Trichloroethane	24.02	1.0	20	0	120	74 - 131				
1,1,2,2-Tetrachloroethane	22.66	1.0	20	0	113	71 - 121				
1,1,2-Trichloroethane	23.09	1.0	20	0	115	80 - 119				
1,1-Dichloroethane	23.8	1.0	20	0	119	77 - 125				
1,1-Dichloroethene	20.39	1.0	20	0	102	71 - 131				
1,1-Dichloropropene	22.16	1.0	20	0	111	78 - 125				
1,2,3-Trichlorobenzene	16.14	1.0	20	0	80.7	69 - 129				
1,2,3-Trichloropropane	23.45	1.0	20	0	117	73 - 122				
1,2,4-Trichlorobenzene	16.51	1.0	20	0	82.6	69 - 130				
1,2,4-Trimethylbenzene	21.7	1.0	20	0	108	76 - 124				
1,2-Dibromo-3-chloropropane	21.16	1.0	20	0	106	62 - 128				
1,2-Dibromoethane	23.26	1.0	20	0	116	77 - 121				
1,2-Dichlorobenzene	21.69	1.0	20	0	108	80 - 119				
1,2-Dichloroethane	23.98	1.0	20	0	120	73 - 128				
1,2-Dichloropropane	22.76	1.0	20	0	114	78 - 122				
1,3,5-Trimethylbenzene	21.58	1.0	20	0	108	75 - 124				
1,3-Dichlorobenzene	21.99	1.0	20	0	110	80 - 119				
1,3-Dichloropropane	22.67	1.0	20	0	113	80 - 119				
1,4-Dichlorobenzene	21.9	1.0	20	0	109	79 - 118				
2,2-Dichloropropane	24.23	1.0	20	0	121	60 - 139				
2-Butanone	47.38	2.0	40	0	118	56 - 143				
2-Chlorotoluene	23.33	1.0	20	0	117	79 - 122				
2-Hexanone	43.64	2.0	40	0	109	57 - 139				
4-Chlorotoluene	22.42	1.0	20	0	112	78 - 122				
4-Isopropyltoluene	20.63	1.0	20	0	103	77 - 127				
4-Methyl-2-pentanone	44.04	2.0	40	0	110	67 - 130				
Acetone	48.84	2.0	40	0	122	39 - 160				
Benzene	23.3	1.0	20	0	117	79 - 120				
Bromobenzene	23.18	1.0	20	0	116	80 - 120				
Bromochloromethane	24.49	1.0	20	0	122	78 - 123				
Bromodichloromethane	23.66	1.0	20	0	118	79 - 125				
Bromoform	22.15	1.0	20	0	111	66 - 130				
Bromomethane	23.2	1.0	20	0	116	53 - 141				

ALS Houston, US

Date: 06-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: HS19120180

QC BATCH REPORT

Batch ID: R351907 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191205	Units: UG/L			Analysis Date: 05-Dec-2019 12:01					
Client ID:	Run ID: VOA6_351907	SeqNo: 5376570	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	47.23	2.0	40	0	118	64 - 133				
Carbon tetrachloride	21.32	1.0	20	0	107	72 - 136				
Chlorobenzene	22.18	1.0	20	0	111	82 - 118				
Chloroethane	20.64	1.0	20	0	103	60 - 138				
Chloroform	23.71	1.0	20	0	119	79 - 124				
Chloromethane	18.27	1.0	20	0	91.4	50 - 139				
cis-1,2-Dichloroethene	24.38	1.0	20	0	122	78 - 123				
cis-1,3-Dichloropropene	23.54	1.0	20	0	118	75 - 124				
Dibromochloromethane	23.19	1.0	20	0	116	74 - 126				
Dibromomethane	23.56	1.0	20	0	118	79 - 123				
Dichlorodifluoromethane	24.96	1.0	20	0	125	32 - 152				
Ethylbenzene	21.38	1.0	20	0	107	79 - 121				
Hexachlorobutadiene	15.56	1.0	20	0	77.8	66 - 134				
Isopropylbenzene	20.41	1.0	20	0	102	72 - 131				
m,p-Xylene	42.71	2.0	40	0	107	80 - 121				
Methylene chloride	23.53	2.0	20	0	118	74 - 124				
Naphthalene	16.46	1.0	20	0	82.3	61 - 128				
n-Butylbenzene	20.65	1.0	20	0	103	75 - 128				
n-Propylbenzene	21.75	1.0	20	0	109	76 - 126				
o-Xylene	21.64	1.0	20	0	108	78 - 122				
sec-Butylbenzene	20.47	1.0	20	0	102	77 - 126				
Styrene	22.25	1.0	20	0	111	78 - 123				
tert-Butylbenzene	21.13	1.0	20	0	106	78 - 124				
Tetrachloroethene	20.24	1.0	20	0	101	74 - 129				
Toluene	22.6	1.0	20	0	113	80 - 121				
trans-1,2-Dichloroethene	24.31	1.0	20	0	122	75 - 124				
trans-1,3-Dichloropropene	23.15	1.0	20	0	116	73 - 127				
Trichloroethene	22.97	1.0	20	0	115	79 - 123				
Trichlorofluoromethane	20.91	1.0	20	0	105	65 - 141				
Vinyl chloride	21.31	1.0	20	0	107	58 - 137				
Surr: 1,2-Dichloroethane-d4	57.5	1.0	50	0	115	81 - 118				
Surr: 4-Bromofluorobenzene	52.2	1.0	50	0	104	85 - 114				
Surr: Dibromofluoromethane	55.1	1.0	50	0	110	80 - 119				
Surr: Toluene-d8	48.13	1.0	50	0	96.3	89 - 112				

ALS Houston, US

Date: 06-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: HS19120180

QC BATCH REPORT

Batch ID: R351907 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS		Sample ID: HS19120180-02MS		Units: UG/L		Analysis Date: 05-Dec-2019 15:13				
Client ID: LH18/24-SP650_120419_BIX		Run ID: VOA6_351907		SeqNo: 5376576		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	18.83	1.0	20	0	94.1	78 - 124				
1,1,1-Trichloroethane	19.93	1.0	20	0	99.6	74 - 131				
1,1,2,2-Tetrachloroethane	18.86	1.0	20	0	94.3	71 - 121				
1,1,2-Trichloroethane	18.51	1.0	20	0	92.5	80 - 119				
1,1-Dichloroethane	19.22	1.0	20	0	96.1	77 - 125				
1,1-Dichloroethene	17.18	1.0	20	0	85.9	71 - 131				
1,1-Dichloropropene	19.3	1.0	20	0	96.5	78 - 125				
1,2,3-Trichlorobenzene	14.11	1.0	20	0	70.5	69 - 129				
1,2,3-Trichloropropane	18.7	1.0	20	0	93.5	73 - 122				
1,2,4-Trichlorobenzene	14.77	1.0	20	0	73.8	69 - 130				
1,2,4-Trimethylbenzene	20.05	1.0	20	0	100	76 - 124				
1,2-Dibromo-3-chloropropane	17	1.0	20	0	85.0	62 - 128				
1,2-Dibromoethane	18.45	1.0	20	0	92.3	77 - 121				
1,2-Dichlorobenzene	18.72	1.0	20	0	93.6	80 - 119				
1,2-Dichloroethane	21.35	1.0	20	1.86	97.4	73 - 128				
1,2-Dichloropropane	17.89	1.0	20	0	89.5	78 - 122				
1,3,5-Trimethylbenzene	20.42	1.0	20	0	102	75 - 124				
1,3-Dichlorobenzene	19.5	1.0	20	0	97.5	80 - 119				
1,3-Dichloropropane	18.39	1.0	20	0	92.0	80 - 119				
1,4-Dichlorobenzene	19.14	1.0	20	0	95.7	79 - 118				
2,2-Dichloropropane	19.32	1.0	20	0	96.6	60 - 139				
2-Butanone	33.38	2.0	40	0	83.5	56 - 143				
2-Chlorotoluene	21.29	1.0	20	0	106	79 - 122				
2-Hexanone	34.68	2.0	40	1.973	81.8	57 - 139				
4-Chlorotoluene	20.19	1.0	20	0	101	78 - 122				
4-Isopropyltoluene	19.76	1.0	20	0	98.8	77 - 127				
4-Methyl-2-pentanone	34.79	2.0	40	0	87.0	67 - 130				
Acetone	28.86	2.0	40	0	72.1	39 - 160				
Benzene	19.12	1.0	20	0	95.6	79 - 120				
Bromobenzene	19.59	1.0	20	0	98.0	80 - 120				
Bromochloromethane	18.62	1.0	20	0	93.1	78 - 123				
Bromodichloromethane	18.93	1.0	20	0	94.7	79 - 125				
Bromoform	17.86	1.0	20	0	89.3	66 - 130				
Bromomethane	15.71	1.0	20	0	78.5	53 - 141				

ALS Houston, US

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Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: HS19120180

QC BATCH REPORT

Batch ID: R351907 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS		Sample ID: HS19120180-02MS		Units: UG/L		Analysis Date: 05-Dec-2019 15:13				
Client ID: LH18/24-SP650_120419_BIX		Run ID: VOA6_351907		SeqNo: 5376576		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Carbon disulfide	39.43	2.0	40	0	98.6	64 - 133				
Carbon tetrachloride	19.2	1.0	20	0	96.0	72 - 136				
Chlorobenzene	18.52	1.0	20	0	92.6	82 - 118				
Chloroethane	16.75	1.0	20	0	83.8	60 - 138				
Chloroform	18.49	1.0	20	0	92.5	79 - 124				
Chloromethane	12.29	1.0	20	0	61.5	50 - 139				
cis-1,2-Dichloroethene	64.19	1.0	20	40.82	117	78 - 123				
cis-1,3-Dichloropropene	18.35	1.0	20	0	91.8	75 - 124				
Dibromochloromethane	18.47	1.0	20	0	92.3	74 - 126				
Dibromomethane	18.48	1.0	20	0	92.4	79 - 123				
Dichlorodifluoromethane	14.51	1.0	20	0	72.5	32 - 152				
Ethylbenzene	19.57	1.0	20	0	97.8	79 - 121				
Hexachlorobutadiene	13.43	1.0	20	0	67.2	66 - 134				
Isopropylbenzene	19.32	1.0	20	0	96.6	72 - 131				
m,p-Xylene	38.34	2.0	40	0	95.9	80 - 121				
Methylene chloride	25.27	2.0	20	7.007	91.3	74 - 124				
Naphthalene	14.61	1.0	20	0	73.0	61 - 128				
n-Butylbenzene	19.67	1.0	20	0	98.4	75 - 128				
n-Propylbenzene	20.89	1.0	20	0	104	76 - 126				
o-Xylene	18.71	1.0	20	0	93.6	78 - 122				
sec-Butylbenzene	20.34	1.0	20	0	102	77 - 126				
Styrene	21.21	1.0	20	0	106	78 - 123				
tert-Butylbenzene	20.39	1.0	20	0	102	78 - 124				
Tetrachloroethene	18.87	1.0	20	0	94.3	74 - 129				
Toluene	19.16	1.0	20	0	95.8	80 - 121				
trans-1,2-Dichloroethene	19.43	1.0	20	0	97.2	75 - 124				
trans-1,3-Dichloropropene	18.32	1.0	20	0	91.6	73 - 127				
Trichloroethene	26.83	1.0	20	6.77	100	79 - 123				
Trichlorofluoromethane	17.43	1.0	20	0	87.1	65 - 141				
Vinyl chloride	16.12	1.0	20	0.5377	77.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	51.1	1.0	50	0	102	81 - 118				
Surr: 4-Bromofluorobenzene	50.11	1.0	50	0	100	85 - 114				
Surr: Dibromofluoromethane	50.25	1.0	50	0	100	80 - 119				
Surr: Toluene-d8	48.16	1.0	50	0	96.3	89 - 112				

ALS Houston, US

Date: 06-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: HS19120180

QC BATCH REPORT

Batch ID: R351907 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD		Sample ID: HS19120180-02MSD		Units: UG/L		Analysis Date: 05-Dec-2019 15:37				
Client ID: LH18/24-SP650_120419_BIX		Run ID: VOA6_351907		SeqNo: 5376577		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	1.0	20	0	90.0	78 - 124	18.83	4.52	20	
1,1,1-Trichloroethane	18.68	1.0	20	0	93.4	74 - 131	19.93	6.46	20	
1,1,2,2-Tetrachloroethane	17.9	1.0	20	0	89.5	71 - 121	18.86	5.19	20	
1,1,2-Trichloroethane	17.9	1.0	20	0	89.5	80 - 119	18.51	3.3	20	
1,1-Dichloroethane	18.09	1.0	20	0	90.5	77 - 125	19.22	6.04	20	
1,1-Dichloroethene	16.06	1.0	20	0	80.3	71 - 131	17.18	6.77	20	
1,1-Dichloropropene	18.33	1.0	20	0	91.7	78 - 125	19.3	5.14	20	
1,2,3-Trichlorobenzene	15.21	1.0	20	0	76.0	69 - 129	14.11	7.49	20	
1,2,3-Trichloropropane	18.05	1.0	20	0	90.3	73 - 122	18.7	3.53	20	
1,2,4-Trichlorobenzene	14.8	1.0	20	0	74.0	69 - 130	14.77	0.208	20	
1,2,4-Trimethylbenzene	18.99	1.0	20	0	94.9	76 - 124	20.05	5.46	20	
1,2-Dibromo-3-chloropropane	16.26	1.0	20	0	81.3	62 - 128	17	4.44	20	
1,2-Dibromoethane	17.99	1.0	20	0	90.0	77 - 121	18.45	2.54	20	
1,2-Dichlorobenzene	17.76	1.0	20	0	88.8	80 - 119	18.72	5.25	20	
1,2-Dichloroethane	20.94	1.0	20	1.86	95.4	73 - 128	21.35	1.93	20	
1,2-Dichloropropane	17.33	1.0	20	0	86.7	78 - 122	17.89	3.2	20	
1,3,5-Trimethylbenzene	19.27	1.0	20	0	96.4	75 - 124	20.42	5.79	20	
1,3-Dichlorobenzene	18.31	1.0	20	0	91.6	80 - 119	19.5	6.25	20	
1,3-Dichloropropane	17.88	1.0	20	0	89.4	80 - 119	18.39	2.8	20	
1,4-Dichlorobenzene	18.25	1.0	20	0	91.3	79 - 118	19.14	4.71	20	
2,2-Dichloropropane	18.07	1.0	20	0	90.4	60 - 139	19.32	6.65	20	
2-Butanone	33.24	2.0	40	0	83.1	56 - 143	33.38	0.425	20	
2-Chlorotoluene	19.85	1.0	20	0	99.3	79 - 122	21.29	7	20	
2-Hexanone	33.89	2.0	40	1.973	79.8	57 - 139	34.68	2.31	20	
4-Chlorotoluene	19.04	1.0	20	0	95.2	78 - 122	20.19	5.84	20	
4-Isopropyltoluene	18.94	1.0	20	0	94.7	77 - 127	19.76	4.24	20	
4-Methyl-2-pentanone	34.22	2.0	40	0	85.5	67 - 130	34.79	1.66	20	
Acetone	26.59	2.0	40	0	66.5	39 - 160	28.86	8.19	20	
Benzene	18.23	1.0	20	0	91.1	79 - 120	19.12	4.78	20	
Bromobenzene	18.65	1.0	20	0	93.3	80 - 120	19.59	4.91	20	
Bromochloromethane	18.18	1.0	20	0	90.9	78 - 123	18.62	2.4	20	
Bromodichloromethane	18.24	1.0	20	0	91.2	79 - 125	18.93	3.71	20	
Bromoform	17.12	1.0	20	0	85.6	66 - 130	17.86	4.2	20	
Bromomethane	14.88	1.0	20	0	74.4	53 - 141	15.71	5.41	20	

ALS Houston, US

Date: 06-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: HS19120180

QC BATCH REPORT

Batch ID: R351907 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19120180-02MSD	Units: UG/L			Analysis Date: 05-Dec-2019 15:37					
Client ID: LH18/24-SP650_120419_BIX	Run ID: VOA6_351907	SeqNo: 5376577	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	36.91	2.0	40	0	92.3	64 - 133	39.43	6.59	20	
Carbon tetrachloride	18	1.0	20	0	90.0	72 - 136	19.2	6.47	20	
Chlorobenzene	17.64	1.0	20	0	88.2	82 - 118	18.52	4.88	20	
Chloroethane	15.91	1.0	20	0	79.5	60 - 138	16.75	5.15	20	
Chloroform	17.5	1.0	20	0	87.5	79 - 124	18.49	5.52	20	
Chloromethane	11.82	1.0	20	0	59.1	50 - 139	12.29	3.95	20	
cis-1,2-Dichloroethene	61.03	1.0	20	40.82	101	78 - 123	64.19	5.05	20	
cis-1,3-Dichloropropene	17.99	1.0	20	0	90.0	75 - 124	18.35	1.98	20	
Dibromochloromethane	18.04	1.0	20	0	90.2	74 - 126	18.47	2.32	20	
Dibromomethane	18.03	1.0	20	0	90.1	79 - 123	18.48	2.45	20	
Dichlorodifluoromethane	13.97	1.0	20	0	69.9	32 - 152	14.51	3.77	20	
Ethylbenzene	18.15	1.0	20	0	90.8	79 - 121	19.57	7.51	20	
Hexachlorobutadiene	13.76	1.0	20	0	68.8	66 - 134	13.43	2.43	20	
Isopropylbenzene	18.14	1.0	20	0	90.7	72 - 131	19.32	6.32	20	
m,p-Xylene	36.15	2.0	40	0	90.4	80 - 121	38.34	5.89	20	
Methylene chloride	24.32	2.0	20	7.007	86.6	74 - 124	25.27	3.84	20	
Naphthalene	14.18	1.0	20	0	70.9	61 - 128	14.61	3	20	
n-Butylbenzene	19.04	1.0	20	0	95.2	75 - 128	19.67	3.27	20	
n-Propylbenzene	19.75	1.0	20	0	98.7	76 - 126	20.89	5.6	20	
o-Xylene	17.79	1.0	20	0	88.9	78 - 122	18.71	5.08	20	
sec-Butylbenzene	19.43	1.0	20	0	97.1	77 - 126	20.34	4.57	20	
Styrene	18.54	1.0	20	0	92.7	78 - 123	21.21	13.4	20	
tert-Butylbenzene	19.31	1.0	20	0	96.5	78 - 124	20.39	5.44	20	
Tetrachloroethene	17.46	1.0	20	0	87.3	74 - 129	18.87	7.79	20	
Toluene	17.98	1.0	20	0	89.9	80 - 121	19.16	6.35	20	
trans-1,2-Dichloroethene	18.26	1.0	20	0	91.3	75 - 124	19.43	6.23	20	
trans-1,3-Dichloropropene	17.92	1.0	20	0	89.6	73 - 127	18.32	2.23	20	
Trichloroethene	25.29	1.0	20	6.77	92.6	79 - 123	26.83	5.92	20	
Trichlorofluoromethane	16.18	1.0	20	0	80.9	65 - 141	17.43	7.42	20	
Vinyl chloride	15.15	1.0	20	0.5377	73.0	58 - 137	16.12	6.26	20	
Surr: 1,2-Dichloroethane-d4	50.12	1.0	50	0	100	81 - 118	51.1	1.93	20	
Surr: 4-Bromofluorobenzene	49.83	1.0	50	0	99.7	85 - 114	50.11	0.556	20	
Surr: Dibromofluoromethane	49.64	1.0	50	0	99.3	80 - 119	50.25	1.22	20	
Surr: Toluene-d8	47.76	1.0	50	0	95.5	89 - 112	48.16	0.822	20	

ALS Houston, US

Date: 06-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: HS19120180

QC BATCH REPORT

Batch ID: R351907 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch: HS19120180-01 HS19120180-02 HS19120180-03 HS19120180-04

ALS Houston, US

Date: 06-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Special Samples
WorkOrder: HS19120180

**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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19120180

Date/Time Received: **05-Dec-2019 09:15**
 Received by: **PMG**

Checklist completed by: Paresh M. Giga 5-Dec-2019
 eSignature Date

Reviewed by: RJ Modashia 5-Dec-2019
 eSignature Date

Matrices: **Water**

Carrier name: **FedEx**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes No Not Present
- Chain of custody present? Yes No 1 Page(s)
- Chain of custody signed when relinquished and received? Yes No COC IDs:None
- Samplers name present on COC? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s): 1.2c U/C IR25
 Cooler(s)/Kit(s): 45369
 Date/Time sample(s) sent to storage: 12/5/19 11:55

- 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:


CHAIN OF CUSTODY

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

Page 1 of 1

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS			Project No. NWO1312.0150.0 16.0001			Analyses										HS19120180 Bhate Environmental Associates, Inc. Longhorn GW Treatment Plant Special Samples 							
Job: GROUNDWATER TREATMENT PLANT SPECIAL SAMPLES						MS / MSD	NO. OF CONTAINERS	VOC															
Prepared By: Scott Beesinger			P.O. Number																				
Field Sample I.D.			Sample Matrix			Date / Time													Remarks (Preservatives, etc.)		Lab I.D.#		
LH18/24-SP650_120419_AIX			Water			12/04/19 / 10:00			3	X											HCl		
LH18/24-SP650_120419_BIX			Water			12/04/19 / 10:00			3	X													
INF Inlet_120419			Water			12/04/19 / 10:00			3	X													
Trip Blank			Water			12/04/19			2	X													
Additional Remarks: 24 hour TAT																							
Relinquished By:		Date	Time	Received By:		Date	Time	Relinquished By:		Date	Time	Received By:		Date	Time								
<i>Scott Beesinger</i>		12/04/19	14:30	<i>[Signature]</i>		12/5/19	09:15																
For Lab Use Only																							
Received At Lab By:			Date	Time	Airbill No.		Opened By:			Date	Time	Temp of Container	Seal No.	Condition									
Remarks:																							

45369 OK.
 1.20
 A 25
 C/F 0.0"

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5387	CUSTODY SEAL		Seal Broken By: <i>SM</i>
	Date: 12/4/19	Time: 1930	Date: 12/05/19
	Name: <i>Scott Beesinger</i>		
	Company: <i>Beesinger</i>		

45369 DEC 05 2019



Must Deliver Next Business Day
Time and Temperature Sensitive!

45369

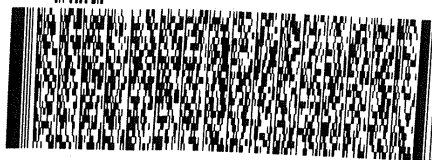
ORIGIN ID:SGRA (903) 930-6193
 SCOTT BEESINGER
 APTIM ENVIRONMENTAL & INFRASTRUCTURE
 1203-B EAST GRAND AVE
 PMB 202
 MARSHALL, TX 75670
 UNITED STATES US

SHIP DATE: 17OCT18
 ACTWT: 1.00 LB MAN
 CAD: 300130/CAF3211
 DIMS: 26x14x14 IN

TO CLIENT SERVICES
 ALS LABORATORY GROUP
 10450 STANCLIFF ROAD
 SUITE 210
 HOUSTON TX 77099

(281) 530-5666
 REF: LHAAP 67 - RJ

RMA: ||| ||| |||



FedEx
 TX# 4380 9533 6725

THU - 05 DEC 10:30A
 PRIORITY OVERNIGHT

AB SGRA

77099
 TX-US
 IAH



FTD 162785 04DEC19 G6GA 56AC2/1800/05A2



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

December 16, 2019

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

Work Order: **HS19120678**

Laboratory Results for: **Longhorn GW Treatment Plant Bi Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Dec 13, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

A handwritten signature in black ink, appearing to read "Raj. P. Modashia", enclosed in a circular scribble.

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
Work Order: HS19120678

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120678-01	LH18/24-SP650_121219	Water		12-Dec-2019 14:00	13-Dec-2019 09:00	<input type="checkbox"/>
HS19120678-02	Trip Blank	Water	CG 101419 -05	12-Dec-2019 00:00	13-Dec-2019 09:00	<input type="checkbox"/>

ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
Work Order: HS19120678

CASE NARRATIVE

GCMS Volatiles by Method SW8260**Batch ID: R352551****Sample ID: VLCSW-191215**

- 1,2,3-Trichlorobenzene and 1,2,4-Trichlorobenzene exceeded QC limits for LCS. CCV is OK. Samples are ND for these compounds..

Sample ID: LH18/24-SP650_121219 (HS19120678-01MS)

- MS/MSD failed QC limits for some compounds

WetChemistry by Method SW9056**Batch ID: R352614****Sample ID: HS19120363-06MS**

- MS and MSD are for an unrelated sample
-

ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Bi Weekly Samples
 Sample ID: LH18/24-SP650_121219
 Collection Date: 12-Dec-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19120678
 Lab ID:HS19120678-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
1,2-Dichloroethane	1.3		0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Dec-2019 15:52	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Dec-2019 15:52	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Dec-2019 15:52	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	15-Dec-2019 15:52	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Dec-2019 15:52	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:52	

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

ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Bi Weekly Samples
 Sample ID: LH18/24-SP650_121219
 Collection Date: 12-Dec-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19120678
 Lab ID:HS19120678-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
cis-1,2-Dichloroethene	38		0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Dec-2019 15:52	
Methylene chloride	1.9	J	0.40	1.0	2.0	UG/L	1	15-Dec-2019 15:52	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Trichloroethene	6.8		0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
Vinyl chloride	0.49	J	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:52	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.6</i>			0	<i>81-118</i>	%REC	1	15-Dec-2019 15:52	
<i>Surr: 4-Bromofluorobenzene</i>	<i>102</i>			0	<i>85-114</i>	%REC	1	15-Dec-2019 15:52	
<i>Surr: Dibromofluoromethane</i>	<i>93.9</i>			0	<i>80-119</i>	%REC	1	15-Dec-2019 15:52	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	%REC	1	15-Dec-2019 15:52	
ANIONS BY SW9056A		Method:SW9056						Analyst: KMU	
Chloride	425		2.00	5.00	5.00	mg/L	10	14-Dec-2019 14:06	
Sulfate	36.5		2.00	5.00	5.00	mg/L	10	14-Dec-2019 14:06	

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

ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Bi Weekly Samples
 Sample ID: Trip Blank
 Collection Date: 12-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19120678
 Lab ID:HS19120678-02
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:04
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 15:04
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:04
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:04
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:04
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 15:04
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 15:04
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:04
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:04
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 15:04
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:04
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 15:04
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:04
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:04
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:04
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Dec-2019 15:04
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Dec-2019 15:04
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:04
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Dec-2019 15:04
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	15-Dec-2019 15:04
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Dec-2019 15:04
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:04

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

ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Bi Weekly Samples
 Sample ID: Trip Blank
 Collection Date: 12-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19120678
 Lab ID:HS19120678-02
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:04
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:04
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Dec-2019 15:04
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Dec-2019 15:04
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Dec-2019 15:04
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:04
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:04
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Dec-2019 15:04
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Dec-2019 15:04
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.8</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>15-Dec-2019 15:04</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>15-Dec-2019 15:04</i>
<i>Surr: Dibromofluoromethane</i>	<i>92.9</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>15-Dec-2019 15:04</i>
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>15-Dec-2019 15:04</i>

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

ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19120678

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R352551 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19120678-01	LH18/24-SP650_121219	12 Dec 2019 14:00			15 Dec 2019 15:52	1
HS19120678-02	Trip Blank	12 Dec 2019 00:00			15 Dec 2019 15:04	1
Batch ID: R352614 (0)		Test Name : ANIONS BY SW9056A			Matrix: Water	
HS19120678-01	LH18/24-SP650_121219	12 Dec 2019 14:00			14 Dec 2019 14:06	10

ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19120678

QC BATCH REPORT

Batch ID: R352551 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191215	Units: UG/L			Analysis Date: 15-Dec-2019 14:40					
Client ID:	Run ID: VOA6_352551	SeqNo: 5391513		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-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
Bromomethane	0.50	1.0								U

ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19120678

QC BATCH REPORT

Batch ID: R352551 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191215	Units: UG/L			Analysis Date: 15-Dec-2019 14:40					
Client ID:	Run ID: VOA6_352551	SeqNo: 5391513	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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	45.21	1.0	50	0	90.4	81 - 118				
Surr: 4-Bromofluorobenzene	49.93	1.0	50	0	99.9	85 - 114				
Surr: Dibromofluoromethane	46.64	1.0	50	0	93.3	80 - 119				
Surr: Toluene-d8	51.05	1.0	50	0	102	89 - 112				

ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19120678

QC BATCH REPORT

Batch ID: R352551 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191215	Units: UG/L			Analysis Date: 15-Dec-2019 13:52					
Client ID:	Run ID: VOA6_352551	SeqNo: 5391512	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	21.23	1.0	20	0	106	78 - 124				
1,1,1-Trichloroethane	21.44	1.0	20	0	107	74 - 131				
1,1,2,2-Tetrachloroethane	22.34	1.0	20	0	112	71 - 121				
1,1,2-Trichloroethane	21.28	1.0	20	0	106	80 - 119				
1,1-Dichloroethane	23.07	1.0	20	0	115	77 - 125				
1,1-Dichloroethene	18.02	1.0	20	0	90.1	71 - 131				
1,1-Dichloropropene	21.29	1.0	20	0	106	78 - 125				
1,2,3-Trichlorobenzene	30.81	1.0	20	0	154	69 - 129				S
1,2,3-Trichloropropane	22.41	1.0	20	0	112	73 - 122				
1,2,4-Trichlorobenzene	26.33	1.0	20	0	132	69 - 130				S
1,2,4-Trimethylbenzene	21.99	1.0	20	0	110	76 - 124				
1,2-Dibromo-3-chloropropane	22.84	1.0	20	0	114	62 - 128				
1,2-Dibromoethane	21.03	1.0	20	0	105	77 - 121				
1,2-Dichlorobenzene	21.09	1.0	20	0	105	80 - 119				
1,2-Dichloroethane	20.96	1.0	20	0	105	73 - 128				
1,2-Dichloropropane	21.82	1.0	20	0	109	78 - 122				
1,3,5-Trimethylbenzene	22.44	1.0	20	0	112	75 - 124				
1,3-Dichlorobenzene	21.7	1.0	20	0	109	80 - 119				
1,3-Dichloropropane	21.52	1.0	20	0	108	80 - 119				
1,4-Dichlorobenzene	21.2	1.0	20	0	106	79 - 118				
2,2-Dichloropropane	21.59	1.0	20	0	108	60 - 139				
2-Butanone	45.2	2.0	40	0	113	56 - 143				
2-Chlorotoluene	23.31	1.0	20	0	117	79 - 122				
2-Hexanone	41.53	2.0	40	0	104	57 - 139				
4-Chlorotoluene	22.47	1.0	20	0	112	78 - 122				
4-Isopropyltoluene	21.68	1.0	20	0	108	77 - 127				
4-Methyl-2-pentanone	42.83	2.0	40	0	107	67 - 130				
Acetone	34.88	2.0	40	0	87.2	39 - 160				
Benzene	22.88	1.0	20	0	114	79 - 120				
Bromobenzene	22.42	1.0	20	0	112	80 - 120				
Bromochloromethane	22.07	1.0	20	0	110	78 - 123				
Bromodichloromethane	21.39	1.0	20	0	107	79 - 125				
Bromoform	20.5	1.0	20	0	102	66 - 130				
Bromomethane	18.26	1.0	20	0	91.3	53 - 141				

ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19120678

QC BATCH REPORT

Batch ID: R352551 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191215	Units: UG/L			Analysis Date: 15-Dec-2019 13:52					
Client ID:	Run ID: VOA6_352551	SeqNo: 5391512		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	49.13	2.0	40	0	123	64 - 133				
Carbon tetrachloride	20.23	1.0	20	0	101	72 - 136				
Chlorobenzene	21.13	1.0	20	0	106	82 - 118				
Chloroethane	18.57	1.0	20	0	92.9	60 - 138				
Chloroform	20.78	1.0	20	0	104	79 - 124				
Chloromethane	18.28	1.0	20	0	91.4	50 - 139				
cis-1,2-Dichloroethene	23.16	1.0	20	0	116	78 - 123				
cis-1,3-Dichloropropene	22.33	1.0	20	0	112	75 - 124				
Dibromochloromethane	21.11	1.0	20	0	106	74 - 126				
Dibromomethane	20.95	1.0	20	0	105	79 - 123				
Dichlorodifluoromethane	22.29	1.0	20	0	111	32 - 152				
Ethylbenzene	21.05	1.0	20	0	105	79 - 121				
Hexachlorobutadiene	25.86	1.0	20	0	129	66 - 134				
Isopropylbenzene	20.87	1.0	20	0	104	72 - 131				
m,p-Xylene	42.95	2.0	40	0	107	80 - 121				
Methylene chloride	21.77	2.0	20	0	109	74 - 124				
Naphthalene	24.8	1.0	20	0	124	61 - 128				
n-Butylbenzene	21.45	1.0	20	0	107	75 - 128				
n-Propylbenzene	22.46	1.0	20	0	112	76 - 126				
o-Xylene	21.2	1.0	20	0	106	78 - 122				
sec-Butylbenzene	21.9	1.0	20	0	110	77 - 126				
Styrene	21.23	1.0	20	0	106	78 - 123				
tert-Butylbenzene	21.9	1.0	20	0	110	78 - 124				
Tetrachloroethene	20.12	1.0	20	0	101	74 - 129				
Toluene	21.78	1.0	20	0	109	80 - 121				
trans-1,2-Dichloroethene	22.73	1.0	20	0	114	75 - 124				
trans-1,3-Dichloropropene	21.65	1.0	20	0	108	73 - 127				
Trichloroethene	21.95	1.0	20	0	110	79 - 123				
Trichlorofluoromethane	17.48	1.0	20	0	87.4	65 - 141				
Vinyl chloride	18.95	1.0	20	0	94.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	49.52	1.0	50	0	99.0	81 - 118				
Surr: 4-Bromofluorobenzene	49.42	1.0	50	0	98.8	85 - 114				
Surr: Dibromofluoromethane	49.06	1.0	50	0	98.1	80 - 119				
Surr: Toluene-d8	46.68	1.0	50	0	93.4	89 - 112				

ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19120678

QC BATCH REPORT

Batch ID: R352551 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS		Sample ID: HS19120678-01MS		Units: UG/L		Analysis Date: 15-Dec-2019 17:52				
Client ID: LH18/24-SP650_121219		Run ID: VOA6_352551		SeqNo: 5391520		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	19.83	1.0	20	0	99.1	78 - 124				
1,1,1-Trichloroethane	18.56	1.0	20	0	92.8	74 - 131				
1,1,2,2-Tetrachloroethane	20.19	1.0	20	0	101	71 - 121				
1,1,2-Trichloroethane	19.42	1.0	20	0	97.1	80 - 119				
1,1-Dichloroethane	19.27	1.0	20	0	96.3	77 - 125				
1,1-Dichloroethene	14.21	1.0	20	0	71.0	71 - 131				
1,1-Dichloropropene	19.43	1.0	20	0	97.2	78 - 125				
1,2,3-Trichlorobenzene	20.18	1.0	20	0	101	69 - 129				
1,2,3-Trichloropropane	19.74	1.0	20	0	98.7	73 - 122				
1,2,4-Trichlorobenzene	19.77	1.0	20	0	98.8	69 - 130				
1,2,4-Trimethylbenzene	21.89	1.0	20	0	109	76 - 124				
1,2-Dibromo-3-chloropropane	18.21	1.0	20	0	91.0	62 - 128				
1,2-Dibromoethane	18.66	1.0	20	0	93.3	77 - 121				
1,2-Dichlorobenzene	19.75	1.0	20	0	98.7	80 - 119				
1,2-Dichloroethane	18.75	1.0	20	1.252	87.5	73 - 128				
1,2-Dichloropropane	19.17	1.0	20	0	95.9	78 - 122				
1,3,5-Trimethylbenzene	22.44	1.0	20	0	112	75 - 124				
1,3-Dichlorobenzene	21.01	1.0	20	0	105	80 - 119				
1,3-Dichloropropane	19.54	1.0	20	0	97.7	80 - 119				
1,4-Dichlorobenzene	20.3	1.0	20	0	102	79 - 118				
2,2-Dichloropropane	17.84	1.0	20	0	89.2	60 - 139				
2-Butanone	33.01	2.0	40	0	82.5	56 - 143				
2-Chlorotoluene	23.18	1.0	20	0	116	79 - 122				
2-Hexanone	34.55	2.0	40	0	86.4	57 - 139				
4-Chlorotoluene	21.88	1.0	20	0	109	78 - 122				
4-Isopropyltoluene	21.97	1.0	20	0	110	77 - 127				
4-Methyl-2-pentanone	36.61	2.0	40	0	91.5	67 - 130				
Acetone	21.74	2.0	40	0	54.4	39 - 160				
Benzene	20.1	1.0	20	0	101	79 - 120				
Bromobenzene	21.27	1.0	20	0	106	80 - 120				
Bromochloromethane	17.57	1.0	20	0	87.9	78 - 123				
Bromodichloromethane	18.42	1.0	20	0	92.1	79 - 125				
Bromoform	18.04	1.0	20	0	90.2	66 - 130				
Bromomethane	10.51	1.0	20	0	52.5	53 - 141			S	

ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19120678

QC BATCH REPORT

Batch ID: R352551 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS		Sample ID: HS19120678-01MS		Units: UG/L		Analysis Date: 15-Dec-2019 17:52				
Client ID: LH18/24-SP650_121219		Run ID: VOA6_352551		SeqNo: 5391520		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Carbon disulfide	33.41	2.0	40	0	83.5	64 - 133				
Carbon tetrachloride	18.66	1.0	20	0	93.3	72 - 136				
Chlorobenzene	19.63	1.0	20	0	98.1	82 - 118				
Chloroethane	11.78	1.0	20	0	58.9	60 - 138			S	
Chloroform	17.59	1.0	20	0	87.9	79 - 124				
Chloromethane	5.655	1.0	20	0	28.3	50 - 139			S	
cis-1,2-Dichloroethene	56.78	1.0	20	37.62	95.8	78 - 123				
cis-1,3-Dichloropropene	19.14	1.0	20	0	95.7	75 - 124				
Dibromochloromethane	18.96	1.0	20	0	94.8	74 - 126				
Dibromomethane	17.85	1.0	20	0	89.3	79 - 123				
Dichlorodifluoromethane	2.723	1.0	20	0	13.6	32 - 152			S	
Ethylbenzene	20.48	1.0	20	0	102	79 - 121				
Hexachlorobutadiene	21.83	1.0	20	0	109	66 - 134				
Isopropylbenzene	20.51	1.0	20	0	103	72 - 131				
m,p-Xylene	40.79	2.0	40	0	102	80 - 121				
Methylene chloride	19.4	2.0	20	1.926	87.4	74 - 124				
Naphthalene	17.48	1.0	20	0	87.4	61 - 128				
n-Butylbenzene	21.32	1.0	20	0	107	75 - 128				
n-Propylbenzene	22.7	1.0	20	0	113	76 - 126				
o-Xylene	19.81	1.0	20	0	99.0	78 - 122				
sec-Butylbenzene	22.27	1.0	20	0	111	77 - 126				
Styrene	19.69	1.0	20	0	98.4	78 - 123				
tert-Butylbenzene	22.7	1.0	20	0	114	78 - 124				
Tetrachloroethene	19.6	1.0	20	0	98.0	74 - 129				
Toluene	20.73	1.0	20	0	104	80 - 121				
trans-1,2-Dichloroethene	18.8	1.0	20	0	94.0	75 - 124				
trans-1,3-Dichloropropene	18.22	1.0	20	0	91.1	73 - 127				
Trichloroethene	27.41	1.0	20	6.751	103	79 - 123				
Trichlorofluoromethane	12.65	1.0	20	0	63.3	65 - 141			S	
Vinyl chloride	9.004	1.0	20	0.493	42.6	58 - 137			S	
Surr: 1,2-Dichloroethane-d4	45.04	1.0	50	0	90.1	81 - 118				
Surr: 4-Bromofluorobenzene	49.88	1.0	50	0	99.8	85 - 114				
Surr: Dibromofluoromethane	46.67	1.0	50	0	93.3	80 - 119				
Surr: Toluene-d8	50.66	1.0	50	0	101	89 - 112				

ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19120678

QC BATCH REPORT

Batch ID: R352551 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19120678-01MSD	Units: UG/L			Analysis Date: 15-Dec-2019 18:16					
Client ID: LH18/24-SP650_121219	Run ID: VOA6_352551	SeqNo: 5391521	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	19.19	1.0	20	0	96.0	78 - 124	19.83	3.25	20	
1,1,1-Trichloroethane	17.61	1.0	20	0	88.1	74 - 131	18.56	5.25	20	
1,1,2,2-Tetrachloroethane	20.08	1.0	20	0	100	71 - 121	20.19	0.524	20	
1,1,2-Trichloroethane	19.18	1.0	20	0	95.9	80 - 119	19.42	1.24	20	
1,1-Dichloroethane	18.52	1.0	20	0	92.6	77 - 125	19.27	3.93	20	
1,1-Dichloroethene	13.7	1.0	20	0	68.5	71 - 131	14.21	3.64	20	S
1,1-Dichloropropene	18.5	1.0	20	0	92.5	78 - 125	19.43	4.91	20	
1,2,3-Trichlorobenzene	21.11	1.0	20	0	106	69 - 129	20.18	4.52	20	
1,2,3-Trichloropropane	19.96	1.0	20	0	99.8	73 - 122	19.74	1.09	20	
1,2,4-Trichlorobenzene	20.11	1.0	20	0	101	69 - 130	19.77	1.69	20	
1,2,4-Trimethylbenzene	21.09	1.0	20	0	105	76 - 124	21.89	3.73	20	
1,2-Dibromo-3-chloropropane	17.8	1.0	20	0	89.0	62 - 128	18.21	2.25	20	
1,2-Dibromoethane	18.39	1.0	20	0	91.9	77 - 121	18.66	1.48	20	
1,2-Dichlorobenzene	19.61	1.0	20	0	98.1	80 - 119	19.75	0.7	20	
1,2-Dichloroethane	18.36	1.0	20	1.252	85.5	73 - 128	18.75	2.12	20	
1,2-Dichloropropane	18.82	1.0	20	0	94.1	78 - 122	19.17	1.85	20	
1,3,5-Trimethylbenzene	21.9	1.0	20	0	110	75 - 124	22.44	2.42	20	
1,3-Dichlorobenzene	20.23	1.0	20	0	101	80 - 119	21.01	3.74	20	
1,3-Dichloropropane	19.23	1.0	20	0	96.1	80 - 119	19.54	1.6	20	
1,4-Dichlorobenzene	19.86	1.0	20	0	99.3	79 - 118	20.3	2.22	20	
2,2-Dichloropropane	16.83	1.0	20	0	84.1	60 - 139	17.84	5.83	20	
2-Butanone	32.75	2.0	40	0	81.9	56 - 143	33.01	0.778	20	
2-Chlorotoluene	22.28	1.0	20	0	111	79 - 122	23.18	3.99	20	
2-Hexanone	34.24	2.0	40	0	85.6	57 - 139	34.55	0.895	20	
4-Chlorotoluene	21.16	1.0	20	0	106	78 - 122	21.88	3.34	20	
4-Isopropyltoluene	21.11	1.0	20	0	106	77 - 127	21.97	3.98	20	
4-Methyl-2-pentanone	36.05	2.0	40	0	90.1	67 - 130	36.61	1.55	20	
Acetone	21.28	2.0	40	0	53.2	39 - 160	21.74	2.14	20	
Benzene	19.17	1.0	20	0	95.9	79 - 120	20.1	4.75	20	
Bromobenzene	20.68	1.0	20	0	103	80 - 120	21.27	2.83	20	
Bromochloromethane	17.4	1.0	20	0	87.0	78 - 123	17.57	1.01	20	
Bromodichloromethane	18.07	1.0	20	0	90.3	79 - 125	18.42	1.93	20	
Bromoform	17.69	1.0	20	0	88.4	66 - 130	18.04	1.97	20	
Bromomethane	9.339	1.0	20	0	46.7	53 - 141	10.51	11.8	20	S

ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19120678

QC BATCH REPORT

Batch ID: R352551 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19120678-01MSD	Units: UG/L			Analysis Date: 15-Dec-2019 18:16					
Client ID: LH18/24-SP650_121219	Run ID: VOA6_352551	SeqNo: 5391521	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	31.55	2.0	40	0	78.9	64 - 133	33.41	5.71	20	
Carbon tetrachloride	17.75	1.0	20	0	88.7	72 - 136	18.66	5.02	20	
Chlorobenzene	18.88	1.0	20	0	94.4	82 - 118	19.63	3.87	20	
Chloroethane	10.94	1.0	20	0	54.7	60 - 138	11.78	7.45	20	S
Chloroform	16.98	1.0	20	0	84.9	79 - 124	17.59	3.51	20	
Chloromethane	5.384	1.0	20	0	26.9	50 - 139	5.655	4.9	20	S
cis-1,2-Dichloroethene	55.13	1.0	20	37.62	87.5	78 - 123	56.78	2.95	20	
cis-1,3-Dichloropropene	18.75	1.0	20	0	93.8	75 - 124	19.14	2.06	20	
Dibromochloromethane	18.8	1.0	20	0	94.0	74 - 126	18.96	0.85	20	
Dibromomethane	17.7	1.0	20	0	88.5	79 - 123	17.85	0.864	20	
Dichlorodifluoromethane	2.615	1.0	20	0	13.1	32 - 152	2.723	4.03	20	S
Ethylbenzene	19.7	1.0	20	0	98.5	79 - 121	20.48	3.85	20	
Hexachlorobutadiene	21.07	1.0	20	0	105	66 - 134	21.83	3.54	20	
Isopropylbenzene	19.71	1.0	20	0	98.5	72 - 131	20.51	3.97	20	
m,p-Xylene	39.36	2.0	40	0	98.4	80 - 121	40.79	3.57	20	
Methylene chloride	18.67	2.0	20	1.926	83.7	74 - 124	19.4	3.83	20	
Naphthalene	18.12	1.0	20	0	90.6	61 - 128	17.48	3.59	20	
n-Butylbenzene	20.87	1.0	20	0	104	75 - 128	21.32	2.11	20	
n-Propylbenzene	21.92	1.0	20	0	110	76 - 126	22.7	3.46	20	
o-Xylene	19.49	1.0	20	0	97.5	78 - 122	19.81	1.6	20	
sec-Butylbenzene	21.51	1.0	20	0	108	77 - 126	22.27	3.5	20	
Styrene	19.2	1.0	20	0	96.0	78 - 123	19.69	2.52	20	
tert-Butylbenzene	21.65	1.0	20	0	108	78 - 124	22.7	4.73	20	
Tetrachloroethene	18.81	1.0	20	0	94.1	74 - 129	19.6	4.09	20	
Toluene	19.84	1.0	20	0	99.2	80 - 121	20.73	4.38	20	
trans-1,2-Dichloroethene	17.98	1.0	20	0	89.9	75 - 124	18.8	4.49	20	
trans-1,3-Dichloropropene	17.77	1.0	20	0	88.8	73 - 127	18.22	2.52	20	
Trichloroethene	25.67	1.0	20	6.751	94.6	79 - 123	27.41	6.54	20	
Trichlorofluoromethane	11.99	1.0	20	0	59.9	65 - 141	12.65	5.39	20	S
Vinyl chloride	8.359	1.0	20	0.493	39.3	58 - 137	9.004	7.43	20	S
Surr: 1,2-Dichloroethane-d4	45.73	1.0	50	0	91.5	81 - 118	45.04	1.51	20	
Surr: 4-Bromofluorobenzene	49.33	1.0	50	0	98.7	85 - 114	49.88	1.12	20	
Surr: Dibromofluoromethane	47.07	1.0	50	0	94.1	80 - 119	46.67	0.862	20	
Surr: Toluene-d8	50.93	1.0	50	0	102	89 - 112	50.66	0.541	20	

ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19120678

QC BATCH REPORT**Batch ID:** R352551 (0)**Instrument:** VOA6**Method:** VOLATILES ORGANICS BY METHOD
8260C

The following samples were analyzed in this batch:

HS19120678-01	HS19120678-02
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ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19120678

QC BATCH REPORT

Batch ID: R352614 (0)		Instrument: ICS-Integrion		Method: ANIONS BY SW9056A						
MBLK	Sample ID: WBLKW3-121319	Units: mg/L			Analysis Date: 14-Dec-2019 11:53					
Client ID:	Run ID: ICS-Integrion_352614	SeqNo: 5392610		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	0.500	0.500							U	
Sulfate	0.500	0.500							U	
LCS	Sample ID: WLCSW3-121319	Units: mg/L			Analysis Date: 14-Dec-2019 12:09					
Client ID:	Run ID: ICS-Integrion_352614	SeqNo: 5392611		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	19.68	0.500	20	0	98.4	80 - 120				
Sulfate	19.51	0.500	20	0	97.5	80 - 120				
LCSD	Sample ID: WLCSDW3-121319	Units: mg/L			Analysis Date: 14-Dec-2019 12:26					
Client ID:	Run ID: ICS-Integrion_352614	SeqNo: 5392612		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	19.6	0.500	20	0	98.0	80 - 120	19.68	0.362	20	
Sulfate	19.39	0.500	20	0	96.9	80 - 120	19.51	0.619	20	
MS	Sample ID: HS19120363-06MS	Units: mg/L			Analysis Date: 14-Dec-2019 19:21					
Client ID:	Run ID: ICS-Integrion_352614	SeqNo: 5392627		PrepDate:			DF: 100			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	2344	50.0	1000	1398	94.6	80 - 120				
Sulfate	1366	50.0	1000	409.2	95.7	80 - 120				
MS	Sample ID: HS19120363-06MS	Units: mg/L			Analysis Date: 14-Dec-2019 18:31					
Client ID:	Run ID: ICS-Integrion_352614	SeqNo: 5392624		PrepDate:			DF: 10			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	1467	5.00	100	1398	69.5	80 - 120			SEO	
Sulfate	509.1	5.00	100	420.3	88.8	80 - 120			O	

ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19120678

QC BATCH REPORT

Batch ID: R352614 (0)		Instrument: ICS-Integrion		Method: ANIONS BY SW9056A						
MSD	Sample ID: HS19120363-06MSD	Units: mg/L			Analysis Date: 14-Dec-2019 19:38					
Client ID:	Run ID: ICS-Integrion_352614	SeqNo: 5392628		PrepDate:			DF: 100			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	2339	50.0	1000	1398	94.1	80 - 120	2344	0.218	20	
Sulfate	1361	50.0	1000	409.2	95.2	80 - 120	1366	0.397	20	
MSD	Sample ID: HS19120363-06MSD	Units: mg/L			Analysis Date: 14-Dec-2019 18:48					
Client ID:	Run ID: ICS-Integrion_352614	SeqNo: 5392625		PrepDate:			DF: 10			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1467	5.00	100	1398	69.3	80 - 120	1467	0.0143	20	SEO
Sulfate	505.2	5.00	100	420.3	84.9	80 - 120	509.1	0.773	20	O

The following samples were analyzed in this batch: HS19120678-01

ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19120678

**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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US

Date: 16-Dec-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
Work Order: HS19120678

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19120678-01	LH18/24-SP650_121219	Login	12/13/2019 1:51:57 PM	JRM	WET037
HS19120678-01	LH18/24-SP650_121219	Login	12/13/2019 1:51:57 PM	JRM	VOA041
HS19120678-02	Trip Blank	Login	12/13/2019 1:51:57 PM	JRM	VOA041

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19120678

Date/Time Received: **13-Dec-2019 09:00**
 Received by: **JRM**

Checklist completed by: Jared R. Makan 13-Dec-2019
 eSignature Date

Reviewed by: RJ Modashia 13-Dec-2019
 eSignature Date

Matrices: **Water**

Carrier name: **FedEx Priority Overnight**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes No Not Present
- Chain of custody present? Yes No 1 Page(s)
- Chain of custody signed when relinquished and received? Yes No
- Samplers name present on COC? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s):

2.1°C / 2.10°C UC/C	IR11
---------------------	------

Cooler(s)/Kit(s):

44180

Date/Time sample(s) sent to storage:

12/13/2019 13:54

- 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:

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Login Notes:

Client Contacted: _____ Date Contacted: _____ Person Contacted: _____
 Contacted By: _____ Regarding: _____

Comments:

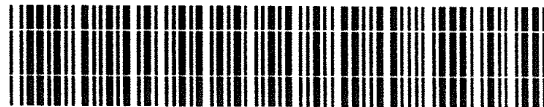
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Corrective Action:


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CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210, Houston, Tx. 77099 ATTN: R.J. Modashia

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS			Project No. NWO1312.0150.0 16.0001		Analyses										Remarks (Preservatives, etc.)	Lab I.D.#									
Job: GROUNDWATER TREATMENT PLANT BI-WEEKLY SAMPLES					MS / MSD	No. OF CONTAINERS	VOC	CHLORIDE, SULFATE																	
Prepared By: Scott Beesinger			P.O Number																						
Field Sample I.D.	Sample Matrix	Date / Time																							
LH18/24-SP650_121219	Water	12/12/19 / 14:00	3	3																HCL					
LH18/24-SP650_121219	Water	12/12/19 / 14:00	1	1																NONE					
Trip Blank	Water	12/12/19	2	2																HCL					
										HS19120678 Bhate Environmental Associates, Inc. Longhorn GW Treatment Plant Bi Weekly Sample:															
																									
Additional Remarks: Standard TAT on Chloride & Sulfate. 24 Hour TAT on VOC																									
Relinquished By:		Date	Time	Received By:		Date	Time	Relinquished By:		Date	Time	Received By:		Date	Time	Received By:		Date	Time	Received By:		Date	Time		
<i>Scott Beesinger</i>		12/12/19	14:30	<i>JM</i>		12/13/19	9:00																		
9 For Lab Use Only																									
Received At Lab By:		Date	Time	Airbill No.	Opened By:		Date	Time	Temp of Container	Seal No.	Condition														
Remarks <div style="text-align: center;"> UIC 2.1 IR11 C/F-Ⓢ 44180 </div>																									

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly


 ALS 10450 Stancilff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	Date:	12/12/19	Time:	1430	Seal Broken By:	
	Name:	Scott Buesing			JM	
	Company:	BNA79			Date:	12/13/19

FedEx
 TRK# 1251 0292 6030
 TF 0221
 102

AB SGRA

FRI - 13 DEC 10:30A
PRIORITY OVERNIGHT

77099
 TX - US IAH



18DD/05A2



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

January 09, 2020

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

Work Order: **HS19120679**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Dec 13, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

A handwritten signature in black ink, appearing to read 'Raj. P. Modashia', enclosed in a circular scribble.

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US

Date: 09-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19120679

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19120679-01	LH18/24-SP650_121219	Water		12-Dec-2019 14:00	13-Dec-2019 09:00	<input type="checkbox"/>
HS19120679-02	LH18/24-SP650_121219_AIX	Water		12-Dec-2019 14:00	13-Dec-2019 09:00	<input type="checkbox"/>

ALS Houston, US

Date: 09-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19120679

CASE NARRATIVE**Work Order Comments**

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

Work Order Comments

- The analysis for TOC was subcontracted to ALS Environmental in Kelso, WA. Final Report attached.
-

WetChemistry by Method E365.3**Batch ID: R353505**

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

WetChemistry by Method E350.3**Batch ID: R352786**

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

ALS Houston, US

Date: 09-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Weekly Samples
 Sample ID: LH18/24-SP650_121219
 Collection Date: 12-Dec-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19120679
 Lab ID:HS19120679-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)								Analyst: MZD
	Method:E350.3							
Nitrogen, Ammonia (As N)	8.0	a	0.20	0.10	0.20	mg/L	1	18-Dec-2019 09:15
ORTHO PHOSPHATE (PO4) AS P BY E365.3								Analyst: KVL
	Method:E365.3							
Phosphorus, Total Orthophosphate (As P)	1.23	a	0.0500	0.125	0.125	mg/L	5	13-Dec-2019 16:00
SUBCONTRACT ANALYSIS - TOC ANALYSIS								Analyst: SUBK
	Method:NA							
Subcontract Analysis	See Attached		0	0		NA	1	09-Jan-2020 15:54

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

ALS Houston, US

Date: 09-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Weekly Samples
 Sample ID: LH18/24-SP650_121219_AIX
 Collection Date: 12-Dec-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19120679
 Lab ID:HS19120679-02
 Matrix:Water

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	30-Dec-2019 17:31

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

ALS Houston, US

Date: 09-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19120679

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R352786 (0)		Test Name : AMMONIA AS N BY E350.3(ISE)			Matrix: Water	
HS19120679-01	LH18/24-SP650_121219	12 Dec 2019 14:00			18 Dec 2019 09:15	1
Batch ID: R353505 (0)		Test Name : ORTHO PHOSPHATE (PO4) AS P BY E365.3			Matrix: Water	
HS19120679-01	LH18/24-SP650_121219	12 Dec 2019 14:00			13 Dec 2019 16:00	5
Batch ID: R353541 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Water	
HS19120679-02	LH18/24-SP650_121219_AIX	12 Dec 2019 14:00			30 Dec 2019 17:31	1
Batch ID: R354153 (0)		Test Name : SUBCONTRACT ANALYSIS - TOC ANALYSIS			Matrix: Water	
HS19120679-01	LH18/24-SP650_121219	12 Dec 2019 14:00			09 Jan 2020 15:54	1

ALS Houston, US

Date: 09-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19120679

QC BATCH REPORT

Batch ID: R352786 (0)		Instrument: WetChem_HS		Method: AMMONIA AS N BY E350.3(ISE)						
MBLK	Sample ID: MBLK-352786	Units: mg/L			Analysis Date: 18-Dec-2019 09:15					
Client ID:	Run ID: WetChem_HS_352786	SeqNo: 5397364			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Nitrogen, Ammonia (As N)	0.10	0.20							U	
LCS	Sample ID: LCS-352786	Units: mg/L			Analysis Date: 18-Dec-2019 09:15					
Client ID:	Run ID: WetChem_HS_352786	SeqNo: 5397365			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Nitrogen, Ammonia (As N)	9.665	0.20	10	0	96.6	80 - 120				
MS	Sample ID: HS19120697-01MS	Units: mg/L			Analysis Date: 18-Dec-2019 09:15					
Client ID:	Run ID: WetChem_HS_352786	SeqNo: 5397367			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Nitrogen, Ammonia (As N)	10.07	0.20	10	0.908	91.7	80 - 120				
MSD	Sample ID: HS19120697-01MSD	Units: mg/L			Analysis Date: 18-Dec-2019 09:15					
Client ID:	Run ID: WetChem_HS_352786	SeqNo: 5397368			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Nitrogen, Ammonia (As N)	9.956	0.20	10	0.908	90.5	80 - 120	10.07	1.18	20	

The following samples were analyzed in this batch: HS19120679-01

ALS Houston, US

Date: 09-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19120679

QC BATCH REPORT

Batch ID:	R353505 (0)	Instrument:	UV-2450	Method:	ORTHO PHOSPHATE (PO4) AS P BY E365.3					
MBLK	Sample ID: MBLK-R353505	Units: mg/L		Analysis Date: 13-Dec-2019 16:00						
Client ID:	Run ID: UV-2450_353505	SeqNo: 5415111		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.0250	0.0250							U	
LCS	Sample ID: LCS-R353505	Units: mg/L		Analysis Date: 13-Dec-2019 16:00						
Client ID:	Run ID: UV-2450_353505	SeqNo: 5415110		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.238	0.0250	0.25	0	95.2	85 - 115				
MS	Sample ID: HS19120679-01MS	Units: mg/L		Analysis Date: 13-Dec-2019 16:00						
Client ID: LH18/24-SP650_121219	Run ID: UV-2450_353505	SeqNo: 5415113		PrepDate:		DF: 5				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	2.405	0.125	1.25	1.23	94.0	80 - 120				
MSD	Sample ID: HS19120679-01MSD	Units: mg/L		Analysis Date: 13-Dec-2019 16:00						
Client ID: LH18/24-SP650_121219	Run ID: UV-2450_353505	SeqNo: 5415112		PrepDate:		DF: 5				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	2.385	0.125	1.25	1.23	92.4	80 - 120	2.405	0.835	20	

The following samples were analyzed in this batch:

ALS Houston, US

Date: 09-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19120679

**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 Quantitation 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 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: 09-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19120679

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19120679-01	LH18/24-SP650_121219	Login	12/13/2019 1:57:24 PM	JRM	MET081
HS19120679-01	LH18/24-SP650_121219	Login	12/13/2019 1:57:24 PM	JRM	WET116
HS19120679-01	LH18/24-SP650_121219	Login	12/13/2019 1:57:24 PM	JRM	Sub
HS19120679-02	LH18/24-SP650_121219_AIX	Login	12/13/2019 1:57:24 PM	JRM	Sub

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19120679

Date/Time Received: **13-Dec-2019 09:00**
 Received by: **JRM**

Checklist completed by: Jared R. Makan 13-Dec-2019
 eSignature Date

Reviewed by: RJ Modashia 13-Dec-2019
 eSignature Date

Matrices: **Water**

Carrier name: **FedEx Priority Overnight**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Samplers name present on COC? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s):

2.1°C / 2.1° UC/C	IR11
-------------------	------

Cooler(s)/Kit(s):

44180

Date/Time sample(s) sent to storage:

12/13/2019 14:00

- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH acceptable upon receipt? Yes No N/A
- pH adjusted? Yes No N/A

pH adjusted by:

--

Login Notes:

Client Contacted: Date Contacted: Person Contacted:
 Contacted By: Regarding:

Comments:

--

Corrective Action:

--

CHAIN OF CUSTODY

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

Page 1 of 1

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS			Project No. NWO1312.0150.0 16.0001			Analyses										Remarks (Preservatives, etc.)	Lab I.D.#
Job: GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES																	
Prepared By: Scott Beesinger			P.O. Number														
Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE									
LH18/24-SP650_121219	Water	12/12/19 / 14:00		3	X	X											H2SO4
LH18/24-SP650_121219	Water	12/12/19 / 14:00		1			X										NONE
LH18/24 -SP650_121219_AIX	Water	12/12/19 / 14:00		1				X									NONE

Additional Remarks: Standard TAT on all parameters

Relinquished By: <i>Scott Beesinger</i>	Date 12/12/19	Time 14:30	Received By: <i>JM</i>	Date 12/13/19	Time 9:00	Relinquished By:	Date	Time	Received By:	Date	Time
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For Lab Use Only										
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition	
Remarks: <i>2.4C TRU CIF-0 44180</i>										

HS19120679

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Weekly Samples



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

Date:
 Name:
 Comp:

CUSTODY SEAL
 12/12/19 Time: 1430
 Name: Scott BARNETT
 any: BNATG

Seal Broken By:
 Date: 12/13/19

FedEx
 TRK# 1251 0292 6030
 TF 0221
 02

FRI - 13 DEC 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

January 09, 2020

Analytical Report for Service Request No: K2000090

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

RE: HS19120679

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 07, 2020
For your reference, these analyses have been assigned our service request number **K2000090**.

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy
Project Manager



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

Table of Contents

Acronyms

Qualifiers

State Certifications, Accreditations, And Licenses

Case Narrative

Chain of Custody

General Chemistry

Raw Data

 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.pjllabs.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/analyte is offered by that state.



Case Narrative

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



Client: ALS Environmental - US
Project: HS19120679
Sample Matrix: Water

Service Request: K2000090
Date Received: 01/07/2020

CASE NARRATIVE

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

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 01/07/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by

Kelley Avejoy

Date

01/09/2020



Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
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10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

K2000090

Subcontract Chain of Custody

SAMPLING STATE: Dept of Defense

COC ID: 13019

SUBCONTRACT TO:

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

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19120679
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19120679-01	LH18/24-SP650_121219	Water	12 Dec 2019 14:00
TOC Analysis for DOD Level IV			09 Jan 2020

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: *[Signature]*
Received By: *[Signature]*
Cooler ID(s): _____

Date/Time: 1/6/2020 1800.
Date/Time: 1/7/2020 0945
Temperature(s): _____



PC KL

Cooler Receipt and Preservation Form

Client ALS Houston Service Request K20 00090

Received: 1/7/2020 Opened: 1/7/2020 By: CG Unloaded: 1/7/2020 By: CG

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

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
-0.5	-0.7	0.5	0.3	-0.2	390	13019	1251 0293 4050		

- 4. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Slegves
- 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	Out of	Head-	Broke	pH	Reagent	Volume	Reagent Lot	Initials	Time
	Bottle Type	Temp	space				added	Number		

Notes, Discrepancies, & Resolutions: _____

RUSH



General Chemistry

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

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: ALS Environmental - US
Project: HS19120679
Sample Matrix: Water
Analysis Method: SM 5310 C
Prep Method: None

Service Request: K2000090
Date Collected: 12/12/19
Date Received: 01/7/20
Units: mg/L
Basis: NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_121219	K2000090-001	0.99	0.50	0.20	0.07	1	01/08/20 01:46	
Method Blank	K2000090-MB	ND U	0.50	0.20	0.07	1	01/07/20 18:52	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19120679
Sample Matrix: Water

Service Request: K2000090
Date Collected: 12/12/19
Date Received: 01/07/20
Date Analyzed: 01/08/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name: LH18/24-SP650_121219
Lab Code: K2000090-001

Units: mg/L
Basis: NA

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>LOQ</u>	<u>LOD</u>	<u>MDL</u>	<u>Sample Result</u>	<u>Duplicate Sample K2000090-001DUP Result</u>	<u>Average</u>	<u>RPD</u>	<u>RPD Limit</u>
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	0.99	0.89	0.939	11 #	10

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

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

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

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19120679
Sample Matrix: Water

Service Request: K2000090
Date Analyzed: 01/07/20
Date Extracted: NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method: SM 5310 C
Prep Method: None

Units: mg/L
Basis: NA
Analysis Lot: 665574

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2000090-LCS	26.5	25.0	106	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19120679

Service Request: K2000090

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	665574	KQ2000092-01	01/07/20 18:23	25.0	25.5	102	90-110
CCV2	665574	KQ2000092-02	01/07/20 22:26	25.0	25.4	102	90-110
CCV3	665574	KQ2000092-03	01/08/20 02:14	25.0	25.3	101	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19120679

Service Request:K2000090

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	665574	KQ2000092-04	01/07/20 18:38	0.50	0.20	0.07	ND	U
CCB2	665574	KQ2000092-05	01/07/20 22:40	0.50	0.20	0.07	ND	U
CCB3	665574	KQ2000092-06	01/08/20 02:28	0.50	0.20	0.07	ND	U



Raw Data

ALS Environmental—Kelso Laboratory
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General Chemistry

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Work Request # ^{Original} () K1911998, 2140, 2160, K2000034, 35, 90, T1901631
 Tier: IV II II IV IV IV IV
 Date Analyzed: 1/7/2020 TOC: 665574
 Analyst: BCP Run # DOC: 665575
 Analysis: TOC/DOC

**DATA QUALITY REPORT
INORGANICS**

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

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

COMMENTS: k2000035-1/1d, 35-2/2d, 90-1/1d report on high % RSR
However, these samples are less than six the MRL.

Final Approved by: Handwritten Signature Date: 01/08/20

DQREPORT

Analytical Results Summary

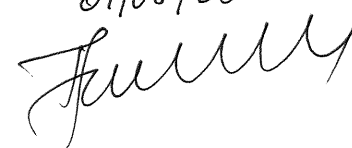
Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 665574 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
K1911998-003	Carbon, Total Organic	N/A		Ground Water	5.81 mg/L	10 ml	291 mg/L	50	4	25			1/7/20 19:36	N	IV
K1912140-002	Carbon, Total Organic	N/A		Water	6.31 mg/L	10 ml	631 mg/L	100	7	50			1/7/20 20:05	N	II
K1912140-003	Carbon, Total Organic	N/A		Water	7.34 mg/L	10 ml	734 mg/L	100	7	50			1/7/20 20:33	N	II
K1912140-004	Carbon, Total Organic	N/A		Water	7.21 mg/L	10 ml	721 mg/L	100	7	50			1/7/20 21:01	N	II
K1912160-001	Carbon, Total Organic	N/A		Water	2.70 mg/L	10 ml	2.70 mg/L	1	0.07	0.50			1/7/20 21:29	N	II
K2000034-001	Carbon, Total Organic	N/A		Water	2.13 mg/L	10 ml	2.13 mg/L	1	0.07	0.50			1/7/20 22:55	N	IV
K2000035-001	Carbon, Total Organic	N/A		Water	0.24 mg/L	10 ml	0.24 mg/L	J 1	0.07	0.50			1/7/20 23:23	N	IV
K2000035-002	Carbon, Total Organic	N/A		Water	0.37 mg/L	10 ml	0.37 mg/L	J 1	0.07	0.50			1/7/20 23:51	N	IV
K2000090-001	Carbon, Total Organic	N/A		Water	0.99 mg/L	10 ml	0.99 mg/L	1	0.07	0.50			1/8/20 01:46	N	IV
KQ2000092-01	Carbon, Total Organic	CCV		Ground Water	25.47 mg/L	10 ml	25.5 mg/L	1					1/7/20 18:23	N	IV
KQ2000092-02	Carbon, Total Organic	CCV		Ground Water	25.44 mg/L	10 ml	25.4 mg/L	1					1/7/20 22:26	N	IV
KQ2000092-03	Carbon, Total Organic	CCV		Ground Water	25.32 mg/L	10 ml	25.3 mg/L	1					1/8/20 02:14	N	IV
KQ2000092-04	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			1/7/20 18:38	N	IV
KQ2000092-05	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			1/7/20 22:40	N	IV
KQ2000092-06	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			1/8/20 02:28	N	IV
KQ2000092-07	Carbon, Total Organic	MB		Ground Water	0.03 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			1/7/20 18:52	N	IV
KQ2000092-08	Carbon, Total Organic	LCS		Ground Water	26.49 mg/L	10 ml	26.5 mg/L	1	0.07	0.50	106		1/7/20 19:07	N	IV
KQ2000092-09	Carbon, Total Organic	MS	K1912160-001	Water	29.87 mg/L	10 ml	29.9 mg/L	1	0.07	0.50	109		1/7/20 21:57	N	II
KQ2000092-10	Carbon, Total Organic	DUP	K1911998-003	Ground Water	5.77 mg/L	10 ml	288 mg/L	50	4	25		<1	1/7/20 19:36	N	IV
KQ2000092-11	Carbon, Total Organic	DUP	K1912160-001	Water	2.59 mg/L	10 ml	2.59 mg/L	1	0.07	0.50		4	1/7/20 21:29	N	II
KQ2000092-12	Carbon, Total Organic	DUP	K1912140-002	Water	6.48 mg/L	10 ml	648 mg/L	100	7	50		3	1/7/20 20:05	N	II
KQ2000092-13	Carbon, Total Organic	DUP	K1912140-003	Water	7.33 mg/L	10 ml	733 mg/L	100	7	50		<1	1/7/20 20:33	N	II
KQ2000092-14	Carbon, Total Organic	DUP	K1912140-004	Water	7.16 mg/L	10 ml	716 mg/L	100	7	50		<1	1/7/20 21:01	N	II
KQ2000092-15	Carbon, Total Organic	DUP	K2000034-001	Water	2.11 mg/L	10 ml	2.11 mg/L	1	0.07	0.50		<1	1/7/20 22:55	N	IV
KQ2000092-16	Carbon, Total Organic	DUP	K2000035-001	Water	0.18 mg/L	10 ml	0.18 mg/L	J 1	0.07	0.50		29*	1/7/20 23:23	N	IV
KQ2000092-17	Carbon, Total Organic	DUP	K2000035-002	Water	0.47 mg/L	10 ml	0.47 mg/L	J 1	0.07	0.50		25*	1/7/20 23:51	N	IV
KQ2000092-18	Carbon, Total Organic	DUP	K2000090-001	Water	0.89 mg/L	10 ml	0.89 mg/L	1	0.07	0.50		11*	1/8/20 01:46	N	IV

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

01/08/20


Analytical Results Summary

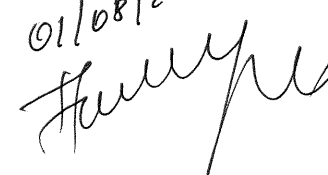
Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 665575 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
KQ2000093-01	Carbon, Dissolved Organic CCV (DOC)			Water	25.44 mg/L	10 ml	25.4 mg/L	1					1/7/20 22:26	N	IV
KQ2000093-02	Carbon, Dissolved Organic CCV (DOC)			Water	25.32 mg/L	10 ml	25.3 mg/L	1					1/8/20 02:14	N	IV
KQ2000093-03	Carbon, Dissolved Organic CCB (DOC)			Water	-0.01 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			1/7/20 22:40	N	IV
KQ2000093-04	Carbon, Dissolved Organic CCB (DOC)			Water	-0.01 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			1/8/20 02:28	N	IV
KQ2000093-05	Carbon, Dissolved Organic MB (DOC)			Water	-0.01 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			1/8/20 01:16	N	IV
KQ2000093-06	Carbon, Dissolved Organic LCS (DOC)			Water	26.28 mg/L	10 ml	26.3 mg/L	1	0.07	0.50	105		1/8/20 01:31	N	IV
KQ2000093-07	Carbon, Dissolved Organic MS (DOC)		T1901631-001	Water	31.46 mg/L	10 ml	31.5 mg/L	1	0.07	0.50	112		1/8/20 00:47	N	IV
KQ2000093-08	Carbon, Dissolved Organic DUP (DOC)		T1901631-001	Water	3.55 mg/L	10 ml	3.55 mg/L	1	0.07	0.50		1	1/8/20 00:19	N	IV
T1901631-001	Carbon, Dissolved Organic N/A (DOC)			Water	3.51 mg/L	10 ml	3.51 mg/L	1	0.07	0.50			1/8/20 00:19	Y	IV

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01/08/20


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

0.036
0.000
0.000
0.000
0.000

			ABOVE
OBSERVATIONS	5		0
STD Deviation	0.01628		0
AVERAGE	0.00728		0
UCL	0.02356		0
LCL	-0.00900		0
			0
			0
OBSERVATIONS	0		0
STD Deviation	0.00000		0
AVERAGE	#DIV/0!		0
UCL	#DIV/0!		0
LCL	#DIV/0!		0
			0
			0
OBSERVATIONS	0		0
STD Deviation	0.00000		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
			0
			0
			0

BCP 1/8/2020

01/08/20
Hull

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	25.476	0.0073	25.4682	25.46822	25.5	1/7/2020
3	ccb	1	0.000	0.0073	-0.0073	-0.00728	<0.5	1/7/2020
4	mb	1	0.036	0.0073	0.0291	0.02912	<0.5	1/7/2020
5	lcs	1	26.501	0.0073	26.4935	26.49352	26.5	1/7/2020
6	K1911998-003	50	5.821	0.0073	5.8137	290.686	290.69	1/7/2020
7	K1911998-003	50	5.777	0.0073	5.7699	288.496	288.5	1/7/2020
8	K1912140-002	100	6.313	0.0073	6.3059	630.592	631	1/7/2020
9	K1912140-002	100	6.486	0.0073	6.4783	647.832	647.83	1/7/2020
10	K1912140-003	100	7.343	0.0073	7.3358	733.582	733.58	1/7/2020
11	K1912140-003	100	7.333	0.0073	7.3260	732.602	732.6	1/7/2020
12	K1912140-004	100	7.217	0.0073	7.2096	720.962	720.96	1/7/2020
13	K1912140-004	100	7.163	0.0073	7.1552	715.522	715.52	1/7/2020
14	K1912160-001	1	2.708	0.0073	2.7008	2.70082	2.70	1/7/2020
15	K1912160-001	1	2.595	0.0073	2.5878	2.58782	2.6	1/7/2020
16	KQ2000092-09	1	29.873	0.0073	29.8656	29.86562	29.9	1/7/2020
17	ccv	1	25.451	0.0073	25.4432	25.44322	25.44	1/7/2020
18	ccb	1	0.000	0.0073	-0.0073	-0.00728	<0.5	1/7/2020
19	K2000034-001	1	2.133	0.0073	2.1255	2.12552	2.1	1/7/2020
20	K2000034-001	1	2.118	0.0073	2.1104	2.11042	2.11	1/7/2020
21	K2000035-001	1	0.246	0.0073	0.2382	0.23822	<0.5	1/7/2020
22	K2000035-001	1	0.184	0.0073	0.1770	0.17702	<0.5	1/7/2020
23	K2000035-002	1	0.374	0.0073	0.3668	0.36682	<0.5	1/7/2020
24	K2000035-002	1	0.480	0.0073	0.4727	0.47272	<0.5	1/7/2020
25	K2000090-001	1	0.998	0.0073	0.9908	0.99082	0.99	1/8/2020

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: <i>BU</i>	Date Analyzed	1/7/2020
Reviewed By: <i>hurry</i>	Date Reviewed	01/08/20

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

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ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER)Method: Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K2000090-001	1	0.895	0.0073	0.8879	0.88792	0.89	1/8/2020
27	ccv	1	25.331	0.0073	25.3234	25.32342	25.32	1/8/2020
28	ccb	1	0.000	0.0073	-0.0073	-0.00728	<0.5	1/8/2020
29		1		0.0000	0.0000	0	<0.5	
30		1		0.0000	0.0000	0	<0.5	
31		1		0.0000	0.0000	0	<0.5	
32		1		0.0000	0.0000	0	<0.5	
33		1		0.0000	0.0000	0	<0.5	
34		1		0.0000	0.0000	0	<0.5	
35		1		0.0000	0.0000	0	<0.5	
36		1		0.0000	0.0000	0	<0.5	
37		1		0.0000	0.0000	0	<0.5	
38		1		0.0000	0.0000	0	<0.5	
39		1		0.0000	0.0000	0	<0.5	
40		1		0.0000	0.0000	0	<0.5	
41		1		0.0000	0.0000	0	<0.5	
42		1		0.0000	0.0000	0	<0.5	
43		1		0.0000	0.0000	0	<0.5	
44		1		0.0000	0.0000	0	<0.5	
45		1		0.0000	0.0000	0	<0.5	
46		1		0.0000	0.0000	0	<0.5	
47		1		0.0000	0.0000	0	<0.5	
48		1		0.0000	0.0000	0	<0.5	
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By: <i>WJ</i>	Date Analyzed: <i>1/7/2020</i>
Reviewed By: <i>Jerry M</i>	Date Reviewed: <i>01/08/20</i>

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	25.451	0.0073	25.4432	25.44322	25.4	1/7/2020
3	ccb	1	0.000	0.0073	-0.0073	-0.00728	<0.5	1/7/2020
4	T1901631-001	1	3.522	0.0073	3.5147	3.51472	3.5	1/8/2020
5	T1901631-001	1	3.562	0.0073	3.5546	3.55462	3.6	1/8/2020
6	T1901631-001 ms	1	31.468	0.0073	31.4609	31.46092	31.46	1/8/2020
7	mb	1	0.000	0.0073	-0.0073	-0.00728	<0.5	1/8/2020
8	lcs	1	26.283	0.0073	26.2760	26.27602	26	1/8/2020
9	ccv	1	25.331	0.0073	25.3234	25.32342	25.32	1/8/2020
10	ccb	1	0.000	0.0073	-0.0073	-0.00728	<0.5	1/8/2020
11		1		0.0000	0.0000	0	<0.5	
12		1		0.0000	0.0000	0	<0.5	
13		1		0.0000	0.0000	0	<0.5	
14		1		0.0000	0.0000	0	<0.5	
15		1		0.0000	0.0000	0	<0.5	
16		1		0.0000	0.0000	0	<0.5	
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)

Analyzed By: <i>BW</i>	Date Analyzed: <i>1/7/2020</i>
Reviewed By: <i>[Signature]</i>	Date Reviewed: <i>01/08/20</i>

TOC:665574
 ROC:665575

Schedule: 01072020

Version: 3

Instrument: Fusion1

Last Saved by: Fusion1 (Fusion1)

Last Saved on: 2020/01/07 16:38 - Tuesday

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
17	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	K1911998-003.02 50x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1912140-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	K1912140-003.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
6	Sample	K1912140-004.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1912160-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K1912160-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
9	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
10	Sample	K2000034-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K2000035-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K2000035-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	T1901631-001.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	T1901631-001.02 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
15	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
16	Sample	MB2	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
18	Sample	K2000090-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

01/08/20
 Fusion1

Fusion Report - 01072020

Tuesday, January 07, 2020 04:29 PM

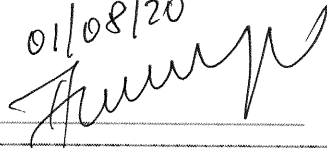
(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2020/01/08 09:19 -
Wednesday

Report Summary Information

Company Location: Gen Chem Lab
 Schedule Name: 01072020
 Instrument Name: Fusion1
 Report Version: 1 of 1
 Report Creation by Operators (schedule version): Fusion1 (Fusion1) (v2)
 Fusion1 (Fusion1) (v3)
 Comment:

Engine 1.1.5.1
 Version:
 Firmware 1.2.0696
 Version:
 Connection: RS232 COM1

Report Results

01/08/20


Sample Type: Clean From Schedule Version 2

Pos	Analysis Type	Sample ID	Start Time
◆ (clean)		Clean	2020/01/07 16:29

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	9.80	14.12	4.32	49.51	05:23
2	TC Clean	6.17	9.77	3.60	50.05	04:04
3	TC Clean	2.20	6.08	3.87	50.03	03:48
4	TC Clean	1.58	5.33	3.75	49.99	03:55

Sample Type: Clean From Schedule Version 3

Pos	Analysis Type	Sample ID	Start Time
◆ (clean)		Clean	2020/01/07 16:51

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.55	4.24	3.70	49.65	05:24
2	TC Clean	4.63	8.36	3.73	50.12	04:04
3	TC Clean	2.38	5.95	3.57	49.99	03:50
4	TC Clean	1.72	5.48	3.76	49.98	03:52

Sample Type: Clean							From Schedule Version 3
Pos	Analysis Type	Sample ID			Start Time		
♦ (clean)		Clean			2020/01/07 17:13		
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	IC Clean	0.77	4.34	3.57	49.40	05:20	
2	TC Clean	4.41	8.11	3.70	49.97	04:01	
3	TC Clean	2.09	5.83	3.74	50.05	03:46	
4	TC Clean	1.53	5.40	3.87	50.06	03:54	

Sample Type: Blank (Creating v1339)							From Schedule Version 3
Pos	Analysis Type	Sample ID			Start Time		
♦ (blank)		Reagent/Acid Blank			2020/01/07 17:35		
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	IC Clean	0.54	4.37	3.82	49.48	05:22	
2	TC Clean	4.22	7.99	3.77	50.07	04:00	
3	TC Clean	1.95	5.93	3.97	50.10	03:47	
4	TC Clean	1.53	5.36	3.83	50.00	03:46	
5	Reagent Blank	8.26	12.03	3.77	50.00	05:05	
6	Acid Blank	1.53	5.40	3.87	49.43	05:25	

Sample Type: Sample							From Schedule Version 3	
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
♦ 17	TOC	RB	0.2812 ppm	0.0000 ppm	0.0000%	2020/01/07 18:08		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2812	2.8122	11.51	15.43	3.92	50.11	10:33
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 9.7309 (IC) (v1339)		CAS_salt_010711 (v4)		CAS_salt_010711 (v31)		

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 3

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
◊	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.4755 ppm (PASS)	0.0000 ppm	0%	2020/01/07 18:23

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.4755	254.7546	171.28	175.15	3.88	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 (v31)	50 ppmC

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

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
◊	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/07 18:38

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	10.02	13.85	3.83	50.13	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 3

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◊	1	TOC	MB1	0.0364 ppm	0.0000 ppm	0.0000%	2020/01/07 18:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0364	0.3639	9.96	13.62	3.66	50.11	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.7309 (IC) (v1339)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

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

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
◊	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	26.5008 ppm (PASS)	0.0000 ppm	0%	2020/01/07 19:07

Pos	Base Analysis	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
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C	TOC	25.0 ppm	1	26.5008	265.0080	177.76	181.38	3.62	50.12	10:34
Completion State		Success Action		Method		Calibration		STD Conc - Pos C		
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v31)		25 ppmC		

Sample Type: Sample From Schedule Version 3

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
2	TOC	ICS	0.3054 ppm	0.0000 ppm	0.0000%	2020/01/07 19:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3054	3.0542	11.66	15.42	3.75	50.09	10:32

Dilution 1:10 **Blank Contribution** (TC) 9.7309 (IC) (v1339) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v31)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
3	TOC	K1911998-003.02 50x	5.7991 ppm	0.0310 ppm	0.5300%	2020/01/07 19:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.8210	58.2099	46.54	50.08	3.55	50.12	10:28
2	TOC	5.7772	57.7718	46.26	50.11	3.85	50.09	10:29

Dilution 1:10 **Blank Contribution** (TC) 9.7309 (IC) (v1339) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v31)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
4	TOC	K1912140-002.01 100x	6.3994 ppm	0.1219 ppm	1.9000%	2020/01/07 20:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.3132	63.1317	49.65	53.44	3.79	50.11	10:27
2	TOC	6.4856	64.8556	50.74	54.40	3.66	50.10	10:29

Dilution 1:10 **Blank Contribution** (TC) 9.7309 (IC) (v1339) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v31)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
5	TOC	K1912140-003.01 100x	7.3382 ppm	0.0069 ppm	0.0900%	2020/01/07 20:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.3431	73.4309	56.16	59.80	3.64	50.10	10:27
2	TOC	7.3333	73.3329	56.10	59.74	3.64	50.12	10:28

Dilution 1:10 **Blank Contribution** (TC) 9.7309 (IC) **Method** CAS_salt_010711 **Calibration** CAS_salt_010711

(v1339)

(v4)

(v31)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
6	TOC	K1912140-004.01 100x	7.1897 ppm	0.0385 ppm	0.5400%	2020/01/07 21:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.2169	72.1688	55.36	58.94	3.58	50.10	10:25
2	TOC	7.1625	71.6248	55.02	58.83	3.81	50.10	10:27

Dilution 1:10 Blank Contribution (TC) 9.7309 (IC) (v1339) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v31)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
7	TOC	K1912160-001.01	2.6516 ppm	0.0800 ppm	3.0200%	2020/01/07 21:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7081	27.0814	26.85	30.57	3.71	50.07	10:28
2	TOC	2.5951	25.9506	26.14	29.79	3.65	50.08	10:29

Dilution 1:10 Blank Contribution (TC) 9.7309 (IC) (v1339) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v31)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
8	TOC	K1912160-001.01 ms	29.8729 ppm	0.0000 ppm	0.0000%	2020/01/07 21:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.8729	298.7288	198.61	202.22	3.61	50.07	10:29

Dilution 1:10 Blank Contribution (TC) 9.7309 (IC) (v1339) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v31)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
9	TOC	RB	0.0171 ppm	0.0000 ppm	0.0000%	2020/01/07 22:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0171	0.1710	9.84	13.40	3.56	50.05	10:31

Dilution 1:10 Blank Contribution (TC) 9.7309 (IC) (v1339) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 3

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.4505 ppm	0.0000 ppm	0%	2020/01/07 22:26

(PASS)										
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.4505	254.5047	171.12	174.92	3.80	50.04	10:32
Completion State		Success Action		Method		Calibration		STD Conc - Pos B		
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v31)		50 ppmC		

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

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/07 22:40

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.95	12.76	3.81	50.03	10:35

Completion State		Success Action		Method		Calibration		STD Conc - Pos D		
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v31)		0 ppmC		

Sample Type: Sample From Schedule Version 3

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 10	TOC	K2000034-001.01	2.1253 ppm	0.0106 ppm	0.5000%	2020/01/07 22:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1328	21.3276	23.22	27.08	3.86	50.02	10:27
2	TOC	2.1177	21.1774	23.12	26.74	3.62	50.03	10:30

Dilution		Blank Contribution		Method		Calibration	
1:10		(TC) 9.7309 (IC) (v1339)		CAS_salt_010711 (v4)		CAS_salt_010711 (v31)	

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 11	TOC	K2000035-001.01	0.2149 ppm	0.0433 ppm	20.1400%	2020/01/07 23:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2455	2.4548	11.28	15.01	3.73	50.01	10:27
2	TOC	0.1843	1.8427	10.90	14.59	3.69	50.03	10:25

Dilution		Blank Contribution		Method		Calibration	
1:10		(TC) 9.7309 (IC) (v1339)		CAS_salt_010711 (v4)		CAS_salt_010711 (v31)	

Pos	Analysis	Sample ID	Result (ppmC)	Std. Dev.	RSD	Start Time
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	Type		(ppmC)		
♦ 12	TOC	K2000035-002.01	0.4270 ppm	0.0749 ppm	17.5500%

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3741	3.7406	12.10	15.92	3.83	50.01	10:26
2	TOC	0.4800	4.8002	12.77	16.42	3.66	50.02	10:28

Dilution 1:10
Blank Contribution (TC) 9.7309 (IC) (v1339)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v31)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 13	TOC	T1901631-001.02 doc	3.5419 ppm	0.0282 ppm	0.8000%	2020/01/08 00:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5220	35.2202	32.00	35.79	3.79	50.01	10:27
2	TOC	3.5619	35.6187	32.25	35.98	3.72	49.99	10:27

Dilution 1:10
Blank Contribution (TC) 9.7309 (IC) (v1339)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v31)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 14	TOC	T1901631-001.02 ms doc	31.4682 ppm	0.0000 ppm	0.0000%	2020/01/08 00:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	31.4682	314.6821	208.70	212.26	3.56	49.99	10:30

Dilution 1:10
Blank Contribution (TC) 9.7309 (IC) (v1339)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v31)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 15	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/08 01:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.10	12.95	3.86	49.98	10:31

Dilution 1:10
Blank Contribution (TC) 9.7309 (IC) (v1339)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v31)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 16	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/08 01:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.93	11.77	3.84	50.00	10:32

Dilution 1:10
Blank Contribution (TC) 9.7309 (IC)
Method CAS_salt_010711
Calibration CAS_salt_010711

(v1339)

(v4)

(v31)

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

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	26.2833 ppm (PASS)	0.0000 ppm	0%	2020/01/08 01:31

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	26.2833	262.8333	176.38	180.12	3.73	50.05	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	25 ppmC

Sample Type: Sample From Schedule Version 3

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 18	TOC	K2000090-001.01	0.9467 ppm	0.0728 ppm	7.6900%	2020/01/08 01:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9981	9.9815	16.04	19.80	3.76	49.97	10:25
2	TOC	0.8952	8.9518	15.39	19.17	3.78	49.97	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.7309 (IC) (v1339)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

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

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.3307 ppm (PASS)	0.0000 ppm	0%	2020/01/08 02:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.3307	253.3075	170.36	174.01	3.64	50.01	10:36

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	50 ppmC

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

Concentration	Min / Max

Pos	BAT	(ppm)	Dil	Sample ID	(% dev)	Result	Std. Dev.	RSD	Start Time
◆ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/08 02:28

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.21	11.96	3.75	50.00	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1338	2.8760	1.7130	0.0000	0.0000	0.0000	2020/01/07 11:53	Fusion1 (Fusion1)
v1339	2.7543	1.5310	0.0000	0.0000	0.0000	2020/01/07 18:08	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v31
 Calibration curve formula: TOC: $y = 6.323x + 10.200$
 Ver Creation: 2020/01/07 14:30
 r^2 value: TOC: $r^2 = 0.99991$
 Comment:
 Operator: Fusion1 (Fusion1)
 Basic Analysis Type: TOC

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	9.5850	0.0000		2020/01/07 13:02
0.500 ppm	12.6160	0.5000		2020/01/07 13:17
1.0 ppm	15.6440	1.0000		2020/01/07 13:31
5.0 ppm	43.7700	5.0000		2020/01/07 13:45
10 ppm	73.2770	10.0000		2020/01/07 14:00
25 ppm	169.4210	25.0000		2020/01/07 14:14
50 ppm	325.6260	50.0000		2020/01/07 14:28

Methods

Name: CAS_salt_010711 (TOC)

Version: v4

Operator: Fusion1 (Fusion1)

Ver Creation: 2019/02/21 17:57

Comment:

Parameter	Value	Advanced Parameter	Value
SampleVolume	10.0 mL	NeedleRinseVolume	5.0 ml
Dilution	1:10	VialPrimeVolume	2.0 ml
AcidVolume	0.5 ml	ICSamplePrimeVolume	2.0 ml
ReagentVolume	2.0 ml	ICSpurgeRinseVolume	12.0 ml
UVReactorPrerinse	Off	BaselineStabilizeTime	0.70 min
UVReactorPrerinseVolume	5.0	DetectorPressureFlow	150 ml/min
NumberOfUVReactorPrerinses	1	SyringeSpeedWaste	10
ICSpurgeTime	1.00 mins	SyringeSpeedAcid	7
DetectorSweepFlow	500 ml/min	SyringeSpeedReagent	7
PreSpurgeTime	2.00 mins	SyringeSpeedDIWater	7
SystemFlow	500 ml/min	NDIRPressurization	60 psig
		SyringeSpeedSampleDispense	5
		SyringeSpeedSampleAspirate	4
		SyringeSpeedUVDispense	5
		SyringeSpeedUVAspirate	5
		SyringeSpeedICDispense	5
		SyringeSpeedICAspirate	5
		NDIRPressureStabilize	1.75 min
		SampleMixing	Off
		SampleMixingCycles	1
		SampleMixingVolume	10.0
		LowLevelFilterNDIR	Off

Acceptance / Approval**Electronic Signatures**

Report Version	User Name	Acceptance	Reason	Date

Report History**Report History**

Report Version	User Name	System Reason	User Reason	Date

1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2020/01/08 02:44
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ALS Environmental

StarLIMS Run: 665574, 665575Analysis: DOC/TOCMethod: SM 5310 C, 9060A, 415.1, 9060CCV: 11-GEN-05-82C 50 ppm LCS: 11-GEN-05-79J 25.0 ppmICAL Date: 1/7/2020ICAL ID: 11-GEN-05-76HICS ID: 11-GEN-05-78MICS TV: 25.0 ppm ICS % R < 1Spike ID: 11-GEN-05-82C 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factorSodium Persulfate: 11-GEN-05-83J21 % H3PO4: 11-GEN-05-83IEquipment ID: K-TOC-03PIPETTE ID: 124276B, 129001F, N11314F, MargeFILTER ID: 16967789

Analyzed By: <u>BOP</u>	Date Analyzed: <u>1/7/2020</u>
Reviewed By: <u>Harvey</u>	Date Reviewed: <u>01/08/20</u>



Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1935345; 1935347; 1935366

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2331 (254172)

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

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ¹⁸O 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 ¹⁸O 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: Samples 1935345003/04 failed the 50-150% method requirement for ISTD recoveries. These samples were re-analyzed and reported at dilutions of 1:2 and 1:5, respectively. Field sample 1935347003 was analyzed and reported from a 1:10 dilution. Field samples 1935345006/10 were analyzed and reported from 1:100 dilutions. Field samples 1935345007 and 1935347001/02 were analyzed and reported from 1:1,000 dilutions. Field samples 1935345008/09 were analyzed and reported from 1:10,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 689525) was less than 1/2 the CRDL. The recovery for the LCS (689526) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on samples 1935347004/05 (Client ID: MW22_121119). 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 failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

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

NC/CAR(s): NA

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

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 – 689523) is reported from the analysis of the Laboratory Control Sample (LCS – 689522) at a level of 3.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafiles 23DEC19D21/23.

Thomas Bosch December 30, 2019
Analyst Date



ANALYTICAL REPORT

Report Date: December 30, 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: **34-1935366**

Project ID: HS19120679

Purchase Order: HS19120679

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_121219_AIX	1935366001	12/12/19	12/17/19	

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ANALYTICAL REPORT

Workorder: 34-1935366

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: LH18/24-SP650_121219_AIX	Sampling Site: NA	Collected: 12/12/2019				
Lab ID: 1935366001	Media: 125 mL Nalgene	Received: 12/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2331 (HBN: 254172) Analyzed: 12/23/2019 13:17	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 254172)

Samples 1935345003/04 failed the 50-150% method requirement for ISTD recoveries. These samples were re-analyzed and reported at dilutions of 1:2 and 1:5, respectively. Field sample 1935347003 was analyzed and reported from a 1:10 dilution. Field samples 1935345006/10 were analyzed and reported from 1:100 dilutions. Field samples 1935345007 and 1935347001/02 were analyzed and reported from 1:1,000 dilutions. Field samples 1935345008/09 were analyzed and reported from 1:10,000 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 12/30/2019 12:07	/S/ Stephen Brose 12/30/2019 15:01

Laboratory Contact Information

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

Phone: (801) 266-7700
Email: als@alst.com
Web: www.alssl.com



ANALYTICAL REPORT

Workorder: 34-1935366

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: 1935366
Limits: Client SOW/Contract Specified
Basis: DoD QSM□□

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2331 (HBN: 254172)
Analyzed By: Thomas Bosch

Blank

LMB: 689525 Analyzed: 12/23/2019 08:53 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 689522 Analyzed: 12/23/2019 08:25 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.20	3.00	107	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1935347003 Analyzed: 12/23/2019 12:07 Dilution: 10 Units: ug/L		MS: 1935347004 Analyzed: 12/23/2019 14:45 Dilution: 10 Units: ug/L			MSD: 1935347005 Analyzed: 12/23/2019 14:59 Dilution: 10 Units: ug/L				
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	210	250	30	▲ 142	78.8 123.8	251	▲ 146	0.487	0.0 20.0

Comments

Samples 1935345003/04 failed the 50-150% method requirement for ISTD recoveries. These samples were re-analyzed and reported at dilutions of 1:2 and 1:5, respectively. Field sample 1935347003 was analyzed and reported from a 1:10 dilution. Field samples 1935345006/10 were analyzed and reported from 1:100 dilutions. Field samples 1935345007 and 1935347001/02 were analyzed and reported from 1:1,000 dilutions. Field samples 1935345008/09 were analyzed and reported from 1:10,000 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 12/30/2019 12:39	/S/ Stephen Brose 12/30/2019 15:01

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



1935366

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Houston, TX 77099
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Subcontract Chain of Custody

18698/#2

SAMPLING STATE: Dept of Defense

COC ID: 12847

SUBCONTRACT TO:

1935366

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: HS19120679
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19120679-02	LH18/24-SP650_121219_AIX	Water	12 Dec 2019 14:00
SUB_Perch-6850			30 Dec 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: [Signature]
Received By: [Signature]
Cooler ID(s): NA

Date/Time: 12/16/19 1800
Date/Time: 12/17/19 900
Temperature(s): 2

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ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston Project/Task/Site: _____
 Date/Time of Receipt: 2/17/19 900 Number of Coolers Received: 1 19353db

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

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

Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.	Cooler Received	Cooler Condition	Temp.
1	<u>good</u>	<u>2</u> °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C			°C	9		°C

Taken By: [Signature] [Signature] Meredith Edmunds [Signature]
Signature Signature Printed Name Date

CLIENT-RELATED INFORMATION

<input type="checkbox"/> Missing Cooler	<input type="checkbox"/> Missing Samples/Bottles	<input type="checkbox"/> Incorrect Preservation	<input type="checkbox"/> Insufficient Sample Volume
<input type="checkbox"/> Cooler Conditions	<input type="checkbox"/> Broken/Leaking Samples	<input type="checkbox"/> pH Criteria Not Met	<input type="checkbox"/> Chain of Custody Problems
<input type="checkbox"/> Missing Paperwork	<input type="checkbox"/> Incorrect Bottle Type	<input type="checkbox"/> Residual Chlorine Present	<input type="checkbox"/> Other:
<input type="checkbox"/> Missing/Incorrect Bottle Labels	<input type="checkbox"/> Cooler Temperatures Out of Range	<input type="checkbox"/> 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: _____ Returned to Sample Receipt by: _____ Date: _____
Printed Name Signature

Must Deliver Next Business Day
Time and Temperature Sensitive!



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

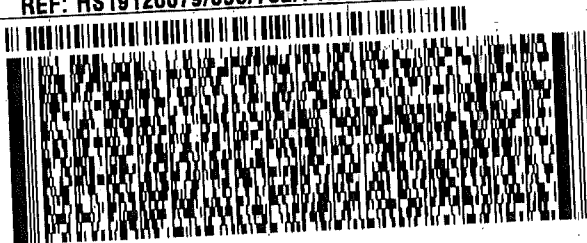
SHIP DATE: 16DEC19
ACTWGT: 47.30 LB
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN
BILL THIRD PARTY

TO **SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE**

SALT LAKE CITY UT 84123

(801) 286-7700

REF: HS19120679/696/702/715/745/765/843/844 -



FedEx
Express



551C2/18DX/104C

TRK# 1251 0292 9451
0201

**TUE - 17 DEC 3:00P
STANDARD OVERNIGHT**

AX BTFA

**84123
UT-US SLC**



ALS Environmental
CHAIN-OF-CUSTODY



Project / Job / Task: HS19120679 Split: Workorder ID: 1935366 Level: ENV_LVL4

Client: ALS Environmental (Houston) Account: 8101 Type: 125Poly

Comments: Preservatives: Containers: EPA 6950, D+D GSM

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Count	Requested Analysis	
1	12/12/2019 14:00	LH18/24-SP650_121219_AIX	1935366001		Water	A	1		A
2									
3									
4									
5									
6									
7									
8									
9									
10									

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

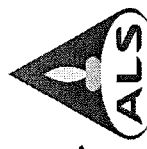
SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

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

Prepared / Analyzed by: _____ Date / Time: _____

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

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	ALS Sample Receiving	Reason for Transfer / Storage Location
Warath, Julie	12/17/2019 09:06	ALS Sample Receiving	OB	Sample Login
Julie Warath	12/19/19 1400	ALS Sample Receiving	OB	Stage
R-33.1	12-19-19 12:00	T.Boach		end analysis



Batch Worklist

HBN: 254172

Instrument:

Created: 12/23/2019 08:02

Batch: ELMS/2331



Status: WP

Analyst: T. Bosch

Rule: EPA 6850, DoD QSM Water

Workorder: 1935345 [ENV_LVL4]
 Workorder: 1935347 [ENV_LVL4]
 Workorder: 1935366 [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	689521	CCV for HBN 254172 [ELMS/2331]				CCV	3	E685041C3Q	E685041C3Q	5311		12/31/2019	12/31/2019
2	689522	LCS for HBN 254172 [ELMS/2331]				LCS	3	E6850Q413Q	E6850Q413Q	5311		12/31/2019	12/31/2019
3	689523	RLVS for HBN 254172 [ELMS/2331]				RLVS	3	E685041C3Q	E685041C3Q	5311		12/31/2019	12/31/2019
4	689524	ICS for HBN 254172 [ELMS/2331]				ICS	3	E6850_D3Q	E6850_D3Q	5311		12/31/2019	12/31/2019
5	689525	LMB for HBN 254172 [ELMS/2331]				LMB	3	E6850Q413Q	E6850Q413Q	5311		12/31/2019	12/31/2019
6	1935345001	MW22_121219				SAMPLE	3	1935345001-A	E6850Q41.3	5480	1/9/2020	12/31/2019	12/31/2019
7	1935345002	MW22_121219_a				SAMPLE	3	1935345002-A	E6850Q41.3	5480	1/9/2020	12/31/2019	12/31/2019
8	1935345003	C08_121219				SAMPLE	3	1935345003-A	E6850Q41.3	5480	1/9/2020	12/31/2019	12/31/2019
9	1935345004	18CPTMW24_121219				SAMPLE	3	1935345004-A	E6850Q41.3	5480	1/9/2020	12/31/2019	12/31/2019
10	1935345005	18CPTMW07_121219				SAMPLE	3	1935345005-A	E6850Q41.3	5480	1/9/2020	12/31/2019	12/31/2019
11	1935345006	109_121219				SAMPLE	3	1935345006-A	E6850Q41.3	5480	1/9/2020	12/31/2019	12/31/2019
12	1935345007	MW3_121219				SAMPLE	3	1935345007-A	E6850Q41.3	5480	1/9/2020	12/31/2019	12/31/2019
13	1935345008	MW23_121219				SAMPLE	3	1935345008-A	E6850Q41.3	5480	1/9/2020	12/31/2019	12/31/2019
14	689528	CCV for HBN 254172 [ELMS/2331]				CCV	3	E685041C3Q	E685041C3Q	5311		12/31/2019	12/31/2019
15	1935345009	MW23_121219_a				SAMPLE	3	1935345009-A	E6850Q41.3	5480	1/9/2020	12/31/2019	12/31/2019
16	1935345010	I25_121219				SAMPLE	3	1935345010-A	E6850Q41.3	5480	1/9/2020	12/31/2019	12/31/2019
17	1935347001	MW21_121119				SAMPLE	3	1935347001-A	E6850Q41.3	5480	1/8/2020	12/31/2019	12/31/2019
18	1935347002	MW21_121119_a				SAMPLE	3	1935347002-A	E6850Q41.3	5480	1/8/2020	12/31/2019	12/31/2019
19	1935347003	MW22_121119				SAMPLE	3	1935347003-A	E6850Q41.3	5480	1/8/2020	12/31/2019	12/31/2019
20	1935347004	MW22_121119MS				MS	3	1935347004-A	E6850Q413Q	5480		12/31/2019	12/31/2019
21	1935347005	MW22_121119MSD				MSD	3	1935347005-A	E6850Q413Q	5480		12/31/2019	12/31/2019
22	1935347006	18CPTMW06_121119				SAMPLE	3	1935347006-A	E6850Q41.3	5480	1/8/2020	12/31/2019	12/31/2019
23	1935347007	18CPTMW03SW_121119				SAMPLE	3	1935347007-A	E6850Q41.3	5480	1/8/2020	12/31/2019	12/31/2019
24	1935366001	LH18/24-SP650_121219_AIX				SAMPLE	3	1935366001-A	E6850Q41.3	5480	1/9/2020	12/31/2019	12/31/2019
25	689529	CCV for HBN 254172 [ELMS/2331]				CCV	3	E685041C3Q	E685041C3Q	5311		12/31/2019	12/31/2019
26	689664	CCV for HBN 254172 [ELMS/2331]				CCV	3	E685041C3Q	E685041C3Q	5311		12/31/2019	12/31/2019



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample # ()'s: 1935345 (001-10); 1935347 (001-07); 1935366 (001)
 ELMS Batch/HBN ID: 2331 (254172)
 Prep Date: 12/21/2019 Analysis Date: 12/23/2019 Analyst: Tom Bosch
 Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
 Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\DEC\23DEC19D.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 689522; Target = 3.0µg/L. ASTM type II water was used for LMB 689525.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on samples 1935347004/05 (Client ID's: MW22_121119). 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. Samples 1935345003/04 failed the 50-150% method requirement for ISTD recoveries. These samples were re-analyzed and reported at dilutions of 1:2 and 1:5, respectively. Field sample 1935347003 was analyzed and reported from a 1:10 dilution. Field samples 1935345006/10 were analyzed and reported from 1:100 dilutions. Field samples 1935345007 and 1935347001/02 were analyzed and reported from 1:1,000 dilutions. Field samples 1935345008/09 were analyzed and reported from 1:10,000 dilutions. The reporting limits have been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\DEC\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alslts013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\254172-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 689523) is reported from the analysis of the Laboratory Control Sample (LCS – 689522) 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: 20SEP103) along with datafile 23DEC19D21/23.

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

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

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2331 HBN: 254172</u>		
Sample Set IDs if Applicable: <u>1935345 1935347 1935366</u>		
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



43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075

Matrix: Water

Hazards: Refer to SDS for complete safety information

Date Certified: Jun 25, 2018

Expiration: Jul 25, 2020

Sample Size: 100 mL

Components: 1

Storage Condition: Ambient (>5 °C)

Included on ISO/IEC 17025 Scope of Accreditation: Yes

Included on ISO 17034 Scope of Accreditation: Yes



Signal Word: None

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



Certificate of Analysis



ISO Guide 34 Reference Material

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



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

Product Name: Perchlorate IC Standard

Description:

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

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

Solvent: water (low TOC, < 50 ppb)

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

Traceability:

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

Estimation of Uncertainties:

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

Homogeneity:

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

Intended Use:

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

Instructions for Use:

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

Hazards:

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

Expiration of Certification:

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



ISO 9001 Registered Quality System – TUV USA

Page 1 of 2



Certificate of Analysis



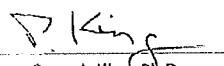
ISO Guide 34 Reference Material

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



ISO 9001 Registered Quality System – TUV USA

Page 2 of 2



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis



Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

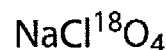
Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl*O4

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

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

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

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)

CIL subscribes to the following standards for different products: ISO 9001, ISO 17025, ISO 13485 and cGMP as appropriate.



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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	
#*	689521	CCV@25	Vial 71	1	Control	1	1.76473e6	7.347	27.49761
#*	689522	QC@3.0	Vial 72	1	Control	2	1.95559e5	7.165	3.20494
#*	689524	ICS@3.0	Vial 73	1	Control	3	1.44963e5	7.209	3.09759
#*	689525	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1935345001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
#*	1935345002		Vial 76	1	Sample	6	0.00000	0.000	0.00000
#*	1935345003		Vial 77	1	Sample	7	0.00000	0.000	0.00000
#*	1935345004		Vial 78	1	Sample	8	8.68794e4	6.933	4.62865
#*	1935345005		Vial 79	1	Sample	9	0.00000	0.000	0.00000
#*	1935345006	100	Vial 80	1	Sample	10	6.85819e5	7.544	1037.77002
#*	1935345007	1K	Vial 81	1	Sample	11	8.48401e5	7.592	1.49867e4
#*	1935345008	10K	Vial 82	1	Sample	12	5.01021e5	7.605	7.31745e4
#*	1935345009	10K	Vial 83	1	Sample	13	4.88880e5	7.614	7.95989e4
#*	1935345010	100	Vial 84	1	Sample	14	1.07600e6	7.601	1802.14414
#*	689414	CCV@25	Vial 71	1	Control	15	1.91095e6	7.461	26.99793
#*	1935347001	1K	Vial 85	1	Sample	16	8.33844e5	7.559	1.27519e4
#*	1935347002	1K	Vial 86	1	Sample	17	9.01055e5	7.560	1.32403e4
#*	1935347003	10X	Vial 87	1	Sample	18	1.33576e6	7.434	207.38479
#*	1935347006		Vial 90	1	Sample	21	3.37508e4	7.329	5.41444e-1 <R/L
#*	1935347007		Vial 91	1	Sample	22	5.21433e5	7.284	9.08369
#*	1935366001		Vial 92	1	Sample	23	3.55813e4	7.225	5.16725e-1 <R/L
#*	1935345003	5X	Vial 93	1	Sample	24	0.00000	0.000	0.00000
#*	1935345004	5X	Vial 94	1	Sample	25	1.12395e5	7.263	10.79582
#*	689415	CCV@25	Vial 71	1	Control	26	1.67312e6	7.458	25.55981
#*	1935347004	MS	Vial 97	1	Sample	29	1.64083e6	7.401	249.90057
#*	1935347005	MSD	Vial 98	1	Sample	30	1.58965e6	7.448	251.12094
#*	1935345003	2X	Vial 99	1	Sample	31	0.00000	0.000	0.00000 ✓
#*	1935345004	2X	Vial 100	1	Sample	32	9.76137e4	7.136	5.83827-N.R.
*	689664	CCV@25	Vial 71	1	Control	33	1.57878e6	7.452	26.31908

N.R. NOT REPORTED/SAMPLE FAILS 83/85 RATIO AT 2x DILN

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
#*	689521	CCV@25	Vial 71	1	Control	1	2.17048e5	7.361	5.00000
#*	689522	QC@3.0	Vial 72	1	Control	2	2.24689e5	7.181	5.00000
#*	689524	ICS@3.0	Vial 73	1	Control	3	1.72263e5	7.224	5.00000
#*	689525	LMB	Vial 74	1	Control	4	2.13087e5	7.315	5.00000
#*	1935345001		Vial 75	1	Sample	5	2.38355e5	7.341	5.00000
#*	1935345002		Vial 76	1	Sample	6	2.83691e5	7.337	5.00000
#*	1935345003		Vial 77	1	Sample	7	8.98345e4	7.060	5.00000
#*	1935345004		Vial 78	1	Sample	8	6.92035e4	6.968	5.00000
#*	1935345005		Vial 79	1	Sample	9	1.93530e5	7.330	5.00000
#*	1935345006	100	Vial 80	1	Sample	10	2.39667e5	7.568	500.00000
#*	1935345007	1K	Vial 81	1	Sample	11	2.01594e5	7.615	5000.00000
#*	1935345008	10K	Vial 82	1	Sample	12	2.50964e5	7.629	5.00000e4
#*	1935345009	10K	Vial 83	1	Sample	13	2.24661e5	7.632	5.00000e4
#*	1935345010	100	Vial 84	1	Sample	14	2.09987e5	7.626	500.00000
#*	689414	CCV@25	Vial 71	1	Control	15	2.39873e5	7.482	5.00000
#*	1935347001	1K	Vial 85	1	Sample	16	2.34965e5	7.574	5000.00000
#*	1935347002	1K	Vial 86	1	Sample	17	2.44063e5	7.574	5000.00000
#*	1935347003	10X	Vial 87	1	Sample	18	2.23994e5	7.454	50.00000
#*	1935347006		Vial 90	1	Sample	21	2.06441e5	7.338	5.00000
#*	1935347007		Vial 91	1	Sample	22	2.09169e5	7.305	5.00000
#*	1935366001		Vial 92	1	Sample	23	2.26617e5	7.284	5.00000
#*	1935345003	5X	Vial 93	1	Sample	24	1.80510e5	7.124	25.00000
#*	1935345004	5X	Vial 94	1	Sample	25	1.90269e5	7.289	25.00000
#*	689415	CCV@25	Vial 71	1	Control	26	2.23153e5	7.477	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
#*	1935347004	MS	Vial 97	1	Sample	29	2.24361e5	7.419	50.00000
#*	1935347005	MSD	Vial 98	1	Sample	30	2.16198e5	7.469	50.00000
#*	1935345003	2X	Vial 99	1	Sample	31	1.59557e5	7.169	10.00000
#*	1935345004	2X	Vial 100	1	Sample	32	1.22992e5	7.153	10.00000
*	689664	CCV@25	Vial 71	1	Control	33	2.03857e5	7.479	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
#*	689521	CCV@25	Vial 71	1	Control	1	5.21339e5	7.363	26.74056
#*	689522	QC@3.0	Vial 72	1	Control	2	6.37839e4	7.182	3.33823
#*	689524	ICS@3.0	Vial 73	1	Control	3	5.30412e4	7.216	3.63016
#*	689525	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1935345001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
#*	1935345002		Vial 76	1	Sample	6	0.00000	0.000	0.00000
#*	1935345003		Vial 77	1	Sample	7	0.00000	0.000	0.00000
#*	1935345004		Vial 78	1	Sample	8	4.19271e4	6.950	7.19033
#*	1935345005		Vial 79	1	Sample	9	0.00000	0.000	0.00000
#*	1935345006	100	Vial 80	1	Sample	10	2.00419e5	7.565	987.24143
#*	1935345007	1K	Vial 81	1	Sample	11	2.50754e5	7.612	1.44793e4
#*	1935345008	10K	Vial 82	1	Sample	12	1.44992e5	7.619	6.85893e4
#*	1935345009	10K	Vial 83	1	Sample	13	1.42326e5	7.621	7.51552e4
#*	1935345010	100	Vial 84	1	Sample	14	3.22493e5	7.617	1767.87343
#*	689414	CCV@25	Vial 71	1	Control	15	5.66704e5	7.478	26.34088
#*	1935347001	1K	Vial 85	1	Sample	16	2.43643e5	7.576	1.21619e4
#*	1935347002	1K	Vial 86	1	Sample	17	2.68208e5	7.574	1.28608e4
#*	1935347003	10X	Vial 87	1	Sample	18	3.97796e5	7.446	202.52947
#*	1935347006		Vial 90	1	Sample	21	1.30256e4	7.346	6.21224e-1
#*	1935347007		Vial 91	1	Sample	22	1.79359e5	7.298	10.11684
#*	1935366001		Vial 92	1	Sample	23	1.40576e4	7.237	6.07978e-1
#*	1935345003	5X	Vial 93	1	Sample	24	0.00000	0.000	0.00000
#*	1935345004	5X	Vial 94	1	Sample	25	4.28598e4	7.292	13.11553
#*	689415	CCV@25	Vial 71	1	Control	26	5.03085e5	7.471	25.23942
#*	1935347004	MS	Vial 97	1	Sample	29	4.75546e5	7.418	238.52283
#*	1935347005	MSD	Vial 98	1	Sample	30	4.64978e5	7.463	241.73838
#*	1935345003	2X	Vial 99	1	Sample	31	0.00000	0.000	0.00000
#*	1935345004	2X	Vial 100	1	Sample	32	4.40685e4	7.140	8.47992
*	689664	CCV@25	Vial 71	1	Control	33	4.78132e5	7.471	26.16731

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\DEC\23DEC19D.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	====	=====	=====	=====
1	Vial 71	689521	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	689522	QC@3.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	689524	ICS@3.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	689525	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1935345001		CLO4-AQN	1	Sample	
6	Vial 76	1935345002		CLO4-AQN	1	Sample	
7	Vial 77	1935345003		CLO4-AQN	1	Sample	
8	Vial 78	1935345004		CLO4-AQN	1	Sample	
9	Vial 79	1935345005		CLO4-AQN	1	Sample	
10	Vial 80	1935345006	100	CLO4-AQN	1	Sample	
11	Vial 81	1935345007	1K	CLO4-AQN	1	Sample	
12	Vial 82	1935345008	10K	CLO4-AQN	1	Sample	
13	Vial 83	1935345009	10K	CLO4-AQN	1	Sample	
14	Vial 84	1935345010	100	CLO4-AQN	1	Sample	
15	Vial 71	689414	CCV@25	CLO4-AQN	1	Ctrl Samp	
16	Vial 85	1935347001	1K	CLO4-AQN	1	Sample	
17	Vial 86	1935347002	1K	CLO4-AQN	1	Sample	
18	Vial 87	1935347003	10X	CLO4-AQN	1	Sample	
19	Vial 88	1935347004	MS	CLO4-AQN	1	Sample	
20	Vial 89	1935347005	MSD	CLO4-AQN	1	Sample	
21	Vial 90	1935347006		CLO4-AQN	1	Sample	
22	Vial 91	1935347007		CLO4-AQN	1	Sample	
23	Vial 92	1935366001		CLO4-AQN	1	Sample	
24	Vial 93	1935345003	5X	CLO4-AQN	1	Sample	
25	Vial 94	1935345004	5X	CLO4-AQN	1	Sample	
26	Vial 71	689415	CCV@25	CLO4-AQN	1	Ctrl Samp	
27	Vial 95	1935347004	NoSpk	CLO4-AQN	1	Sample	
28	Vial 96	1935347005	NoSpk	CLO4-AQN	1	Sample	
29	Vial 97	1935347004	MS	CLO4-AQN	1	Sample	
30	Vial 98	1935347005	MSD	CLO4-AQN	1	Sample	
31	Vial 99	1935345003	2X	CLO4-AQN	1	Sample	
32	Vial 100	1935345004	2X	CLO4-AQN	1	Sample	
33	Vial 71	689664	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD01.D

Sample Name: 689521 CCV@25

Injection Date: 12/23/2019 08:09:10

Seq Line: 1

Sample Name: 689521 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

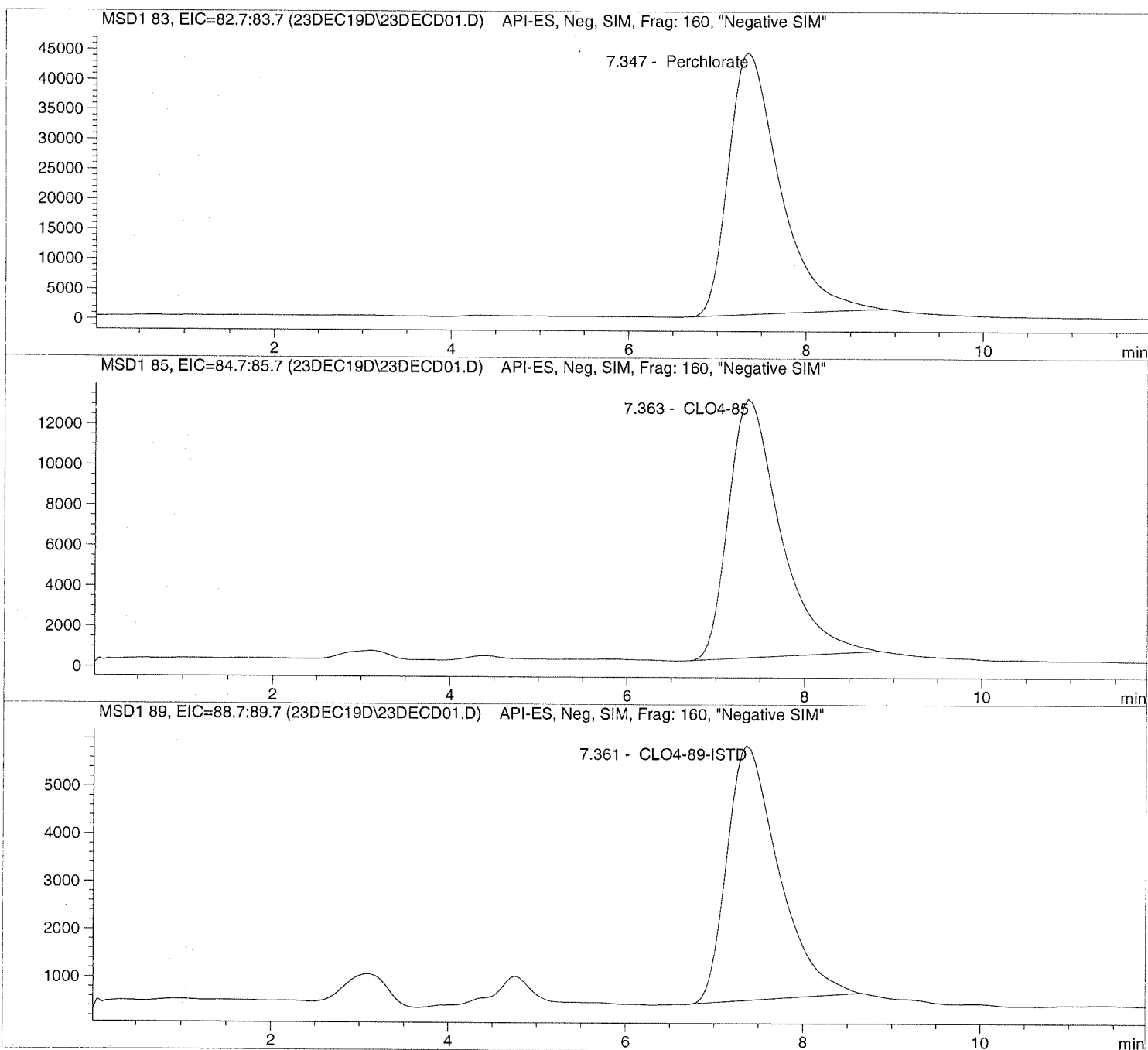
Inj. Vol.: 35 µl

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\23DEC19D\23DECD01.D Sample Name: 689521 CCV@25

```

=====
Injection Date: 12/23/2019 08:09:10      Seq Line: 1
Sample Name:    689521 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
7.347	PBA	1764733.7	27.4976	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.363	PBA	521339.0	26.7406	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.361	PBA	217048.4	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD02.D

Sample Name: 689522 QC@3.0

Injection Date: 12/23/2019 08:25:30

Seq Line: 2

Sample Name: 689522 QC@3.0

Location: Vial 72

Acq Operator: TNB

Inj. No.: 1

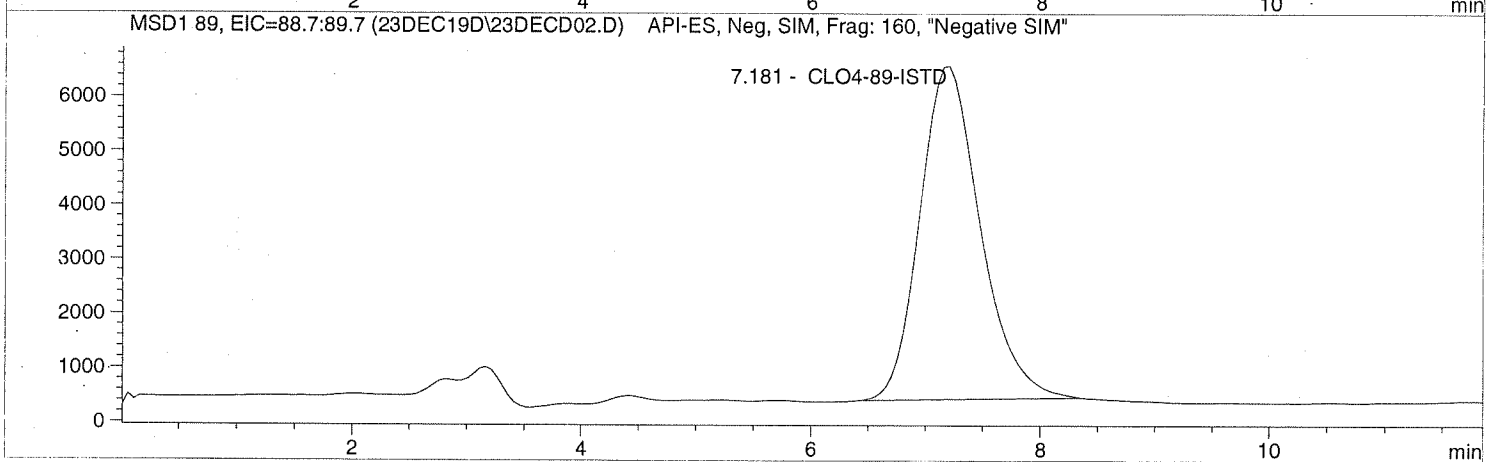
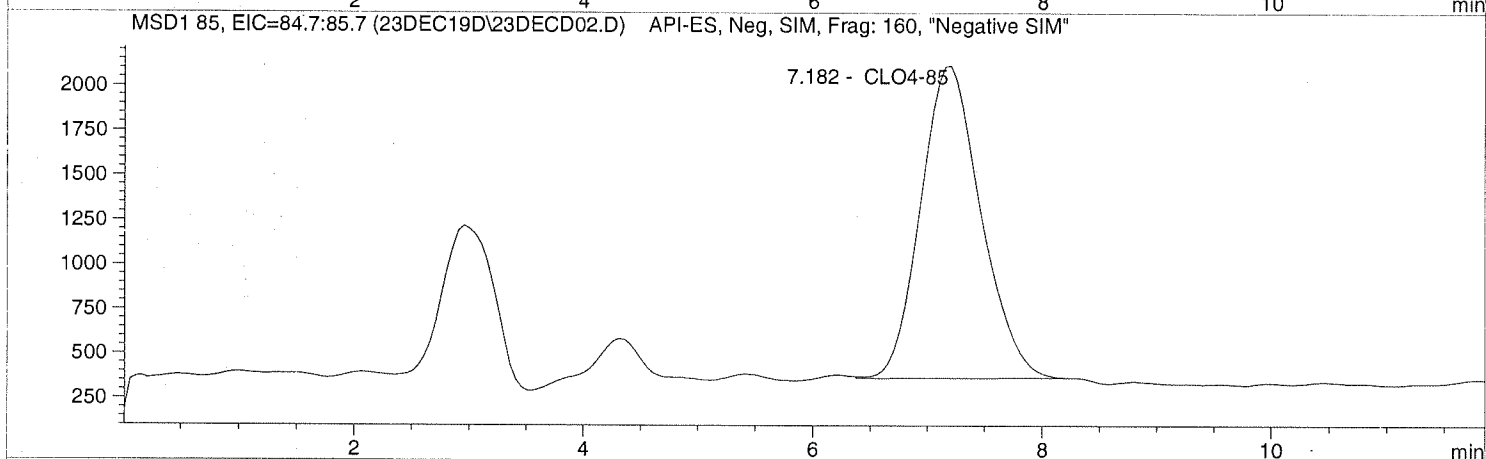
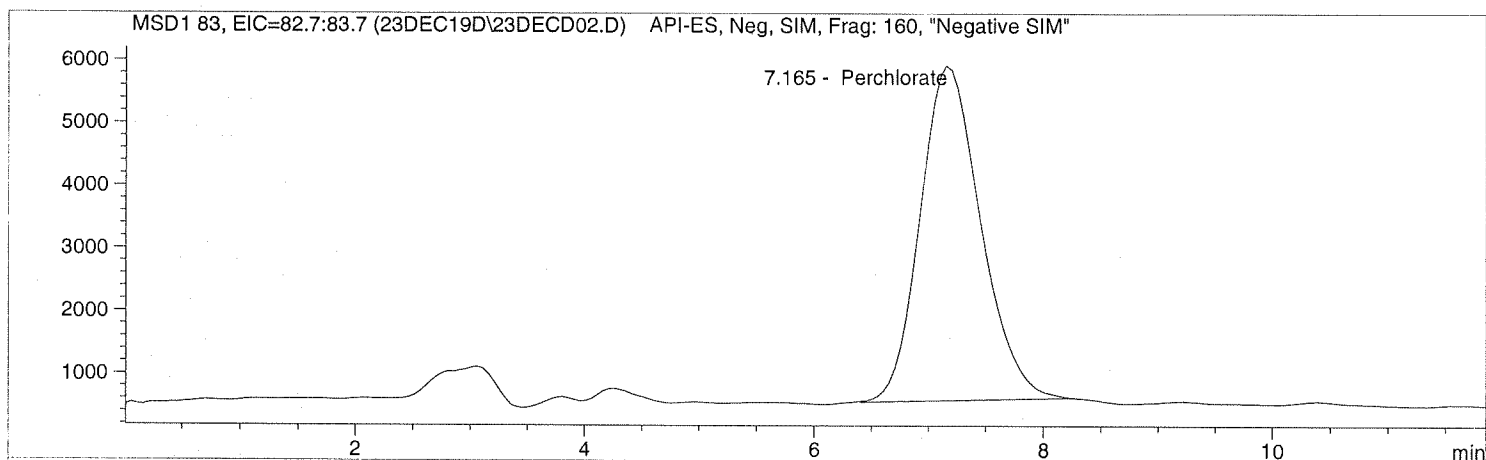
Inj. Vol.: 35 μ l

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\23DEC19D\23DECD02.D Sample Name: 689522 QC@3.0

=====
 Injection Date: 12/23/2019 08:25:30 Seq Line: 2
 Sample Name: 689522 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
7.165	BBA	195559.3	3.2049	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.182	BBA	63783.9	3.3382	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.181	BBA	224689.5	5.0000	CLO4-89-ISTD

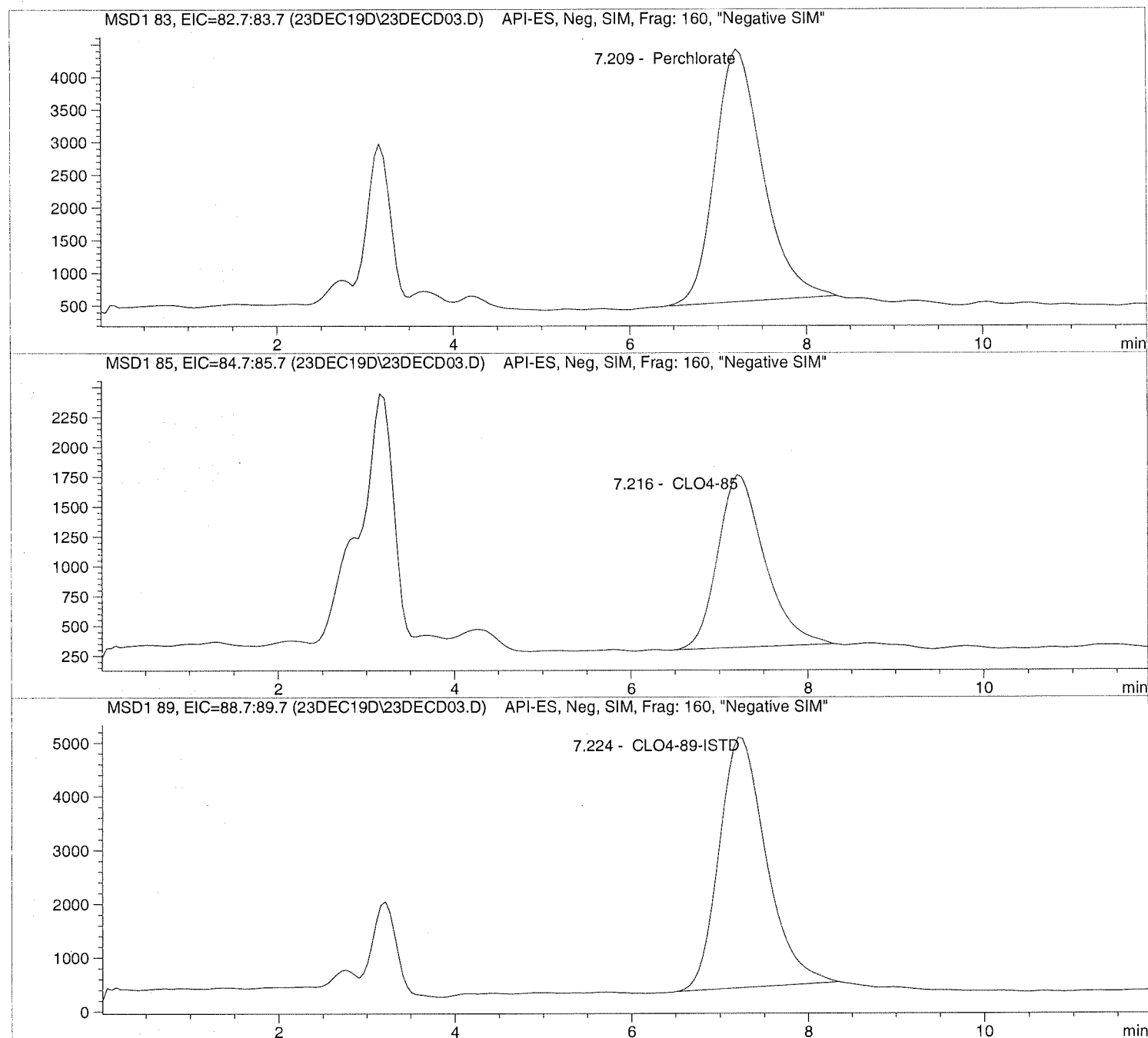
=====
 *** End of Report ***
 =====

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD03.D Sample Name: 689524 ICS@3.0

=====
Injection Date: 12/23/2019 08:39:24 Seq Line: 3
Sample Name: 689524 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\23DEC19D\23DECD03.D Sample Name: 689524 ICS@3.0

```

=====
Injection Date: 12/23/2019 08:39:24      Seq Line:      3
Sample Name:    689524 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
7.209	BBA	144963.1	3.0976	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.216	PBA	53041.2	3.6302	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.224	PBA	172262.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

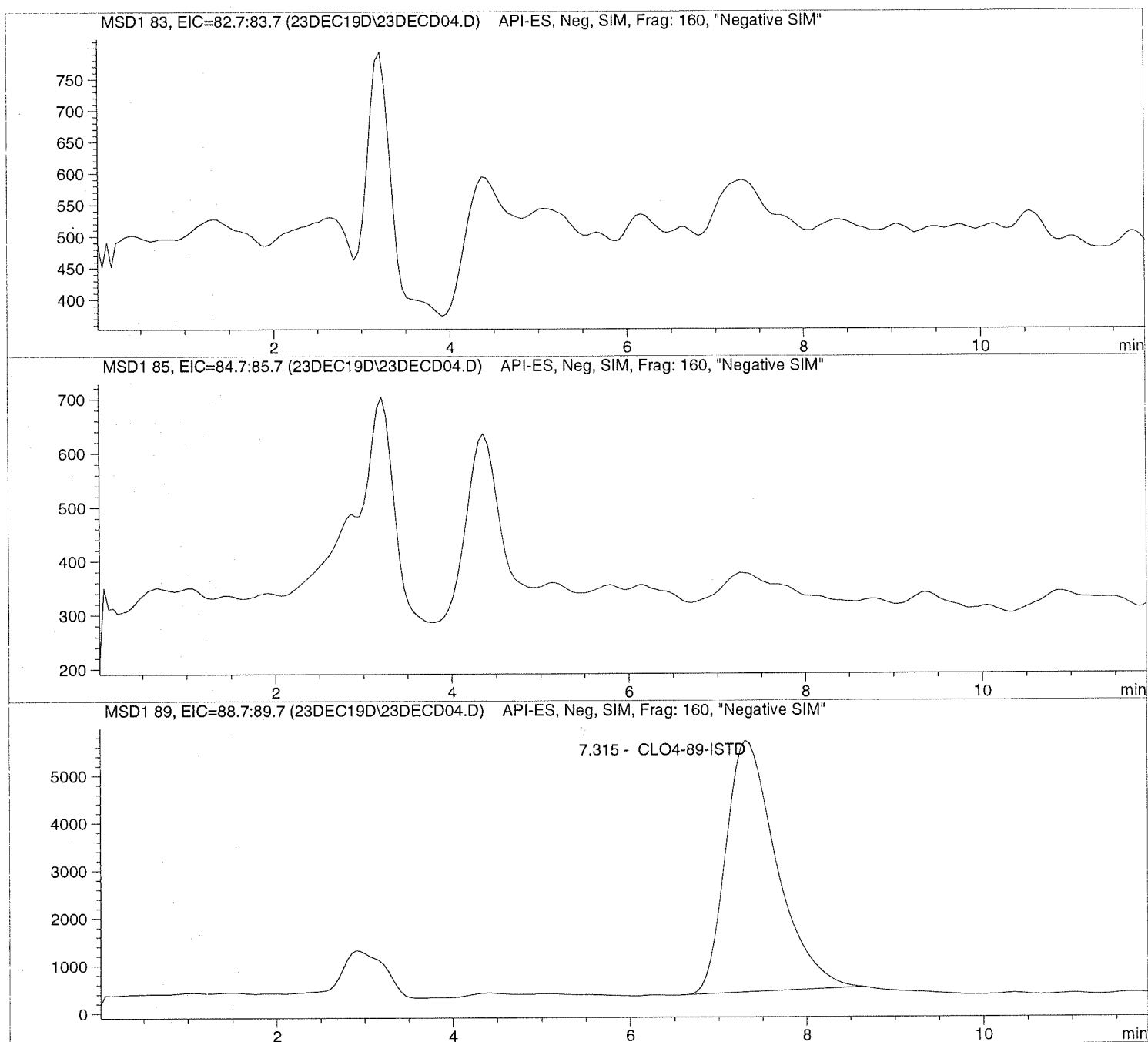
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD04.D Sample Name: 689525 LMB

```
=====
Injection Date: 12/23/2019 08:53:18      Seq Line: 4
Sample Name: 689525 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\23DEC19D\23DEC04.D Sample Name: 689525 LMB

```

=====
Injection Date: 12/23/2019 08:53:18      Seq Line:          4
Sample Name:    689525 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
7.315	PBA	213086.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD05.D

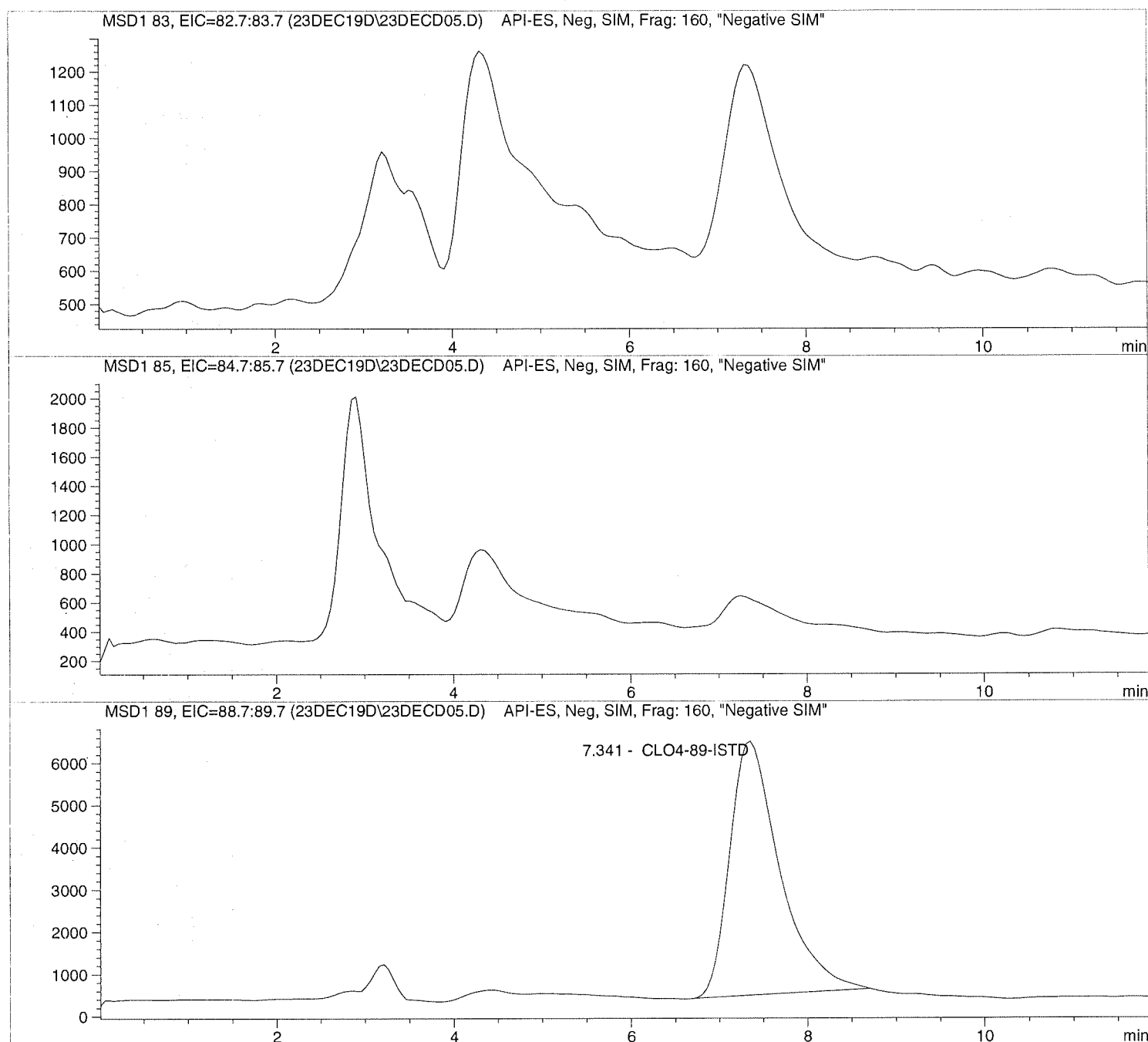
Sample Name: 1935345001

Injection Date: 12/23/2019 09:07:14
Sample Name: 1935345001
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
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\23DEC19D\23DECD05.D Sample Name: 1935345001

```

=====
Injection Date: 12/23/2019 09:07:14      Seq Line:          5
Sample Name:   1935345001                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
7.341	PBA	238355.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD06.D

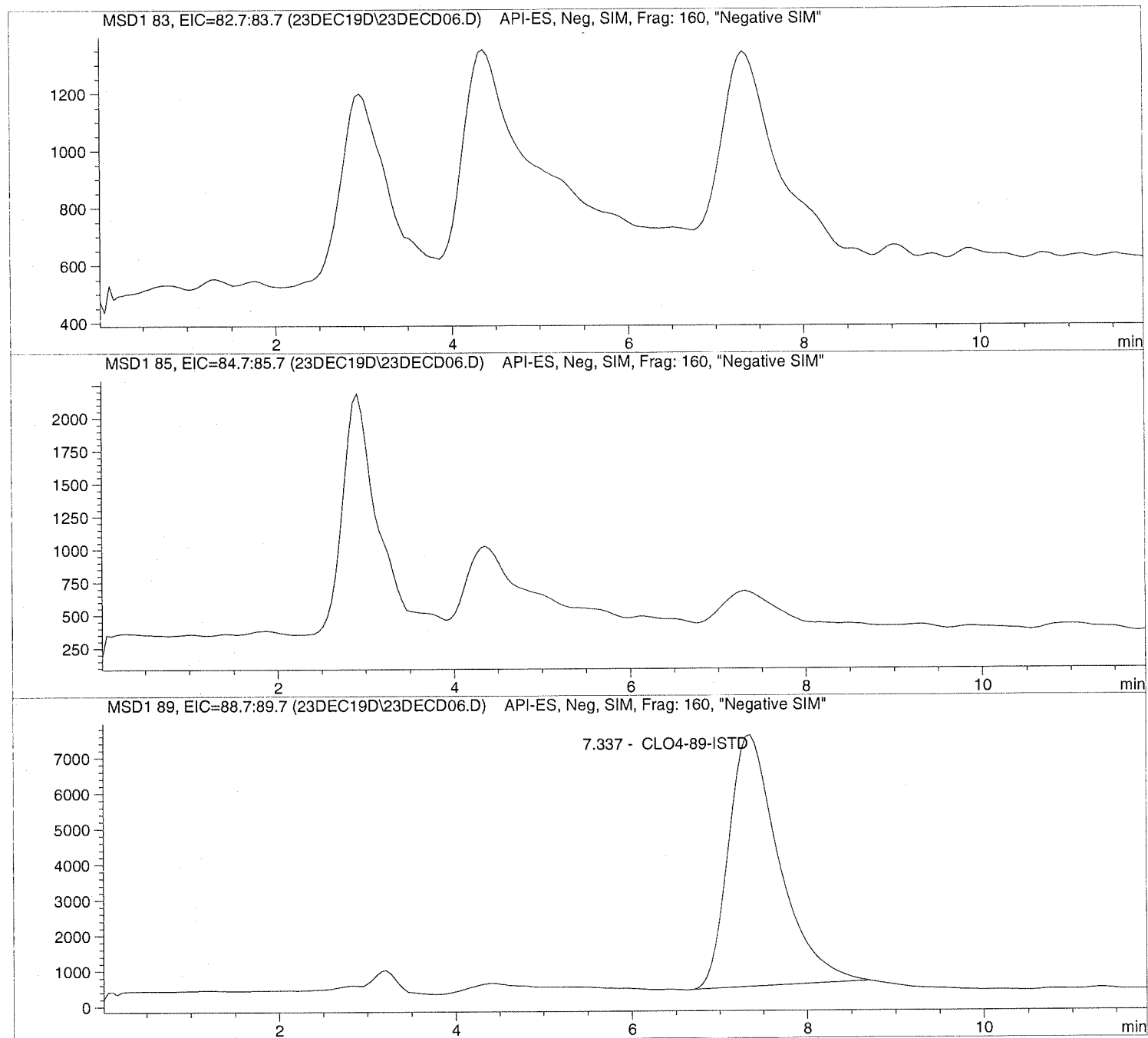
Sample Name: 1935345002

=====
Injection Date: 12/23/2019 09:21:10
Sample Name: 1935345002
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
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\23DEC19D\23DECD06.D Sample Name: 1935345002

```

=====
Injection Date: 12/23/2019 09:21:10      Seq Line: 6
Sample Name: 1935345002                  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
7.337	PBA	283690.6	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD07.D

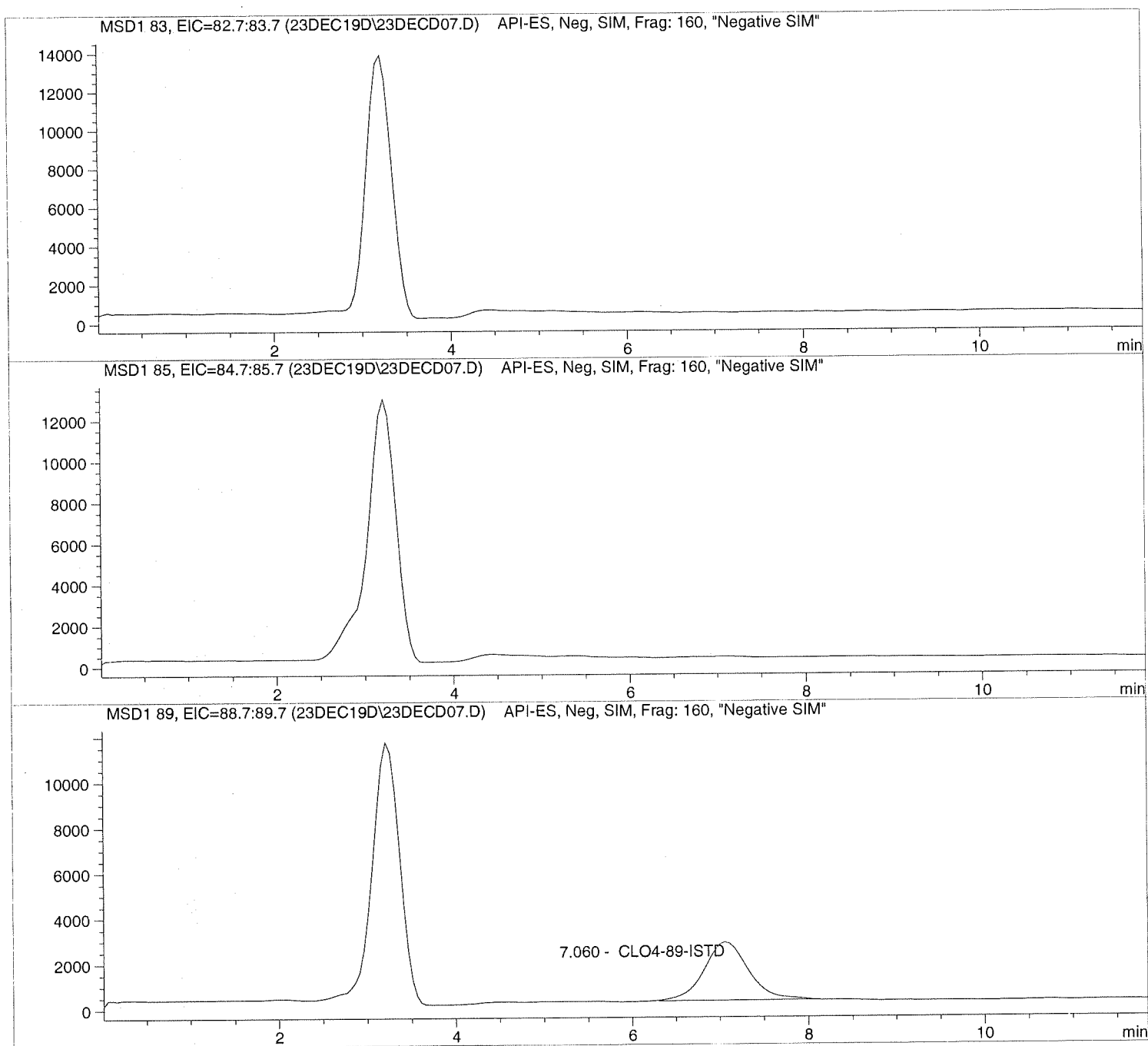
Sample Name: 1935345003

Injection Date: 12/23/2019 09:35:04
Sample Name: 1935345003
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 35 μ l

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\23DEC19D\23DECD07.D Sample Name: 1935345003

```

=====
Injection Date: 12/23/2019 09:35:04      Seq Line:          7
Sample Name:    1935345003                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
7.060	BBA	89834.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD08.D

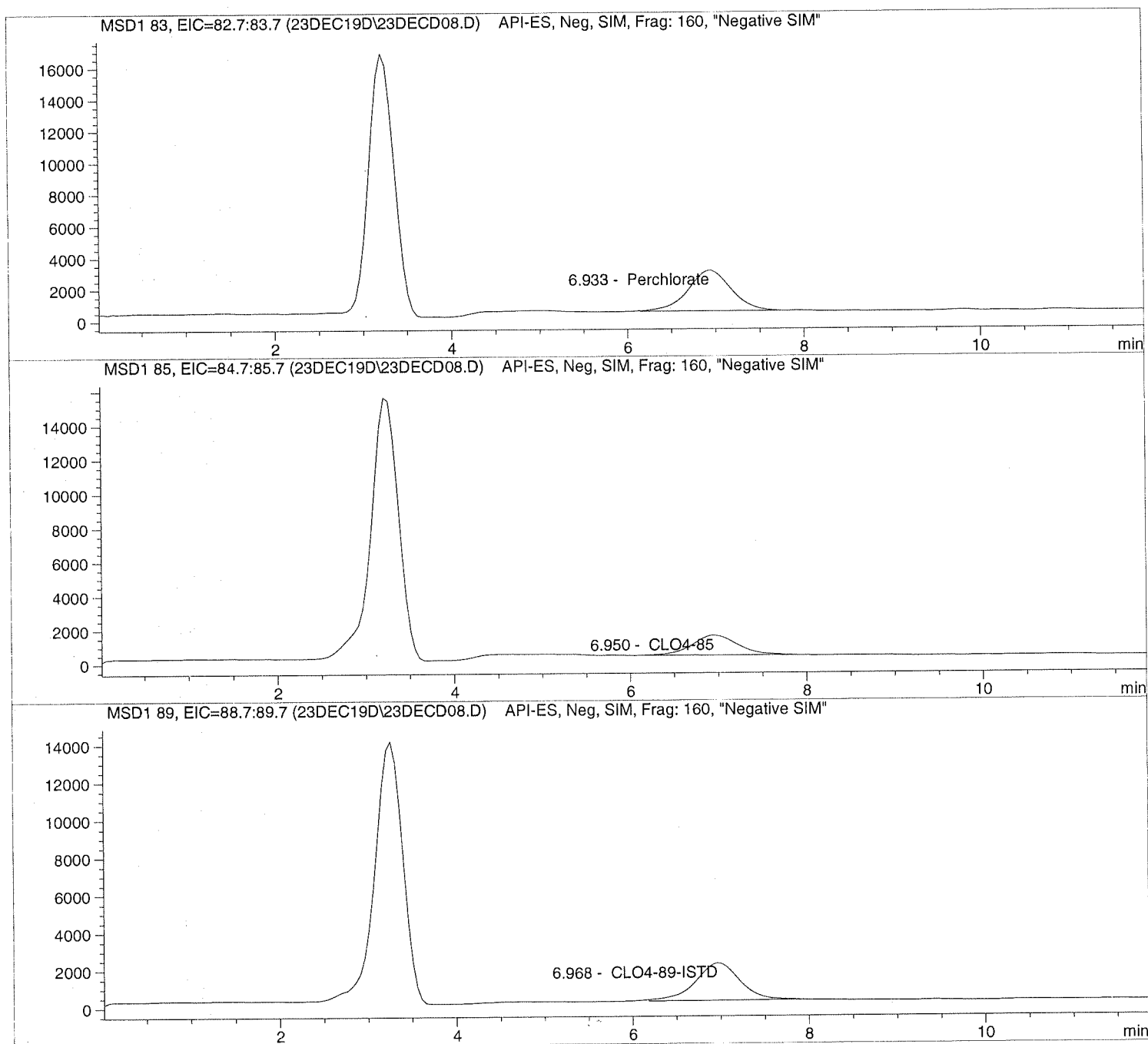
Sample Name: 1935345004

Injection Date: 12/23/2019 09:48:56
Sample Name: 1935345004
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 35 μ l

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\23DEC19D\23DECD08.D

Sample Name: 1935345004

```

=====
Injection Date: 12/23/2019 09:48:56      Seq Line:      8
Sample Name:   1935345004                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
6.933	BBA	86879.4	4.6286	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.950	PBA	41927.1	7.1903	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.968	BBA	69203.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD09.D

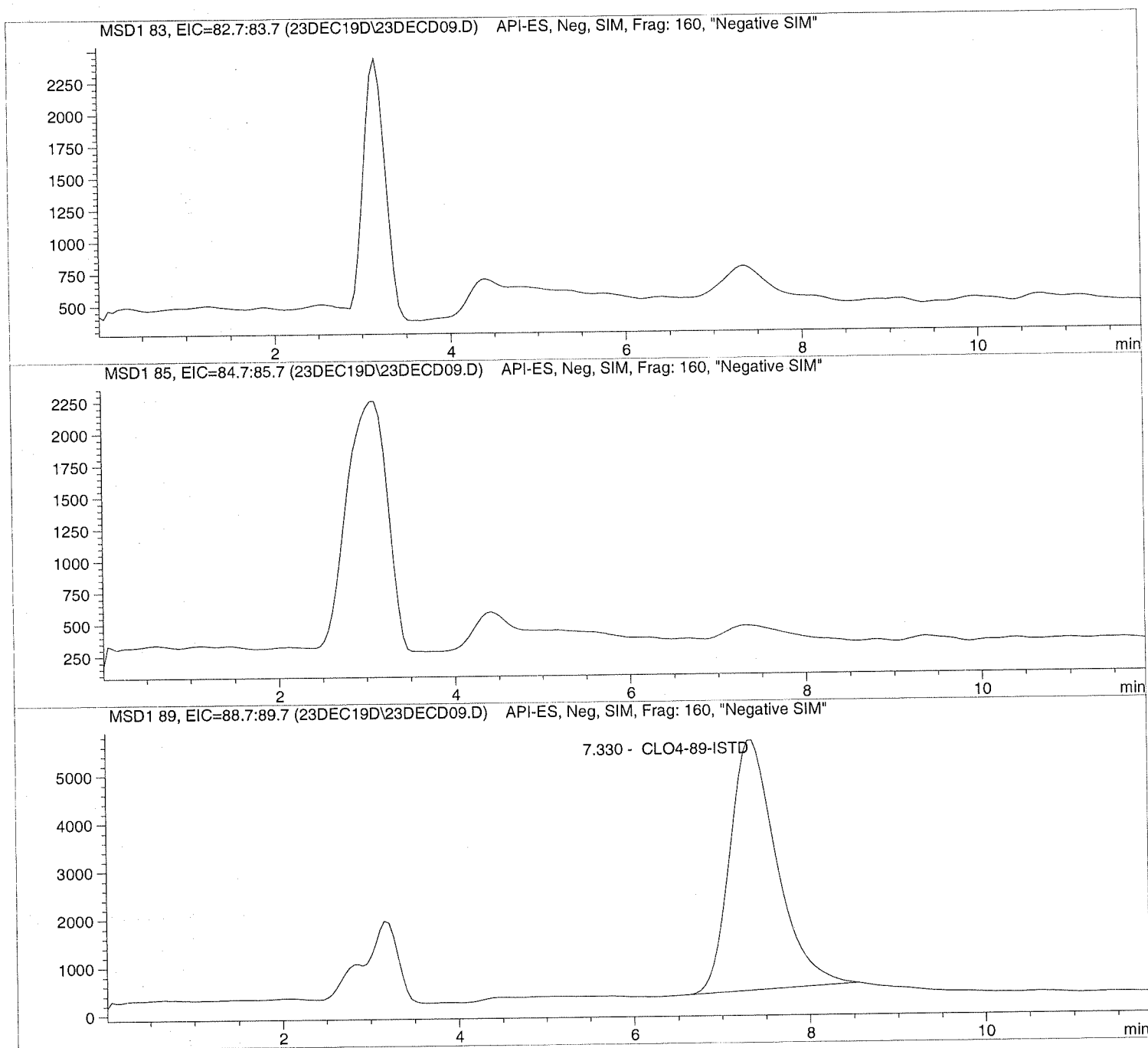
Sample Name: 1935345005

Injection Date: 12/23/2019 10:02:49
Sample Name: 1935345005
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 35 μ l

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\23DEC19D\23DECD09.D Sample Name: 1935345005

```

=====
Injection Date: 12/23/2019 10:02:49      Seq Line:          9
Sample Name:   1935345005                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
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
7.330	PBA	193530.4	5.0000	CLO4-89-ISTD

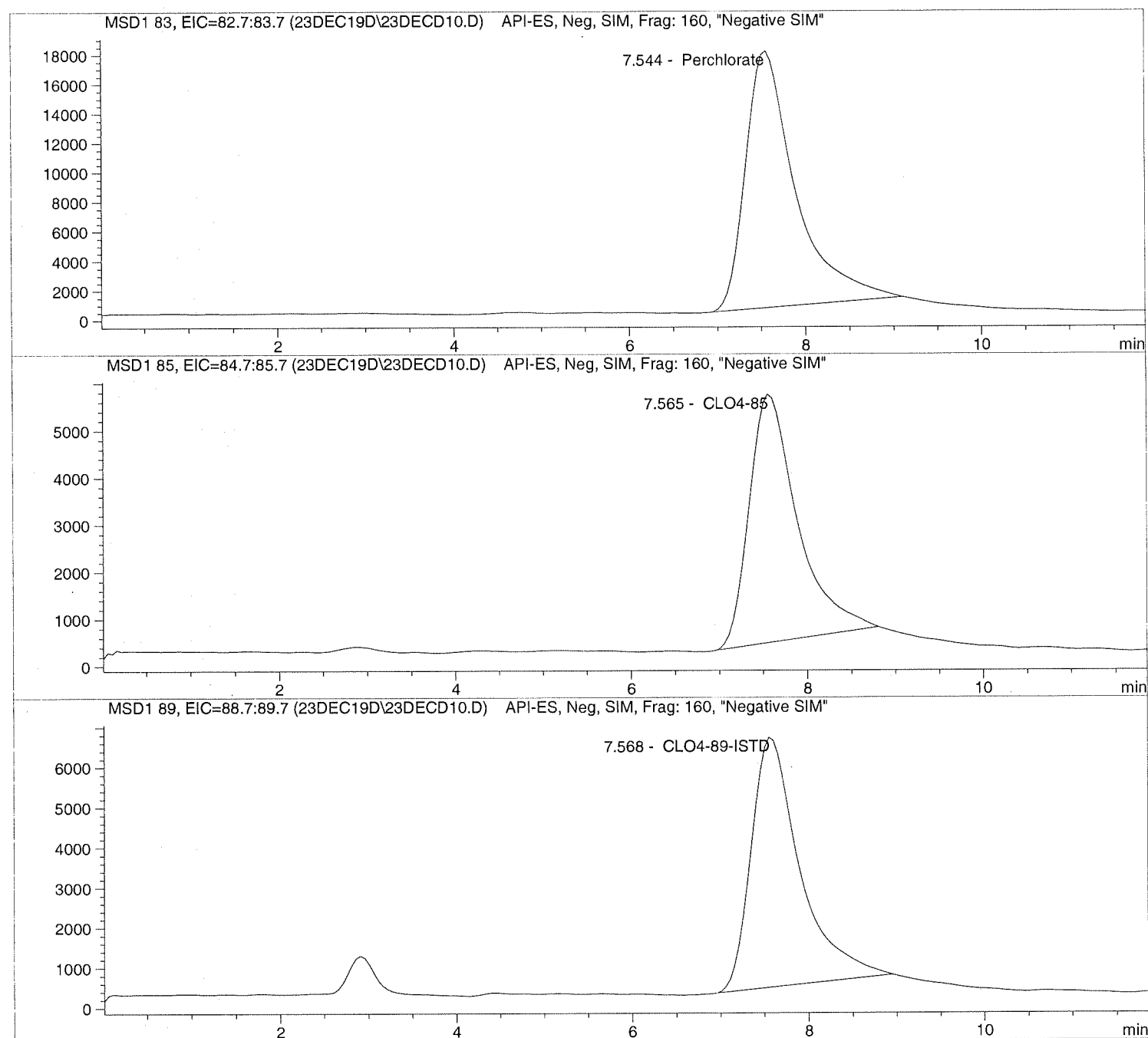
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD10.D Sample Name: 1935345006 100

```
=====
Injection Date: 12/23/2019 10:16:44      Seq Line:      10
Sample Name:    1935345006 100            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\23DEC19D\23DECD10.D Sample Name: 1935345006 100

```

=====
Injection Date: 12/23/2019 10:16:44      Seq Line:      10
Sample Name:    1935345006 100           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:       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
7.544	PBA	685819.4	1037.7700	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.565	PBA	200418.5	987.2414	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.568	PBA	239667.0	500.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD11.D

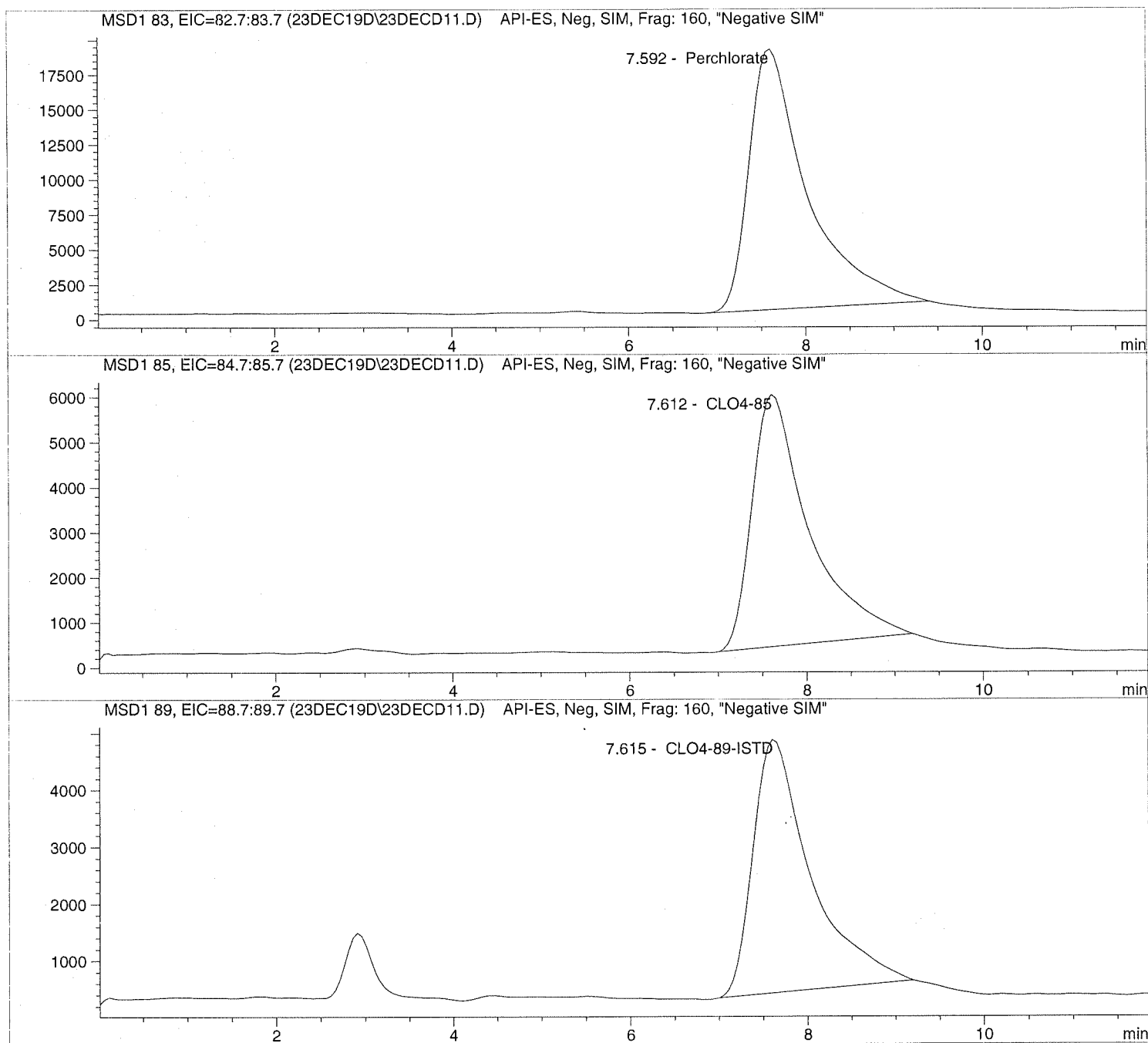
Sample Name: 1935345007 1K

Injection Date: 12/23/2019 10:30:38
Sample Name: 1935345007 1K
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
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\23DEC19D\23DECD11.D Sample Name: 1935345007 1K

```

=====
Injection Date: 12/23/2019 10:30:38      Seq Line:          11
Sample Name:    1935345007 1K           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:       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
7.592	PBA	848401.4	14986.6893	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.612	PBA	250753.5	14479.3444	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.615	PBA	201594.0	5000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

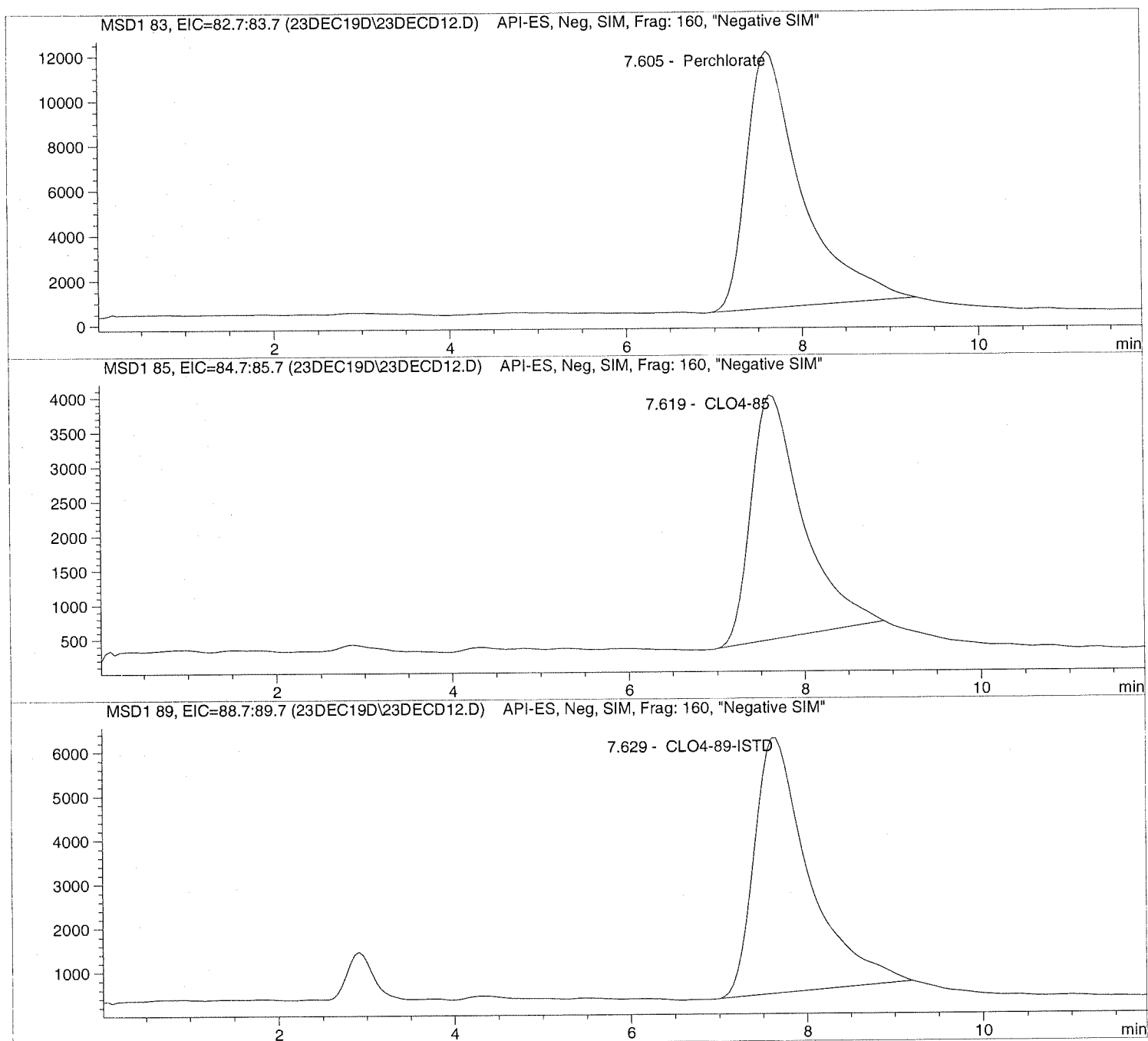
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD12.D Sample Name: 1935345008 10K

```
=====
Injection Date: 12/23/2019 10:44:29      Seq Line:      12
Sample Name:    1935345008 10K           Location:      Vial 82
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\23DEC19D\23DECD12.D Sample Name: 1935345008 10K

```

=====
Injection Date: 12/23/2019 10:44:29      Seq Line:      12
Sample Name:    1935345008 10K           Location:      Vial 82
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:       10000.000000
Sample Amount:  0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.605	PBA	501020.7	73174.5193	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.619	PBA	144991.8	68589.2543	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.629	PBA	250964.5	50000.0000	CLO4-89-ISTD

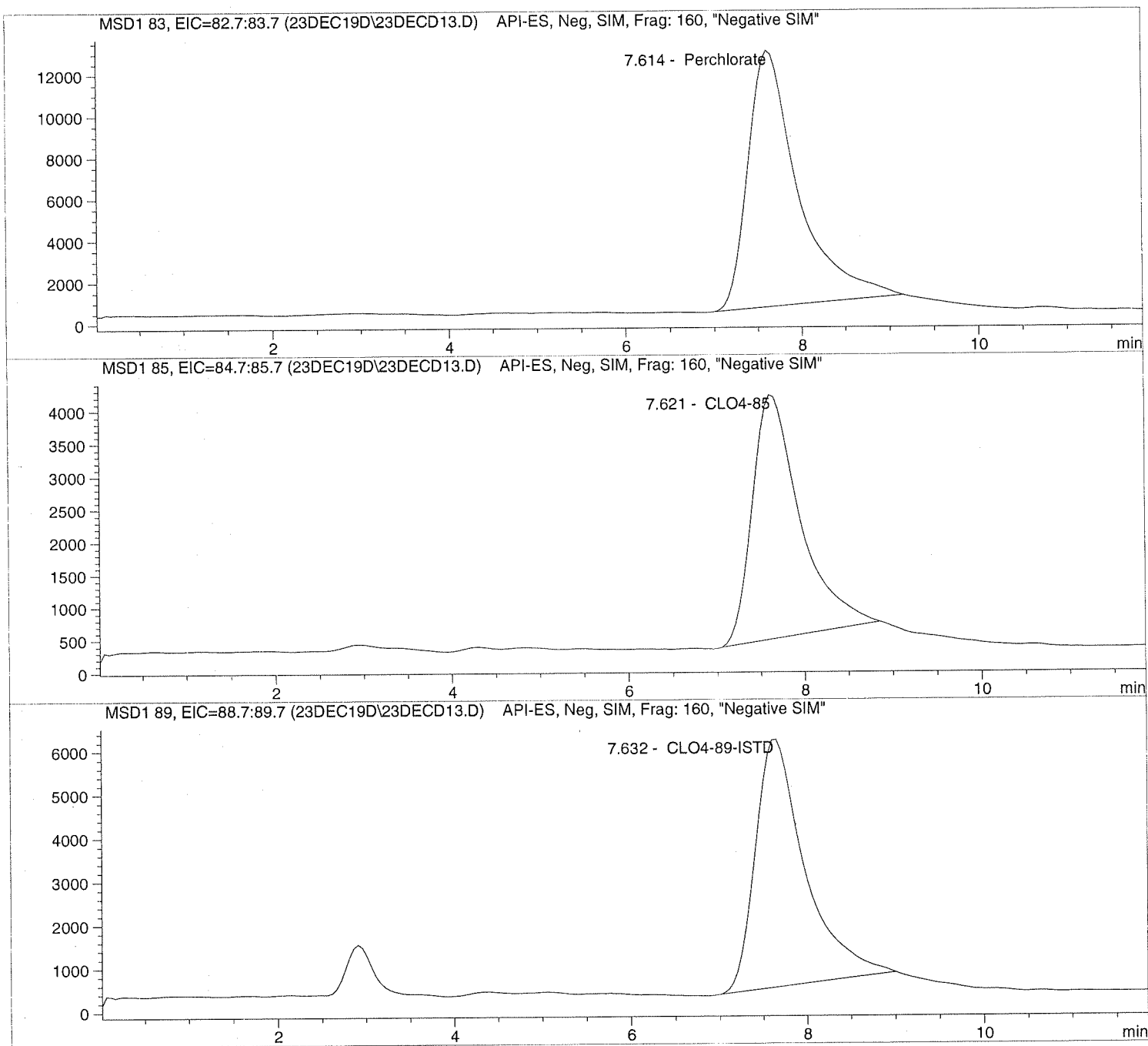
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD13.D Sample Name: 1935345009 10K

```
=====
Injection Date: 12/23/2019 10:58:21 Seq Line: 13
Sample Name: 1935345009 10K 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\23DEC19D\23DECD13.D Sample Name: 1935345009 10K

```

=====
Injection Date: 12/23/2019 10:58:21      Seq Line:      13
Sample Name:    1935345009 10K           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:       10000.000000
Sample Amount:  0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.614	PBA	488879.8	79598.8740	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.621	PBA	142325.9	75155.2365	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.632	PBA	224661.1	50000.0000	CLO4-89-ISTD

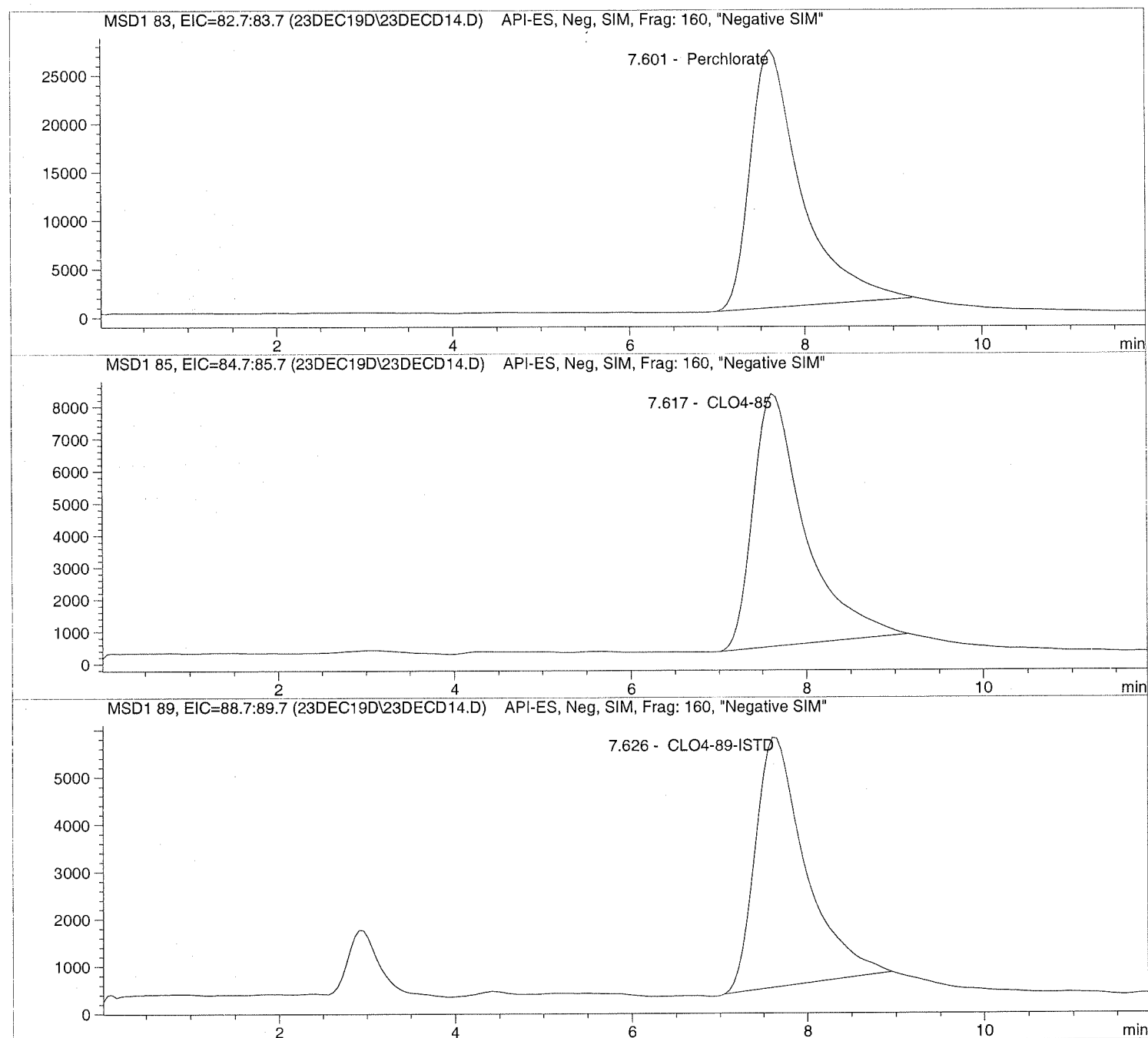
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD14.D Sample Name: 1935345010 100

```
=====
Injection Date: 12/23/2019 11:12:11      Seq Line:      14
Sample Name:    1935345010 100           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\23DEC19D\23DECD14.D Sample Name: 1935345010 100

```

=====
Injection Date: 12/23/2019 11:12:11      Seq Line:          14
Sample Name:    1935345010 100           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:       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
7.601	PBA	1076000.9	1802.1441	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.617	PBA	322492.7	1767.8734	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.626	PBA	209986.7	500.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD15.D

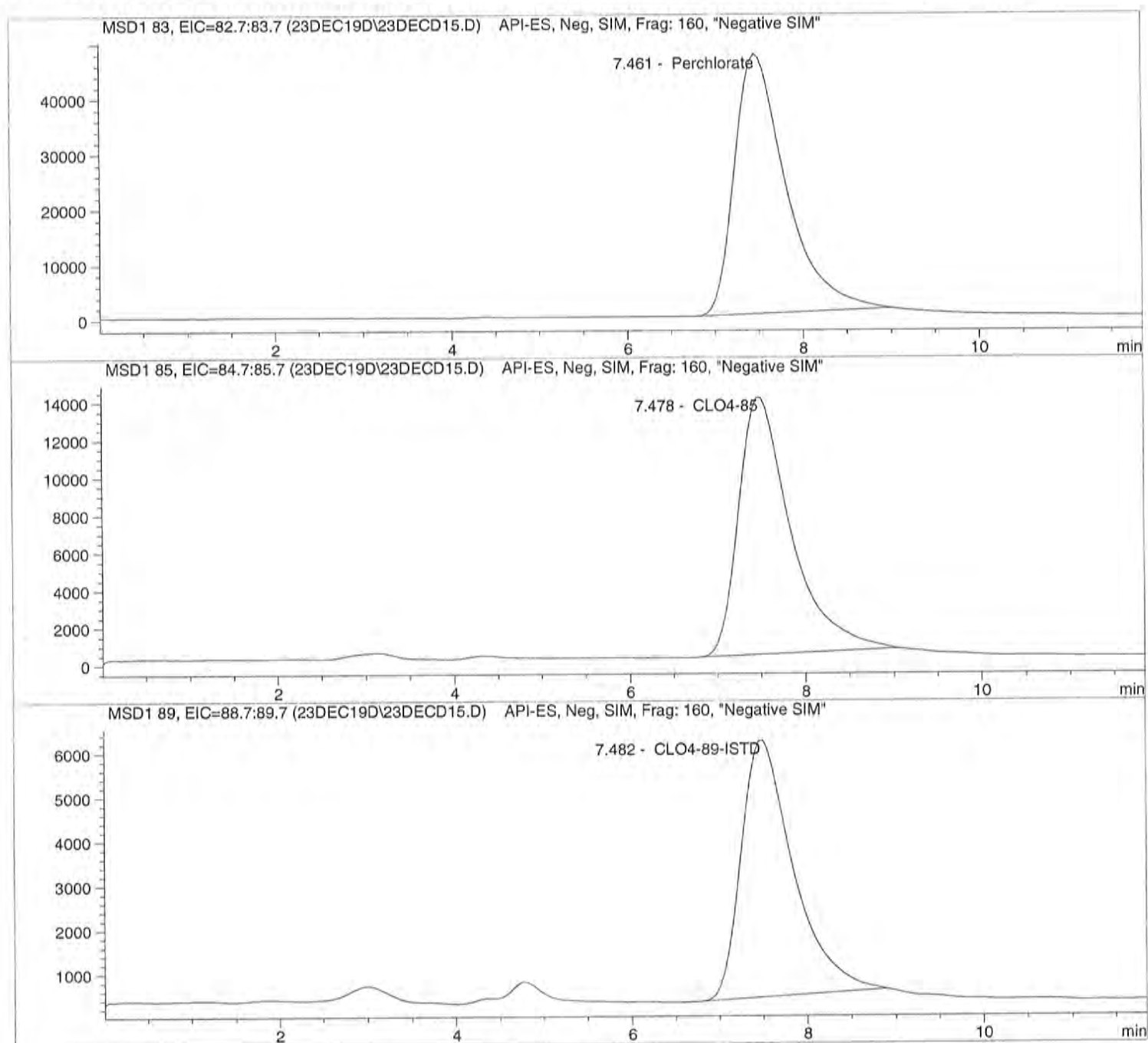
Sample Name: 689414 CCV@25

Injection Date: 12/23/2019 11:26:02
Sample Name: 689414 CCV@25
Acq Operator: TNB 528

Seq Line: 15
Location: Vial 71
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\23DEC19D\23DECD15.D Sample Name: 689414 CCV@25

```

=====
Injection Date: 12/23/2019 11:26:02      Seq Line:          15
Sample Name:   689414 CCV@25             Location:          Vial 71
Acq Operator:  TNB 528                   Inj. No.:         1
                                           Inj. Vol.:        35 µl
                                           TB 12-30-19
=====

```

```

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
7.461	PBA	1910947.6	26.9979	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.478	PBA	566704.3	26.3409	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.482	PBA	239872.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

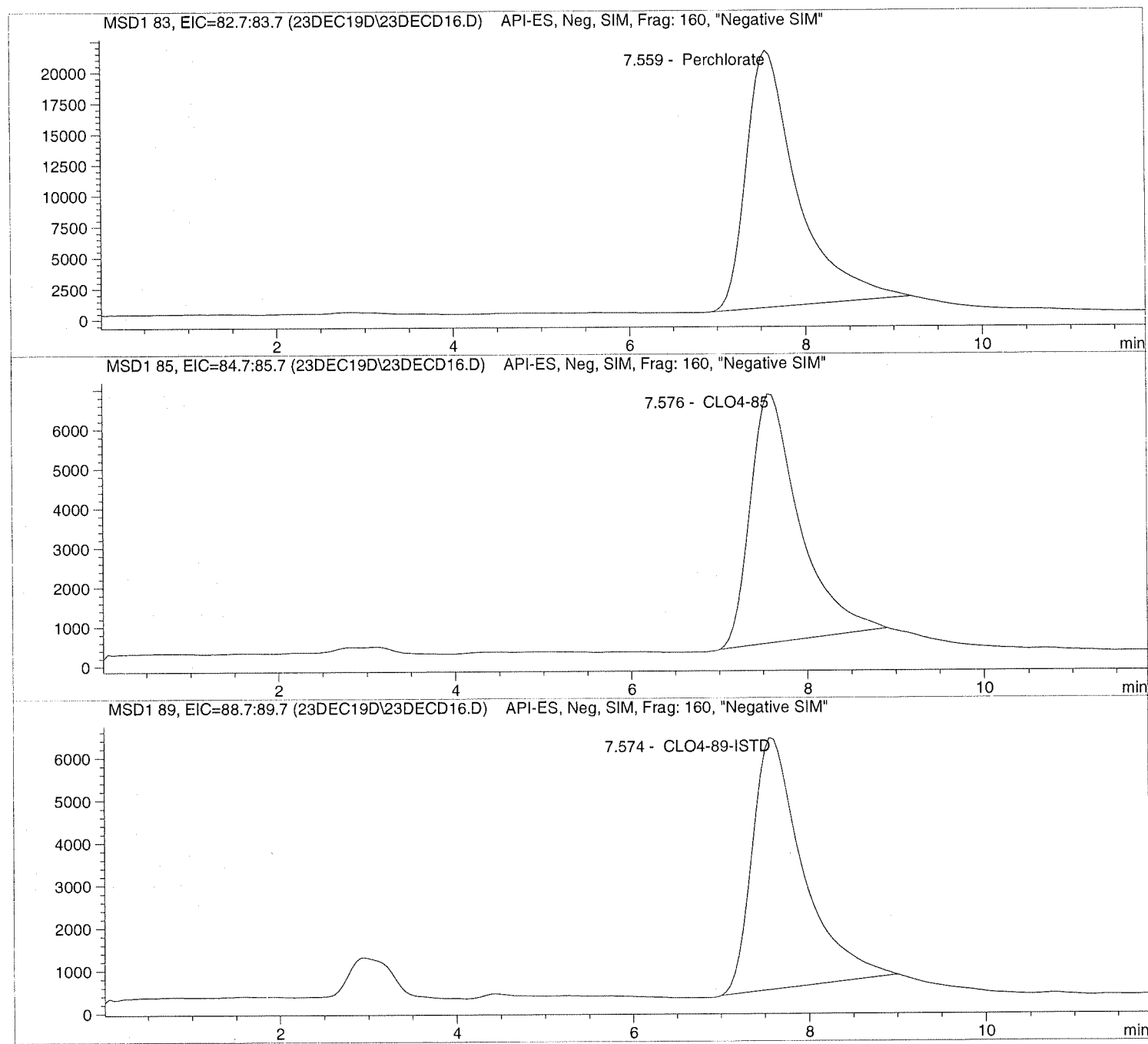
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD16.D Sample Name: 1935347001 1K

```
=====
Injection Date: 12/23/2019 11:39:57      Seq Line:      16
Sample Name:    1935347001 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\23DEC19D\23DECD16.D Sample Name: 1935347001 1K

```
=====
Injection Date: 12/23/2019 11:39:57      Seq Line:      16
Sample Name:    1935347001 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
7.559	PBA	833844.3	12751.9297	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.576	PBA	243643.4	12161.9406	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.574	PBA	234965.2	5000.0000	CLO4-89-ISTD

=====

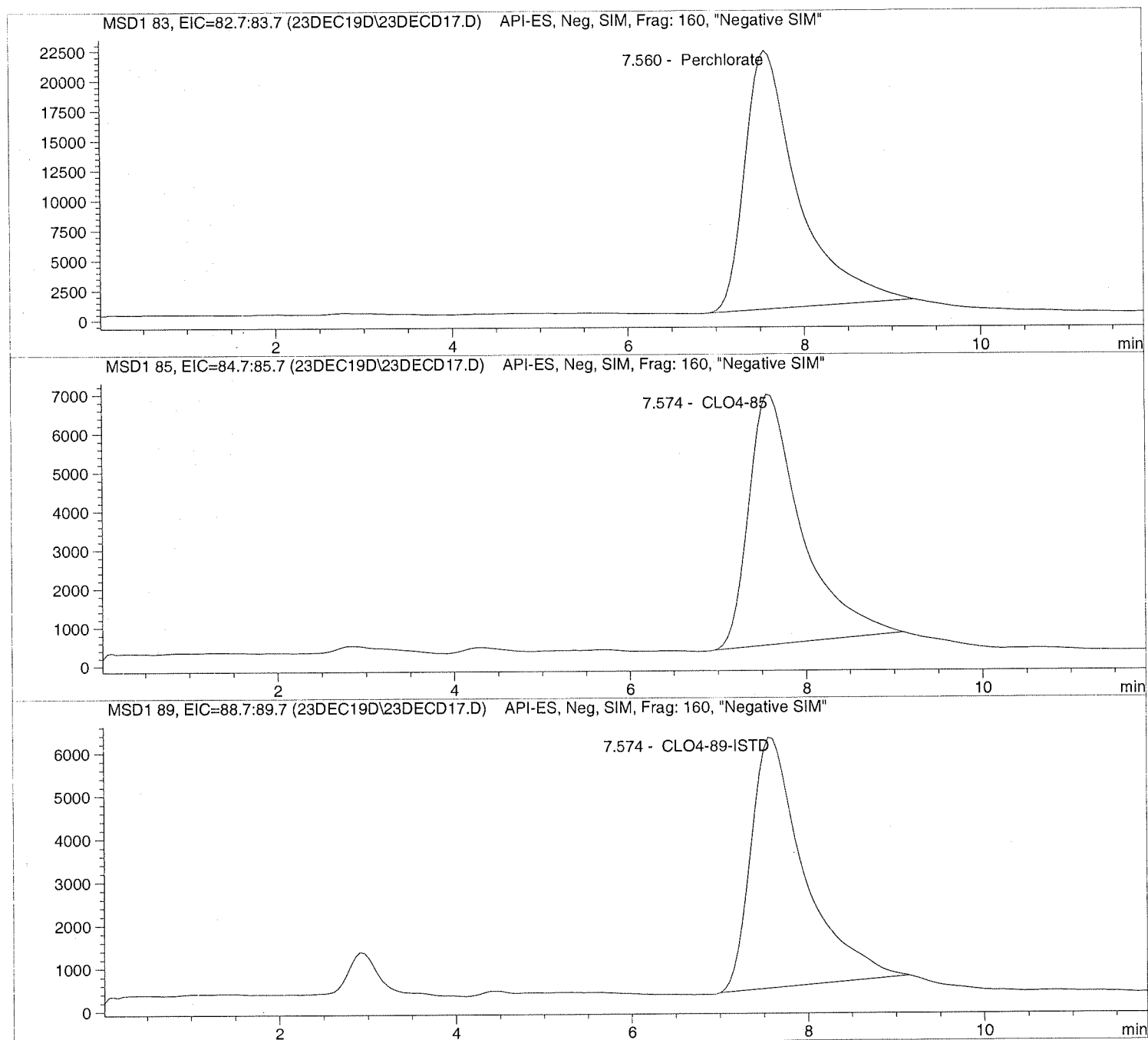
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD17.D Sample Name: 1935347002 1K

```
=====
Injection Date: 12/23/2019 11:53:49      Seq Line:          17
Sample Name:    1935347002 1K             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\23DEC19D\23DEC17.D Sample Name: 1935347002 1K

```

=====
Injection Date: 12/23/2019 11:53:49      Seq Line:      17
Sample Name:   1935347002 1K             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:      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
7.560	PBA	901055.0	13240.2824	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.574	PBA	268208.5	12860.7607	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.574	PBA	244063.0	5000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD18.D

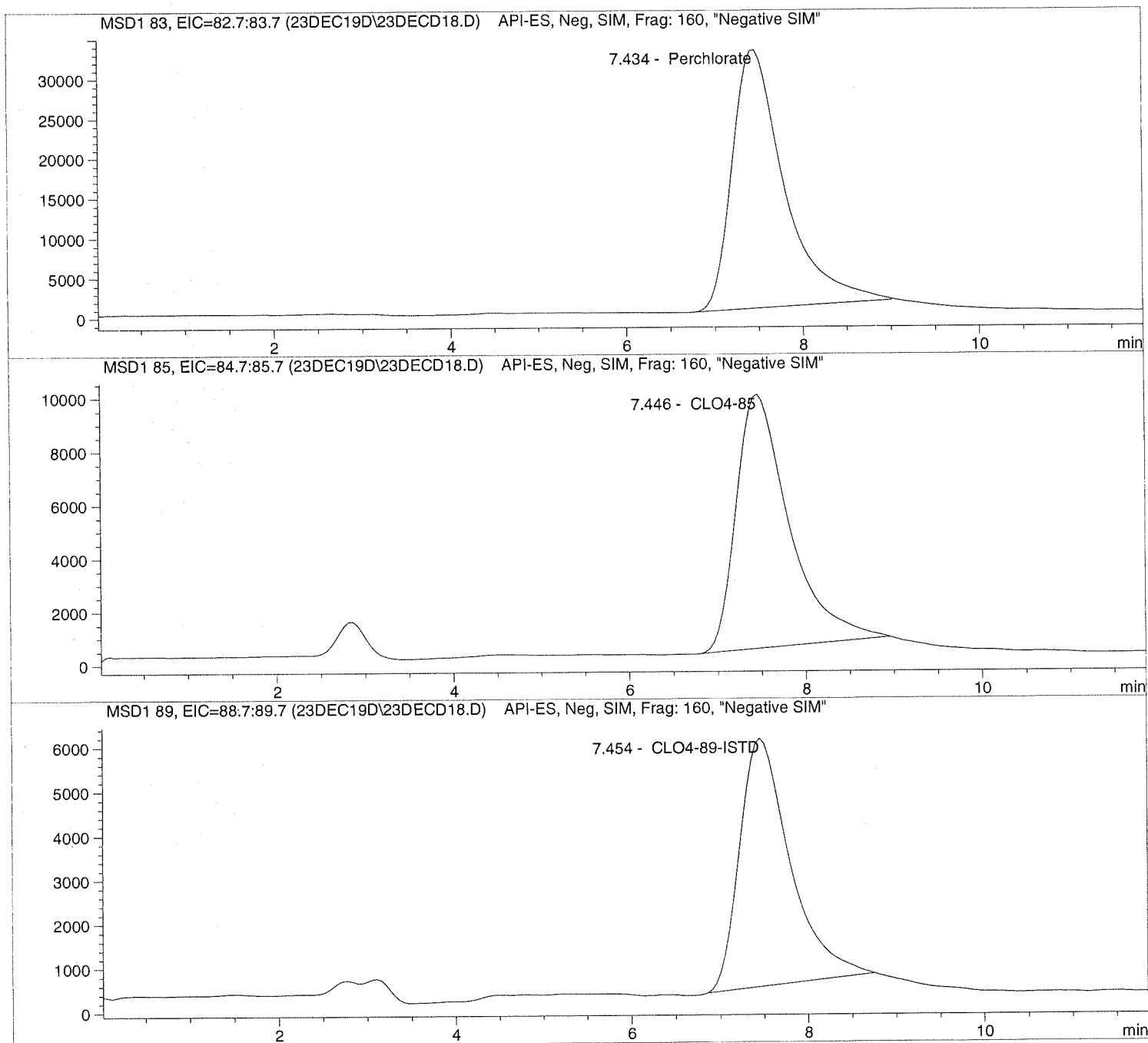
Sample Name: 1935347003 10X

Injection Date: 12/23/2019 12:07:42
Sample Name: 1935347003 10X
Acq Operator: TNB

Seq Line: 18
Location: Vial 87
Inj. No.: 1
Inj. Vol.: 35 μ l

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\23DEC19D\23DECD18.D Sample Name: 1935347003 10X

```

=====
Injection Date: 12/23/2019 12:07:42      Seq Line: 18
Sample Name: 1935347003 10X              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: 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
7.434	PBA	1335757.6	207.3848	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.446	PBA	397795.7	202.5295	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.454	PBA	223994.3	50.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD21.D

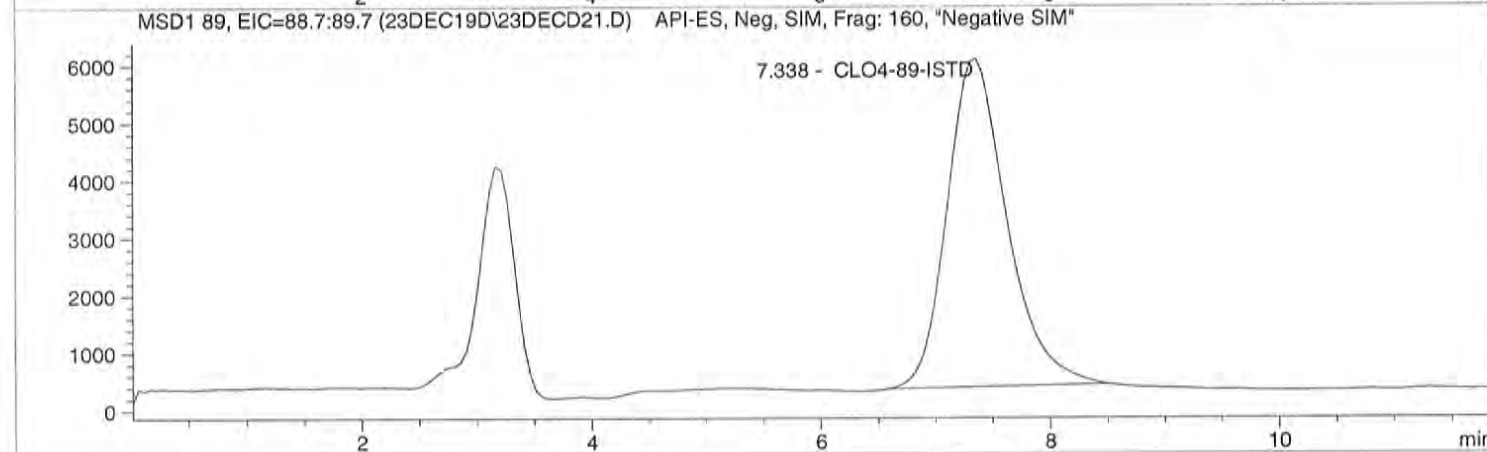
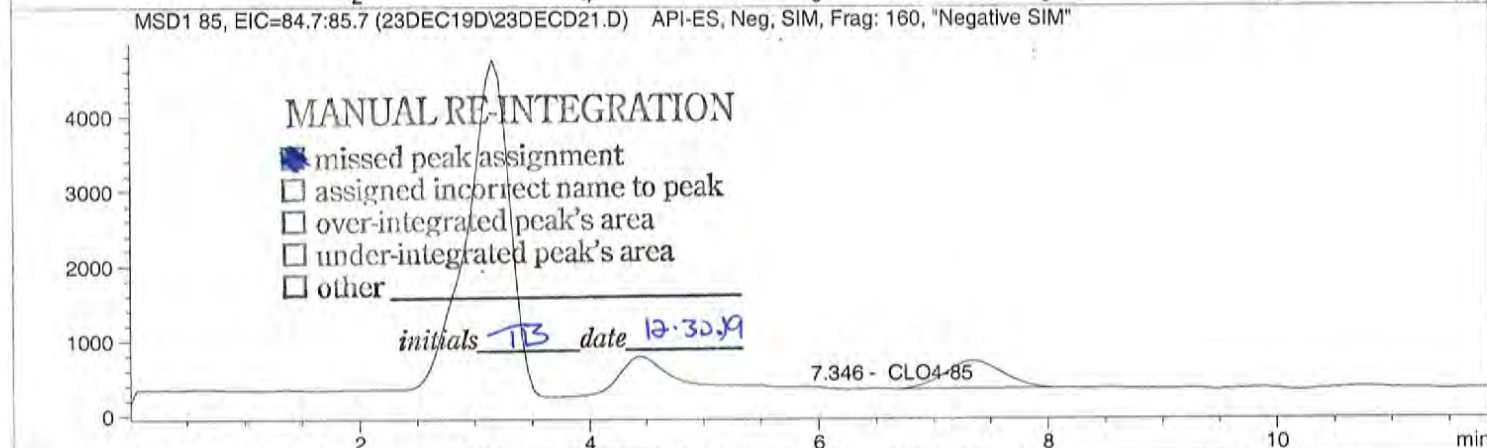
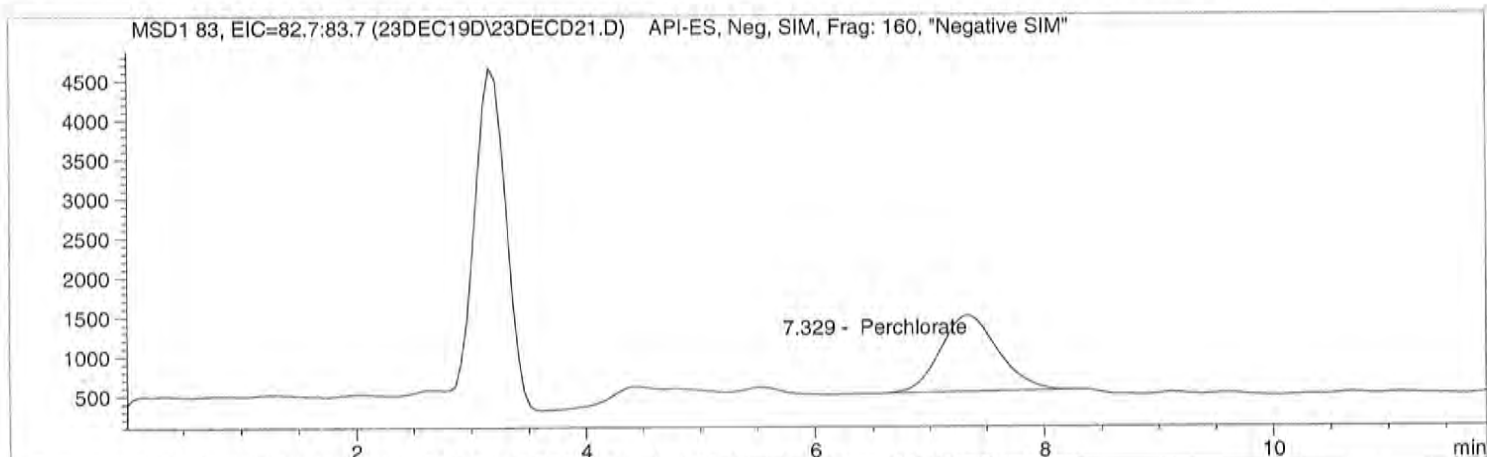
Sample Name: 1935347006

Injection Date: 12/23/2019 12:49:23
 Sample Name: 1935347006
 Acq Operator: TNB

Seq Line: 21
 Location: Vial 90
 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\23DEC19D\23DECD21.D

Sample Name: 1935347006

```

=====
Injection Date: 12/23/2019 12:49:23      Seq Line:          21
Sample Name:    1935347006                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
7.329	PBA	33750.8	0.5414	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.346	MM	13025.6	0.6212	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.338	BBA	206441.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD22.D

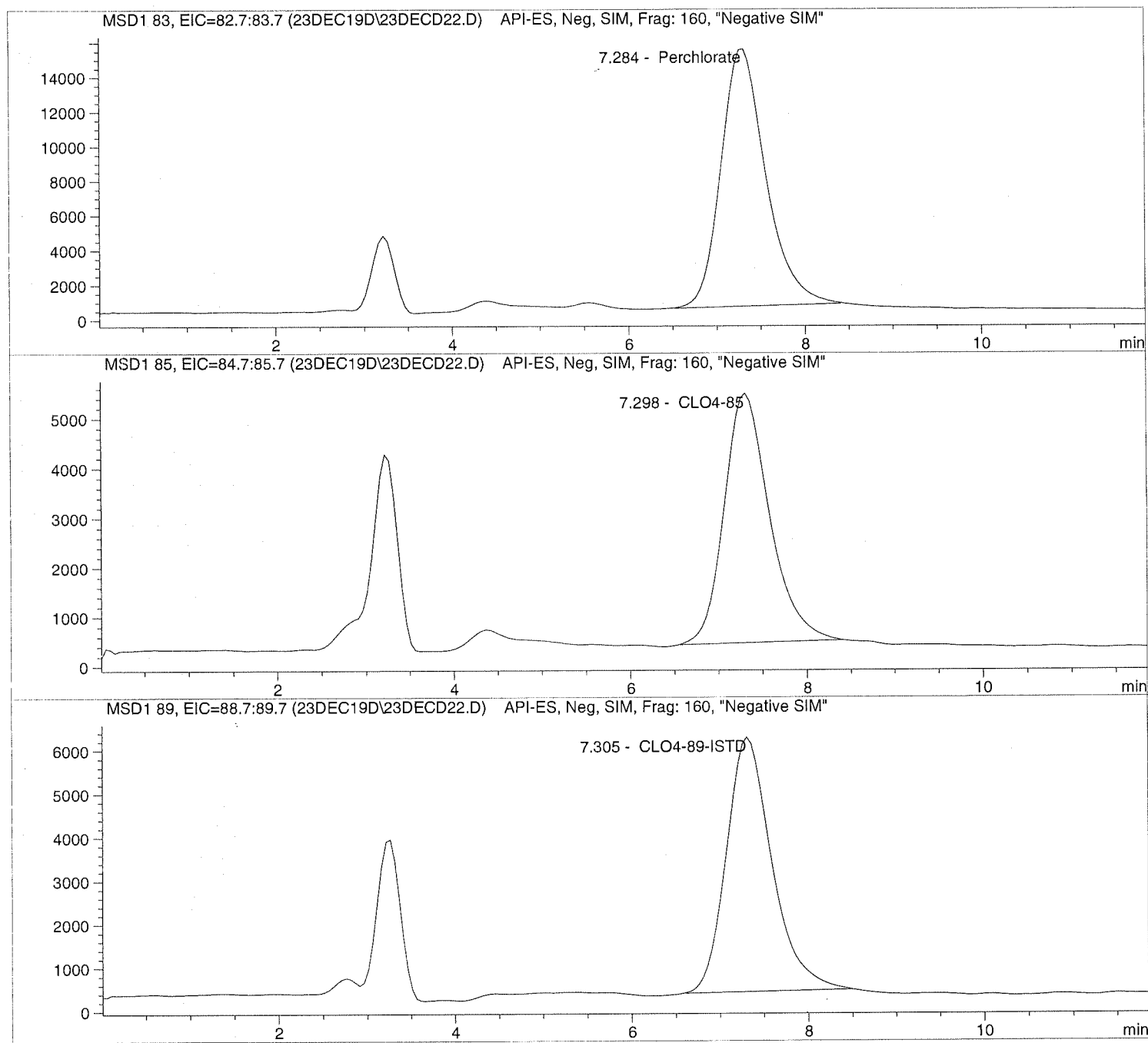
Sample Name: 1935347007

=====
Injection Date: 12/23/2019 13:03:18
Sample Name: 1935347007
Acq Operator: TNB

Seq Line: 22
Location: Vial 91
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\23DEC19D\23DECD22.D Sample Name: 1935347007

```

=====
Injection Date: 12/23/2019 13:03:18      Seq Line:          22
Sample Name:    1935347007                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
7.284	BBA	521432.8	9.0837	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.298	BBA	179359.4	10.1168	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.305	BBA	209168.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD23.D

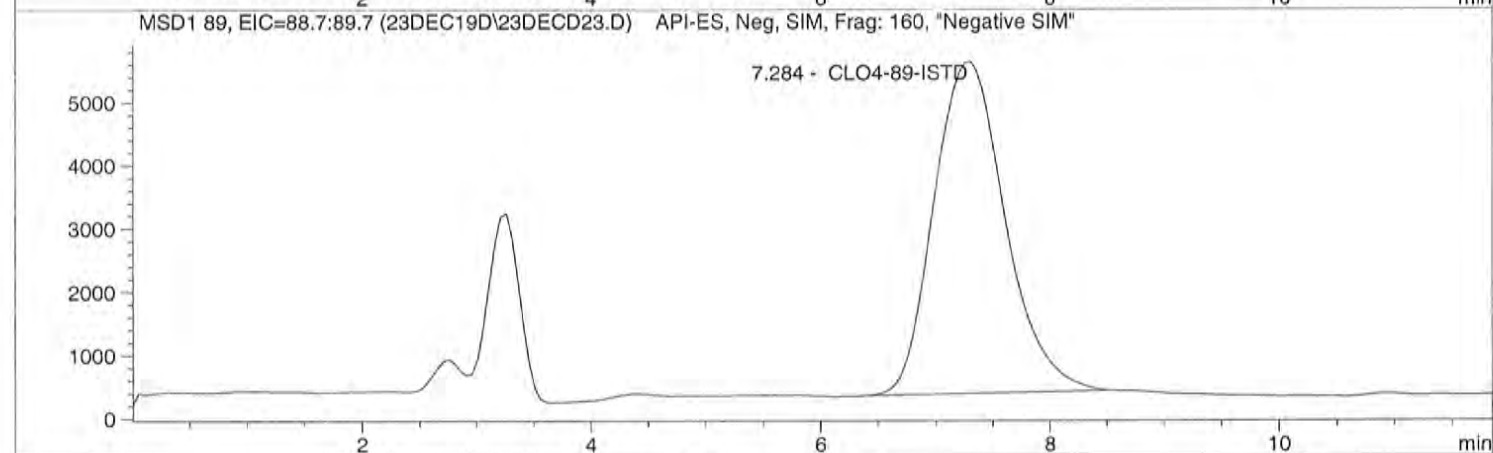
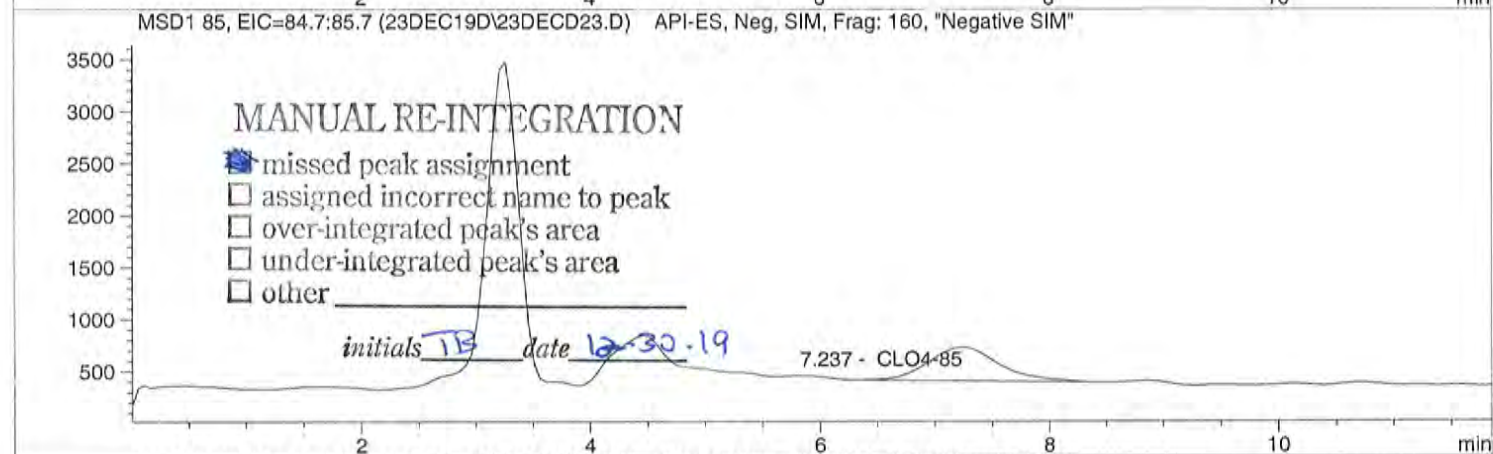
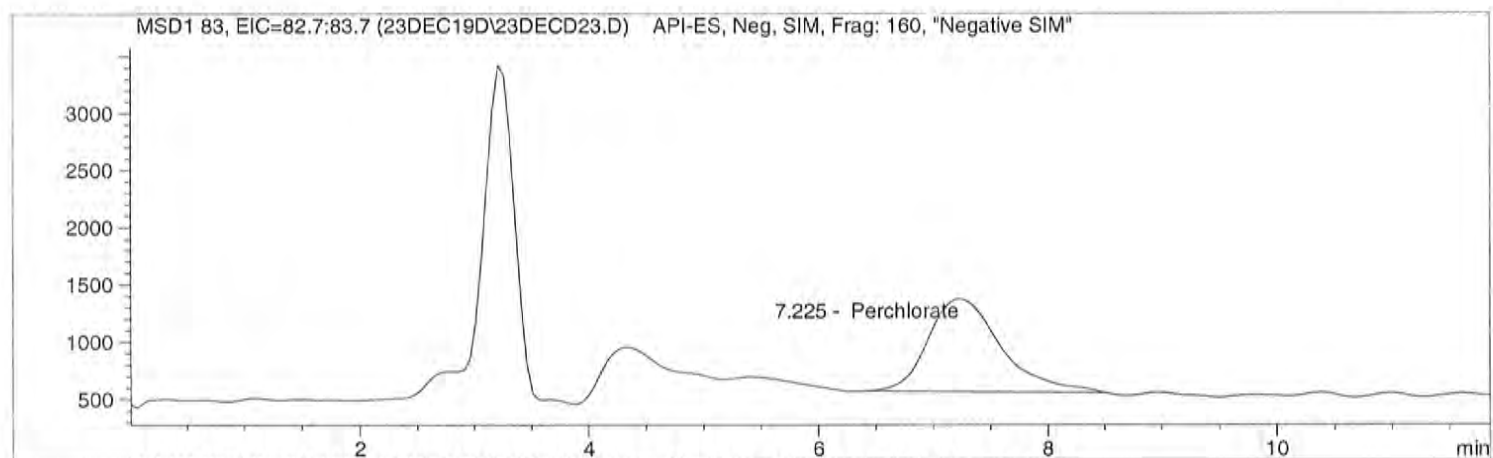
Sample Name: 1935366001

=====
 Injection Date: 12/23/2019 13:17:14
 Sample Name: 1935366001
 Acq Operator: TNB

Seq Line: 23
 Location: Vial 92
 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\23DEC19D\23DECD23.D

Sample Name: 1935366001

```

=====
Injection Date: 12/23/2019 13:17:14      Seq Line:      23
Sample Name:    1935366001                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:       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
7.225	PBA	35581.3	0.5167	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.237	MM	14057.6	0.6080	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.284	PBA	226617.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

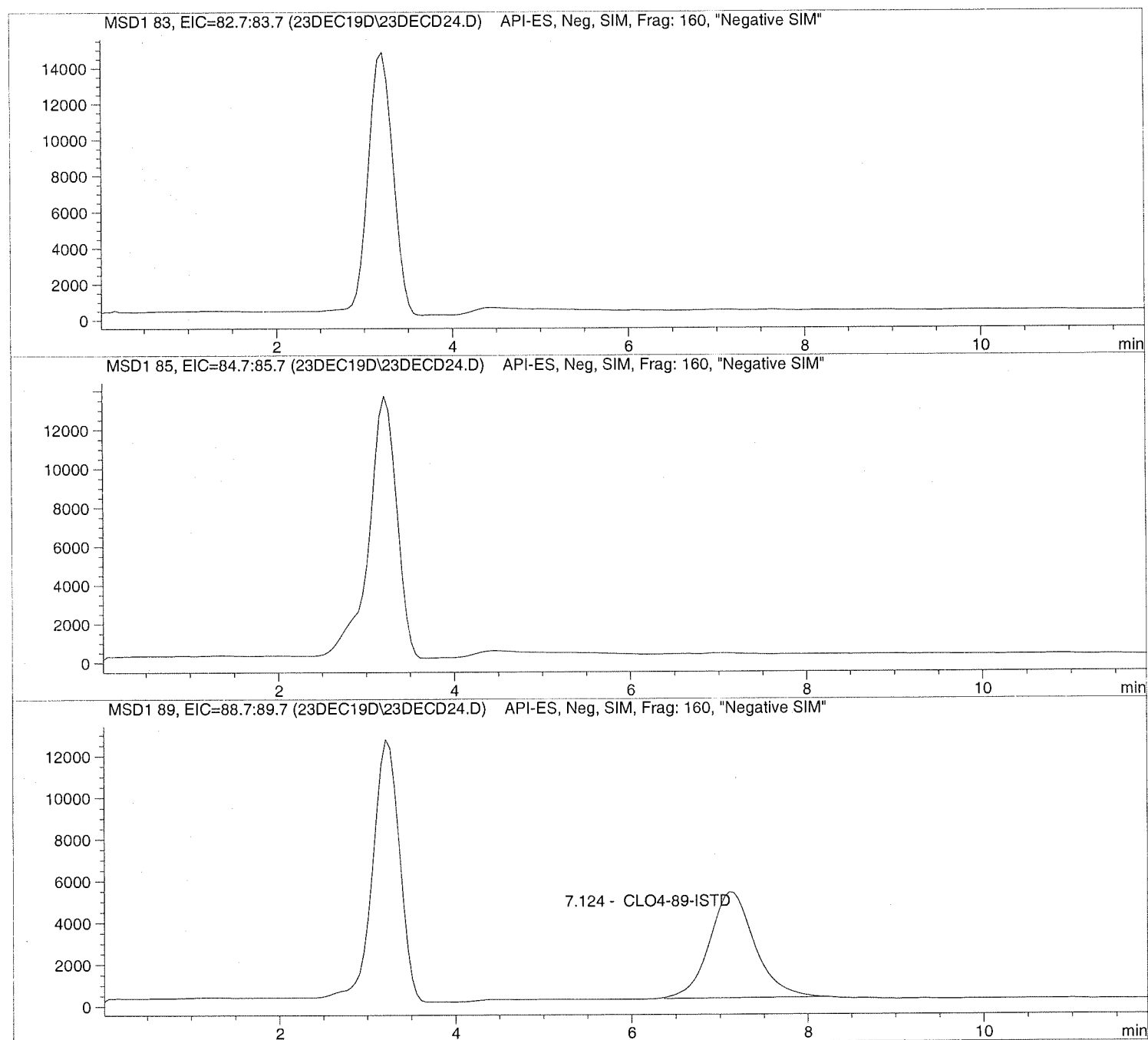
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD24.D Sample Name: 1935345003 5X

```
=====
Injection Date: 12/23/2019 13:31:15      Seq Line:      24
Sample Name:    1935345003 5X            Location:      Vial 93
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\23DEC19D\23DECD24.D Sample Name: 1935345003 5X

```

=====
Injection Date: 12/23/2019 13:31:15      Seq Line:          24
Sample Name:   1935345003 5X             Location:         Vial 93
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:      5.000000
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
7.124	BBA	180510.4	25.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD25.D

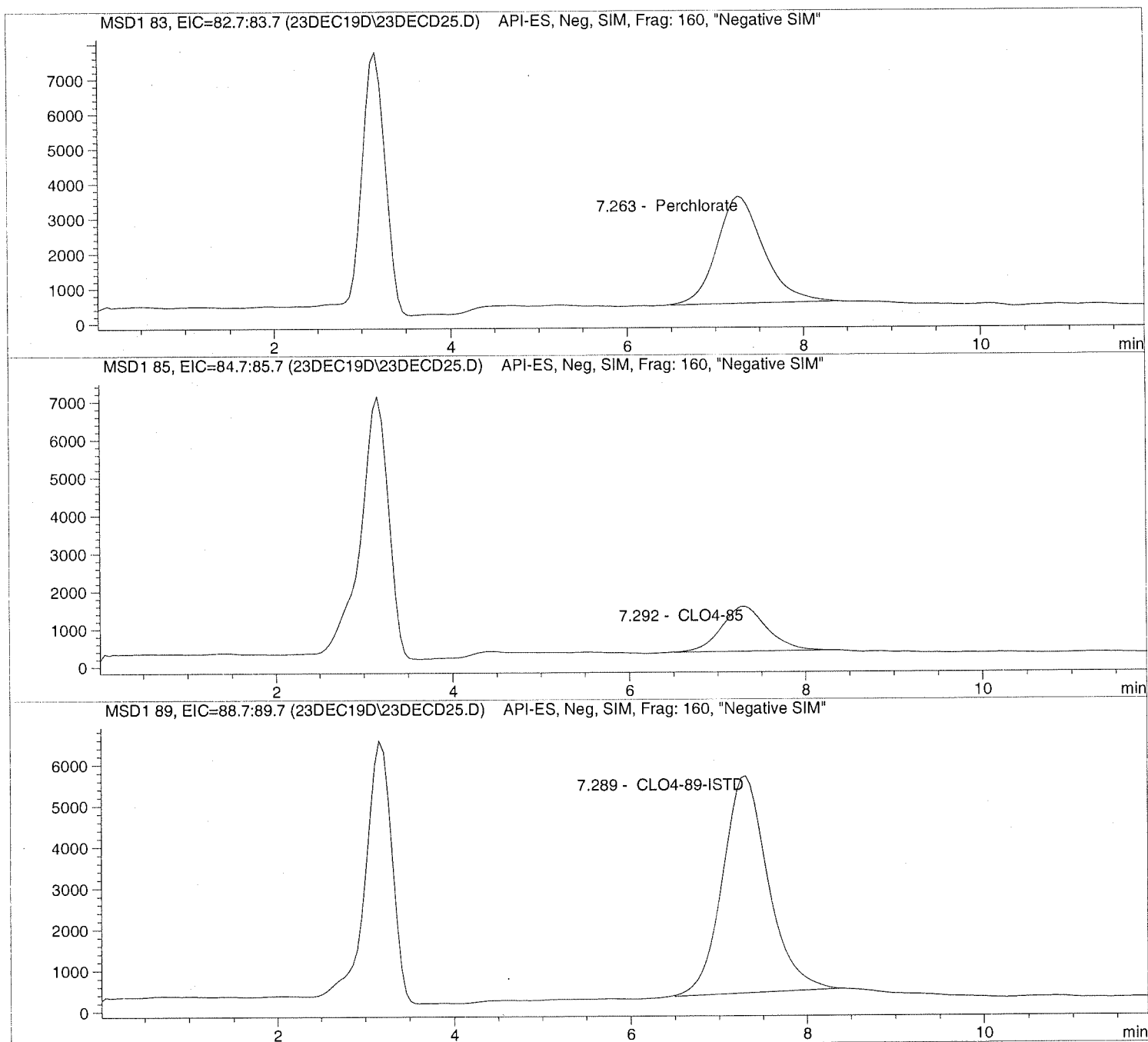
Sample Name: 1935345004 5X

Injection Date: 12/23/2019 13:45:07
Sample Name: 1935345004 5X
Acq Operator: TNB

Seq Line: 25
Location: Vial 94
Inj. No.: 1
Inj. Vol.: 35 μ l

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\23DEC19D\23DECD25.D Sample Name: 1935345004 5X

```

=====
Injection Date: 12/23/2019 13:45:07      Seq Line:          25
Sample Name:   1935345004 5X             Location:         Vial 94
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:       5.000000
Sample Amount:  0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.263	BBA	112394.8	10.7958	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.292	BBA	42859.8	13.1155	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.289	BBA	190269.1	25.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD26.D

Sample Name: 689415 CCV@25

Injection Date: 12/23/2019 13:59:13

Seq Line: 26

Sample Name: ~~689415~~ CCV@25

Location: Vial 71

Acq Operator: TNB *529*

Inj. No.: 1

TB 12.30.19

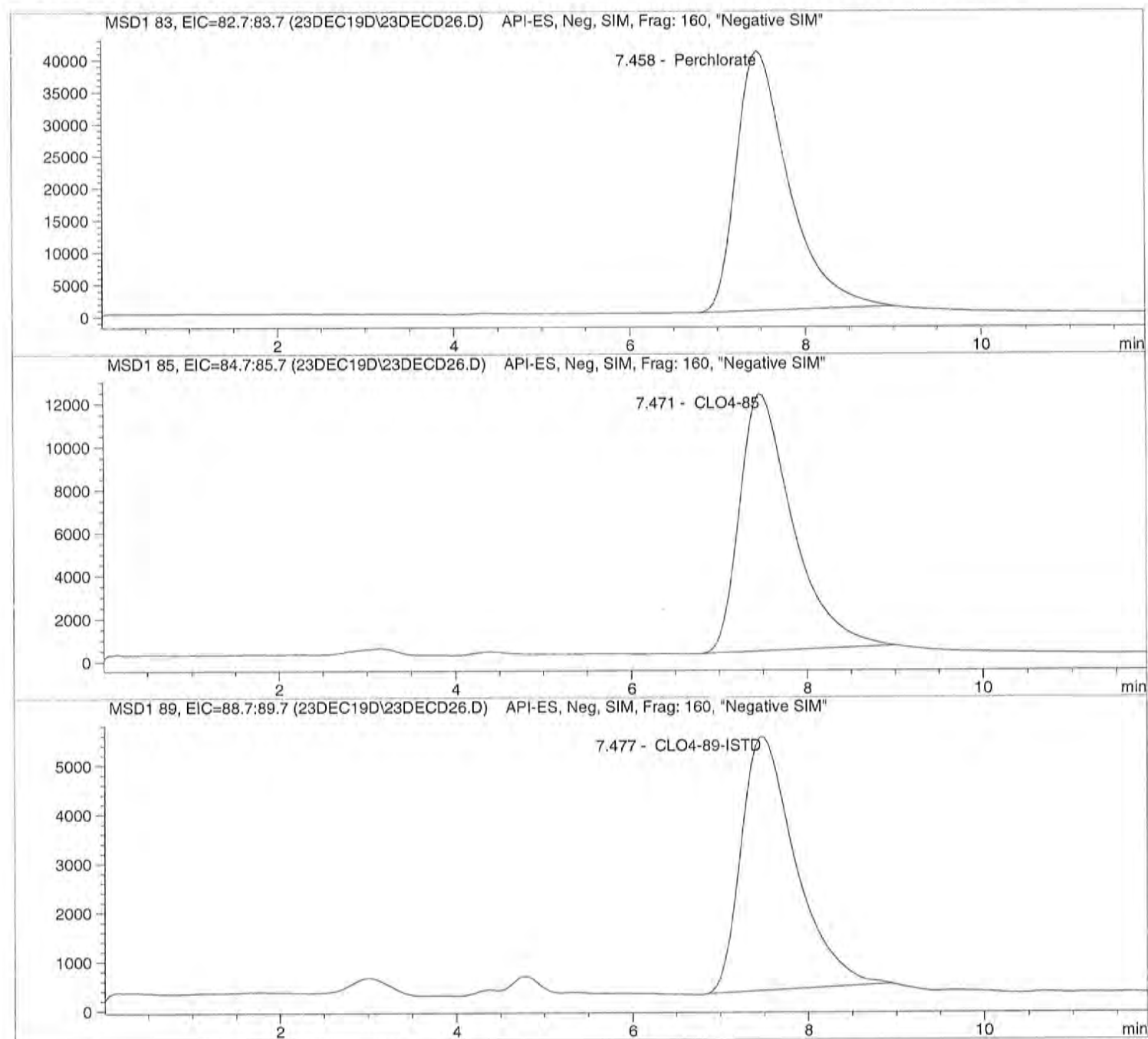
Inj. Vol.: 35 µl

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\23DEC19D\23DECD26.D Sample Name: 689415 CCV@25

```

=====
Injection Date: 12/23/2019 13:59:13      Seq Line:          26
Sample Name:   689415 CCV@25              Location:          Vial 71
Acq Operator:  TNB 529                     Inj. No.:         1
                                           Inj. Vol.:        35 µl
                                           TB 12.30.19
=====

```

```

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
7.458	PBA	1673122.6	25.5598	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.471	PBA	503084.9	25.2394	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.477	PBA	223152.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD29.D

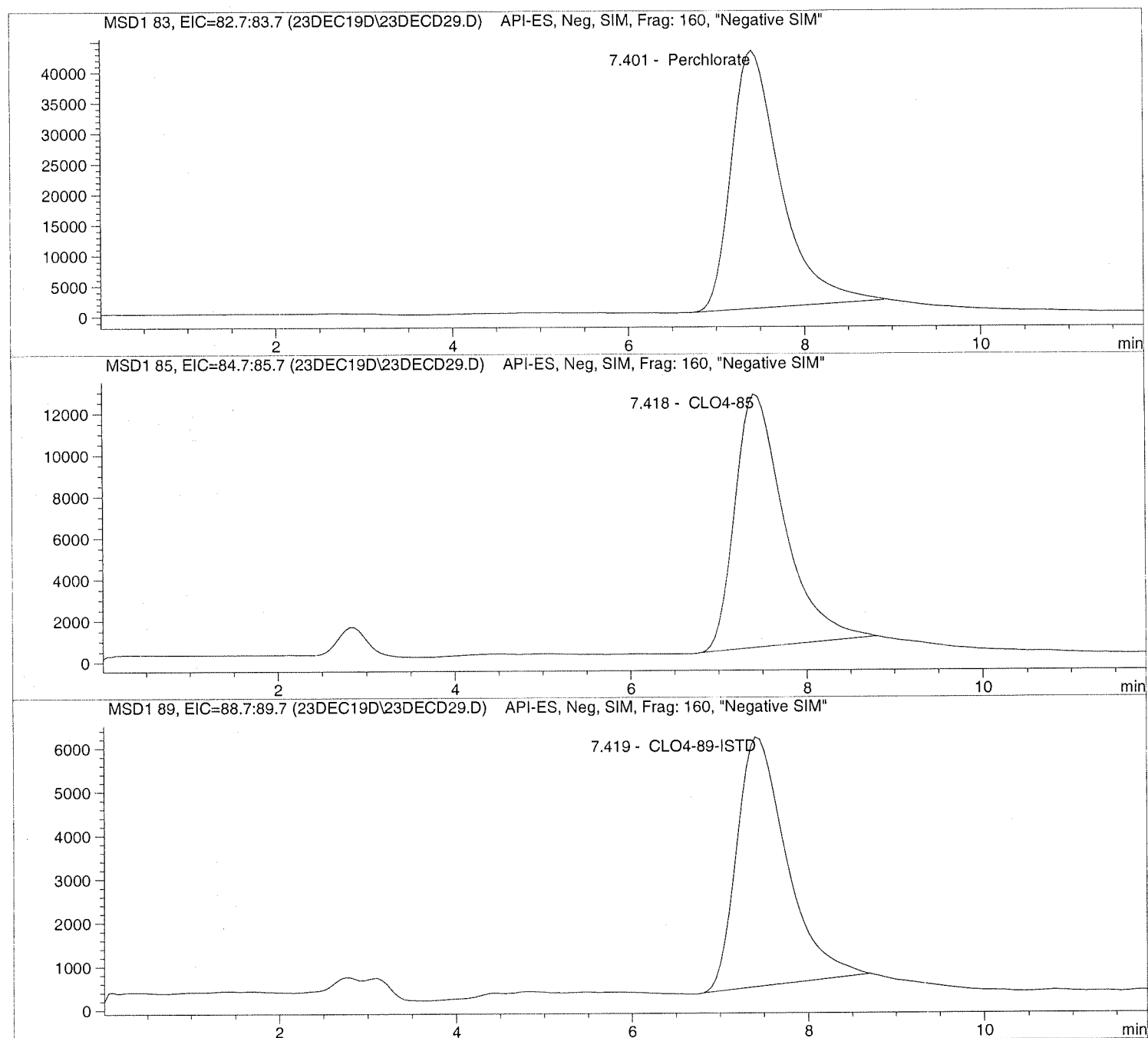
Sample Name: 1935347004 MS

=====
Injection Date: 12/23/2019 14:45:56
Sample Name: 1935347004 MS
Acq Operator: TNB

Seq Line: 29
Location: Vial 97
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\23DEC19D\23DECD29.D

Sample Name: 1935347004 MS

```

=====
Injection Date: 12/23/2019 14:45:56      Seq Line:          29
Sample Name:   1935347004 MS              Location:         Vial 97
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
7.401	PBA	1640825.4	249.9006	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.418	PBA	475545.6	238.5228	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.419	PBA	224360.6	50.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD30.D

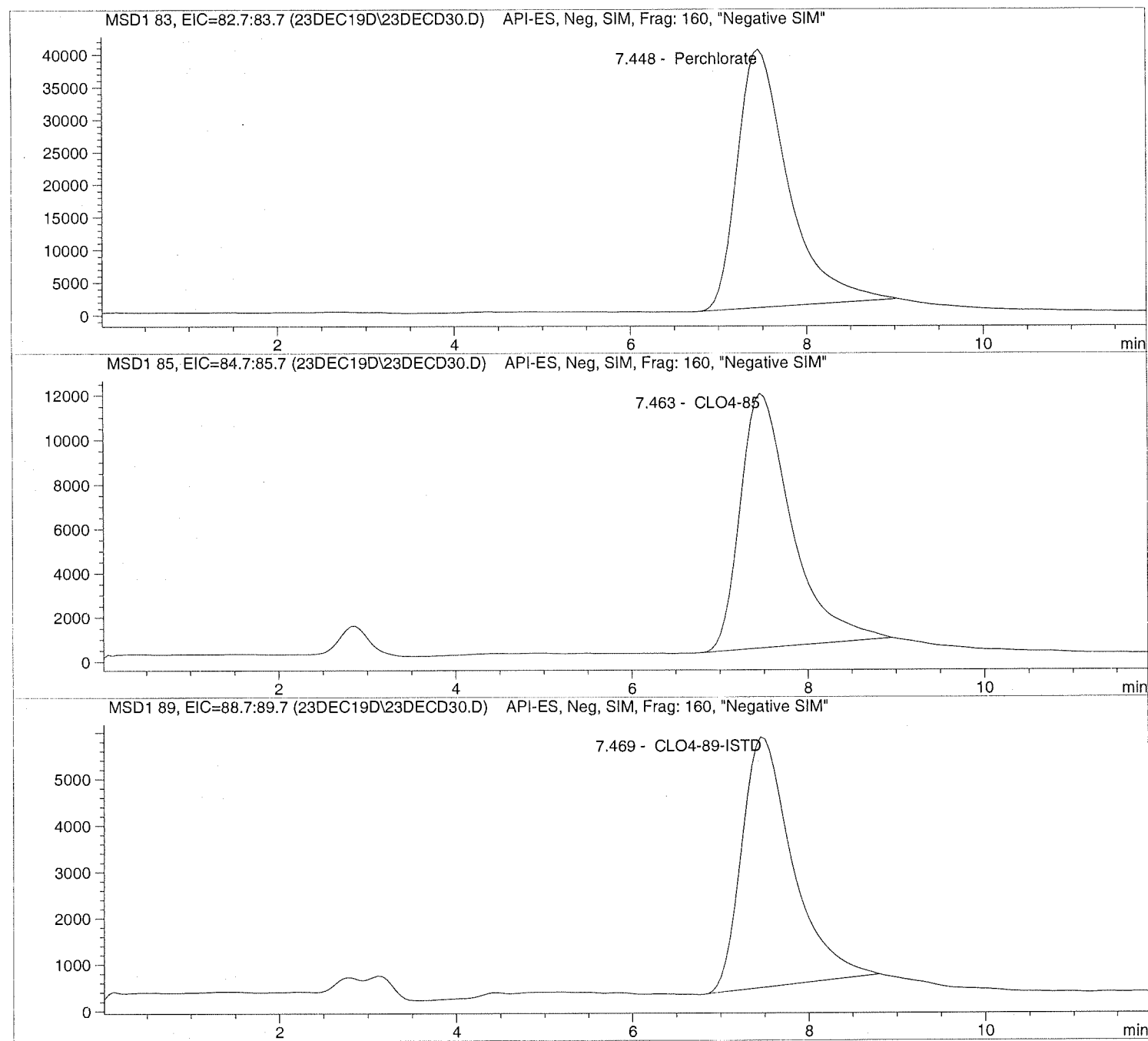
Sample Name: 1935347005 MSD

Injection Date: 12/23/2019 14:59:48
Sample Name: 1935347005 MSD
Acq Operator: TNB

Seq Line: 30
Location: Vial 98
Inj. No.: 1
Inj. Vol.: 35 μ l

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\23DEC19D\23DECD30.D Sample Name: 1935347005 MSD

```

=====
Injection Date: 12/23/2019 14:59:48      Seq Line:          30
Sample Name:    1935347005    MSD        Location:          Vial 98
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
7.448	PBA	1589648.0	251.1209	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.463	PBA	464977.5	241.7384	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.469	PBA	216197.6	50.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

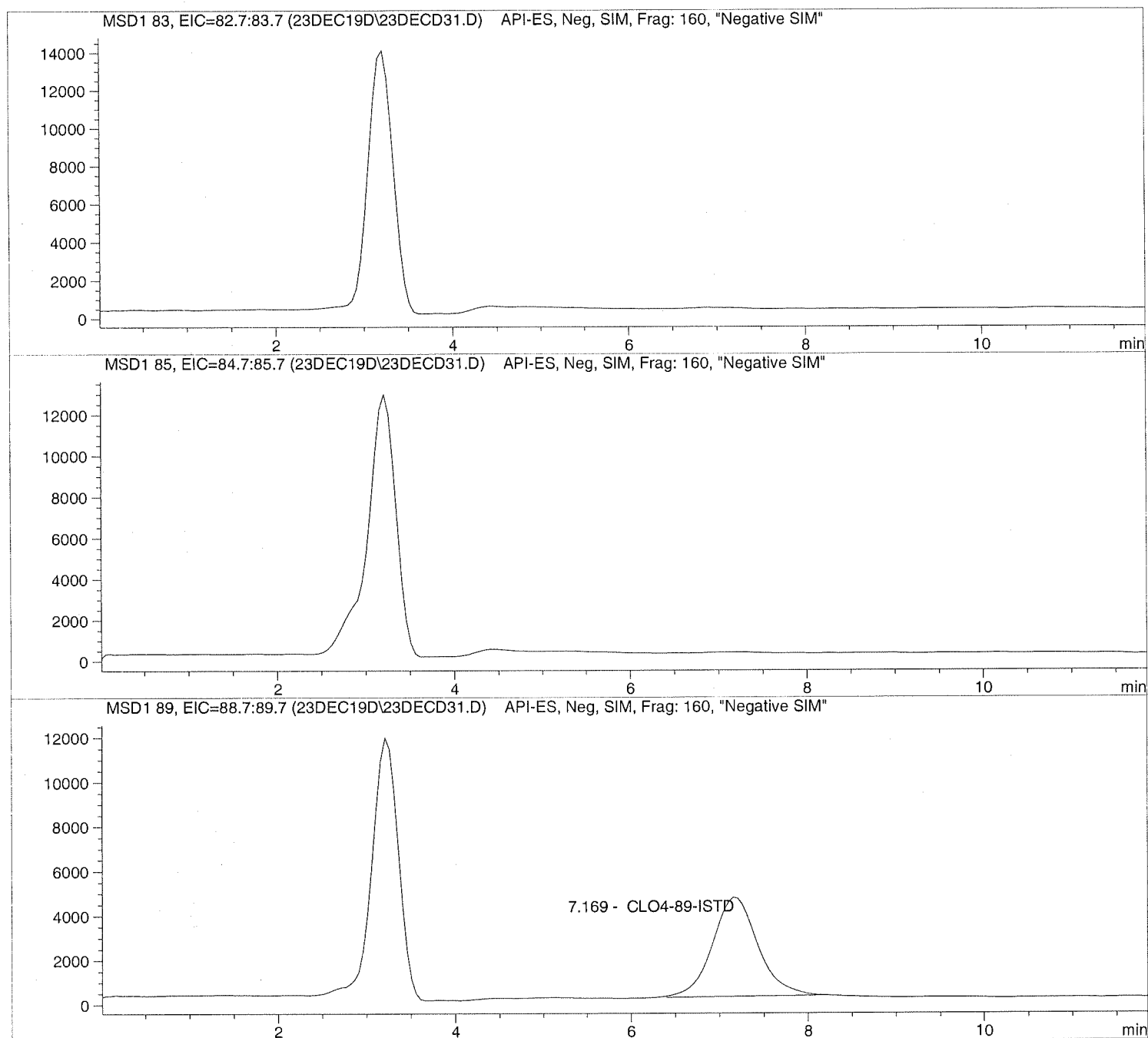
```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD31.D Sample Name: 1935345003 2X

```
=====
Injection Date: 12/23/2019 15:18:09      Seq Line:          31
Sample Name:    1935345003 2X             Location:          Vial 99
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\23DEC19D\23DECD31.D Sample Name: 1935345003 2X

```

=====
Injection Date: 12/23/2019 15:18:09      Seq Line:      31
Sample Name:   1935345003 2X             Location:      Vial 99
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:      2.000000
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
7.169	BBA	159557.1	10.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD32.D

Sample Name: 1935345004 2X

Injection Date: 12/23/2019 15:32:02

Seq Line: 32

Sample Name: 1935345004 2X

Location: Vial 100

Acq Operator: TNB

Inj. No.: 1

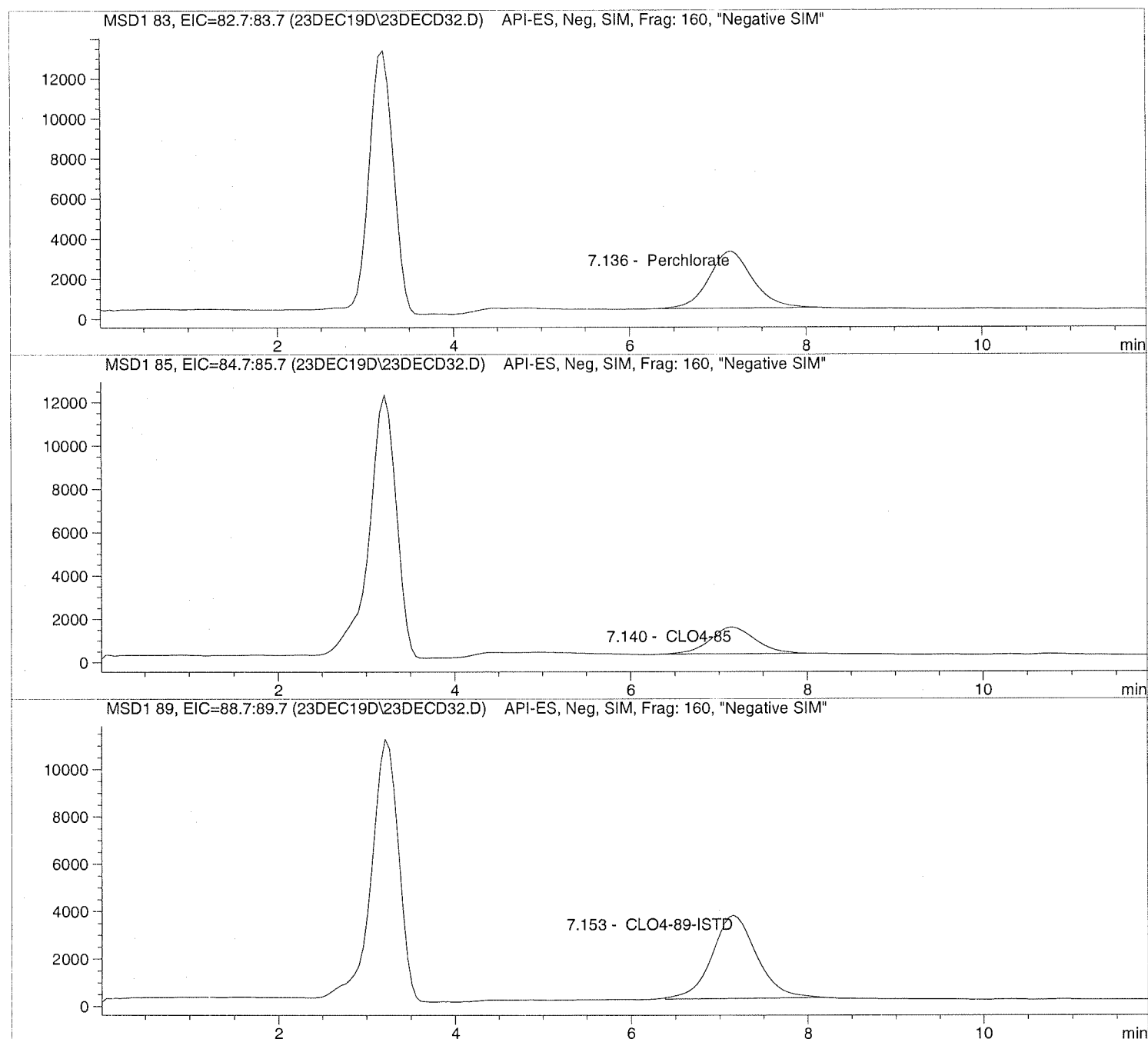
Inj. Vol.: 35 µl

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\23DEC19D\23DECD32.D Sample Name: 1935345004 2X

```

=====
Injection Date: 12/23/2019 15:32:02      Seq Line:      32
Sample Name:    1935345004 2X            Location:      Vial 100
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:      2.000000
Sample Amount: 0.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.136	BBA	97613.7	5.8383	Perchlorate

*Not REPORTED
83/85 RATIO FAILS*

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.140	PBA	44068.5	8.4799	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.153	BBA	122991.7	10.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD33.D

Sample Name: 689664 CCV@25

Injection Date: 12/23/2019 15:46:07

Seq Line: 33

Sample Name: 689664 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

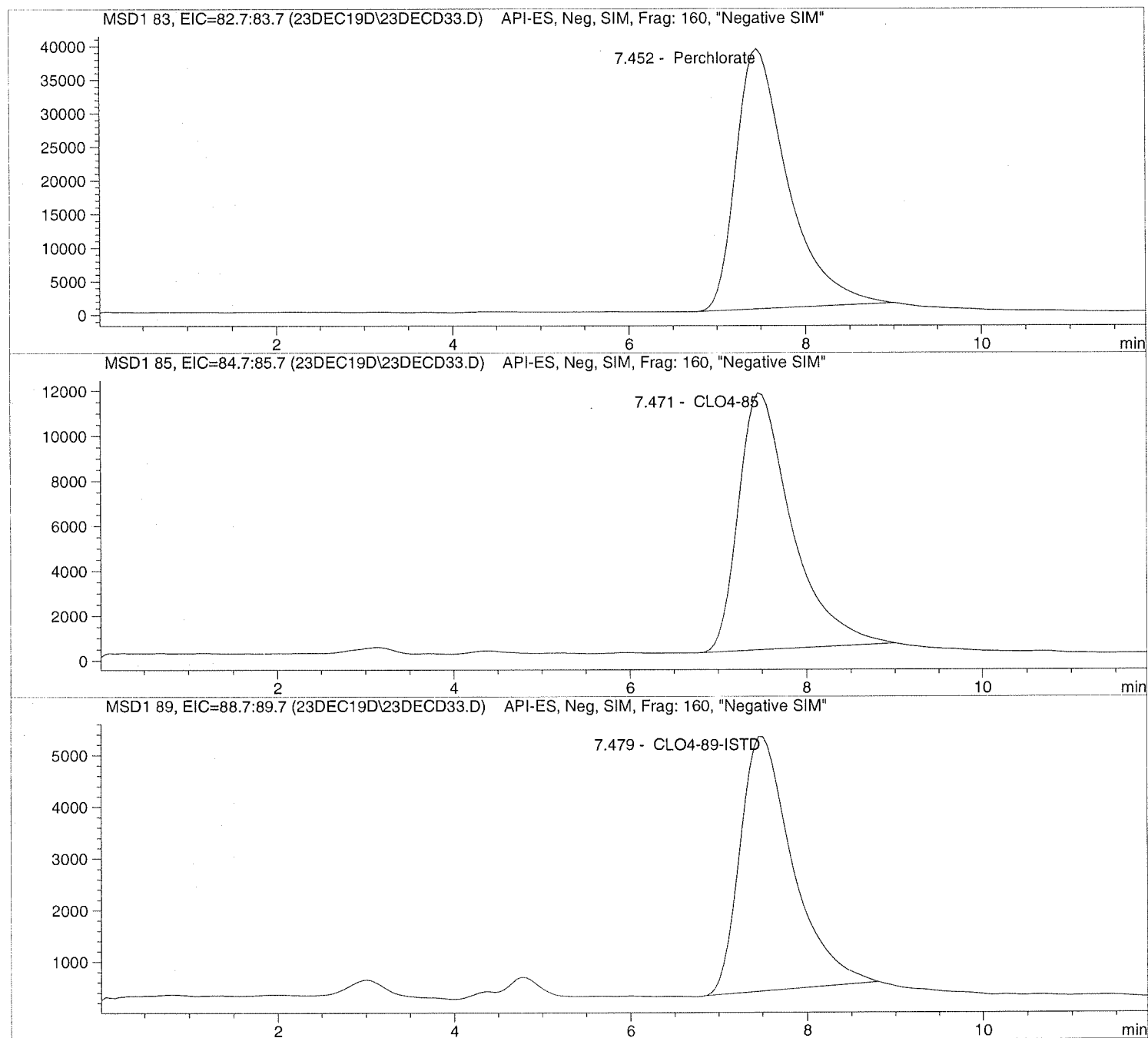
Inj. Vol.: 35 µl

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\23DEC19D\23DECD33.D Sample Name: 689664 CCV@25

```
=====
Injection Date:   12/23/2019 15:46:07      Seq Line:           33
Sample Name:     689664    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	1578778.2	26.3191	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.471	PBA	478131.8	26.1673	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.479	PBA	203856.7	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	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
[min]	Sig						
7.750	1 3	1.00000	5.39218e4	1.85454e-5	1		Perchlorate
	4	2.00000	1.32825e5	1.50574e-5			
	5	5.00000	2.76271e5	1.80982e-5			
	6	10.00000	5.61298e5	1.78159e-5			
	7	25.00000	1.51820e6	1.64669e-5			
	8	50.00000	3.31156e6	1.50986e-5			
	9	75.00000	5.23914e6	1.43153e-5			
7.767	3 3	5.00000	2.14568e5	2.33026e-5	+I1		CLO4-89-ISTD
	4	5.00000	2.04758e5	2.44190e-5			
	5	5.00000	2.13407e5	2.34294e-5			
	6	5.00000	2.09246e5	2.38953e-5			
	7	5.00000	2.07403e5	2.41077e-5			
	8	5.00000	2.02929e5	2.46391e-5			
	9	5.00000	1.97933e5	2.52611e-5			
7.778	2 3	1.00000	1.70436e4	5.86732e-5	1		CLO4-85
	4	2.00000	4.20754e4	4.75337e-5			
	5	5.00000	9.24707e4	5.40712e-5			
	6	10.00000	1.68622e5	5.93041e-5			
	7	25.00000	4.63724e5	5.39114e-5			
	8	50.00000	9.95933e5	5.02042e-5			

Method C:\HPCHEM\1\METHODS\CLO4-DP3.M

RetTime [min]	Lvl Sig	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

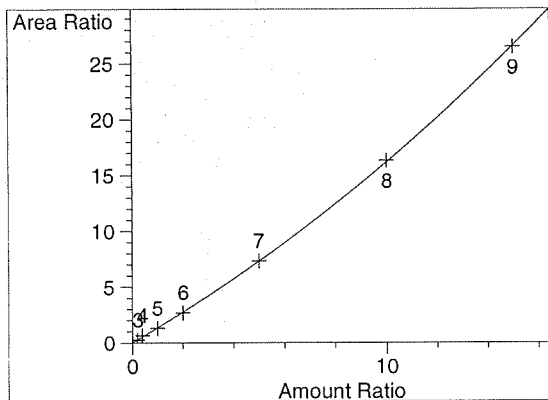
Origin : Ignored

Calibration Level Weights:/

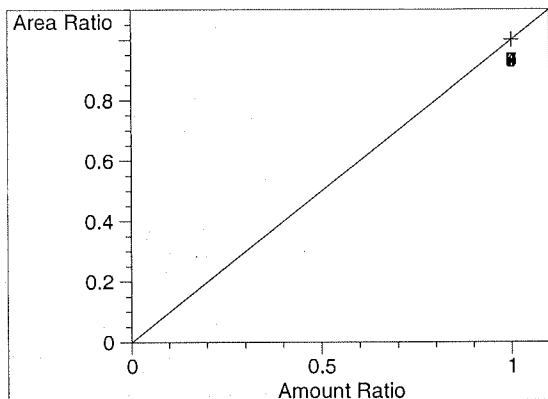
Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

=====
 Peak Sum Table
 =====

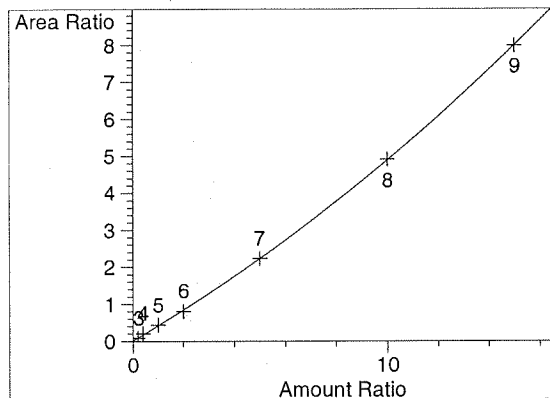
No Entries in table
 =====

=====
 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:

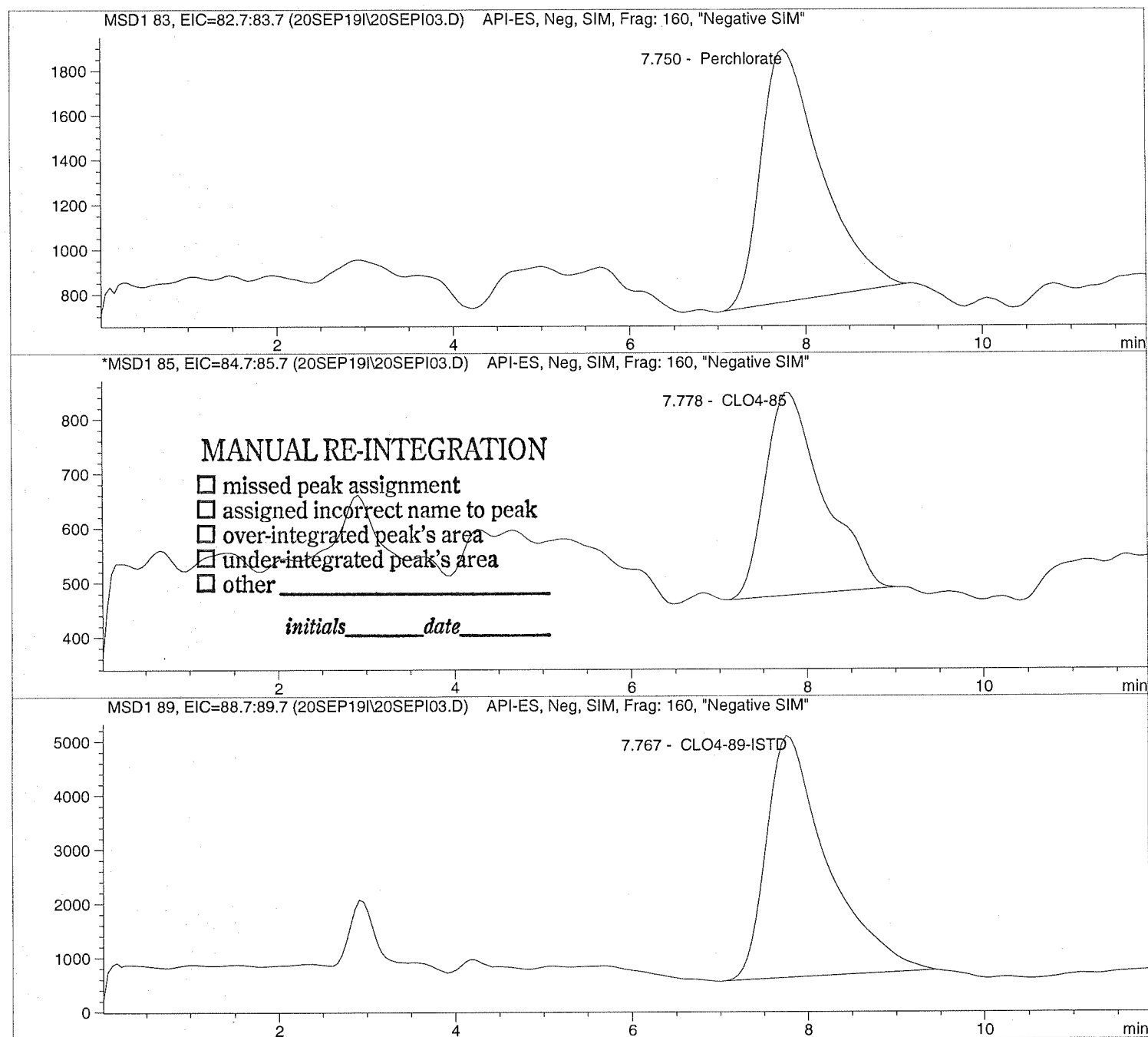
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	====	=====	=====	=====
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN 1		Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN 1		Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN 1		Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN 1		Ctrl Samp		
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\20SEP19\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 ***
=====

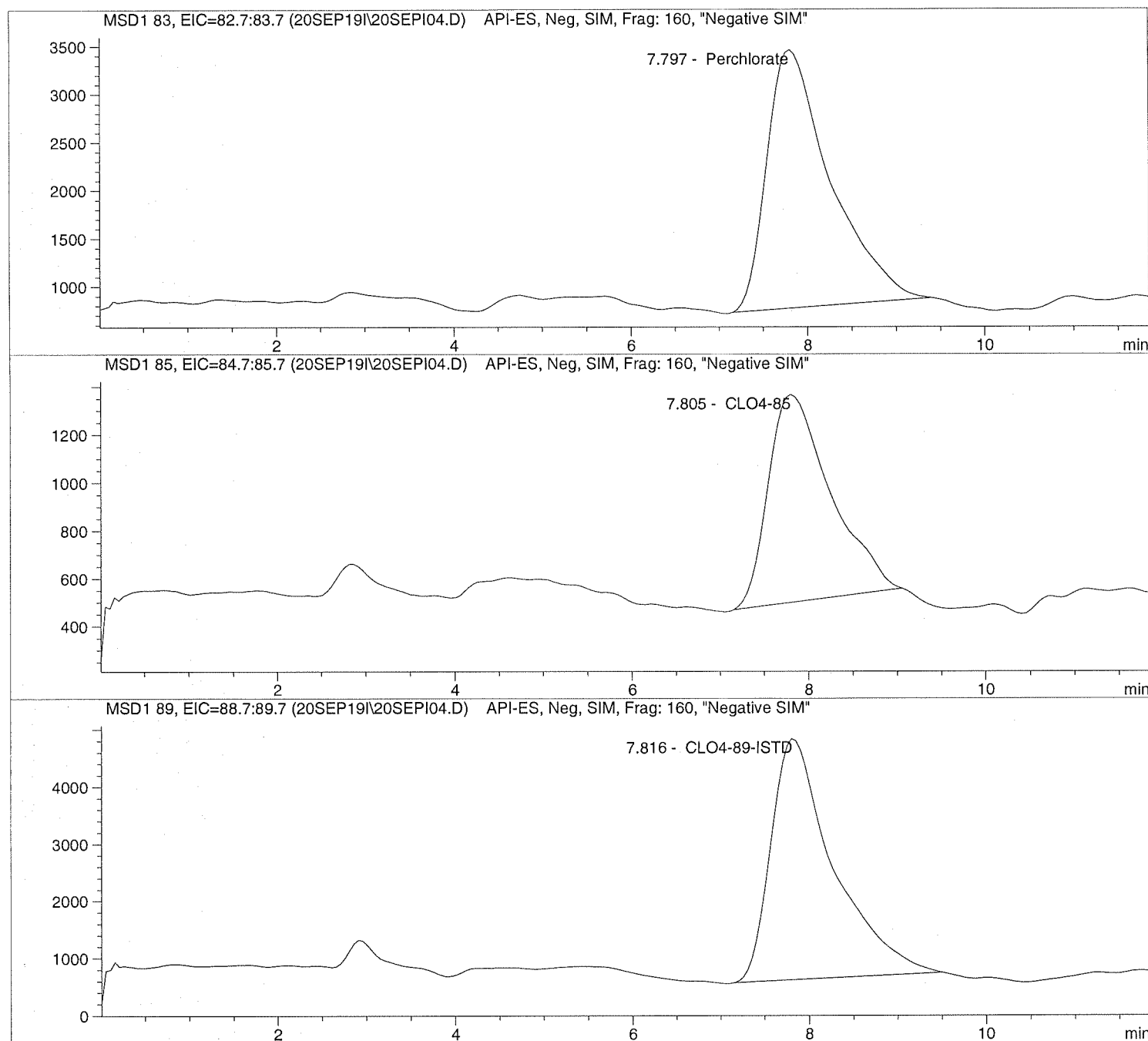
```

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

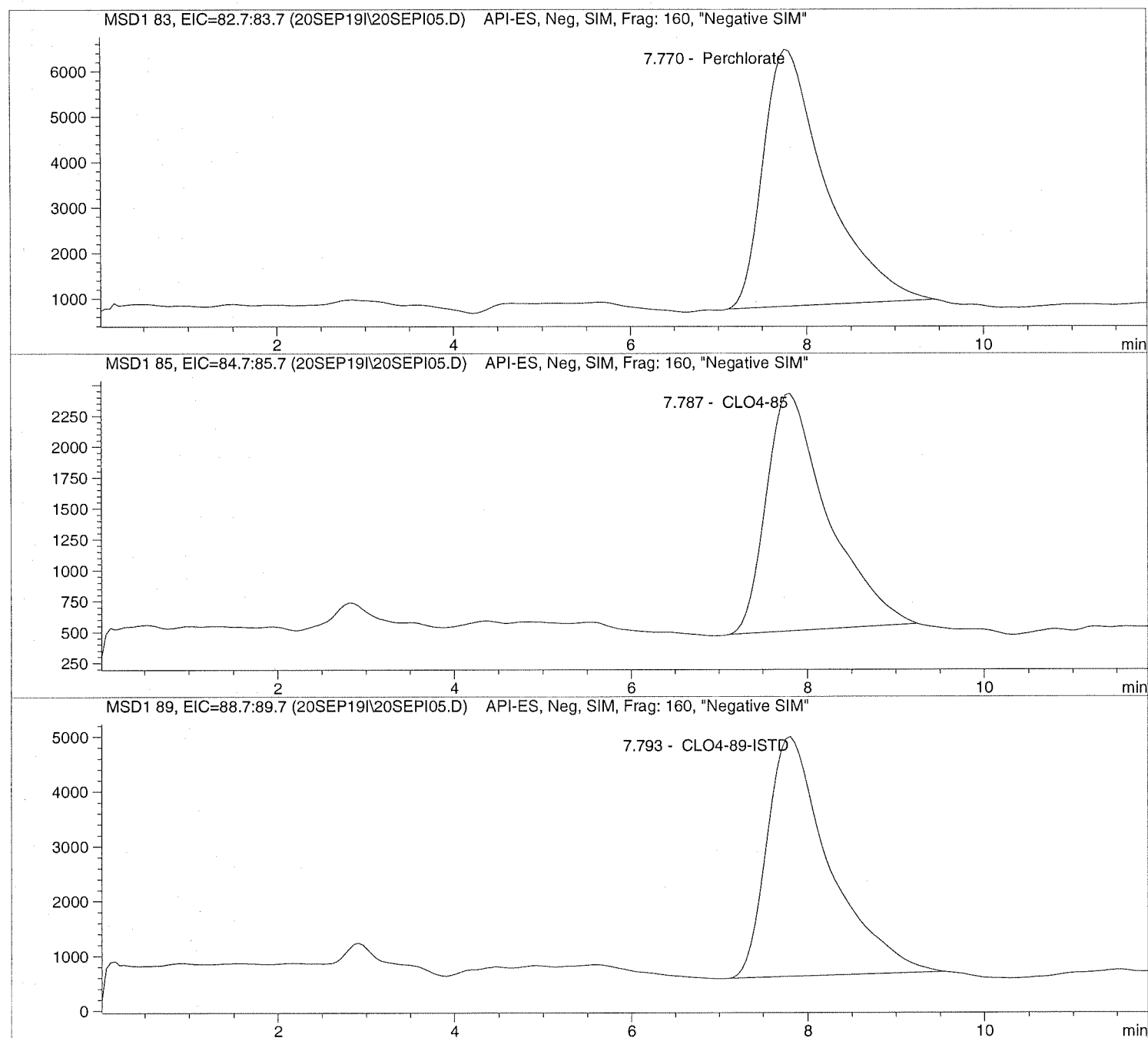
Sample Name: CLO4@ 5.0ug/L

Injection Date: 9/20/2019 09:51:49
Sample Name: CLO4@ 5.0ug/L
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
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

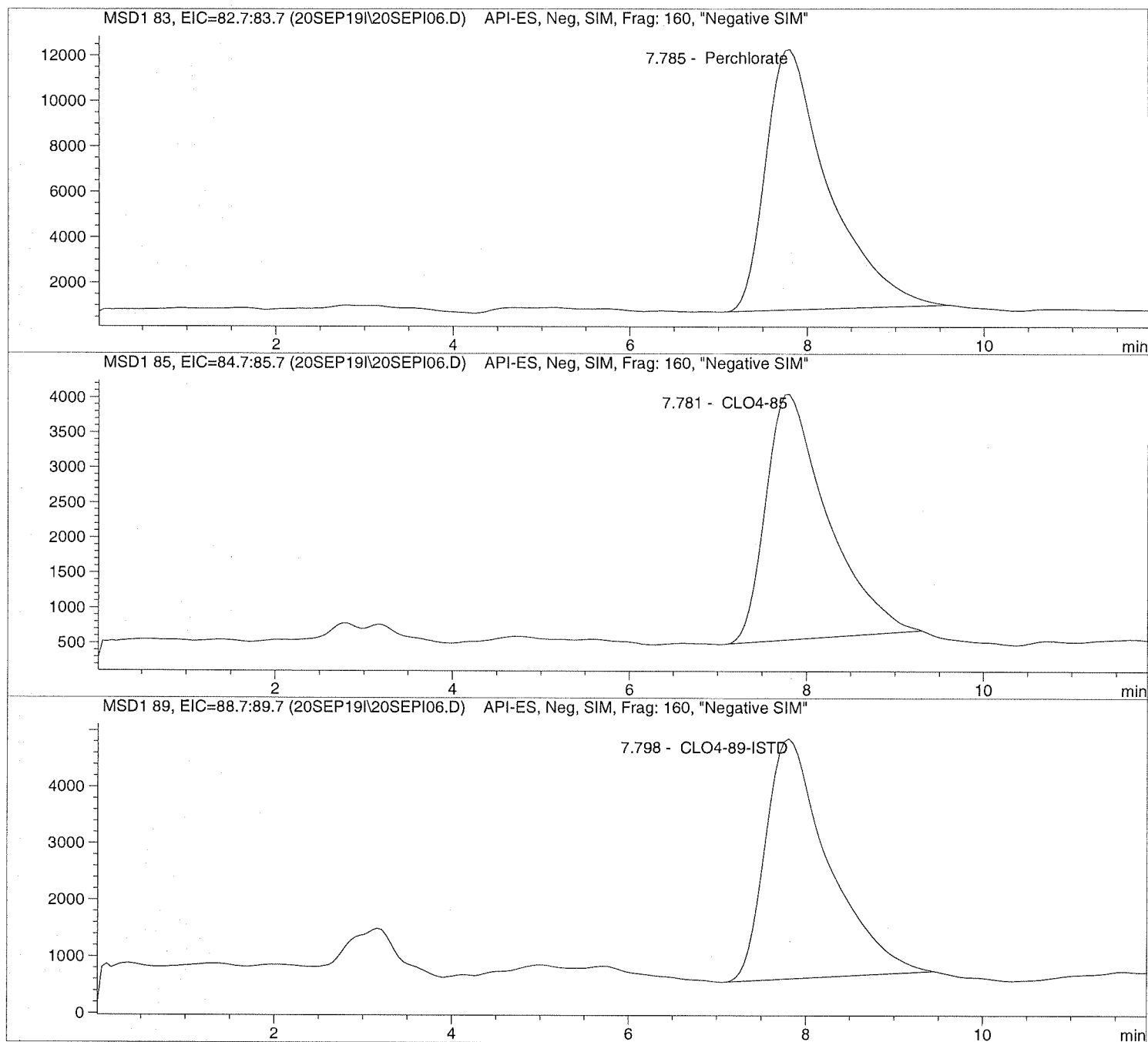
Sample Name: CLO4@ 10.ug/L

Injection Date: 9/20/2019 10:05:36
Sample Name: CLO4@ 10.ug/L
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
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\20SEP19\20SEPI07.D

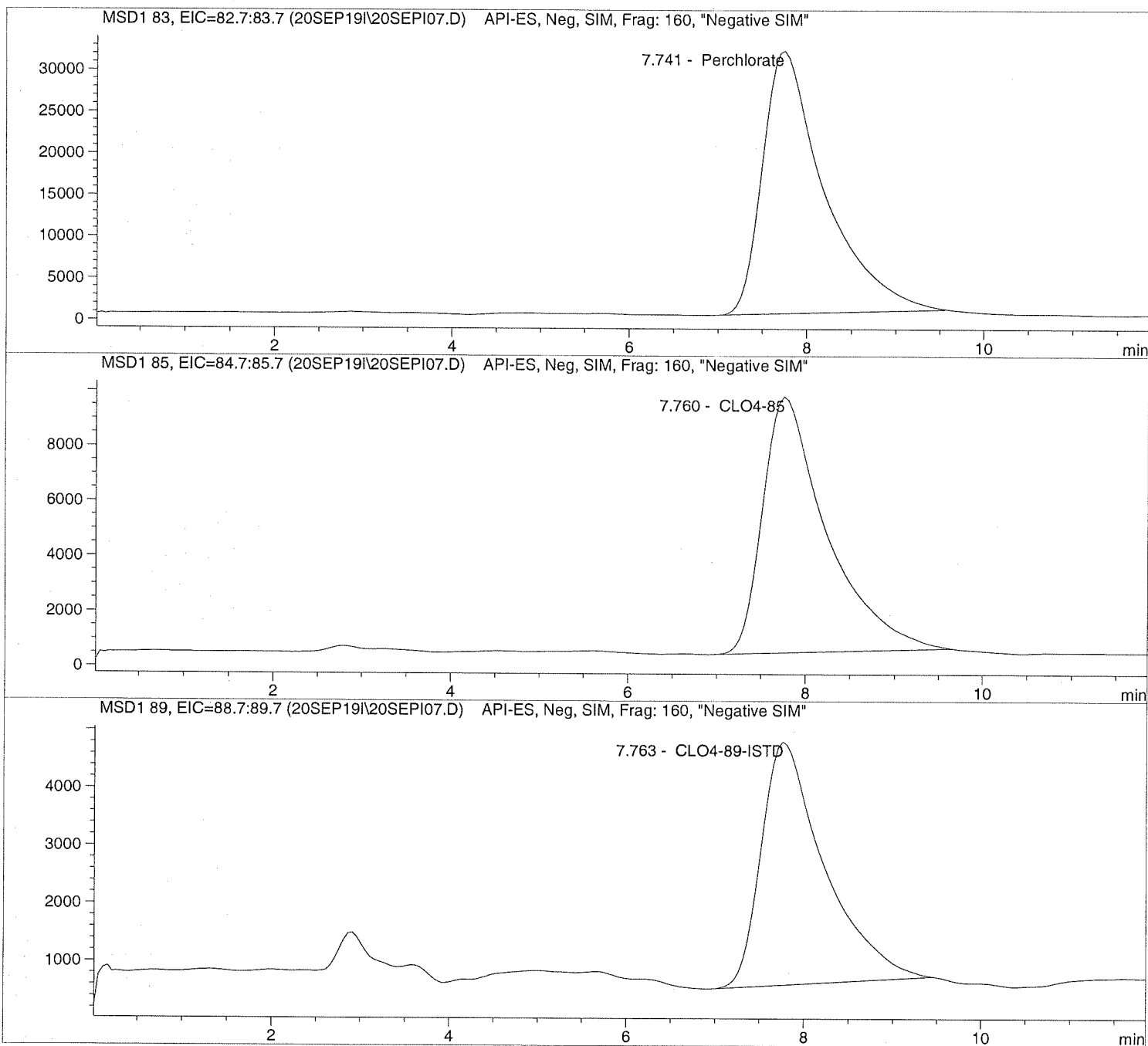
Sample Name: CLO4@ 25.ug/L

Injection Date: 9/20/2019 10:19:23
Sample Name: CLO4@ 25.ug/L
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
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

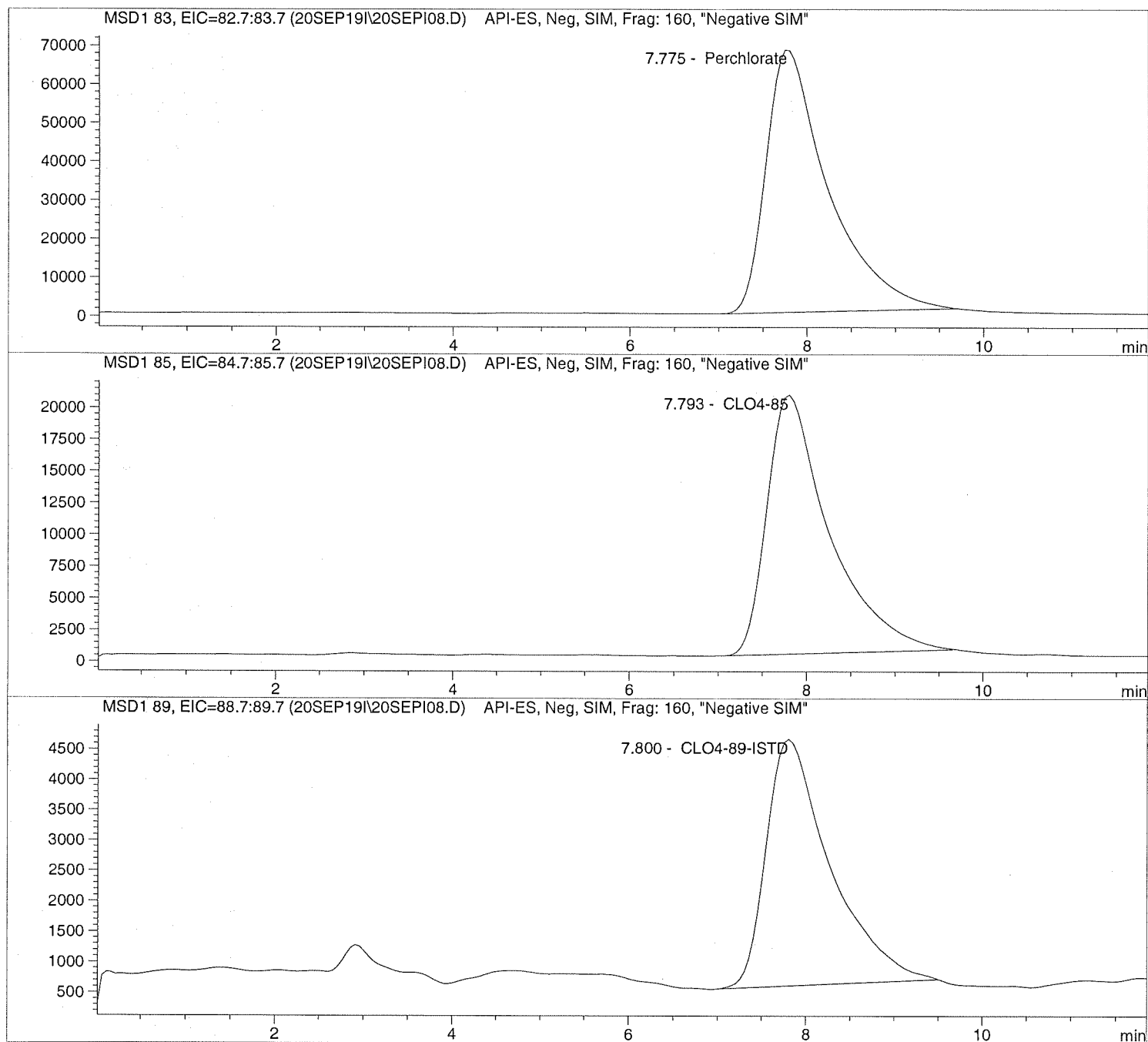
Sample Name: CLO4@ 50.ug/L

Injection Date: 9/20/2019 10:33:18
Sample Name: CLO4@ 50.ug/L
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
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

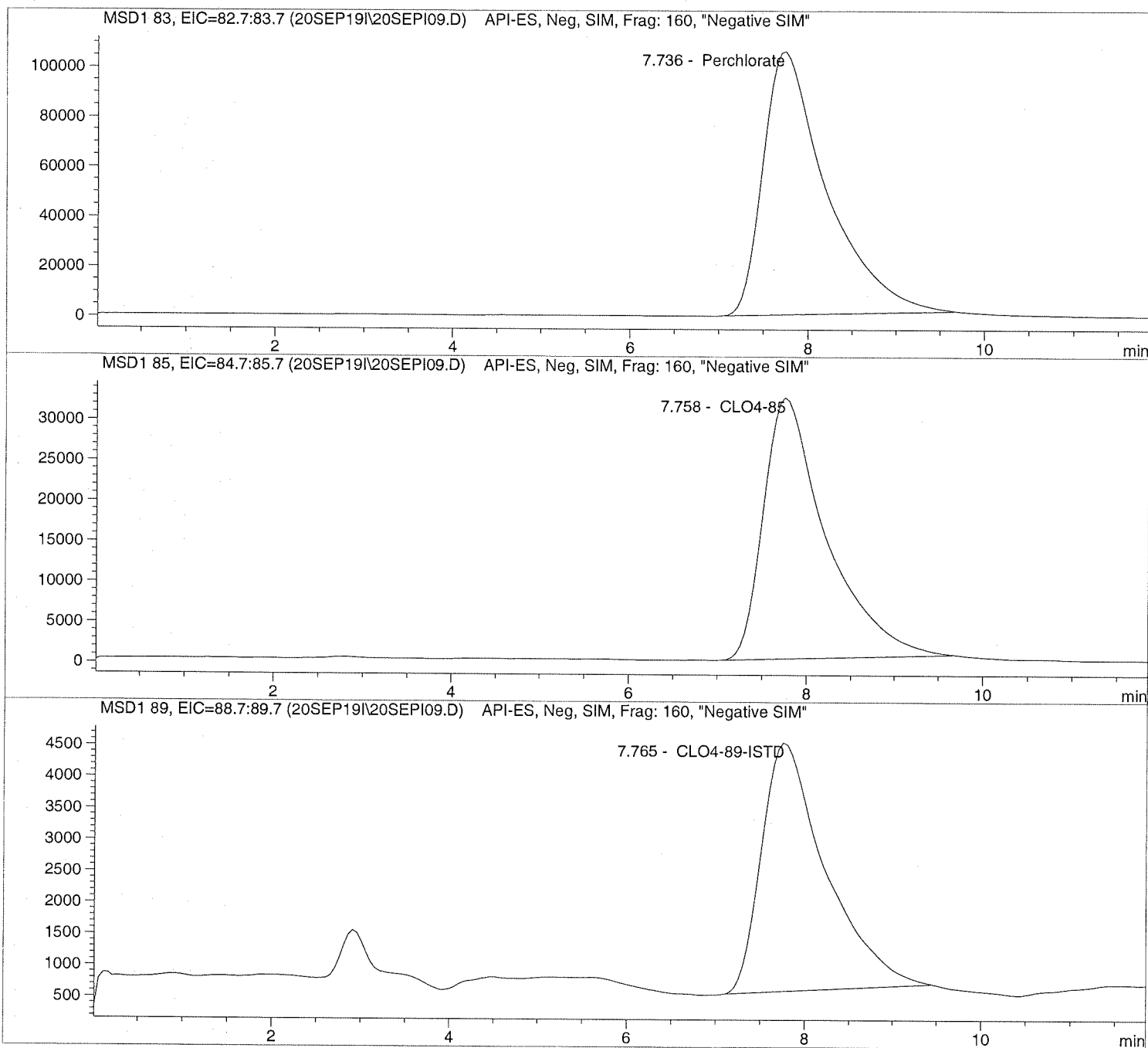
Sample Name: CLO4@ 75.ug/L

=====
Injection Date: 9/20/2019 10:47:05
Sample Name: CLO4@ 75.ug/L
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
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\20SEP19\20SEPI11.D

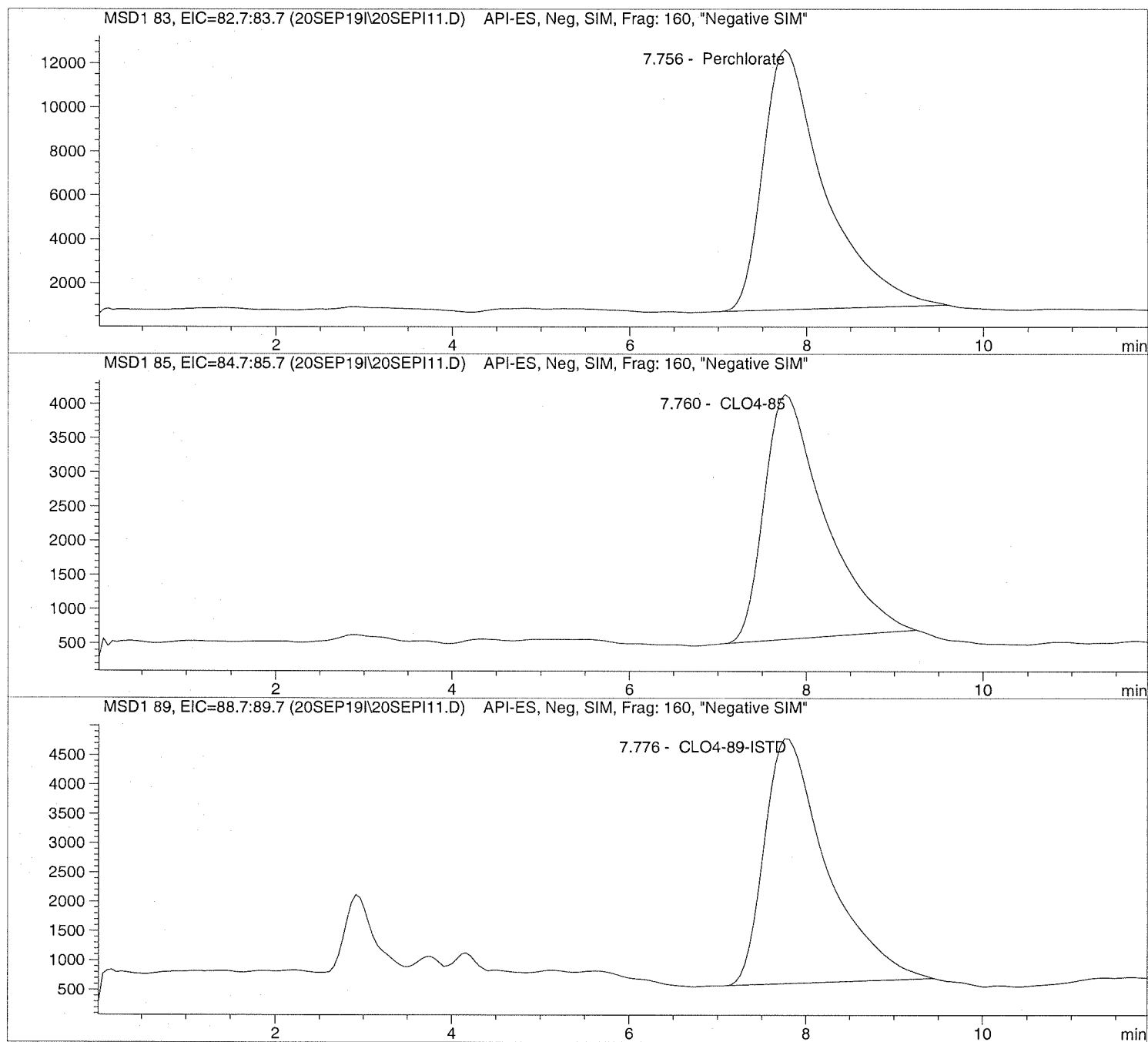
Sample Name: ICAL Verf@10ug/L

Injection Date: 9/20/2019 11:14:45
Sample Name: ICAL Verf@10ug/L
Acq Operator: TNB

Seq Line: 11
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 30 μ l

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

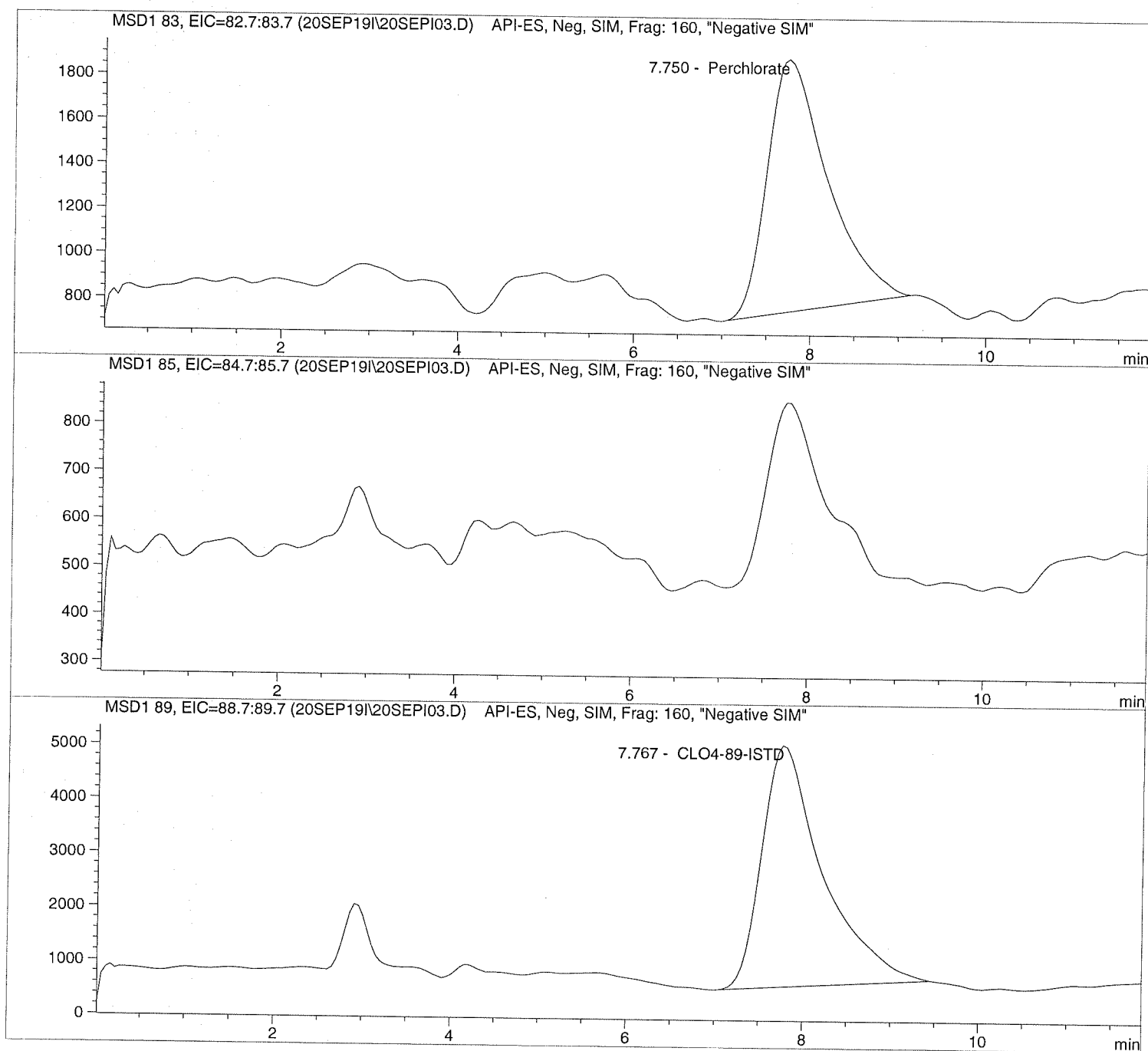
Inj. Vol.: 30 µl

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\23DEC19D\23DECD21.D

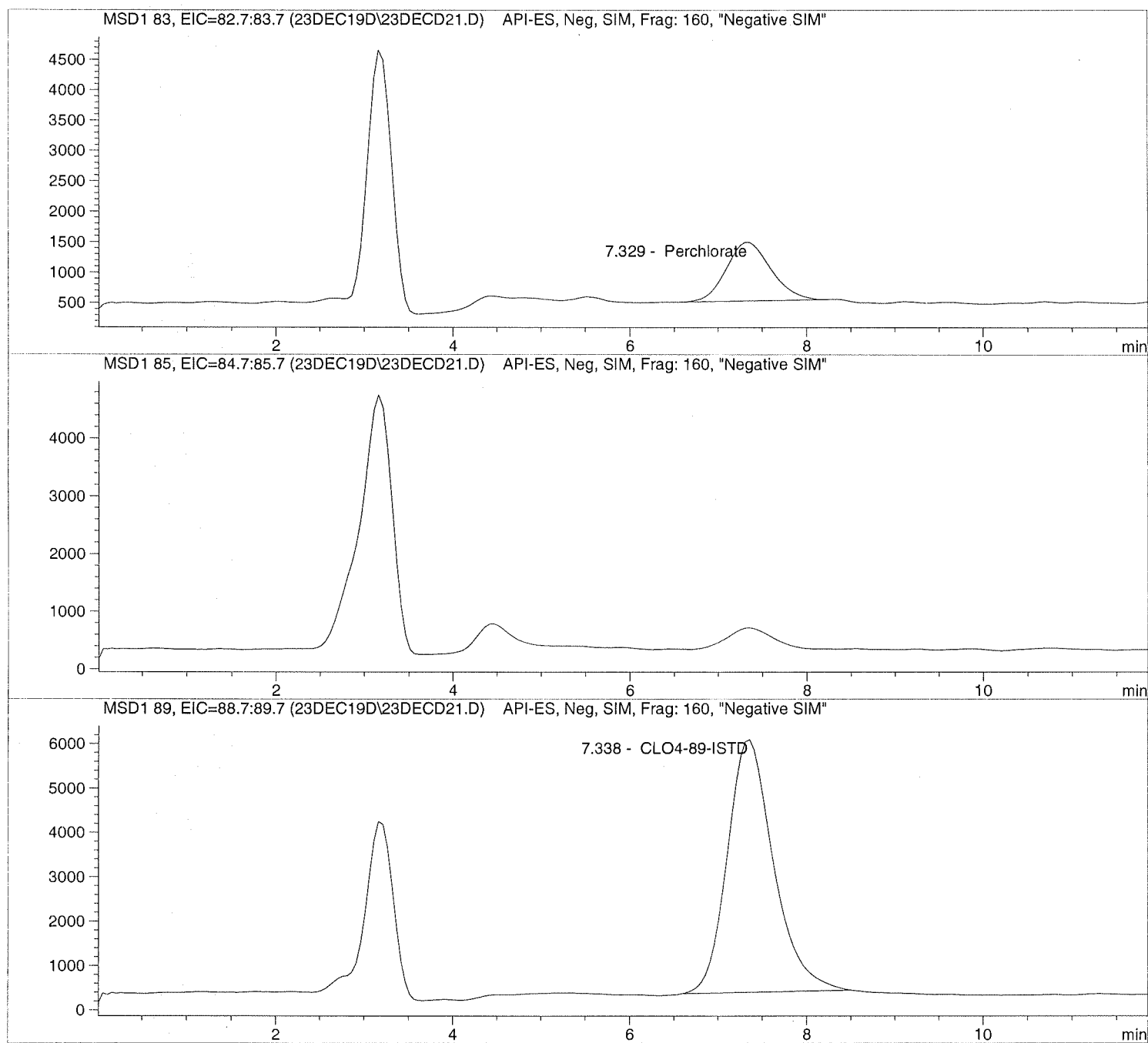
Sample Name: 1935347006

=====
Injection Date: 12/23/2019 12:49:23
Sample Name: 1935347006
Acq Operator: TNB

Seq Line: 21
Location: Vial 90
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\23DEC19D\23DECD21.D Sample Name: 1935347006

```

=====
Injection Date: 12/23/2019 12:49:23      Seq Line:          21
Sample Name:   1935347006                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
7.329	PBA	33750.8	0.5414	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
7.338	BBA	206441.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\23DEC19D\23DECD23.D

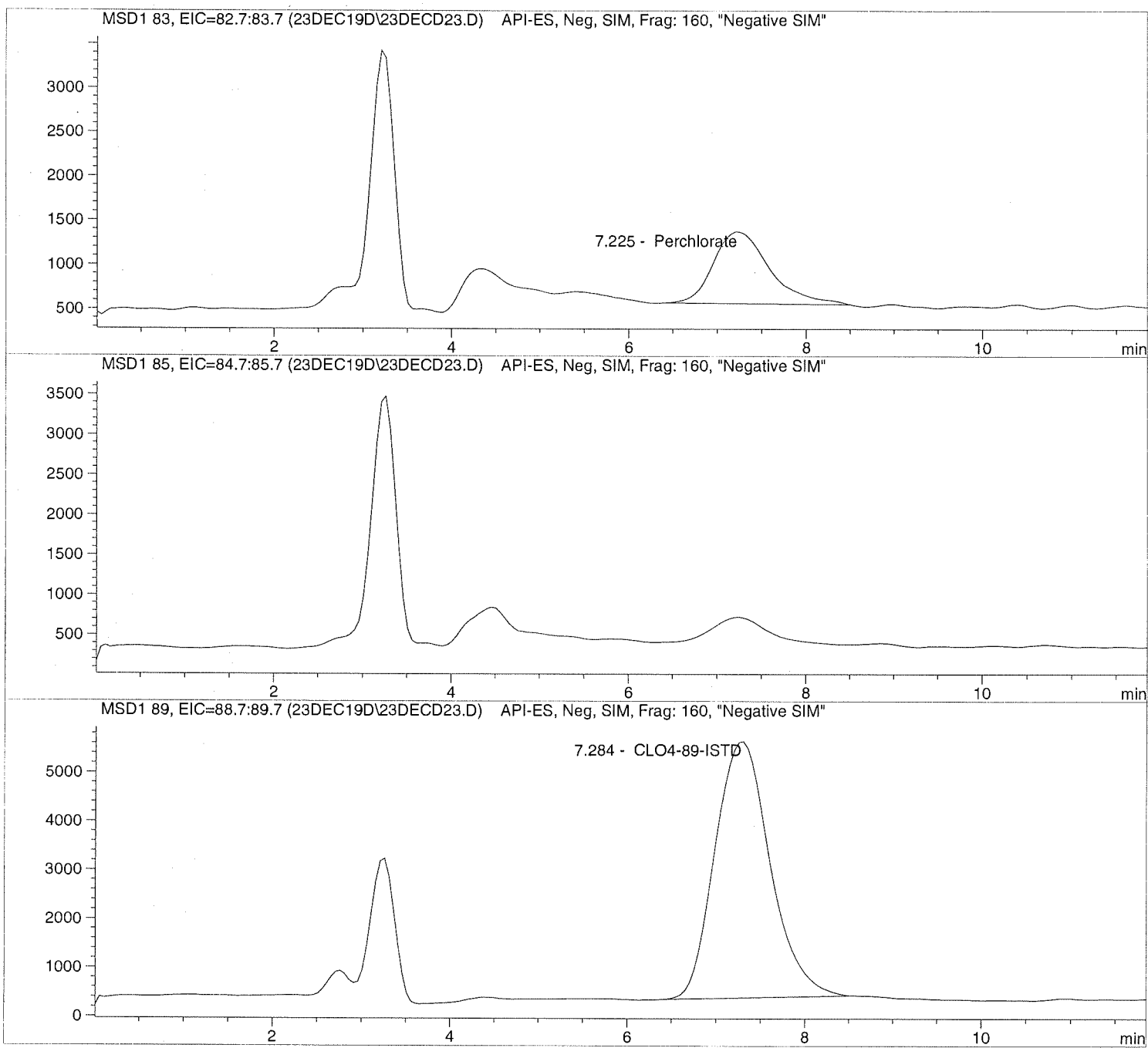
Sample Name: 1935366001

=====
Injection Date: 12/23/2019 13:17:14
Sample Name: 1935366001
Acq Operator: TNB

Seq Line: 23
Location: Vial 92
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\23DEC19D\23DECD23.D Sample Name: 1935366001

```
=====
Injection Date: 12/23/2019 13:17:14      Seq Line:          23
Sample Name:    1935366001                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:       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
7.225	PBA	35581.3	0.5167	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
7.284	PBA	226617.1	5.0000	CLO4-89-ISTD

*** End of Report ***



10450 Stancliff Rd. Suite 210
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T: +1 281 530 5656
F: +1 281 530 5887

January 06, 2020

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

Work Order: **HS19121001**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Dec 18, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

A handwritten signature in black ink, appearing to read "Raj. P. Modashia", enclosed in a circular scribble.

Generated By: DAYNA.FISHER

RJ Modashia
Project Manager

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19121001

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19121001-01	LH18/24-SP650_121719	Water		17-Dec-2019 14:00	18-Dec-2019 10:50	<input type="checkbox"/>
HS19121001-02	LH18/24-SP650_121719_BIX	Water		17-Dec-2019 14:00	18-Dec-2019 10:50	<input type="checkbox"/>

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19121001

CASE NARRATIVE

Work Order Comments

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

Work Order Comments

- The analyses for TOC was subcontracted to ALS Environmental in Kelso, WA. Final Report attached.
-

WetChemistry by Method E350.3**Batch ID: R353301**

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

WetChemistry by Method E365.3**Batch ID: R352849**

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Weekly Samples
 Sample ID: LH18/24-SP650_121719
 Collection Date: 17-Dec-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19121001
 Lab ID:HS19121001-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)								Analyst: MZD
	Method:E350.3							
Nitrogen, Ammonia (As N)	0.35	a	0.20	0.10	0.20	mg/L	1	26-Dec-2019 11:15
ORTHO PHOSPHATE (PO4) AS P BY E365.3								Analyst: MZD
	Method:E365.3							
Phosphorus, Total Orthophosphate (As P)	0.0110	Ja	0.0100	0.0250	0.0250	mg/L	1	18-Dec-2019 15:44
SUBCONTRACT ANALYSIS - TOC ANALYSIS								Analyst: SUBK
	Method:NA							
Subcontract Analysis	See Attached		0	0		NA	1	03-Jan-2020 18:34

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Weekly Samples
 Sample ID: LH18/24-SP650_121719_BIX
 Collection Date: 17-Dec-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19121001
 Lab ID:HS19121001-02
 Matrix:Water

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	06-Jan-2020 14:07

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19121001

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R352849 (0)		Test Name : ORTHO PHOSPHATE (PO4) AS P BY E365.3			Matrix: Water	
HS19121001-01	LH18/24-SP650_121719	17 Dec 2019 14:00			18 Dec 2019 15:44	1
Batch ID: R353301 (0)		Test Name : AMMONIA AS N BY E350.3(ISE)			Matrix: Water	
HS19121001-01	LH18/24-SP650_121719	17 Dec 2019 14:00			26 Dec 2019 11:15	1
Batch ID: R353817 (0)		Test Name : SUBCONTRACT ANALYSIS - TOC ANALYSIS			Matrix: Water	
HS19121001-01	LH18/24-SP650_121719	17 Dec 2019 14:00			03 Jan 2020 18:34	1
Batch ID: R353891 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Water	
HS19121001-02	LH18/24-SP650_121719_BIX	17 Dec 2019 14:00			06 Jan 2020 14:07	1

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19121001

QC BATCH REPORT

Batch ID:	R352849 (0)	Instrument:	UV-2450	Method:	ORTHO PHOSPHATE (PO4) AS P BY E365.3					
MBLK	Sample ID: MBLK-352849	Units: mg/L		Analysis Date: 18-Dec-2019 15:44						
Client ID:	Run ID: UV-2450_352849	SeqNo: 5399012		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.0250	0.0250							U	
LCS	Sample ID: LCS-352849	Units: mg/L		Analysis Date: 18-Dec-2019 15:44						
Client ID:	Run ID: UV-2450_352849	SeqNo: 5399013		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.244	0.0250	0.25	0	97.6	85 - 115				
LCSD	Sample ID: LCSD-352849	Units: mg/L		Analysis Date: 18-Dec-2019 15:44						
Client ID:	Run ID: UV-2450_352849	SeqNo: 5399014		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.242	0.0250	0.25	0	96.8	85 - 115	0.244	0.823	20	
MS	Sample ID: HS19120979-03MS	Units: mg/L		Analysis Date: 18-Dec-2019 15:44						
Client ID:	Run ID: UV-2450_352849	SeqNo: 5399016		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.229	0.0250	0.25	0.003	90.4	80 - 120				
MSD	Sample ID: HS19120979-03MSD	Units: mg/L		Analysis Date: 18-Dec-2019 15:44						
Client ID:	Run ID: UV-2450_352849	SeqNo: 5399017		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.238	0.0250	0.25	0.003	94.0	80 - 120	0.229	3.85	20	

The following samples were analyzed in this batch: HS19121001-01

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19121001

QC BATCH REPORT

Batch ID: R353301 (0)		Instrument: WetChem_HS		Method: AMMONIA AS N BY E350.3(ISE)					
MBLK	Sample ID: MBLK-353301	Units: mg/L		Analysis Date: 26-Dec-2019 11:15					
Client ID:	Run ID: WetChem_HS_353301	SeqNo: 5409631		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (As N)	0.10	0.20							U
LCS	Sample ID: LCS-353301	Units: mg/L		Analysis Date: 26-Dec-2019 11:15					
Client ID:	Run ID: WetChem_HS_353301	SeqNo: 5409632		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (As N)	9.943	0.20	10	0	99.4	80 - 120			
MS	Sample ID: HS19120987-01MS	Units: mg/L		Analysis Date: 26-Dec-2019 11:15					
Client ID:	Run ID: WetChem_HS_353301	SeqNo: 5409634		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (As N)	10.78	0.20	10	0.43	103	80 - 120			
MSD	Sample ID: HS19120987-01MSD	Units: mg/L		Analysis Date: 26-Dec-2019 11:15					
Client ID:	Run ID: WetChem_HS_353301	SeqNo: 5409635		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Nitrogen, Ammonia (As N)	10.72	0.20	10	0.43	103	80 - 120	10.78	0.586	20

The following samples were analyzed in this batch: HS19121001-01

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19121001

**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 Quantitation 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 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: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19121001

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19121001-01	LH18/24-SP650_121719	Login	12/18/2019 3:58:15 PM	JRM	WET393
HS19121001-01	LH18/24-SP650_121719	Login	12/18/2019 3:58:15 PM	JRM	WET393
HS19121001-01	LH18/24-SP650_121719	Login	12/18/2019 3:58:15 PM	JRM	Sub
HS19121001-02	LH18/24-SP650_121719_BIX	Login	12/18/2019 3:58:15 PM	JRM	Sub

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19121001

Date/Time Received: **18-Dec-2019 10:50**
 Received by: **JRM**

Checklist completed by: Jared R. Makan 18-Dec-2019
 eSignature Date

Reviewed by: Corey Grandits 18-Dec-2019
 eSignature Date

Matrices: **Water**

Carrier name: **FedEx Priority Overnight**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes No Not Present
- Chain of custody present? Yes No 1 Page(s)
- Chain of custody signed when relinquished and received? Yes No
- 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): 1.7°C / 1.7°C UC/C IR11
 Cooler(s)/Kit(s): 45576
 Date/Time sample(s) sent to storage: 12/18/2019 16:00

- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH acceptable upon receipt? Yes No N/A
- pH adjusted? Yes No N/A

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:
 Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

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

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS			Project No. NWO1312.0150.0 16.0001		MS / MSD	No. OF CONTAINERS	Analyses											Remarks (Preservatives, etc.)	Lab I.D.#						
Job: GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES							AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE															
Prepared By: Scott Beesinger			P.O. Number																						
Field Sample I.D.	Sample Matrix	Date / Time																							
LH18/24-SP650_121719	Water	12/17/19 / 14:00	3	X	X													H2SO4							
LH18/24-SP650_121719	Water	12/17/19 / 14:00	1				X											NONE							
LH18/24 -SP650_121719_BIX	Water	12/17/19 / 14:00	1					X										NONE							

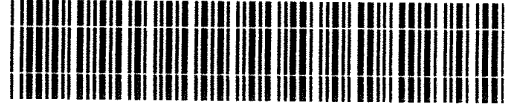
Additional Remarks: **Standard TAT on all parameters**

Relinquished By:		Date	Time	Received By:		Date	Time	Relinquished By:		Date	Time	Received By:		Date	Time
<i>Scott Beesinger</i>		12/17/19	14:30												

Received At Lab By:		Date	Time	Airbill No.	For Lab Use Only					
<i>J. M... ..</i>		12/18/19	10:50		Opened By:	Date	Time	Temp of Container	Seal No.	Condition
Remarks: <i>Cooler 45576 1411</i> <i>Temp 1.7 CF00</i>										

HS19121001

Bhate Environmental Associates, Inc.
 Longhorn GW Treatment Plant Weekly Samples



(Word) S:\1-ces\FORMS\Chain of Custody - BiWeekly

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

CUSTODY SEAL

Date: 12/18/19	Time: 1430	Seal Broken By: Jm
Name: Suite 210		Date: 12/18/19
Company: ALS		

FedEx
 TRACKING 4380 9533 6736
 WED - 18 DEC 10:30A
 PRIORITY OVERNIGHT

AB SGRA 77099
 TX-US
 IAH



FID 162785 17DEC19 666A 56AC2/18DD/05A2



ALS Environmental
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Kelso, WA 98626
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F : +1 360 636 1068
www.alsglobal.com

January 03, 2020

Analytical Report for Service Request No: K1911995

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

RE: HS19121001

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory December 20, 2019
For your reference, these analyses have been assigned our service request number **K1911995**.

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy
Project Manager



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Table of Contents

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.pjllabs.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/analyte is offered by that state.



Case Narrative

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



Client: ALS Environmental - US
Project: HS19121001
Sample Matrix: Water

Service Request: K1911995
Date Received: 12/20/2019

CASE NARRATIVE

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

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 12/20/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by

Kelley Avejoy

Date

01/03/2020



Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
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KL1911995

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: Dept of Defense

COC ID: 12898

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: HS19121001
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19121001-01	LH18/24-SP650_121719	Water	17 Dec 2019 14:00
TOC Analysis for DOD Level IV			27 Dec 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By:

Date/Time:

12/19/19 18:00

Received By:

Date/Time:

12/20/19 10:00

Cooler ID(s):

Temperature(s):

RIGHT SOLUTIONS | RIGHT PARTNER



PC KL

Cooler Receipt and Preservation Form

Client ALS Houston Service Request K19 11995

Received: 12/20/19 Opened: 12/20/19 By: CG Unloaded: 12/20/19 By: CG

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

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID	Tracking Number	NA	Filed
-0.1	-0.2	1.0	0.9	-0.1	374	12898	1251 029 30639		

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

RUSH



General Chemistry

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

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: ALS Environmental - US
Project: HS19121001
Sample Matrix: Water
Analysis Method: SM 5310 C
Prep Method: None

Service Request: K1911995
Date Collected: 12/17/19
Date Received: 12/20/19
Units: mg/L
Basis: NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_121719	K1911995-001	2.19	0.50	0.20	0.07	1	12/31/19 21:48	
Method Blank	K1911995-MB	ND U	0.50	0.20	0.07	1	12/31/19 21:04	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19121001
Sample Matrix: Water

Service Request: K1911995
Date Collected: 12/17/19
Date Received: 12/20/19
Date Analyzed: 12/31/19

Replicate Sample Summary
General Chemistry Parameters

Sample Name: LH18/24-SP650_121719
Lab Code: K1911995-001

Units: mg/L
Basis: NA

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>LOQ</u>	<u>LOD</u>	<u>MDL</u>	<u>Sample Result</u>	<u>Duplicate Sample K1911995-001DUP Result</u>	<u>Average</u>	<u>RPD</u>	<u>RPD Limit</u>
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	2.19	2.23	2.21	2	10

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

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

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

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19121001
Sample Matrix: Water

Service Request: K1911995
Date Collected: 12/17/19
Date Received: 12/20/19
Date Analyzed: 12/31/19
Date Extracted: NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name: LH18/24-SP650_121719
Lab Code: K1911995-001
Analysis Method: SM 5310 C
Prep Method: None

Units: mg/L
Basis: NA

Matrix Spike
K1911995-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	2.19	28.3	25.0	104	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
Project: HS19121001
Sample Matrix: Water

Service Request: K1911995
Date Analyzed: 12/31/19
Date Extracted: NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method: SM 5310 C
Prep Method: None

Units: mg/L
Basis: NA
Analysis Lot: 665302

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1911995-LCS	25.1	25.0	100	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19121001

Service Request: K1911995

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C

Units: mg/L

	Analysis		Date	True	Measured	Percent	Acceptance Limits
	Lot	Lab Code	Analyzed	Value	Value	Recovery	
CCV1	665302	KQ1919248-01	12/31/19 20:35	25.0	24.0	96	90-110
CCV2	665302	KQ1919248-02	01/01/20 00:38	25.0	25.1	100	90-110
CCV3	665302	KQ1919248-03	01/01/20 05:48	25.0	24.0	96	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19121001

Service Request: K1911995

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	665302	KQ1919248-04	12/31/19 20:49	0.50	0.20	0.07	ND	U
CCB2	665302	KQ1919248-05	01/01/20 00:53	0.50	0.20	0.07	ND	U
CCB3	665302	KQ1919248-06	01/01/20 06:03	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

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

Work Request # (Original) K1911762, 11807, 11895, 11934, 11980, 11981, 11995, 11998, 12042, 11800, 11868, 11909, 11910, 11960, 12004

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

Date Analyzed: 12/27/2019

Analyst: BCP

Analysis: TOC

Run # 1001664898, 664900, 664901, 664902

11914, 11968, 11970, 12040, 12074
IV IV IV IV II

**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: K1911995-1, 11998-1/2/3/4/5/6, 12042-1/2/3/4/5, 11934-2, 11980-1, 11981-1
sent for RA due to contaminated CCBs.
K1911807-4nd, 11868-4nd, 11914-1/11970-5/6 report a high %RSD.
However, these samples are less than 5x the MRL

Final Approved by: QC Date: 12/31/19 DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 664898 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
K1911762-003	Carbon, Total Organic	N/A		Water	4.08 mg/L	10 ml	408 mg/L	100	7	50			12/28/19 08:10	N	II
K1911762-004	Carbon, Total Organic	N/A		Water	5.35 mg/L	10 ml	535 mg/L	100	7	50			12/28/19 08:38	N	II
K1911762-005	Carbon, Total Organic	N/A		Water	5.51 mg/L	10 ml	551 mg/L	100	7	50			12/28/19 09:06	N	II
K1911807-004	Carbon, Total Organic	N/A		Water	0.66 mg/L	10 ml	0.66 mg/L	1	0.07	0.50			12/28/19 09:34	N	II
K1911895-001	Carbon, Total Organic	N/A		Drinking Water	0.45 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/28/19 07:42	N	I
K1911934-002	Carbon, Total Organic	N/A		Drinking Water	1.04 mg/L	10 ml	1.04 mg/L	1	0.07	0.50			12/28/19 05:19	N	I
K1911980-001	Carbon, Total Organic	N/A		Water	4.22 mg/L	10 ml	4.22 mg/L	1	0.07	0.50			12/28/19 05:47	N	II
K1911981-001	Carbon, Total Organic	N/A		Water	3.74 mg/L	10 ml	3.74 mg/L	1	0.07	0.50			12/28/19 06:15	N	II
K1911995-001	Carbon, Total Organic	N/A		Water	2.64 mg/L	10 ml	2.64 mg/L	1	0.07	0.50			12/27/19 22:43	N	IV
K1911998-001	Carbon, Total Organic	N/A		Ground Water	3.35 mg/L	10 ml	3.35 mg/L	1	0.07	0.50			12/27/19 23:40	N	IV
K1911998-002	Carbon, Total Organic	N/A		Ground Water	1.31 mg/L	10 ml	131 mg/L	100	7	50			12/28/19 00:08	N	IV
K1911998-003	Carbon, Total Organic	N/A		Ground Water	0.32 mg/L	10 ml	320 mg/L J	1000	70	500			12/28/19 00:37	N	IV
K1911998-004	Carbon, Total Organic	N/A		Ground Water	10.95 mg/L	10 ml	10.9 mg/L	1	0.07	0.50			12/28/19 01:05	N	IV
K1911998-005	Carbon, Total Organic	N/A		Ground Water	94.31 mg/L	10 ml	94.3 mg/L	1	0.07	0.50			12/28/19 02:02	N	IV
K1911998-006	Carbon, Total Organic	N/A		Ground Water	6.19 mg/L	10 ml	6.19 mg/L	1	0.07	0.50			12/28/19 02:30	N	IV
K1912042-001	Carbon, Total Organic	N/A		Ground Water	6.24 mg/L	10 ml	6.24 mg/L	1	0.07	0.50			12/28/19 02:59	N	IV
K1912042-002	Carbon, Total Organic	N/A		Ground Water	5.13 mg/L	10 ml	5.13 mg/L	1	0.07	0.50			12/28/19 03:27	N	IV
K1912042-003	Carbon, Total Organic	N/A		Ground Water	14.04 mg/L	10 ml	14.0 mg/L	1	0.07	0.50			12/28/19 03:55	N	IV
K1912042-004	Carbon, Total Organic	N/A		Ground Water	14.68 mg/L	10 ml	14.7 mg/L	1	0.07	0.50			12/28/19 04:23	N	IV
K1912042-005	Carbon, Total Organic	N/A		Ground Water	4.14 mg/L	10 ml	4.14 mg/L	1	0.07	0.50			12/28/19 04:51	N	IV
KQ1919209-01	Carbon, Total Organic	CCV		Water	24.92 mg/L	10 ml	24.9 mg/L	1					12/27/19 21:30	N	IV
KQ1919209-02	Carbon, Total Organic	CCV		Water	26.02 mg/L	10 ml	26.0 mg/L	1					12/28/19 01:33	N	IV
KQ1919209-03	Carbon, Total Organic	CCV		Water	24.62 mg/L	10 ml	24.6 mg/L	1					12/28/19 06:43	N	IV
KQ1919209-04	Carbon, Total Organic	CCV		Water	24.84 mg/L	10 ml	24.8 mg/L	1					12/28/19 11:12	N	IV
KQ1919209-05	Carbon, Total Organic	CCB		Water	0.58 mg/L	10 ml	0.58 mg/L	1	0.07	0.50			12/27/19 21:45	N	IV
KQ1919209-06	Carbon, Total Organic	CCB		Water	0.54 mg/L	10 ml	0.54 mg/L	1	0.07	0.50			12/28/19 01:47	N	IV
KQ1919209-07	Carbon, Total Organic	CCB		Water	0.16 mg/L	10 ml	0.16 mg/L J	1	0.07	0.50			12/28/19 06:58	N	IV
KQ1919209-08	Carbon, Total Organic	CCB		Water	0.15 mg/L	10 ml	0.15 mg/L J	1	0.07	0.50			12/28/19 11:27	N	IV
KQ1919209-09	Carbon, Total Organic	MB		Water	0.03 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/27/19 21:59	N	IV
KQ1919209-10	Carbon, Total Organic	LCS		Water	26.17 mg/L	10 ml	26.2 mg/L	1	0.07	0.50	105		12/27/19 22:14	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: 664898 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
KQ1919209-11	Carbon, Total Organic	MS	K1911995-001	Water	28.07 mg/L	10 ml	28.1 mg/L	1	0.07	0.50	102		12/27/19 23:11	N	IV
KQ1919209-12	Carbon, Total Organic	DUP	K1911807-004	Water	0.56 mg/L	10 ml	0.56 mg/L	1	0.07	0.50		16*	12/28/19 09:34	N	II
KQ1919209-13	Carbon, Total Organic	DUP	K1911762-003	Water	4.12 mg/L	10 ml	412 mg/L	100	7	50		<1	12/28/19 08:10	N	II
KQ1919209-14	Carbon, Total Organic	DUP	K1911895-001	Drinking Water	0.30 mg/L	10 ml	0.30 mg/L	J 1	0.07	0.50		NC	12/28/19 07:42	N	I
KQ1919209-15	Carbon, Total Organic	DUP	K1911762-004	Water	5.35 mg/L	10 ml	535 mg/L	100	7	50		<1	12/28/19 08:38	N	II
KQ1919209-16	Carbon, Total Organic	DUP	K1911934-002	Drinking Water	0.87 mg/L	10 ml	0.87 mg/L	1	0.07	0.50		17*	12/28/19 05:19	N	I
KQ1919209-17	Carbon, Total Organic	DUP	K1911762-005	Water	5.43 mg/L	10 ml	543 mg/L	100	7	50		2	12/28/19 09:06	N	II
KQ1919209-18	Carbon, Total Organic	DUP	K1911980-001	Water	4.17 mg/L	10 ml	4.17 mg/L	1	0.07	0.50		1	12/28/19 05:47	N	II
KQ1919209-19	Carbon, Total Organic	DUP	K1911981-001	Water	3.66 mg/L	10 ml	3.66 mg/L	1	0.07	0.50		2	12/28/19 06:15	N	II
KQ1919209-20	Carbon, Total Organic	DUP	K1911995-001	Water	2.63 mg/L	10 ml	2.63 mg/L	1	0.07	0.50		<1	12/27/19 22:43	N	IV
KQ1919209-21	Carbon, Total Organic	DUP	K1911998-002	Ground Water	1.23 mg/L	10 ml	123 mg/L	100	7	50		6	12/28/19 00:08	N	IV
KQ1919209-22	Carbon, Total Organic	DUP	K1911998-001	Ground Water	3.35 mg/L	10 ml	3.35 mg/L	1	0.07	0.50		<1	12/27/19 23:40	N	IV
KQ1919209-23	Carbon, Total Organic	DUP	K1911998-003	Ground Water	0.30 mg/L	10 ml	300 mg/L	J 1000	70	500		5	12/28/19 00:37	N	IV
KQ1919209-24	Carbon, Total Organic	DUP	K1911998-004	Ground Water	10.80 mg/L	10 ml	10.8 mg/L	1	0.07	0.50		1	12/28/19 01:05	N	IV
KQ1919209-25	Carbon, Total Organic	DUP	K1911998-005	Ground Water	94.83 mg/L	10 ml	94.8 mg/L	1	0.07	0.50		<1	12/28/19 02:02	N	IV
KQ1919209-26	Carbon, Total Organic	DUP	K1911998-006	Ground Water	3.61 mg/L	10 ml	3.61 mg/L	1	0.07	0.50		53*	12/28/19 02:30	N	IV
KQ1919209-27	Carbon, Total Organic	DUP	K1912042-002	Ground Water	4.85 mg/L	10 ml	4.84 mg/L	1	0.07	0.50		6	12/28/19 03:27	N	IV
KQ1919209-28	Carbon, Total Organic	DUP	K1912042-001	Ground Water	5.79 mg/L	10 ml	5.79 mg/L	1	0.07	0.50		7	12/28/19 02:59	N	IV
KQ1919209-29	Carbon, Total Organic	DUP	K1912042-003	Ground Water	13.92 mg/L	10 ml	13.9 mg/L	1	0.07	0.50		<1	12/28/19 03:55	N	IV
KQ1919209-30	Carbon, Total Organic	DUP	K1912042-004	Ground Water	14.90 mg/L	10 ml	14.9 mg/L	1	0.07	0.50		1	12/28/19 04:23	N	IV
KQ1919209-31	Carbon, Total Organic	DUP	K1912042-005	Ground Water	3.58 mg/L	10 ml	3.58 mg/L	1	0.07	0.50		14*	12/28/19 04:51	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 664900 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
K1911810-001	Carbon, Total Organic	N/A		Water	2.42 mg/L	10 ml	2.42 mg/L	1	0.07	0.50			12/28/19 10:02	N	II
K1911810-002	Carbon, Total Organic	N/A		Water	2.24 mg/L	10 ml	2.24 mg/L	1	0.07	0.50			12/28/19 10:30	N	II
K1911868-001	Carbon, Total Organic	N/A		Ground Water	0.72 mg/L	10 ml	0.72 mg/L	1	0.07	0.50			12/28/19 11:42	N	IV
K1911868-002	Carbon, Total Organic	N/A		Ground Water	0.75 mg/L	10 ml	0.75 mg/L	1	0.07	0.50			12/28/19 12:10	N	IV
K1911868-003	Carbon, Total Organic	N/A		Ground Water	7.88 mg/L	10 ml	7.88 mg/L	1	0.07	0.50			12/28/19 12:38	N	IV
K1911868-004	Carbon, Total Organic	N/A		Ground Water	0.14 mg/L	10 ml	0.14 mg/L	J 1	0.07	0.50			12/28/19 13:06	N	IV
K1911909-001	Carbon, Total Organic	N/A		Water	-0.15 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			12/28/19 13:34	N	IV
K1911910-001	Carbon, Total Organic	N/A		Water	9.84 mg/L	10 ml	98.4 mg/L	10	0.7	5.0			12/28/19 14:02	N	II
K1911960-001	Carbon, Total Organic	N/A		Water	8.94 mg/L	10 ml	8.94 mg/L	1	0.07	0.50			12/28/19 14:59	N	I
K1911960-002	Carbon, Total Organic	N/A		Water	12.64 mg/L	10 ml	12.6 mg/L	1	0.07	0.50			12/28/19 15:27	N	I
K1911960-003	Carbon, Total Organic	N/A		Water	1.80 mg/L	10 ml	1.80 mg/L	1	0.07	0.50			12/28/19 15:55	N	I
K1911960-004	Carbon, Total Organic	N/A		Water	23.35 mg/L	10 ml	23.3 mg/L	1	0.07	0.50			12/28/19 17:22	N	I
K1911960-005	Carbon, Total Organic	N/A		Water	8.92 mg/L	10 ml	8.92 mg/L	1	0.07	0.50			12/28/19 17:50	N	I
K1911960-006	Carbon, Total Organic	N/A		Water	15.47 mg/L	10 ml	15.5 mg/L	1	0.07	0.50			12/28/19 18:18	N	I
K1911960-007	Carbon, Total Organic	N/A		Water	4.86 mg/L	10 ml	38.9 mg/L	8	0.6	4.0			12/28/19 18:46	N	I
K1911960-008	Carbon, Total Organic	N/A		Water	11.31 mg/L	10 ml	11.3 mg/L	1	0.07	0.50			12/28/19 19:14	N	I
K1911960-009	Carbon, Total Organic	N/A		Water	15.59 mg/L	10 ml	15.6 mg/L	1	0.07	0.50			12/28/19 19:42	N	I
K1912004-001	Carbon, Total Organic	N/A		Water	-0.26 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			12/28/19 14:31	N	II
KQ1919210-01	Carbon, Total Organic	CCV		Water	24.62 mg/L	10 ml	24.6 mg/L	1					12/28/19 06:43	N	II
KQ1919210-02	Carbon, Total Organic	CCV		Water	24.84 mg/L	10 ml	24.8 mg/L	1					12/28/19 11:12	N	II
KQ1919210-03	Carbon, Total Organic	CCV		Water	24.79 mg/L	10 ml	24.8 mg/L	1					12/28/19 16:23	N	II
KQ1919210-04	Carbon, Total Organic	CCV		Water	24.27 mg/L	10 ml	24.3 mg/L	1					12/28/19 21:07	N	II
KQ1919210-05	Carbon, Total Organic	CCB		Water	0.16 mg/L	10 ml	0.16 mg/L	J 1	0.07	0.50			12/28/19 06:58	N	II
KQ1919210-06	Carbon, Total Organic	CCB		Water	0.15 mg/L	10 ml	0.15 mg/L	J 1	0.07	0.50			12/28/19 11:27	N	II
KQ1919210-07	Carbon, Total Organic	CCB		Water	-0.03 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			12/28/19 16:38	N	II
KQ1919210-08	Carbon, Total Organic	CCB		Water	-0.25 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			12/28/19 21:21	N	II
KQ1919210-09	Carbon, Total Organic	MB		Water	-0.32 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			12/28/19 07:12	N	II
KQ1919210-10	Carbon, Total Organic	LCS		Water	25.86 mg/L	10 ml	25.9 mg/L	1	0.07	0.50	103		12/28/19 07:27	N	II
KQ1919210-11	Carbon, Total Organic	MS	K1911810-001	Water	28.47 mg/L	10 ml	28.5 mg/L	1	0.07	0.50	104		12/28/19 10:58	N	II
KQ1919210-12	Carbon, Total Organic	DUP	K1911810-001	Water	2.38 mg/L	10 ml	2.38 mg/L	1	0.07	0.50		2	12/28/19 10:02	N	II
KQ1919210-13	Carbon, Total Organic	DUP	K1911810-002	Water	2.24 mg/L	10 ml	2.24 mg/L	1	0.07	0.50		<1	12/28/19 10:30	N	II
KQ1919210-14	Carbon, Total Organic	DUP	K1911868-001	Ground Water	0.70 mg/L	10 ml	0.70 mg/L	1	0.07	0.50		3	12/28/19 11:42	N	IV
KQ1919210-15	Carbon, Total Organic	DUP	K1911868-002	Ground Water	0.71 mg/L	10 ml	0.71 mg/L	1	0.07	0.50		5	12/28/19 12:10	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: 664900 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
KQ1919210-16	Carbon, Total Organic	DUP	K1911868-003	Ground Water	7.92 mg/L	10 ml	7.92 mg/L	1	0.07	0.50		<1	12/28/19 12:38	N	IV
KQ1919210-17	Carbon, Total Organic	DUP	K1911868-004	Ground Water	0.09 mg/L	10 ml	0.09 mg/L	J 1	0.07	0.50		47*	12/28/19 13:06	N	IV
KQ1919210-18	Carbon, Total Organic	DUP	K1911910-001	Water	9.71 mg/L	10 ml	97.1 mg/L	10	0.7	5.0		1	12/28/19 14:02	N	II
KQ1919210-19	Carbon, Total Organic	DUP	K1911909-001	Water	-0.20 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50		NC	12/28/19 13:34	N	IV
KQ1919210-20	Carbon, Total Organic	DUP	K1911960-001	Water	8.96 mg/L	10 ml	8.96 mg/L	1	0.07	0.50		<1	12/28/19 14:59	N	I
KQ1919210-21	Carbon, Total Organic	DUP	K1911960-002	Water	12.32 mg/L	10 ml	12.3 mg/L	1	0.07	0.50		3	12/28/19 15:27	N	I
KQ1919210-22	Carbon, Total Organic	DUP	K1911960-003	Water	1.67 mg/L	10 ml	1.67 mg/L	1	0.07	0.50		7	12/28/19 15:55	N	I
KQ1919210-23	Carbon, Total Organic	DUP	K1911960-004	Water	23.44 mg/L	10 ml	23.4 mg/L	1	0.07	0.50		<1	12/28/19 17:22	N	I
KQ1919210-24	Carbon, Total Organic	DUP	K1911960-005	Water	8.85 mg/L	10 ml	8.85 mg/L	1	0.07	0.50		<1	12/28/19 17:50	N	I
KQ1919210-25	Carbon, Total Organic	DUP	K1911960-006	Water	15.42 mg/L	10 ml	15.4 mg/L	1	0.07	0.50		<1	12/28/19 18:18	N	I
KQ1919210-26	Carbon, Total Organic	DUP	K1911960-007	Water	4.68 mg/L	10 ml	37.4 mg/L	8	0.6	4.0		4	12/28/19 18:46	N	I
KQ1919210-27	Carbon, Total Organic	DUP	K1911960-008	Water	11.04 mg/L	10 ml	11.0 mg/L	1	0.07	0.50		2	12/28/19 19:14	N	I
KQ1919210-28	Carbon, Total Organic	DUP	K1911960-009	Water	15.45 mg/L	10 ml	15.4 mg/L	1	0.07	0.50		<1	12/28/19 19:42	N	I
KQ1919210-29	Carbon, Total Organic	DUP	K1912004-001	Water	-0.07 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50		NC	12/28/19 14:31	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: 664901 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
K1911914-001	Carbon, Total Organic	N/A		Ground Water	0.55 mg/L	10 ml	0.55 mg/L	1	0.07	0.50			12/28/19 23:00	Y	IV
K1911914-002	Carbon, Total Organic	N/A		Ground Water	1.54 mg/L	10 ml	1.54 mg/L	1	0.07	0.50			12/28/19 23:57	N	IV
K1911914-003	Carbon, Total Organic	N/A		Ground Water	3.20 mg/L	10 ml	3.20 mg/L	1	0.07	0.50			12/29/19 00:25	N	IV
K1911914-004	Carbon, Total Organic	N/A		Ground Water	0.52 mg/L	10 ml	0.52 mg/L	1	0.07	0.50			12/29/19 00:53	N	IV
K1911914-005	Carbon, Total Organic	N/A		Ground Water	5.68 mg/L	10 ml	5.68 mg/L	1	0.07	0.50			12/29/19 01:22	N	IV
K1911914-006	Carbon, Total Organic	N/A		Ground Water	9.50 mg/L	10 ml	9.50 mg/L	1	0.07	0.50			12/29/19 02:48	N	IV
K1911914-007	Carbon, Total Organic	N/A		Ground Water	0.33 mg/L	10 ml	0.33 mg/L	J 1	0.07	0.50			12/29/19 03:17	N	IV
K1911914-008	Carbon, Total Organic	N/A		Ground Water	-0.32 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			12/29/19 03:45	N	IV
K1911914-009	Carbon, Total Organic	N/A		Ground Water	-0.32 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			12/29/19 04:13	N	IV
K1911968-001	Carbon, Total Organic	N/A		Water	1.23 mg/L	10 ml	1.23 mg/L	1	0.07	0.50			12/28/19 20:11	N	IV
K1911968-002	Carbon, Total Organic	N/A		Water	1.15 mg/L	10 ml	1.15 mg/L	1	0.07	0.50			12/28/19 20:39	N	IV
K1911968-003	Carbon, Total Organic	N/A		Water	0.70 mg/L	10 ml	0.70 mg/L	1	0.07	0.50			12/28/19 21:36	N	IV
KQ1919211-01	Carbon, Total Organic	CCV		Water	24.79 mg/L	10 ml	24.8 mg/L	1					12/28/19 16:23	N	IV
KQ1919211-02	Carbon, Total Organic	CCV		Water	24.27 mg/L	10 ml	24.3 mg/L	1					12/28/19 21:07	N	IV
KQ1919211-03	Carbon, Total Organic	CCV		Water	24.10 mg/L	10 ml	24.1 mg/L	1					12/29/19 01:50	N	IV
KQ1919211-04	Carbon, Total Organic	CCV		Water	23.91 mg/L	10 ml	23.9 mg/L	1					12/29/19 06:21	N	IV
KQ1919211-05	Carbon, Total Organic	CCB		Water	-0.03 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			12/28/19 16:38	N	IV
KQ1919211-06	Carbon, Total Organic	CCB		Water	-0.25 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			12/28/19 21:21	N	IV
KQ1919211-07	Carbon, Total Organic	CCB		Water	-0.32 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			12/29/19 02:04	N	IV
KQ1919211-08	Carbon, Total Organic	CCB		Water	-0.32 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			12/29/19 06:35	N	IV
KQ1919211-09	Carbon, Total Organic	MB		Water	-0.32 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			12/28/19 16:53	N	IV
KQ1919211-10	Carbon, Total Organic	LCS		Water	25.70 mg/L	10 ml	25.7 mg/L	1	0.07	0.50	103		12/28/19 17:07	N	IV
KQ1919211-11	Carbon, Total Organic	MS	K1911914-001	Ground Water	27.35 mg/L	10 ml	27.3 mg/L	1	0.07	0.50	107		12/28/19 23:28	N	IV
KQ1919211-12	Carbon, Total Organic	DUP	K1911914-001	Ground Water	0.55 mg/L	10 ml	0.55 mg/L	1	0.07	0.50		<1	12/28/19 23:00	N	IV
KQ1919211-13	Carbon, Total Organic	DUP	K1911914-002	Ground Water	1.47 mg/L	10 ml	1.47 mg/L	1	0.07	0.50		5	12/28/19 23:57	N	IV
KQ1919211-14	Carbon, Total Organic	DUP	K1911914-003	Ground Water	3.11 mg/L	10 ml	3.11 mg/L	1	0.07	0.50		3	12/29/19 00:25	N	IV
KQ1919211-15	Carbon, Total Organic	DUP	K1911914-004	Ground Water	0.48 mg/L	10 ml	0.48 mg/L	J 1	0.07	0.50		8	12/29/19 00:53	N	IV
KQ1919211-16	Carbon, Total Organic	DUP	K1911914-005	Ground Water	5.66 mg/L	10 ml	5.66 mg/L	1	0.07	0.50		<1	12/29/19 01:22	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: 664901 Method/Testcode: SM 5310 C/TOC T

<u>Lab Code</u>	<u>Target Analytes</u>	<u>QC</u>	<u>Parent Sample</u>	<u>Matrix</u>	<u>Raw Result</u>	<u>Sample Amt.</u>	<u>Final Result</u>	<u>Dil</u>	<u>MDL</u>	<u>PQL</u>	<u>% Rec</u>	<u>% RSD</u>	<u>Date Analyzed</u>	<u>QC?</u>	<u>Tier</u>
KQ1919211-17	Carbon, Total Organic	DUP	K1911914-006	Ground Water	9.42 mg/L	10 ml	9.42 mg/L	1	0.07	0.50		<1	12/29/19 02:48	N	IV
KQ1919211-18	Carbon, Total Organic	DUP	K1911914-007	Ground Water	0.24 mg/L	10 ml	0.24 mg/L	J 1	0.07	0.50		32*	12/29/19 03:17	N	IV
KQ1919211-19	Carbon, Total Organic	DUP	K1911914-008	Ground Water	-0.32 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50		NC	12/29/19 03:45	N	IV
KQ1919211-20	Carbon, Total Organic	DUP	K1911914-009	Ground Water	-0.32 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50		NC	12/29/19 04:13	N	IV
KQ1919211-21	Carbon, Total Organic	DUP	K1911968-001	Water	1.15 mg/L	10 ml	1.15 mg/L	1	0.07	0.50		7	12/28/19 20:11	N	IV
KQ1919211-22	Carbon, Total Organic	DUP	K1911968-002	Water	1.20 mg/L	10 ml	1.20 mg/L	1	0.07	0.50		4	12/28/19 20:39	N	IV
KQ1919211-23	Carbon, Total Organic	DUP	K1911968-003	Water	0.63 mg/L	10 ml	0.63 mg/L	1	0.07	0.50		10	12/28/19 21:36	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: 664902 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
K1911970-001	Carbon, Total Organic	N/A		Ground Water	-0.32 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/19 04:41	N	IV
K1911970-002	Carbon, Total Organic	N/A		Ground Water	0.67 mg/L	10 ml	0.67 mg/L	1	0.07	0.50			12/29/19 05:09	N	IV
K1911970-003	Carbon, Total Organic	N/A		Ground Water	0.05 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/19 05:38	N	IV
K1911970-004	Carbon, Total Organic	N/A		Ground Water	17.01 mg/L	10 ml	17.0 mg/L	1	0.07	0.50			12/29/19 06:50	N	IV
K1911970-005	Carbon, Total Organic	N/A		Ground Water	0.85 mg/L	10 ml	0.85 mg/L	1	0.07	0.50			12/29/19 07:18	N	IV
K1912040-001	Carbon, Total Organic	N/A		Water	1.23 mg/L	10 ml	1.23 mg/L	1	0.07	0.50			12/29/19 08:43	N	IV
K1912040-002	Carbon, Total Organic	N/A		Water	16.08 mg/L	10 ml	16.1 mg/L	1	0.07	0.50			12/29/19 09:11	N	IV
K1912040-003	Carbon, Total Organic	N/A		Water	2.94 mg/L	10 ml	2.94 mg/L	1	0.07	0.50			12/29/19 09:39	N	IV
K1912074-001	Carbon, Total Organic	N/A		Water	8.38 mg/L	10 ml	838 mg/L	100	7	50			12/29/19 07:46	N	II
K1912074-002	Carbon, Total Organic	N/A		Water	6.55 mg/L	10 ml	655 mg/L	100	7	50			12/29/19 08:15	N	II
KQ1919213-01	Carbon, Total Organic	CCV		Ground Water	24.10 mg/L	10 ml	24.1 mg/L	1					12/29/19 01:50	N	IV
KQ1919213-02	Carbon, Total Organic	CCV		Ground Water	23.91 mg/L	10 ml	23.9 mg/L	1					12/29/19 06:21	N	IV
KQ1919213-03	Carbon, Total Organic	CCV		Ground Water	23.95 mg/L	10 ml	23.9 mg/L	1					12/29/19 10:07	N	IV
KQ1919213-04	Carbon, Total Organic	CCB		Ground Water	-0.32 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/19 02:04	N	IV
KQ1919213-05	Carbon, Total Organic	CCB		Ground Water	-0.32 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/19 06:35	N	IV
KQ1919213-06	Carbon, Total Organic	CCB		Ground Water	-0.32 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/19 10:22	N	IV
KQ1919213-07	Carbon, Total Organic	MB		Ground Water	-0.32 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			12/29/19 02:19	N	IV
KQ1919213-08	Carbon, Total Organic	LCS		Ground Water	25.40 mg/L	10 ml	25.4 mg/L	1	0.07	0.50	102		12/29/19 02:34	N	IV
KQ1919213-09	Carbon, Total Organic	MS	K1911970-003	Ground Water	26.71 mg/L	10 ml	26.7 mg/L	1	0.07	0.50	107		12/29/19 06:06	N	IV
KQ1919213-10	Carbon, Total Organic	DUP	K1911970-001	Ground Water	-0.32 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	12/29/19 04:41	N	IV
KQ1919213-11	Carbon, Total Organic	DUP	K1911970-005	Ground Water	0.75 mg/L	10 ml	0.75 mg/L	1	0.07	0.50		12*	12/29/19 07:18	N	IV
KQ1919213-12	Carbon, Total Organic	DUP	K1911970-002	Ground Water	0.64 mg/L	10 ml	0.64 mg/L	1	0.07	0.50		5	12/29/19 05:09	N	IV
KQ1919213-13	Carbon, Total Organic	DUP	K1911970-003	Ground Water	0.08 mg/L	10 ml	0.08 mg/L J	1	0.07	0.50		NC	12/29/19 05:38	N	IV
KQ1919213-14	Carbon, Total Organic	DUP	K1911970-004	Ground Water	17.18 mg/L	10 ml	17.2 mg/L	1	0.07	0.50		<1	12/29/19 06:50	N	IV
KQ1919213-15	Carbon, Total Organic	DUP	K1912040-002	Water	15.96 mg/L	10 ml	16.0 mg/L	1	0.07	0.50		<1	12/29/19 09:11	N	IV
KQ1919213-16	Carbon, Total Organic	DUP	K1912040-001	Water	1.14 mg/L	10 ml	1.14 mg/L	1	0.07	0.50		7	12/29/19 08:43	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: 664902 Method/Testcode: SM 5310 C/TOC T

<u>Lab Code</u>	<u>Target Analytes</u>	<u>QC</u>	<u>Parent Sample</u>	<u>Matrix</u>	<u>Raw Result</u>	<u>Sample Amt.</u>	<u>Final Result</u>	<u>Dil</u>	<u>MDL</u>	<u>PQL</u>	<u>% Rec</u>	<u>% RSD</u>	<u>Date Analyzed</u>	<u>QC?</u>	<u>Tier</u>
KQ1919213-17	Carbon, Total Organic	DUP	K1912040-003	Water	2.87 mg/L	10 ml	2.87 mg/L	1	0.07	0.50		2	12/29/19 09:39	N	IV
KQ1919213-18	Carbon, Total Organic	DUP	K1912074-001	Water	8.44 mg/L	10 ml	844 mg/L	100	7	50		<1	12/29/19 07:46	N	II
KQ1919213-19	Carbon, Total Organic	DUP	K1912074-002	Water	6.51 mg/L	10 ml	651 mg/L	100	7	50		<1	12/29/19 08:15	N	II

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

0.901				OBSERVATIONS	13	ABOVE
0.345	0.345	0.345	0.345	STD Deviation	0.33082	0.3446
0.862				AVERAGE	0.26252	ABOVE
0.481	0.481			UCL	0.59335	0.4808
0.000				LCL	-0.06830	0
0.464	0.464					0.4641
0.291	0.291	0.291	0.291			0.2909
0.000				OBSERVATIONS	5	0
0.070	0.070			STD Deviation	0.12251	0.0696
0.000				AVERAGE	0.33000	0
0.000				UCL	0.45251	0
0.000				LCL	0.20749	0
0.000						0
				OBSERVATIONS	2	0
				STD Deviation	0.08838	0
				AVERAGE	0.31775	0
				UCL	0.40613	0
				LCL	0.22937	0
						0
				OBSERVATIONS	2	0
				STD Deviation	0.05370	0
				AVERAGE	0.31775	0
						0
						0
						0
						0
						0
						0
						0
						0
						0

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	25.241	0.3178	24.9233	24.92325	24.9	12/27/2019
3	ccb	1	0.901	0.3178	0.5831	0.58305	0.6	12/27/2019
4	mb	1	0.345	0.3178	0.0269	0.02685	<0.5	12/27/2019
5	lcs	1	26.489	0.3178	26.1708	26.17075	26.2	12/27/2019
6	K1911995-001	1	2.955	0.3178	2.6369	2.63685	2.64	12/27/2019
7	K1911995-001	1	2.948	0.3178	2.6302	2.63015	2.6	12/27/2019
8	KQ1919209-11	1	28.386	0.3178	28.0678	28.06775	28	12/27/2019
9	K1911998-001	1	3.672	0.3178	3.3540	3.35395	3.35	12/27/2019
10	K1911998-001	1	3.668	0.3178	3.3502	3.35015	3.35	12/27/2019
11	K1911998-002	100	1.625	0.3178	1.3077	130.765	130.8	12/28/2019
12	K1911998-002	100	1.551	0.3178	1.2329	123.285	123.29	12/28/2019
13	K1911998-003	1000	0.637	0.3178	0.3194	319.35	319.35	12/28/2019
14	K1911998-003	1000	0.621	0.3178	0.3030	302.95	302.95	12/28/2019
15	K1911998-004	1	11.265	0.3178	10.9472	10.94715	10.9	12/28/2019
16	K1911998-004	1	11.121	0.3178	10.8035	10.80345	10.8	12/28/2019
17	ccv	1	26.337	0.3178	26.0197	26.01965	26.02	12/28/2019
18	ccb	1	0.862	0.3178	0.5443	0.54425	0.5	12/28/2019
19	K1911998-005	1	94.630	0.3178	94.3122	94.31215	94.3	12/28/2019
20	K1911998-005	1	95.146	0.3178	94.8286	94.82855	94.83	12/28/2019
21	K1911998-006	1	6.508	0.3178	6.1905	6.19045	6.19	12/28/2019
22	K1911998-006	1	3.924	0.3178	3.6058	3.60575	3.6	12/28/2019
23	K1912042-001	1	6.555	0.3178	6.2375	6.23745	6.2	12/28/2019
24	K1912042-001	1	6.107	0.3178	5.7892	5.78915	5.79	12/28/2019
25	K1912042-002	1	5.452	0.3178	5.1345	5.13445	5.13	12/28/2019

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: <i>KCP</i>	Date Analyzed	12/27/19
Reviewed By: <i>QC</i>	Date Reviewed	12/31/19

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	K1912042-002	1	5.163	0.3178	4.8450	4.84495	4.84	12/28/2019
27	K1912042-003	1	14.359	0.3178	14.0413	14.04125	14.04	12/28/2019
28	K1912042-003	1	14.240	0.3178	13.9223	13.92225	13.9	12/28/2019
29	K1912042-004	1	14.997	0.3178	14.6791	14.67905	14.7	12/28/2019
30	K1912042-004	1	15.218	0.3178	14.9001	14.90005	14.9	12/28/2019
31	K1912042-005	1	4.455	0.3178	4.1372	4.13715	4.1	12/28/2019
32	K1912042-005	1	3.898	0.3178	3.5806	3.58055	3.6	12/28/2019
33	K1911934-002	1	1.353	0.3178	1.0353	1.03525	1.0	12/28/2019
34	K1911934-002	1	1.192	0.3178	0.8746	0.87455	0.9	12/28/2019
35	K1911980-001	1	4.533	0.3178	4.2155	4.21545	4.2	12/28/2019
36	K1911980-001	1	4.484	0.3178	4.1659	4.16585	4.2	12/28/2019
37	K1911981-001	1	4.055	0.3178	3.7372	3.73715	3.7	12/28/2019
38	K1911981-001	1	3.976	0.3178	3.6578	3.65775	3.7	12/28/2019
39	ccv	1	24.936	0.3178	24.6181	24.61805	24.6	12/28/2019
40	ccb	1	0.481	0.3178	0.1631	0.16305	<0.5	12/28/2019
41	K1911895-001	1	0.768	0.3178	0.4502	0.45015	<0.5	12/28/2019
42	K1911895-001	1	0.614	0.3178	0.2964	0.29635	<0.5	12/28/2019
43	K1911762-003	100	4.396	0.3178	4.0784	407.835	407.8	12/28/2019
44	K1911762-003	100	4.433	0.3178	4.1152	411.515	411.5	12/28/2019
45	K1911762-004	100	5.663	0.3178	5.3455	534.545	534.5	12/28/2019
46	K1911762-004	100	5.668	0.3178	5.3498	534.975	535.0	12/28/2019
47	K1911762-005	100	5.831	0.3178	5.5134	551.335	551.3	12/28/2019
48	K1911762-005	100	5.749	0.3178	5.4308	543.075	543.1	12/28/2019
49	K1911807-004	1	0.976	0.3178	0.6581	0.65805	0.7	12/28/2019
50	K1911807-004	1	0.878	0.3178	0.5605	0.56045	0.6	12/28/2019

Analyzed By: <i>RP</i>	Date Analyzed: <i>12/27/19</i>
Reviewed By: <i>QC</i>	Date Reviewed: <i>12/28/19</i>

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	25.159	0.3178	24.8417	24.84165	24.84	12/28/2019
52	ccb	1	0.464	0.3178	0.1464	0.14635	<0.5	12/28/2019
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: <i>BCP</i>	Date Analyzed: <i>12/27/19</i>
Reviewed By: <i>JC</i>	Date Reviewed: <i>12/31/19</i>

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	24.936	0.3178	24.6181	24.61805	24.6	12/28/2019
3	ccb	1	0.481	0.3178	0.1631	0.16305	<0.5	12/28/2019
4	mb	1	0.000	0.3178	-0.3178	-0.31775	<0.5	12/28/2019
5	lcs	1	26.176	0.3178	25.8584	25.85835	25.9	12/28/2019
6	K1911810-001	1	2.742	0.3178	2.4243	2.42425	2.42	12/28/2019
7	K1911810-001	1	2.703	0.3178	2.3848	2.38475	2.4	12/28/2019
8	K1911810-002	1	2.561	0.3178	2.2434	2.24335	2	12/28/2019
9	K1911810-002	1	2.553	0.3178	2.2354	2.23535	2.24	12/28/2019
10	KQ1919210-11	1	28.785	0.3178	28.4677	28.46765	28.47	12/28/2019
11	ccv	1	25.159	0.3178	24.8417	24.84165	24.8	12/28/2019
12	ccb	1	0.464	0.3178	0.1464	0.14635	<0.5	12/28/2019
13	K1911868-001	1	1.037	0.3178	0.7189	0.71885	0.72	12/28/2019
14	K1911868-001	1	1.014	0.3178	0.6965	0.69645	0.70	12/28/2019
15	K1911868-002	1	1.065	0.3178	0.7476	0.74755	0.7	12/28/2019
16	K1911868-002	1	1.031	0.3178	0.7129	0.71285	0.7	12/28/2019
17	K1911868-003	1	8.200	0.3178	7.8822	7.88215	7.88	12/28/2019
18	K1911868-003	1	8.241	0.3178	7.9237	7.92365	7.9	12/28/2019
19	K1911868-004	1	0.455	0.3178	0.1376	0.13755	<0.5	12/28/2019
20	K1911868-004	1	0.403	0.3178	0.0856	0.08555	<0.5	12/28/2019
21	K1911909-001	1	0.164	0.3178	-0.1542	-0.15415	<0.5	12/28/2019
22	K1911909-001	1	0.113	0.3178	-0.2046	-0.20455	<0.5	12/28/2019
23	K1911910-001	10	10.159	0.3178	9.8411	98.4105	98.4	12/28/2019
24	K1911910-001	10	10.027	0.3178	9.7092	97.0915	97.09	12/28/2019
25	K1912004-001	1	0.056	0.3178	-0.2621	-0.26205	<0.5	12/28/2019

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)

Analyzed By: <i>KCP</i>	Date Analyzed: <i>12/27/19</i>
Reviewed By: <i>QC</i>	Date Reviewed: <i>12/31/19</i>

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	K1912004-001	1	0.250	0.3178	-0.0683	-0.06825	<0.5	12/28/2019
27	K1911960-001	1	9.254	0.3178	8.9358	8.93575	8.94	12/28/2019
28	K1911960-001	1	9.274	0.3178	8.9559	8.95585	9.0	12/28/2019
29	K1911960-002	1	12.963	0.3178	12.6449	12.64485	12.6	12/28/2019
30	K1911960-002	1	12.640	0.3178	12.3218	12.32175	12.3	12/28/2019
31	K1911960-003	1	2.117	0.3178	1.7992	1.79915	1.8	12/28/2019
32	K1911960-003	1	1.991	0.3178	1.6728	1.67275	1.7	12/28/2019
33	ccv	1	25.104	0.3178	24.7865	24.78645	24.8	12/28/2019
34	ccb	1	0.291	0.3178	-0.0269	-0.02685	<0.5	12/28/2019
35	K1911960-004	1	23.664	0.3178	23.3464	23.34635	23.3	12/28/2019
36	K1911960-004	1	23.753	0.3178	23.4351	23.43505	23.4	12/28/2019
37	K1911960-005	1	9.239	0.3178	8.9215	8.92145	8.9	12/28/2019
38	K1911960-005	1	9.171	0.3178	8.8533	8.85325	8.9	12/28/2019
39	K1911960-006	1	15.788	0.3178	15.4703	15.47025	15.5	12/28/2019
40	K1911960-006	1	15.741	0.3178	15.4229	15.42285	15.4	12/28/2019
41	K1911960-007	8	5.175	0.3178	4.8576	38.8604	38.9	12/28/2019
42	K1911960-007	8	4.998	0.3178	4.6805	37.4436	37.4	12/28/2019
43	K1911960-008	1	11.627	0.3178	11.3094	11.30935	11.3	12/28/2019
44	K1911960-008	1	11.358	0.3178	11.0407	11.04065	11.0	12/28/2019
45	K1911960-009	1	15.908	0.3178	15.5904	15.59035	15.6	12/28/2019
46	K1911960-009	1	15.767	0.3178	15.4491	15.44905	15.4	12/28/2019
47	ccv	1	24.588	0.3178	24.2698	24.26975	24.3	12/28/2019
48	ccb	1	0.070	0.3178	-0.2482	-0.24815	<0.5	12/28/2019
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By: <i>wp</i>	Date Analyzed: <i>12/27/19</i>
Reviewed By: <i>gc</i>	Date Reviewed: <i>12/31/19</i>

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	25.104	0.3178	24.7865	24.78645	24.8	12/28/2019
3	ccb	1	0.291	0.3178	-0.0269	-0.02685	<0.5	12/28/2019
4	mb	1	0.000	0.3178	-0.3178	-0.31775	<0.5	12/28/2019
5	lcs	1	26.014	0.3178	25.6966	25.69655	25.7	12/28/2019
6	K1911968-001	1	1.551	0.3178	1.2336	1.23355	1.23	12/28/2019
7	K1911968-001	1	1.469	0.3178	1.1508	1.15075	1.2	12/28/2019
8	K1911968-002	1	1.466	0.3178	1.1482	1.14815	1	12/28/2019
9	K1911968-002	1	1.513	0.3178	1.1955	1.19545	1.20	12/28/2019
10	ccv	1	24.588	0.3178	24.2698	24.26975	24.27	12/28/2019
11	ccb	1	0.070	0.3178	-0.2482	-0.24815	<0.5	12/28/2019
12	K1911968-003	1	1.018	0.3178	0.7005	0.70045	0.70	12/28/2019
13	K1911968-003	1	0.949	0.3178	0.6315	0.63145	0.63	12/28/2019
14	K1911968-004	1	1.361	0.3178	1.0430	1.04295	1.04	12/28/2019
15	K1911968-004	1	1.318	0.3178	1.0003	1.00025	1.0	12/28/2019
16	K1911968-005	1	0.000	0.3178	-0.3178	-0.31775	<0.5	12/28/2019
17	K1911968-005	1	0.000	0.3178	-0.3178	-0.31775	<0.5	12/28/2019
18	K1911914-001	1	0.868	0.3178	0.5501	0.55005	0.6	12/28/2019
19	K1911914-001	1	0.869	0.3178	0.5512	0.55115	0.6	12/28/2019
20	KQ1919211-11	1	27.664	0.3178	27.3458	27.34575	27.35	12/28/2019
21	K1911914-002	1	1.861	0.3178	1.5430	1.54295	1.54	12/28/2019
22	K1911914-002	1	1.788	0.3178	1.4704	1.47035	1.5	12/28/2019
23	K1911914-003	1	3.520	0.3178	3.2018	3.20175	3.2	12/29/2019
24	K1911914-003	1	3.427	0.3178	3.1096	3.10955	3.11	12/29/2019
25	K1911914-004	1	0.839	0.3178	0.5213	0.52125	0.52	12/29/2019

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)

Analyzed By:	Date Analyzed	date	time
YCC	12/27/19		
Reviewed By:	Date Reviewed	12/31/19	

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	K1911914-004	1	0.800	0.3178	0.4826	0.48255	<0.5	12/29/2019
27	K1911914-005	1	5.996	0.3178	5.6786	5.67855	5.68	12/29/2019
28	K1911914-005	1	5.978	0.3178	5.6600	5.65995	5.7	12/29/2019
29	ccv	1	24.413	0.3178	24.0955	24.09545	24.1	12/29/2019
30	ccb	1	0.000	0.3178	-0.3178	-0.31775	<0.5	12/29/2019
31	K1911914-006	1	9.818	0.3178	9.4999	9.49985	9.5	12/29/2019
32	K1911914-006	1	9.738	0.3178	9.4199	9.41985	9.4	12/29/2019
33	K1911914-007	1	0.649	0.3178	0.3317	0.33165	<0.5	12/29/2019
34	K1911914-007	1	0.559	0.3178	0.2408	0.24075	<0.5	12/29/2019
35	K1911914-008	1	0.000	0.3178	-0.3178	-0.31775	<0.5	12/29/2019
36	K1911914-008	1	0.000	0.3178	-0.3178	-0.31775	<0.5	12/29/2019
37	K1911914-009	1	0.000	0.3178	-0.3178	-0.31775	<0.5	12/29/2019
38	K1911914-009	1	0.000	0.3178	-0.3178	-0.31775	<0.5	12/29/2019
39	ccv	1	24.226	0.3178	23.9078	23.90775	23.9	12/29/2019
40	ccb	1	0.000	0.3178	-0.3178	-0.31775	<0.5	12/29/2019
41		1		0.0000	0.0000	0	<0.5	
42		1		0.0000	0.0000	0	<0.5	
43		1		0.0000	0.0000	0	<0.5	
44		1		0.0000	0.0000	0	<0.5	
45		1		0.0000	0.0000	0	<0.5	
46		1		0.0000	0.0000	0	<0.5	
47		1		0.0000	0.0000	0	<0.5	
48		1		0.0000	0.0000	0	<0.5	
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By: <i>BCD</i>	Date Analyzed: <i>12/27/19</i>
Reviewed By: <i>gc</i>	Date Reviewed: <i>12/31/19</i>

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	24.413	0.3178	24.0955	24.09545	24.1	12/29/2019
3	ccb	1	0.000	0.3178	-0.3178	-0.31775	<0.5	12/29/2019
4	mb	1	0.000	0.3178	-0.3178	-0.31775	<0.5	12/29/2019
5	lcs	1	25.715	0.3178	25.3971	25.39705	25.4	12/29/2019
6	K1911970-001	1	0.000	0.3178	-0.3178	-0.31775	<0.5	12/29/2019
7	K1911970-001	1	0.000	0.3178	-0.3178	-0.31775	<0.5	12/29/2019
8	K1911970-002	1	0.990	0.3178	0.6720	0.67195	1	12/29/2019
9	K1911970-002	1	0.959	0.3178	0.6414	0.64135	0.64	12/29/2019
10	K1911970-003	1	0.373	0.3178	0.0548	0.05475	<0.5	12/29/2019
11	K1911970-003	1	0.398	0.3178	0.0800	0.07995	<0.5	12/29/2019
12	KQ1919213-09	1	27.031	0.3178	26.7129	26.71285	26.71	12/29/2019
13	ccv	1	24.226	0.3178	23.9078	23.90775	23.91	12/29/2019
14	ccb	1	0.000	0.3178	-0.3178	-0.31775	<0.5	12/29/2019
15	K1911970-004	1	17.332	0.3178	17.0143	17.01425	17.0	12/29/2019
16	K1911970-004	1	17.495	0.3178	17.1771	17.17705	17.2	12/29/2019
17	K1911970-005	1	1.164	0.3178	0.8466	0.84655	0.85	12/29/2019
18	K1911970-005	1	1.069	0.3178	0.7513	0.75125	0.8	12/29/2019
19	K1912074-001	100	8.699	0.3178	8.3813	838.125	838.1	12/29/2019
20	K1912074-001	100	8.760	0.3178	8.4421	844.205	844.21	12/29/2019
21	K1912074-002	100	6.870	0.3178	6.5525	655.245	655.25	12/29/2019
22	K1912074-002	100	6.824	0.3178	6.5065	650.645	650.6	12/29/2019
23	K1912040-001	1	1.543	0.3178	1.2254	1.22535	1.2	12/29/2019
24	K1912040-001	1	1.461	0.3178	1.1433	1.14325	1.14	12/29/2019
25	K1912040-002	1	16.394	0.3178	16.0760	16.07595	16.08	12/29/2019

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)

Analyzed By: <i>BCP</i>	Date Analyzed: <i>12/29/19</i>
Reviewed By: <i>JK</i>	Date Reviewed: <i>12/31/19</i>

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	K1912040-002	1	16.273	0.3178	15.9556	15.95555	15.96	12/29/2019
27	K1912040-003	1	3.257	0.3178	2.9392	2.93915	2.94	12/29/2019
28	K1912040-003	1	3.192	0.3178	2.8743	2.87425	2.9	12/29/2019
29	ccv	1	24.267	0.3178	23.9497	23.94965	23.9	12/29/2019
30	ccb	1	0.000	0.3178	-0.3178	-0.31775	<0.5	12/29/2019
31		1		0.0000	0.0000	0	<0.5	
32		1		0.0000	0.0000	0	<0.5	
33		1		0.0000	0.0000	0	<0.5	
34		1		0.0000	0.0000	0	<0.5	
35		1		0.0000	0.0000	0	<0.5	
36		1		0.0000	0.0000	0	<0.5	
37		1		0.0000	0.0000	0	<0.5	
38		1		0.0000	0.0000	0	<0.5	
39		1		0.0000	0.0000	0	<0.5	
40		1		0.0000	0.0000	0	<0.5	
41		1		0.0000	0.0000	0	<0.5	
42		1		0.0000	0.0000	0	<0.5	
43		1		0.0000	0.0000	0	<0.5	
44		1		0.0000	0.0000	0	<0.5	
45		1		0.0000	0.0000	0	<0.5	
46		1		0.0000	0.0000	0	<0.5	
47		1		0.0000	0.0000	0	<0.5	
48		1		0.0000	0.0000	0	<0.5	
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By: <i>EW</i>	Date Analyzed: <i>12/27/19</i>
Reviewed By: <i>JS</i>	Date Reviewed: <i>12/31/19</i>

TOC: 664898,
664900,
664901,
664902

Schedule: 12272019b

Version: 2

Instrument: Fusion1

Last Saved by: Fusion1 (Fusion1)

Last Saved on: 2019/12/27 17:30 - Friday

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)	10	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	K1911995-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1911995-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
5	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K1911998-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1911998-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K1911998-003.01 1000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1911998-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1911998-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1911998-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1912042-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1912042-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1912042-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1912042-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1912042-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1911934-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1911980-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1911981-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
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	K1911895-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1911762-003.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1911762-004.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1911762-005.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1911807-004.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1911810-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1911810-002.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1911810-001.02 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
29	Sample	K1911868-001.15	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1911868-002.15	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K1911868-003.15	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	K1911868-004.15	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K1911909-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K1911910-001.04 10x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K1912004-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1911960-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1911960-002.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K1911960-003.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

Printed on: December 31, 2019 09:22:17

Schedule: 12272019b

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	K1911960-004.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K1911960-005.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K1911960-006.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	K1911960-007.02 8x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	K1911960-008.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K1911960-009.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K1911968-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	K1911968-002.01	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
48	Sample	K1911968-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	K1911968-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
50	Sample	K1911968-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
51	Sample	K1911914-001.15	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	K1911914-001.15 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
53	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
54	Sample	K1911914-002.15	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	K1911914-003.15	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	K1911914-004.15	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
57	Sample	K1911914-005.15	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	K1911914-006.15	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
60	Sample	K1911914-007.15	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
61	Sample	K1911914-008.15	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
62	Sample	K1911914-009.15	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
63	Sample	K1911970-001.17	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
64	Sample	K1911970-002.17	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
65	Sample	K1911970-003.17	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
66	Sample	K1911970-003.17 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
67	Sample	K1911970-004.17	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
68	Sample	K1911970-005.17	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
69	Sample	K1912074-001.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
70	Sample	K1912074-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
71	Sample	K1912040-001.15	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
72	Sample	K1912040-002.15	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
73	Sample	K1912040-003.15	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 - 12272019b

Friday, December 27, 2019 05:30 PM

(View - Repts, Unused Repts, Meta-Data, Signature, History)
Printed on 2019/12/31 09:22 - Tuesday

Report Summary Information

Company Location: Gen Chem Lab
 Schedule Name: 12272019b
 Instrument Name: Fusion1
 Report Version: 1 of 1
 Report Creation by Operators (schedule version): Fusion1 (Fusion1) (v1)
 Fusion1 (Fusion1) (v2)
 Comment:

Engine Version: 1.1.5.1
 Firmware Version: 1.2.0696
 Connection: RS232 COM1

Report Results

Sample Type: Clean							From Schedule Version 1
Pos	Analysis Type	Sample ID			Start Time		
◆ (clean)		Clean			2019/12/27 17:30		
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	IC Clean	12.29	16.86	4.57	49.49	05:21	
2	TC Clean	6.57	10.18	3.61	49.94	04:02	
3	TC Clean	2.92	6.53	3.61	50.03	03:47	
4	TC Clean	1.77	5.39	3.62	50.00	03:54	

Sample Type: Clean							From Schedule Version 2
Pos	Analysis Type	Sample ID			Start Time		
◆ (clean)		Clean			2019/12/27 17:52		
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	IC Clean	0.81	4.38	3.57	49.51	05:21	
2	TC Clean	6.44	10.21	3.77	50.03	04:04	
3	TC Clean	3.63	7.20	3.57	49.98	03:49	
4	TC Clean	2.71	6.27	3.56	49.94	03:53	

Sample Type: Clean							From Schedule Version 2
Pos	Analysis Type	Sample ID			Start Time		
♦ (clean)		Clean			2019/12/27 18:14		
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	IC Clean	0.97	4.54	3.57	49.41	05:22	
2	TC Clean	8.19	11.96	3.77	50.04	04:00	
3	TC Clean	4.38	8.04	3.66	50.03	03:47	
4	TC Clean	2.72	6.39	3.67	50.01	03:46	

Sample Type: Blank (Creating v1332)							From Schedule Version 2
Pos	Analysis Type	Sample ID			Start Time		
♦ (blank)		Reagent/Acid Blank			2019/12/27 18:36		
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	IC Clean	1.17	4.75	3.57	49.60	05:23	
2	TC Clean	8.55	12.23	3.68	49.94	04:00	
3	TC Clean	5.26	8.93	3.67	50.02	03:45	
4	TC Clean	3.21	7.06	3.85	49.92	03:44	
5	Reagent Blank	18.61	22.61	4.00	49.93	05:04	
6	Acid Blank	2.58	6.18	3.60	49.49	05:26	

Sample Type: Sample							From Schedule Version 2	
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
♦ D	TOC	RB	0.5662 ppm	0.2739 ppm	48.3700%	2019/12/27 19:09		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2975	12.9750	21.21	25.07	3.85	49.99	10:27
2	TOC	0.7216	7.2162	17.30	21.09	3.79	50.03	10:26
3	TOC	0.5472	5.4720	16.12	19.94	3.82	50.01	10:26
4	TOC	0.4790	4.7899	15.66	19.61	3.95	50.01	10:30
5	TOC	0.4326	4.3258	15.34	19.13	3.79	50.00	10:26
6	TOC	0.4862	4.8621	15.71	19.40	3.69	50.00	10:26
7	TOC	0.4528	4.5276	15.48	19.18	3.70	49.99	10:30

8	TOC	0.4206	4.2065	15.26	18.88	3.62	50.01	10:29
9	TOC	0.4489	4.4893	15.45	18.99	3.54	49.98	10:28
10	TOC	0.3759	3.7586	14.96	18.62	3.67	49.98	10:27
Dilution		Blank Contribution		Method	Calibration			
1:10		(TC) 12.4067 (IC) (v1332)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 2

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.2410 ppm (PASS)	0.0000 ppm	0%	2019/12/27 21:30	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.2410	252.4101	180.80	184.44	3.64	49.96	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 2

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)	0.9008 ppm (PASS)	0.0000 ppm	0%	2019/12/27 21:45	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.9008	9.0079	15.58	19.24	3.66	49.96	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 2

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
♦ 1	TOC	MB1	0.3446 ppm	0.0000 ppm	0.0000%	2019/12/27 21:59		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3446	3.4463	14.75	18.44	3.70	49.97	10:31
Dilution		Blank Contribution		Method	Calibration			
1:10		(TC) 12.4067 (IC) (v1332)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			

Sample Type: Check Standard --> LCS										From Schedule Version 2	
Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time		
♦ C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	26.4885 ppm (PASS)	0.0000 ppm	0%	2019/12/27 22:14		
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time	
C	TOC	25.0 ppm	1	26.4885	264.8852	189.26	192.85	3.59	49.94	10:34	
<u>Completion State</u>		<u>Success Action</u>		<u>Method</u>		<u>Calibration</u>		<u>STD Conc - Pos C</u>			
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		25 ppmC			

Sample Type: Sample										From Schedule Version 2	
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time					
♦ 2	TOC	ICS	1.0163 ppm	0.0000 ppm	0.0000%	2019/12/27 22:29					
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time			
1	TOC	1.0163	10.1626	19.30	22.94	3.64	49.96	10:32			
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>		<u>Calibration</u>					
1:10		(TC) 12.4067 (IC) (v1332)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)					
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time					
♦ 3	TOC	K1911995-001.01	2.9512 ppm	0.0047 ppm	0.1600%	2019/12/27 22:43					
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time			
1	TOC	2.9546	29.5455	32.46	36.12	3.66	49.94	10:26			
2	TOC	2.9479	29.4792	32.42	36.25	3.83	49.93	10:27			
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>		<u>Calibration</u>					
1:10		(TC) 12.4067 (IC) (v1332)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)					
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time					
♦ 4	TOC	K1911995-001.01 ms	28.3855 ppm	0.0000 ppm	0.0000%	2019/12/27 23:11					
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time			
1	TOC	28.3855	283.8554	205.09	208.77	3.69	49.92	10:30			
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>		<u>Calibration</u>					
1:10		(TC) 12.4067 (IC) (v1332)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)					
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time					

◆	5	TOC	RB	0.5110 ppm	0.0000 ppm	0.0000%	2019/12/27 23:26		
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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5110	5.1096	15.88	19.70	3.82	49.93	10:33

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	6	TOC	K1911998-001.01	3.6698 ppm	0.0027 ppm	0.0700%	2019/12/27 23:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.6717	36.7171	37.33	41.13	3.80	49.91	10:26
2	TOC	3.6679	36.6788	37.30	41.00	3.69	49.93	10:26

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	7	TOC	K1911998-002.01 100x	1.5880 ppm	0.0529 ppm	3.3300%	2019/12/28 00:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6254	16.2543	23.44	27.14	3.70	49.93	10:27
2	TOC	1.5506	15.5059	22.93	26.59	3.65	49.92	10:27

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	8	TOC	K1911998-003.01 1000x	0.6289 ppm	0.0116 ppm	1.8400%	2019/12/28 00:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6371	6.3706	16.73	20.36	3.63	49.91	10:27
2	TOC	0.6207	6.2071	16.62	20.38	3.76	49.92	10:29

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	9	TOC	K1911998-004.01	11.1931 ppm	0.1016 ppm	0.9100%	2019/12/28 01:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.2649	112.6488	88.87	92.56	3.68	49.90	10:27
2	TOC	11.1212	111.2124	87.90	91.68	3.78	49.90	10:26

Dilution **Blank Contribution** **Method** **Calibration**

1:10 (TC) 12.4067 (IC) CAS_salt_010711 CAS_salt_010711
(v1332) (v4) (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 2

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)	26.3374 ppm (PASS)	0.0000 ppm	0%	2019/12/28 01:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	26.3374	263.3737	188.24	191.98	3.74	49.92	10:31

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

Sample Type: Check Standard --> CCB

From Schedule Version 2

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)	0.8620 ppm (PASS)	0.0000 ppm	0%	2019/12/28 01:47

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.8620	8.6205	15.31	18.91	3.60	49.89	10:31

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

Sample Type: Sample

From Schedule Version 2

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 10	TOC	K1911998-005.01	94.8881 ppm	0.3651 ppm	0.3800%	2019/12/28 02:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	94.6299	946.2993	654.75	658.45	3.70	49.86	10:28
2	TOC	95.1463	951.4628	658.25	662.80	4.54	49.87	10:29

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 11	TOC	K1911998-006.01	5.2158 ppm	1.8277 ppm	35.0400%	2019/12/28 02:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.5082	65.0821	56.58	60.95	4.37	49.89	10:28
2	TOC	3.9235	39.2348	39.04	42.79	3.75	49.88	10:27

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
12	TOC	K1912042-001.01	6.3311 ppm	0.3170 ppm	5.0100%	2019/12/28 02:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.5552	65.5520	56.90	60.70	3.79	49.92	10:27
2	TOC	6.1069	61.0691	53.86	57.52	3.66	49.91	10:26

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
13	TOC	K1912042-002.01	5.3075 ppm	0.2047 ppm	3.8600%	2019/12/28 03:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.4522	54.5222	49.42	52.92	3.51	49.91	10:26
2	TOC	5.1627	51.6273	47.45	50.87	3.42	49.89	10:28

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
14	TOC	K1912042-003.01	14.2995 ppm	0.0842 ppm	0.5900%	2019/12/28 03:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.3590	143.5904	109.88	113.45	3.57	49.87	10:28
2	TOC	14.2400	142.4001	109.07	112.55	3.48	49.89	10:27

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
15	TOC	K1912042-004.01	15.1073 ppm	0.1563 ppm	1.0300%	2019/12/28 04:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.9968	149.9679	114.20	117.83	3.62	49.88	10:27
2	TOC	15.2178	152.1777	115.70	119.33	3.63	49.86	10:25

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC)
Method CAS_salt_010711
Calibration CAS_salt_010711

(v1332)

(v4)

(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
16	TOC	K1912042-005.01	4.1766 ppm	0.3936 ppm	9.4200%	2019/12/28 04:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.4549	44.5486	42.65	46.32	3.67	49.90	10:27
2	TOC	3.8983	38.9829	38.87	42.52	3.66	49.87	10:25

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
17	TOC	K1911934-002.01	1.2727 ppm	0.1137 ppm	8.9300%	2019/12/28 05:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3530	13.5304	21.59	25.06	3.46	49.88	10:31
2	TOC	1.1923	11.9231	20.50	24.01	3.51	49.89	10:31

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
18	TOC	K1911980-001.01	4.5084 ppm	0.0351 ppm	0.7800%	2019/12/28 05:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.5332	45.3324	43.18	46.80	3.62	49.88	10:28
2	TOC	4.4836	44.8359	42.84	46.35	3.51	49.88	10:26

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
19	TOC	K1911981-001.01	4.0152 ppm	0.0561 ppm	1.4000%	2019/12/28 06:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.0549	40.5489	39.93	43.50	3.57	49.90	10:29
2	TOC	3.9755	39.7548	39.39	42.97	3.58	49.88	10:26

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 2

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
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◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.9358 ppm (PASS)	0.0000 ppm	0%	2019/12/28 06:43
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9358	249.3577	178.72	182.40	3.68	49.90	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 2

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)	0.4808 ppm (PASS)	0.0000 ppm	0%	2019/12/28 06:58
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.4808	4.8078	12.73	16.46	3.74	49.90	10:35
Completion State		Success Action		Method		Calibration		STD Conc - Pos D		
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		0 ppmC		

Sample Type: Sample From Schedule Version 2

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
◆	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/12/28 07:12	
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	12.27	15.90	3.63	49.90	10:30
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 12.4067 (IC) (v1332)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		

Sample Type: Check Standard --> LCS From Schedule Version 2

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
◆	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	26.1761 ppm (PASS)	0.0000 ppm	0%	2019/12/28 07:27
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	26.1761	261.7606	187.14	190.88	3.74	49.91	10:29

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

Sample Type: Sample

From Schedule Version 2

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
21	TOC	K1911895-001.01	0.6910 ppm	0.1088 ppm	15.7400%	2019/12/28 07:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7679	7.6788	17.62	21.33	3.71	49.90	10:31
2	TOC	0.6141	6.1408	16.58	20.39	3.81	49.90	10:25

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 12.4067 (IC) (v1332)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
22	TOC	K1911762-003.01 100x	4.4145 ppm	0.0260 ppm	0.5900%	2019/12/28 08:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.3961	43.9608	42.25	46.00	3.76	49.90	10:29
2	TOC	4.4329	44.3291	42.50	46.24	3.74	49.92	10:29

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 12.4067 (IC) (v1332)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
23	TOC	K1911762-004.01 100x	5.6653 ppm	0.0030 ppm	0.0500%	2019/12/28 08:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.6632	56.6318	50.85	54.53	3.68	49.90	10:27
2	TOC	5.6675	56.6745	50.88	54.47	3.59	49.93	10:27

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 12.4067 (IC) (v1332)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
24	TOC	K1911762-005.01 100x	5.7898 ppm	0.0584 ppm	1.0100%	2019/12/28 09:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.8311	58.3113	51.99	55.60	3.61	49.91	10:26
2	TOC	5.7485	57.4848	51.43	55.18	3.75	49.91	10:25

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 12.4067 (IC) (v1332)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
25	TOC	K1911807-004.03	0.9270 ppm	0.0690 ppm	7.4400%	2019/12/28 09:34		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9758	9.7575	19.03	22.67	3.64	49.90	10:26
2	TOC	0.8782	8.7822	18.37	22.03	3.66	49.89	10:27
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 12.4067 (IC) (v1332)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
26	TOC	K1911810-001.02	2.7222 ppm	0.0279 ppm	1.0300%	2019/12/28 10:02		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7420	27.4197	31.02	34.71	3.69	49.89	10:27
2	TOC	2.7025	27.0249	30.75	34.34	3.59	49.89	10:25
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 12.4067 (IC) (v1332)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
27	TOC	K1911810-002.02	2.5571 ppm	0.0056 ppm	0.2200%	2019/12/28 10:30		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5611	25.6106	29.79	33.53	3.74	49.90	10:26
2	TOC	2.5531	25.5311	29.74	33.46	3.73	49.92	10:30
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 12.4067 (IC) (v1332)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
28	TOC	K1911810-001.02 ms	28.7854 ppm	0.0000 ppm	0.0000%	2019/12/28 10:58		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.7854	287.8536	207.80	211.55	3.75	49.91	10:32
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 12.4067 (IC) (v1332)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 2

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.1594 ppm (PASS)	0.0000 ppm	0%	2019/12/28 11:12

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.1594	251.5940	180.24	184.00	3.76	49.92	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 2

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)	0.4641 ppm (PASS)	0.0000 ppm	0%	2019/12/28 11:27

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.4641	4.6413	12.61	16.27	3.66	49.93	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 2

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 29	TOC	K1911868-001.15	1.0254 ppm	0.0158 ppm	1.5400%	2019/12/28 11:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0366	10.3659	19.44	23.20	3.76	49.92	10:30
2	TOC	1.0142	10.1420	19.29	22.99	3.70	49.95	10:25

Dilution 1:10 **Blank Contribution** (TC) 12.4067 (IC) (v1332) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 30	TOC	K1911868-002.15	1.0479 ppm	0.0246 ppm	2.3500%	2019/12/28 12:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0653	10.6532	19.64	23.28	3.64	49.98	10:31
2	TOC	1.0306	10.3055	19.40	22.93	3.52	49.96	10:30

Dilution 1:10 **Blank Contribution** (TC) 12.4067 (IC) (v1332) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 31	TOC	K1911868-003.15	8.2207 ppm	0.0294 ppm	0.3600%	2019/12/28 12:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.1999	81.9989	68.07	71.60	3.53	49.98	10:28
2	TOC	8.2414	82.4143	68.35	71.85	3.50	49.96	10:30

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
32	TOC	K1911868-004.15	0.4293 ppm	0.0368 ppm	8.5700%	2019/12/28 13:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4553	4.5527	15.50	19.14	3.65	49.99	10:28
2	TOC	0.4033	4.0326	15.14	18.65	3.50	50.01	10:26

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
33	TOC	K1911909-001.02	0.1384 ppm	0.0356 ppm	25.7400%	2019/12/28 13:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1636	1.6357	13.52	17.00	3.48	50.00	10:29
2	TOC	0.1132	1.1319	13.18	16.76	3.59	50.04	10:25

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
34	TOC	K1911910-001.04 10x	10.0929 ppm	0.0932 ppm	0.9200%	2019/12/28 14:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.1588	101.5880	81.36	84.88	3.51	49.99	10:28
2	TOC	10.0269	100.2695	80.47	84.18	3.71	50.00	10:25

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
35	TOC	K1912004-001.02	0.1526 ppm	0.1370 ppm	89.7700%	2019/12/28 14:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0557	0.5574	12.78	16.33	3.55	50.03	10:28
2	TOC	0.2495	2.4946	14.10	17.67	3.57	49.99	10:25

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC)
Method CAS_salt_010711
Calibration CAS_salt_010711

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
	36	TOC	K1911960-001.02	9.2635 ppm	0.0142 ppm	0.1500%	2019/12/28 14:59	
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.2535	92.5352	75.22	78.74	3.52	49.98	10:28
2	TOC	9.2736	92.7355	75.36	79.02	3.67	50.01	10:28
Dilution		Blank Contribution		Method	Calibration			
1:10		(TC) 12.4067 (IC) (v1332)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
	37	TOC	K1911960-002.02	12.8011 ppm	0.2284 ppm	1.7800%	2019/12/28 15:27	
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.9626	129.6260	100.40	104.17	3.77	49.97	10:29
2	TOC	12.6395	126.3952	98.20	101.92	3.72	49.99	10:22
Dilution		Blank Contribution		Method	Calibration			
1:10		(TC) 12.4067 (IC) (v1332)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
	38	TOC	K1911960-003.02	2.0537 ppm	0.0894 ppm	4.3500%	2019/12/28 15:55	
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1169	21.1689	26.78	30.53	3.76	49.94	10:30
2	TOC	1.9905	19.9049	25.92	29.64	3.73	49.99	10:26
Dilution		Blank Contribution		Method	Calibration			
1:10		(TC) 12.4067 (IC) (v1332)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			

Sample Type: Check Standard --> CCV 25 ppm										From Schedule Version 2	
	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.1042 ppm (PASS)	0.0000 ppm	0%	2019/12/28 16:23	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time	
B	TOC	25 ppm	1	25.1042	251.0415	179.87	183.48	3.61	50.01	10:31	
Completion State		Success Action		Method		Calibration		STD Conc - Pos B			
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		50 ppmC			

Sample Type: Check Standard --> CCB										From Schedule Version 2	
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)	0.2909 ppm (PASS)	0.0000 ppm	0%	2019/12/28 16:38		
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time	
D	TOC	0 ppm	1	0.2909	2.9089	11.44	15.05	3.61	49.99	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 2				
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time					
♦ 39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/12/28 16:53					
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time			
1	TOC	0.0000	0.0000	10.91	14.46	3.55	50.00	10:31			
Dilution		Blank Contribution		Method		Calibration					
1:10		(TC) 12.4067 (IC) (v1332)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)					

Sample Type: Check Standard --> LCS										From Schedule Version 2	
Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time		
♦ C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	26.0143 ppm (PASS)	0.0000 ppm	0%	2019/12/28 17:07		
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time	
C	TOC	25.0 ppm	1	26.0143	260.1430	186.05	189.61	3.56	50.03	10:29	
Completion State		Success Action		Method		Calibration		STD Conc - Pos C			
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		25 ppmC			

Sample Type: Sample							From Schedule Version 2				
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time					
♦ 40	TOC	K1911960-004.02	23.7084 ppm	0.0627 ppm	0.2600%	2019/12/28 17:22					
Rep	Base				Adjusted			Baseline	Pressure	Run	

#	Analysis Type	ppm	µg	(Abs)	NDIR (Abs)	(Abs)	(psig)	Time
1	TOC	23.6641	236.6407	173.04	176.72	3.69	50.01	10:27
2	TOC	23.7528	237.5276	173.64	177.22	3.58	50.01	10:25

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
41	TOC	K1911960-005.02	9.2051 ppm	0.0482 ppm	0.5200%	2019/12/28 17:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.2392	92.3923	75.12	78.86	3.74	49.98	10:29
2	TOC	9.1710	91.7102	74.66	78.30	3.65	50.00	10:31

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
42	TOC	K1911960-006.02	15.7643 ppm	0.0335 ppm	0.2100%	2019/12/28 18:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	15.7880	157.8805	119.58	123.29	3.71	49.98	10:30
2	TOC	15.7406	157.4061	119.25	122.89	3.63	49.97	10:27

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
43	TOC	K1911960-007.02 8x	5.0867 ppm	0.1252 ppm	2.4600%	2019/12/28 18:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1753	51.7526	47.54	51.13	3.59	49.98	10:26
2	TOC	4.9982	49.9818	46.33	50.08	3.75	49.97	10:24

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
44	TOC	K1911960-008.02	11.4928 ppm	0.1900 ppm	1.6500%	2019/12/28 19:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.6271	116.2714	91.33	95.12	3.79	49.94	10:27
2	TOC	11.3584	113.5843	89.51	93.31	3.80	49.94	10:27

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	15.9081	159.0811	120.39	124.14	3.75	49.96	10:25
2	TOC	15.7668	157.6683	119.43	123.27	3.84	49.97	10:28

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
46	TOC	K1911968-001.01	1.5099 ppm	0.0585 ppm	3.8800%	2019/12/28 20:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5513	15.5133	22.94	26.64	3.70	49.94	10:27
2	TOC	1.4685	14.6854	22.38	26.13	3.75	49.94	10:25

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
47	TOC	K1911968-002.01	1.4895 ppm	0.0334 ppm	2.2400%	2019/12/28 20:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4659	14.6588	22.36	26.08	3.73	49.93	10:25
2	TOC	1.5132	15.1317	22.68	26.43	3.75	49.92	10:24

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 2

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)	24.5875 ppm (PASS)	0.0000 ppm	0%	2019/12/28 21:07

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5875	245.8750	176.36	180.03	3.67	49.92	10:29

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

Sample Type: Check Standard --> CCB

From Schedule Version 2

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)	0.0696 ppm (PASS)	0.0000 ppm	0%	2019/12/28 21:21

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0696	0.6961	9.94	13.73	3.80	49.92	10:35

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

Sample Type: Sample From Schedule Version 2

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 48	TOC	K1911968-003.01	0.9837 ppm	0.0488 ppm	4.9600%	2019/12/28 21:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0182	10.1818	19.32	22.91	3.59	49.90	10:28
2	TOC	0.9492	9.4923	18.85	22.61	3.76	49.91	10:27

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 12.4067 (IC) (v1332)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 49	TOC	K1911968-004.01	1.3393 ppm	0.0302 ppm	2.2600%	2019/12/28 22:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3607	13.6070	21.64	25.30	3.65	49.91	10:28
2	TOC	1.3180	13.1797	21.35	25.07	3.72	49.90	10:26

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 12.4067 (IC) (v1332)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 50	TOC	K1911968-005.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/12/28 22:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.84	13.63	3.79	49.92	10:25
2	TOC	0.0000	0.0000	9.88	13.46	3.58	49.91	10:25

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 12.4067 (IC) (v1332)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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

◆	51	TOC	K1911914-001.15	0.8684 ppm	0.0008 ppm	0.1000%	2019/12/28 23:00
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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8678	8.6776	18.30	21.91	3.62	49.91	10:26
2	TOC	0.8689	8.6894	18.30	21.90	3.60	49.92	10:25

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 12.4067 (IC) (v1332)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	52	TOC	K1911914-001.15 ms	27.6635 ppm	0.0000 ppm	0.0000%	2019/12/28 23:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.6635	276.6352	200.18	203.73	3.54	49.90	10:31

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 12.4067 (IC) (v1332)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	53	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/12/28 23:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.34	13.06	3.73	49.90	10:29

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 12.4067 (IC) (v1332)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	54	TOC	K1911914-002.15	1.8244 ppm	0.0514 ppm	2.8100%	2019/12/28 23:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8607	18.6070	25.04	28.69	3.65	49.91	10:26
2	TOC	1.7881	17.8807	24.54	28.23	3.69	49.89	10:25

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 12.4067 (IC) (v1332)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	55	TOC	K1911914-003.15	3.4734 ppm	0.0652 ppm	1.8800%	2019/12/29 00:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5195	35.1953	36.30	39.92	3.63	49.92	10:27
2	TOC	3.4273	34.2730	35.67	39.10	3.43	49.89	10:23

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 12.4067 (IC) (v1332)	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	0.8390	8.3904	18.10	21.56	3.46	49.89	10:29
2	TOC	0.8003	8.0029	17.84	21.44	3.60	49.89	10:24

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 57	TOC	K1911914-005.15	5.9870 ppm	0.0131 ppm	0.2200%	2019/12/29 01:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.9963	59.9627	53.11	56.59	3.48	49.85	10:29
2	TOC	5.9777	59.7771	52.98	56.57	3.58	49.86	10:30

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 2

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)	24.4132 ppm (PASS)	0.0000 ppm	0%	2019/12/29 01:50

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4132	244.1322	175.18	178.89	3.71	49.83	10:31

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

Sample Type: Check Standard --> CCB

From Schedule Version 2

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%	2019/12/29 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	8.80	12.34	3.55	49.79	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 2

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/12/29 02:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.16	11.78	3.61	49.79	10:33

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS

From Schedule Version 2

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	25.7148 ppm (PASS)	0.0000 ppm	0%	2019/12/29 02:34

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.7148	257.1480	184.01	187.45	3.44	49.78	10:33

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

Sample Type: Sample

From Schedule Version 2

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
59	TOC	K1911914-006.15	9.7776 ppm	0.0566 ppm	0.5800%	2019/12/29 02:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.8176	98.1761	79.05	82.68	3.63	49.78	10:25
2	TOC	9.7376	97.3761	78.50	82.20	3.70	49.79	10:27

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
60	TOC	K1911914-007.15	0.6040 ppm	0.0643 ppm	10.6400%	2019/12/29 03:17

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

1	TOC	0.6494	6.4944	16.81	20.50	3.68	49.78	10:26
2	TOC	0.5585	5.5854	16.20	19.77	3.57	49.77	10:28

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
61	TOC	K1911914-008.15	0.0000 ppm	0.0000 ppm	0.0000%	2019/12/29 03:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.95	12.59	3.64	49.78	10:26
2	TOC	0.0000	0.0000	8.91	12.36	3.45	49.80	10:27

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
62	TOC	K1911914-009.15	0.0000 ppm	0.0000 ppm	0.0000%	2019/12/29 04:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.15	11.75	3.60	49.81	10:25
2	TOC	0.0000	0.0000	8.11	11.69	3.58	49.80	10:25

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
63	TOC	K1911970-001.17	0.0000 ppm	0.0000 ppm	0.0000%	2019/12/29 04:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.88	11.51	3.63	49.83	10:30
2	TOC	0.0000	0.0000	7.73	11.42	3.69	49.84	10:30

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
64	TOC	K1911970-002.17	0.9744 ppm	0.0217 ppm	2.2200%	2019/12/29 05:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9897	9.8975	19.12	22.79	3.67	49.84	10:30
2	TOC	0.9591	9.5910	18.92	22.49	3.58	49.84	10:26

Dilution 1:10
Blank Contribution (TC) 12.4067 (IC) (v1332)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
65	TOC	K1911970-003.17	0.3851 ppm	0.0178 ppm	4.6300%	2019/12/29 05:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3725	3.7247	14.94	18.63	3.70	49.83	10:29
2	TOC	0.3977	3.9767	15.11	18.56	3.46	49.86	10:28

Dilution 1:10 **Blank Contribution** (TC) 12.4067 (IC) (v1332) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
66	TOC	K1911970-003.17 ms	27.0306 ppm	0.0000 ppm	0.0000%	2019/12/29 06:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.0306	270.3063	195.89	199.51	3.62	49.85	10:32

Dilution 1:10 **Blank Contribution** (TC) 12.4067 (IC) (v1332) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 2

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)	24.2255 ppm (PASS)	0.0000 ppm	0%	2019/12/29 06:21

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2255	242.2554	173.90	177.52	3.62	49.84	10:32

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

Sample Type: Check Standard --> CCB From Schedule Version 2

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%	2019/12/29 06:35

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	11.18	3.69	49.86	10:30

Completion State Success - Criteria **Success Action** Do Nothing **Method** CAS_salt_010711 **Calibration** CAS_salt_010711 **STD Conc - Pos D** 0 ppmC

met.

(v4)

(v30)

Sample Type: Sample

From Schedule Version 2

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
67	TOC	K1911970-004.17	17.4134 ppm	0.1151 ppm	0.6600%	2019/12/29 06:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	17.3320	173.3196	130.06	133.74	3.69	49.86	10:30
2	TOC	17.4948	174.9475	131.16	134.76	3.60	49.86	10:23

Dilution 1:10 **Blank Contribution** (TC) 12.4067 (IC) (v1332) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
68	TOC	K1911970-005.17	1.1167 ppm	0.0674 ppm	6.0400%	2019/12/29 07:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1643	11.6432	20.31	23.95	3.64	49.87	10:28
2	TOC	1.0690	10.6900	19.66	23.22	3.56	49.86	10:31

Dilution 1:10 **Blank Contribution** (TC) 12.4067 (IC) (v1332) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
69	TOC	K1912074-001.01 100x	8.7294 ppm	0.0430 ppm	0.4900%	2019/12/29 07:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.6990	86.9901	71.46	75.03	3.58	49.89	10:31
2	TOC	8.7598	87.5985	71.87	75.53	3.66	49.87	10:25

Dilution 1:10 **Blank Contribution** (TC) 12.4067 (IC) (v1332) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
70	TOC	K1912074-002.01 100x	6.8472 ppm	0.0325 ppm	0.4700%	2019/12/29 08:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.8702	68.7017	59.04	62.60	3.55	49.87	10:28
2	TOC	6.8242	68.2421	58.73	62.52	3.79	49.89	10:30

Dilution 1:10 **Blank Contribution** (TC) 12.4067 (IC) (v1332) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
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71	TOC	K1912040-001.15	1.5021 ppm	0.0580 ppm	3.8600%	2019/12/29 08:43
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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5431	15.4308	22.88	26.63	3.75	49.87	10:31
2	TOC	1.4610	14.6102	22.32	25.86	3.53	49.86	10:25

Dilution 1:10
 Blank Contribution (TC) 12.4067 (IC) (v1332)
 Method CAS_salt_010711 (v4)
 Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
72	TOC	K1912040-002.15	16.3335 ppm	0.0851 ppm	0.5200%	2019/12/29 09:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	16.3937	163.9368	123.69	127.23	3.54	49.87	10:27
2	TOC	16.2733	162.7332	122.87	126.56	3.69	49.87	10:32

Dilution 1:10
 Blank Contribution (TC) 12.4067 (IC) (v1332)
 Method CAS_salt_010711 (v4)
 Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
73	TOC	K1912040-003.15	3.2244 ppm	0.0458 ppm	1.4200%	2019/12/29 09:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2569	32.5685	34.51	38.15	3.64	49.87	10:31
2	TOC	3.1920	31.9203	34.07	37.70	3.62	49.88	10:29

Dilution 1:10
 Blank Contribution (TC) 12.4067 (IC) (v1332)
 Method CAS_salt_010711 (v4)
 Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 2

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)	24.2674 ppm (PASS)	0.0000 ppm	0%	2019/12/29 10:07

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2674	242.6738	174.19	177.71	3.52	49.88	10:31

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

Sample Type: Check Standard --> CCB From Schedule Version 2

Concentration	Min / Max

Pos	BAT	(ppm)	Dil	Sample ID	(% dev)	Result	Std. Dev.	RSD	Start Time
◆ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/12/29 10:22

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.26	10.83	3.57	49.86	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

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1331	6.0703	3.0960	0.0000	0.0000	0.0000	2019/12/27 15:34	Fusion1 (Fusion1)
v1332	6.2033	2.5850	0.0000	0.0000	0.0000	2019/12/27 19:09	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v30
 Calibration curve formula: TOC: $y = 6.788x + 9.463$
 Ver Creation: 2019/03/05 17:42
 r^2 value: TOC: $r^2 = 0.99963$
 Comment:
 Operator: Fusion1 (Fusion1)
 Basic Analysis Type: TOC

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version: v4
 Ver Creation: 2019/02/21 17:57
 Comment:

Operator: Fusion1 (Fusion1)

Parameter	Value	Advanced Parameter	Value
SampleVolume	10.0 mL	NeedleRinseVolume	5.0 ml
Dilution	1:10	VialPrimeVolume	2.0 ml
AcidVolume	0.5 ml	ICSamplePrimeVolume	2.0 ml
ReagentVolume	2.0 ml	ICSpurgeRinseVolume	12.0 ml
UVReactorPrerinse	Off	BaselineStabilizeTime	0.70 min
UVReactorPrerinseVolume	5.0	DetectorPressureFlow	150 ml/min
NumberOfUVReactorPrerinses	1	SyringeSpeedWaste	10
ICSpurgeTime	1.00 mins	SyringeSpeedAcid	7
DetectorSweepFlow	500 ml/min	SyringeSpeedReagent	7
PreSpurgeTime	2.00 mins	SyringeSpeedDIWater	7
SystemFlow	500 ml/min	NDIRPressurization	60 psig
		SyringeSpeedSampleDispense	5
		SyringeSpeedSampleAspirate	4
		SyringeSpeedUVDispense	5
		SyringeSpeedUVAspirate	5
		SyringeSpeedICDispense	5
		SyringeSpeedICAspirate	5
		NDIRPressureStabilize	1.75 min
		SampleMixing	Off
		SampleMixingCycles	1
		SampleMixingVolume	10.0
		LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date

1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/12/29 10:37
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ALS Environmental

StarLIMS Run: 664898, 664900, 664901, 664902
 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-05-83H

21 % H3PO4: 11-GEN-05-83G

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By: <u>BCP</u>	Date Analyzed: <u>12/23/19</u>
Reviewed By: <u>QC</u>	Date Reviewed: <u>12/31/19</u>

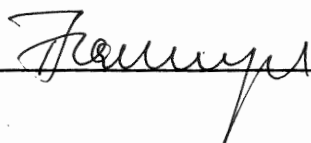
Work Request # ^{Original} (K1911934, 11980, 11981, 11995, 11998, 12042, 11912, 11968, 12074, 12105, 12140, 11963)
 Tier: I II II IV IV IV II IV II IV II II
 Date Analyzed: 12/31/19 TOC: 665302, 665303
 Analyst: BCP Run # DOC:665304
 Analysis: TOC/DOC

**DATA QUALITY REPORT
INORGANICS**

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

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

COMMENTS: K1911934-2/2d report a high %RSD. However, these samples are less than 5x the MRL.
K1912042-5/5d report a high %RSD due to suspected non-homogenous sample.
K1911998-3 sent for RA due to being overdiluted.

Final Approved by:  Date: 01/03/20 DQREPORT

Analytical Results Summary


Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 665302 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
K1911934-002	Carbon, Total Organic	N/A		Drinking Water	0.80 mg/L	10 mL	0.80 mg/L	1	0.07	0.50			1/1/20 04:24:00	N	I
K1911980-001	Carbon, Total Organic	N/A		Water	3.94 mg/L	10 mL	3.94 mg/L	1	0.07	0.50			1/1/20 04:52:00	N	II
K1911981-001	Carbon, Total Organic	N/A		Water	3.51 mg/L	10 mL	3.51 mg/L	1	0.07	0.50			1/1/20 05:20:00	N	II
K1911995-001	Carbon, Total Organic	N/A		Water	2.19 mg/L	10 mL	2.19 mg/L	1	0.07	0.50			12/31/19 21:48:00	N	IV
K1911998-001	Carbon, Total Organic	N/A		Ground Water	2.96 mg/L	10 mL	2.96 mg/L	1	0.07	0.50			12/31/19 22:45:00	N	IV
K1911998-002	Carbon, Total Organic	N/A		Ground Water	0.92 mg/L	10 mL	92 mg/L	100	7	50			12/31/19 23:14:00	N	IV
K1911998-003	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	500 mg/L U	1000	70	500			12/31/19 23:42:00	N	IV
K1911998-004	Carbon, Total Organic	N/A		Ground Water	9.94 mg/L	10 mL	9.94 mg/L	1	0.07	0.50			1/1/20 00:10:00	N	IV
K1911998-005	Carbon, Total Organic	N/A		Ground Water	2.54 mg/L	10 mL	127 mg/L	50	4	25			1/1/20 01:07:00	N	IV
K1911998-006	Carbon, Total Organic	N/A		Ground Water	1.75 mg/L	10 mL	1.75 mg/L	1	0.07	0.50			1/1/20 01:35:00	N	IV
K1912042-001	Carbon, Total Organic	N/A		Ground Water	4.44 mg/L	10 mL	4.44 mg/L	1	0.07	0.50			1/1/20 02:03:00	N	IV
K1912042-002	Carbon, Total Organic	N/A		Ground Water	4.10 mg/L	10 mL	4.10 mg/L	1	0.07	0.50			1/1/20 02:32:00	N	IV
K1912042-003	Carbon, Total Organic	N/A		Ground Water	13.05 mg/L	10 mL	13.1 mg/L	1	0.07	0.50			1/1/20 03:00:00	N	IV
K1912042-004	Carbon, Total Organic	N/A		Ground Water	13.77 mg/L	10 mL	13.8 mg/L	1	0.07	0.50			1/1/20 03:28:00	N	IV
K1912042-005	Carbon, Total Organic	N/A		Ground Water	3.48 mg/L	10 mL	3.48 mg/L	1	0.07	0.50			1/1/20 03:56:00	N	IV
KQ1919248-01	Carbon, Total Organic	CCV		Water	23.98 mg/L	10 mL	24.0 mg/L	1					12/31/19 20:35:00	N	IV
KQ1919248-02	Carbon, Total Organic	CCV		Water	25.08 mg/L	10 mL	25.1 mg/L	1					1/1/20 00:38:00	N	IV
KQ1919248-03	Carbon, Total Organic	CCV		Water	24.03 mg/L	10 mL	24.0 mg/L	1					1/1/20 05:48:00	N	IV
KQ1919248-04	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			12/31/19 20:49:00	N	IV
KQ1919248-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/1/20 00:53:00	N	IV
KQ1919248-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/1/20 06:03:00	N	IV
KQ1919248-07	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			12/31/19 21:04:00	N	IV
KQ1919248-08	Carbon, Total Organic	LCS		Water	25.12 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		12/31/19 21:19:00	N	IV
KQ1919248-09	Carbon, Total Organic	MS	K1911995-001	Water	28.29 mg/L	10 mL	28.3 mg/L	1	0.07	0.50	104		12/31/19 22:16:00	N	IV
KQ1919248-10	Carbon, Total Organic	DUP	K1911934-002	Drinking Water	0.63 mg/L	10 mL	0.63 mg/L	1	0.07	0.50		23*	1/1/20 04:24:00	N	I
KQ1919248-11	Carbon, Total Organic	DUP	K1911980-001	Water	3.92 mg/L	10 mL	3.92 mg/L	1	0.07	0.50		<1	1/1/20 04:52:00	N	II
KQ1919248-12	Carbon, Total Organic	DUP	K1911981-001	Water	3.50 mg/L	10 mL	3.50 mg/L	1	0.07	0.50		<1	1/1/20 05:20:00	N	II
KQ1919248-13	Carbon, Total Organic	DUP	K1911995-001	Water	2.23 mg/L	10 mL	2.23 mg/L	1	0.07	0.50		2	12/31/19 21:48:00	N	IV
KQ1919248-14	Carbon, Total Organic	DUP	K1911998-002	Ground Water	0.88 mg/L	10 mL	88 mg/L	100	7	50		5	12/31/19 23:14:00	N	IV

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

01/03/20


Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 665302 Method/Testcode: SM 5310 C/TOC T

<u>Lab Code</u>	<u>Target Analytes</u>	<u>QC</u>	<u>Parent Sample</u>	<u>Matrix</u>	<u>Raw Result</u>	<u>Sample Amt.</u>	<u>Final Result</u>	<u>Dil</u>	<u>MDL</u>	<u>PQL</u>	<u>% Rec</u>	<u>% RSD</u>	<u>Date Analyzed</u>	<u>QC?</u>	<u>Tier</u>
KQ1919248-15	Carbon, Total Organic	DUP	K1911998-001	Ground Water	2.86 mg/L	10 mL	2.86 mg/L	1	0.07	0.50		3	12/31/19 22:45:00	N	IV
KQ1919248-16	Carbon, Total Organic	DUP	K1911998-003	Ground Water	0.00 mg/L	10 mL	500 mg/L U 1000		70	500		NC	12/31/19 23:42:00	N	IV
KQ1919248-17	Carbon, Total Organic	DUP	K1911998-004	Ground Water	9.77 mg/L	10 mL	9.77 mg/L	1	0.07	0.50		2	1/1/20 00:10:00	N	IV
KQ1919248-18	Carbon, Total Organic	DUP	K1911998-005	Ground Water	2.50 mg/L	10 mL	125 mg/L	50	4	25		2	1/1/20 01:07:00	N	IV
KQ1919248-19	Carbon, Total Organic	DUP	K1911998-006	Ground Water	1.77 mg/L	10 mL	1.77 mg/L	1	0.07	0.50		1	1/1/20 01:35:00	N	IV
KQ1919248-20	Carbon, Total Organic	DUP	K1912042-002	Ground Water	4.01 mg/L	10 mL	4.01 mg/L	1	0.07	0.50		2	1/1/20 02:32:00	N	IV
KQ1919248-21	Carbon, Total Organic	DUP	K1912042-001	Ground Water	4.41 mg/L	10 mL	4.41 mg/L	1	0.07	0.50		<1	1/1/20 02:03:00	N	IV
KQ1919248-22	Carbon, Total Organic	DUP	K1912042-003	Ground Water	13.43 mg/L	10 mL	13.4 mg/L	1	0.07	0.50		3	1/1/20 03:00:00	N	IV
KQ1919248-23	Carbon, Total Organic	DUP	K1912042-004	Ground Water	14.50 mg/L	10 mL	14.5 mg/L	1	0.07	0.50		5	1/1/20 03:28:00	N	IV
KQ1919248-24	Carbon, Total Organic	DUP	K1912042-005	Ground Water	3.01 mg/L	10 mL	3.01 mg/L	1	0.07	0.50		14*	1/1/20 03:56:00	N	IV

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

Analytical Results Summary

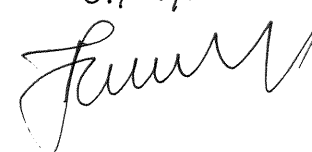
Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 665303 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
K1911912-001	Carbon, Total Organic	N/A		Water	1.32 mg/L	10 mL	1.32 mg/L	1	0.07	0.50			1/1/20 07:44:00	N	II
K1911912-002	Carbon, Total Organic	N/A		Water	0.42 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/1/20 08:12:00	N	II
K1911912-003	Carbon, Total Organic	N/A		Water	0.62 mg/L	10 mL	0.62 mg/L	1	0.07	0.50			1/1/20 08:40:00	N	II
K1911912-004	Carbon, Total Organic	N/A		Water	0.35 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/1/20 09:08:00	N	II
K1911968-004	Carbon, Total Organic	N/A		Water	1.15 mg/L	10 mL	1.15 mg/L	1	0.07	0.50			1/1/20 09:36:00	N	IV
K1911968-005	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/1/20 10:34:00	N	IV
K1912074-003	Carbon, Total Organic	N/A		Water	7.12 mg/L	10 mL	7.12 mg/L	1	0.07	0.50			1/1/20 11:02:00	N	II
K1912105-001	Carbon, Total Organic	N/A		Water	2.46 mg/L	10 mL	2.46 mg/L	1	0.07	0.50			1/1/20 06:47:00	N	IV
K1912140-001	Carbon, Total Organic	N/A		Water	7.36 mg/L	10 mL	7.36 mg/L	1	0.07	0.50			1/1/20 11:30:00	N	II
KQ1919247-01	Carbon, Total Organic	CCV		Water	24.03 mg/L	10 mL	24.0 mg/L	1					1/1/20 05:48:00	N	IV
KQ1919247-02	Carbon, Total Organic	CCV		Water	23.99 mg/L	10 mL	24.0 mg/L	1					1/1/20 10:04:00	N	IV
KQ1919247-03	Carbon, Total Organic	CCV		Water	23.70 mg/L	10 mL	23.7 mg/L	1					1/1/20 15:01:00	N	IV
KQ1919247-04	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/1/20 06:03:00	N	IV
KQ1919247-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/1/20 10:19:00	N	IV
KQ1919247-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/1/20 15:15:00	N	IV
KQ1919247-07	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/1/20 06:18:00	N	IV
KQ1919247-08	Carbon, Total Organic	LCS		Water	25.08 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		1/1/20 06:32:00	N	IV
KQ1919247-09	Carbon, Total Organic	MS	K1912105-001	Water	28.13 mg/L	10 mL	28.1 mg/L	1	0.07	0.50	103		1/1/20 07:15:00	N	IV
KQ1919247-10	Carbon, Total Organic	DUP	K1911912-001	Water	1.28 mg/L	10 mL	1.28 mg/L	1	0.07	0.50		3	1/1/20 07:44:00	N	II
KQ1919247-11	Carbon, Total Organic	DUP	K1911912-002	Water	0.40 mg/L	10 mL	0.40 mg/L J	1	0.07	0.50		NC	1/1/20 08:12:00	N	II
KQ1919247-12	Carbon, Total Organic	DUP	K1911912-003	Water	0.63 mg/L	10 mL	0.63 mg/L	1	0.07	0.50		2	1/1/20 08:40:00	N	II
KQ1919247-13	Carbon, Total Organic	DUP	K1911912-004	Water	0.35 mg/L	10 mL	0.35 mg/L J	1	0.07	0.50		NC	1/1/20 09:08:00	N	II
KQ1919247-14	Carbon, Total Organic	DUP	K1911968-004	Water	1.21 mg/L	10 mL	1.21 mg/L	1	0.07	0.50		5	1/1/20 09:36:00	N	IV
KQ1919247-15	Carbon, Total Organic	DUP	K1911968-005	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	1/1/20 10:34:00	N	IV
KQ1919247-16	Carbon, Total Organic	DUP	K1912074-003	Water	7.18 mg/L	10 mL	7.18 mg/L	1	0.07	0.50		<1	1/1/20 11:02:00	N	II
KQ1919247-17	Carbon, Total Organic	DUP	K1912105-001	Water	2.33 mg/L	10 mL	2.33 mg/L	1	0.07	0.50		5	1/1/20 06:47:00	N	IV
KQ1919247-18	Carbon, Total Organic	DUP	K1912140-001	Water	7.35 mg/L	10 mL	7.35 mg/L	1	0.07	0.50		<1	1/1/20 11:30:00	N	II

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

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 665304 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
K1911963-001	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.40 mg/L	10 mL	2.40 mg/L	1	0.07	0.50			1/1/20 12:13:00	N	II
K1911963-002	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.38 mg/L	10 mL	2.38 mg/L	1	0.07	0.50			1/1/20 12:41:00	N	II
K1911963-003	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	0.51 mg/L	10 mL	0.51 mg/L	1	0.07	0.50			1/1/20 13:09:00	N	II
K1911963-004	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.57 mg/L	10 mL	1.57 mg/L	1	0.07	0.50			1/1/20 13:37:00	N	II
K1911963-005	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.50 mg/L	10 mL	1.50 mg/L	1	0.07	0.50			1/1/20 14:05:00	N	II
K1911963-006	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.96 mg/L	10 mL	1.96 mg/L	1	0.07	0.50			1/1/20 14:33:00	N	II
K1911963-007	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.14 mg/L	10 mL	2.14 mg/L	1	0.07	0.50			1/1/20 16:00:00	N	II
K1911963-008	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.92 mg/L	10 mL	1.92 mg/L	1	0.07	0.50			1/1/20 16:28:00	N	II
K1911963-009	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.95 mg/L	10 mL	1.95 mg/L	1	0.07	0.50			1/1/20 16:56:00	N	II
K1911963-010	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.04 mg/L	10 mL	2.04 mg/L	1	0.07	0.50			1/1/20 17:25:00	N	II
K1911963-011	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.93 mg/L	10 mL	1.93 mg/L	1	0.07	0.50			1/1/20 17:53:00	N	II
K1911963-012	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	0.46 mg/L	10 mL	0.46 mg/L	J 1	0.07	0.50			1/1/20 18:21:00	N	II
KQ1919246-01	Carbon, Dissolved Organic (DOC)	MS	K1911963-012	Surface Water	27.18 mg/L	10 mL	27.2 mg/L	1	0.07	0.50	107		1/1/20 18:49:00	N	II
KQ1919246-02	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	23.99 mg/L	10 mL	24.0 mg/L	1					1/1/20 10:04:00	N	II
KQ1919246-03	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	23.70 mg/L	10 mL	23.7 mg/L	1					1/1/20 15:01:00	N	II
KQ1919246-04	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	23.80 mg/L	10 mL	23.8 mg/L	1					1/1/20 19:32:00	N	II
KQ1919246-05	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			1/1/20 10:19:00	N	II
KQ1919246-06	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			1/1/20 15:15:00	N	II
KQ1919246-07	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			1/1/20 19:46:00	N	II
KQ1919246-08	Carbon, Dissolved Organic (DOC)	MB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			1/1/20 15:30:00	N	II
KQ1919246-09	Carbon, Dissolved Organic (DOC)	LCS		Surface Water	24.87 mg/L	10 mL	24.9 mg/L	1	0.07	0.50	99		1/1/20 15:45:00	N	II
KQ1919246-10	Carbon, Dissolved Organic (DOC)	DUP	K1911963-001	Surface Water	2.35 mg/L	10 mL	2.35 mg/L	1	0.07	0.50		2	1/1/20 12:13:00	N	II
KQ1919246-11	Carbon, Dissolved Organic (DOC)	DUP	K1911963-002	Surface Water	2.35 mg/L	10 mL	2.35 mg/L	1	0.07	0.50		1	1/1/20 12:41:00	N	II

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

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Results Summary

01/03/20
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Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 665304 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
KQ1919246-12	Carbon, Dissolved Organic (DOC)	DUP	K1911963-003	Surface Water	0.51 mg/L	10 mL	0.51 mg/L	1	0.07	0.50		1	1/1/20 13:09:00	N	II
KQ1919246-13	Carbon, Dissolved Organic (DOC)	DUP	K1911963-004	Surface Water	1.53 mg/L	10 mL	1.53 mg/L	1	0.07	0.50		3	1/1/20 13:37:00	N	II
KQ1919246-14	Carbon, Dissolved Organic (DOC)	DUP	K1911963-005	Surface Water	1.40 mg/L	10 mL	1.40 mg/L	1	0.07	0.50		7	1/1/20 14:05:00	N	II
KQ1919246-15	Carbon, Dissolved Organic (DOC)	DUP	K1911963-006	Surface Water	1.93 mg/L	10 mL	1.93 mg/L	1	0.07	0.50		1	1/1/20 14:33:00	N	II
KQ1919246-16	Carbon, Dissolved Organic (DOC)	DUP	K1911963-007	Surface Water	2.00 mg/L	10 mL	2.00 mg/L	1	0.07	0.50		6	1/1/20 16:00:00	N	II
KQ1919246-17	Carbon, Dissolved Organic (DOC)	DUP	K1911963-008	Surface Water	1.89 mg/L	10 mL	1.89 mg/L	1	0.07	0.50		2	1/1/20 16:28:00	N	II
KQ1919246-18	Carbon, Dissolved Organic (DOC)	DUP	K1911963-009	Surface Water	1.82 mg/L	10 mL	1.82 mg/L	1	0.07	0.50		7	1/1/20 16:56:00	N	II
KQ1919246-19	Carbon, Dissolved Organic (DOC)	DUP	K1911963-010	Surface Water	1.90 mg/L	10 mL	1.90 mg/L	1	0.07	0.50		7	1/1/20 17:25:00	N	II
KQ1919246-20	Carbon, Dissolved Organic (DOC)	DUP	K1911963-011	Surface Water	1.88 mg/L	10 mL	1.88 mg/L	1	0.07	0.50		2	1/1/20 17:53:00	N	II
KQ1919246-21	Carbon, Dissolved Organic (DOC)	DUP	K1911963-012	Surface Water	0.46 mg/L	10 mL	0.46 mg/L	J 1	0.07	0.50		<1	1/1/20 18:21:00	N	II

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

TOC: 665302,
665303
DOC: 665304

Schedule: Daily Run Method 010711

Version: 80

Instrument: Fusion1

Last Saved by: Fusion1 (Fusion1)

Last Saved on: 2019/12/31 16:45 - Tuesday

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)	10	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	K1911995-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1911995-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
5	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K1911998-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1911998-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K1911998-003.01 1000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1911998-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1911998-005.01 50x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1911998-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1912042-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1912042-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1912042-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1912042-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1912042-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1911934-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1911980-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1911981-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
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	K1912105-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1912105-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
23	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
24	Sample	K1911912-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1911912-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1911912-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1911912-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1911968-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1911968-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1912074-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K1912140-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	FB 12/20/19 1501	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
33	Sample	K1911963-001.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K1911963-002.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K1911963-003.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1911963-004.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1911963-005.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K1911963-006.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

Printed on: January 3, 2020 09:21:40

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Schedule: Daily Run Method 010711

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	K1911963-007.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K1911963-008.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K1911963-009.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	K1911963-010.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	K1911963-011.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K1911963-012.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K1911963-012.01 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
47	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	

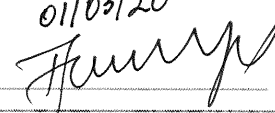
Fusion Report - Daily Run Method 010711 Tuesday, December 31, 2019 04:35 PM

(View - Repts, Unused Repts, Meta-Data, Signature, History)
Printed on 2020/01/03 09:21 -
Friday

Report Summary Information

Company Location: Gen Chem Lab
 Schedule Name: Daily Run Method 010711 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) (v79)
 Fusion1 (Fusion1) (v80)
 Comment:

Report Results

01/03/20


Sample Type: Clean From Schedule Version 79

Pos	Analysis Type	Sample ID	Start Time
◆ (clean)		Clean	2019/12/31 16:35

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.71	19.28	5.58	49.47	05:23
2	TC Clean	14.29	17.33	3.04	50.01	04:04
3	TC Clean	2.88	6.69	3.81	49.97	03:47
4	TC Clean	2.31	6.12	3.80	50.02	03:53

Sample Type: Clean From Schedule Version 80

Pos	Analysis Type	Sample ID	Start Time
◆ (clean)		Clean	2019/12/31 16:57

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.21	5.09	3.88	49.61	05:24
2	TC Clean	5.91	9.66	3.76	50.10	04:01
3	TC Clean	2.51	6.24	3.73	50.04	03:45
4	TC Clean	2.01	5.82	3.81	49.94	03:47

Sample Type: Clean		From Schedule Version 80				
Pos	Analysis Type	Sample ID			Start Time	
♦ (clean)		Clean			2019/12/31 17:19	
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.28	5.01	3.73	49.37	05:20
2	TC Clean	6.29	10.12	3.84	50.05	04:01
3	TC Clean	2.28	6.27	3.99	50.05	03:44
4	TC Clean	2.20	5.97	3.77	50.08	03:46

Sample Type: Blank (Creating v1333)		From Schedule Version 80				
Pos	Analysis Type	Sample ID			Start Time	
♦ (blank)		Reagent/Acid Blank			2019/12/31 17:40	
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.32	5.05	3.72	49.64	05:13
2	TC Clean	5.58	9.42	3.84	49.99	04:01
3	TC Clean	2.53	6.30	3.78	50.09	03:47
4	TC Clean	2.36	6.26	3.90	49.92	03:51
5	Reagent Blank	4.25	8.29	4.04	50.14	05:02
6	Acid Blank	1.36	5.20	3.84	49.53	05:26

Sample Type: Sample		From Schedule Version 80						
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
♦ D	TOC	RB	0.0441 ppm	0.1394 ppm	316.2300%	2019/12/31 18:14		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4407	4.4075	11.79	15.74	3.95	50.07	10:28
2	TOC	0.0000	0.0000	7.58	11.48	3.89	50.07	10:27
3	TOC	0.0000	0.0000	6.95	10.79	3.84	50.09	10:25
4	TOC	0.0000	0.0000	7.18	11.14	3.96	50.11	10:27
5	TOC	0.0000	0.0000	6.53	10.27	3.73	50.09	10:27
6	TOC	0.0000	0.0000	6.62	10.19	3.57	50.12	10:27
7	TOC	0.0000	0.0000	6.43	10.02	3.58	50.08	10:26

8	TOC	0.0000	0.0000	6.52	10.04	3.52	50.11	10:28
9	TOC	0.0000	0.0000	6.12	9.81	3.70	50.09	10:29
10	TOC	0.0000	0.0000	6.26	10.07	3.82	50.10	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7992 (IC) (v1333)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.9773 ppm (PASS)	0.0000 ppm	0%	2019/12/31 20:35

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9773	239.7730	172.22	176.04	3.82	50.08	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 80

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%	2019/12/31 20:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.78	10.54	3.76	50.08	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 80

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/12/31 21:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.94	9.79	3.85	50.09	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7992 (IC) (v1333)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS										From Schedule Version 80	
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)	25.1165 ppm (PASS)	0.0000 ppm	0%	2019/12/31 21:19	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time	
C	TOC	25.0 ppm	1	25.1165	251.1653	179.95	183.84	3.89	50.07	10:33	
Completion State		Success Action		Method		Calibration		STD Conc - Pos C			
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		25 ppmC			

Sample Type: Sample										From Schedule Version 80	
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time					
♦	2	TOC	ICS	0.0636 ppm	0.0000 ppm	0.0000%	2019/12/31 21:34				
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time			
1	TOC	0.0636	0.6361	9.23	13.06	3.83	50.09	10:34			
Dilution		Blank Contribution		Method		Calibration					
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)					
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time					
♦	3	TOC	K1911995-001.01	2.2088 ppm	0.0314 ppm	1.4200%	2019/12/31 21:48				
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time			
1	TOC	2.1866	21.8664	23.64	27.48	3.83	50.06	10:27			
2	TOC	2.2310	22.3098	23.94	27.71	3.76	50.06	10:26			
Dilution		Blank Contribution		Method		Calibration					
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)					
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time					
♦	4	TOC	K1911995-001.01 ms	28.2887 ppm	0.0000 ppm	0.0000%	2019/12/31 22:16				
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time			
1	TOC	28.2887	282.8866	200.82	204.62	3.80	50.05	10:33			
Dilution		Blank Contribution		Method		Calibration					
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)					
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time					

◆	5	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/12/31 22:31		
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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.43	11.35	3.92	50.02	10:32

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	6	TOC	K1911998-001.01	2.9073 ppm	0.0683 ppm	2.3500%	2019/12/31 22:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9556	29.5565	28.86	32.62	3.76	50.06	10:29
2	TOC	2.8590	28.5901	28.21	31.99	3.78	50.04	10:27

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	7	TOC	K1911998-002.01 100x	0.8965 ppm	0.0303 ppm	3.3800%	2019/12/31 23:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9179	9.1792	15.03	18.91	3.88	50.07	10:27
2	TOC	0.8750	8.7505	14.74	18.37	3.63	50.05	10:29

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	8	TOC	K1911998-003.01 1000x	0.0000 ppm	0.0000 ppm	0.0000%	2019/12/31 23:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.30	12.03	3.73	50.06	10:27
2	TOC	0.0000	0.0000	7.79	11.74	3.94	50.07	10:28

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	9	TOC	K1911998-004.01	9.8591 ppm	0.1210 ppm	1.2300%	2020/01/01 00:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.9447	99.4466	76.30	80.14	3.84	50.03	10:31
2	TOC	9.7735	97.7347	75.14	79.02	3.87	50.08	10:29

Dilution **Blank Contribution** **Method** **Calibration**

1:10 (TC) 8.7992 (IC) (v1333) CAS_salt_010711 (v4) CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.0809 ppm (PASS)	0.0000 ppm	0%	2020/01/01 00:38

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.0809	250.8088	179.71	183.63	3.92	50.04	10:34

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

Sample Type: Check Standard --> CCB

From Schedule Version 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/01 00:53

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.54	11.40	3.87	50.02	10:29

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

Sample Type: Sample

From Schedule Version 80

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 10	TOC	K1911998-005.01 50x	2.5177 ppm	0.0309 ppm	1.2300%	2020/01/01 01:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5396	25.3962	26.04	29.64	3.60	50.04	10:30
2	TOC	2.4959	24.9586	25.74	29.62	3.88	50.03	10:27

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 11	TOC	K1911998-006.01	1.7592 ppm	0.0168 ppm	0.9500%	2020/01/01 01:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7473	17.4733	20.66	24.42	3.76	50.04	10:29
2	TOC	1.7710	17.7105	20.82	24.62	3.79	50.03	10:26

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
12	TOC	K1912042-001.01	4.4235 ppm	0.0222 ppm	0.5000%	2020/01/01 02:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.4392	44.3916	38.93	42.78	3.85	50.07	10:30
2	TOC	4.4078	44.0778	38.72	42.49	3.77	50.03	10:26

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
13	TOC	K1912042-002.01	4.0549 ppm	0.0614 ppm	1.5100%	2020/01/01 02:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.0983	40.9826	36.62	40.28	3.66	50.04	10:28
2	TOC	4.0115	40.1149	36.03	39.76	3.73	50.02	10:28

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
14	TOC	K1912042-003.01	13.2410 ppm	0.2666 ppm	2.0100%	2020/01/01 03:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.0525	130.5252	97.40	101.21	3.82	50.04	10:26
2	TOC	13.4295	134.2952	99.96	103.63	3.67	50.04	10:26

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
15	TOC	K1912042-004.01	14.1339 ppm	0.5156 ppm	3.6500%	2020/01/01 03:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.7692	137.6924	102.26	106.01	3.75	50.01	10:24
2	TOC	14.4985	144.9847	107.21	111.01	3.80	50.04	10:25

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC)
Method CAS_salt_010711
Calibration CAS_salt_010711

(v1333)

(v4)

(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
16	TOC	K1912042-005.01	3.2440 ppm	0.3311 ppm	10.2100%	2020/01/01 03:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.4780	34.7804	32.41	36.29	3.88	50.01	10:27
2	TOC	3.0099	30.0986	29.23	33.20	3.97	50.04	10:25

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
17	TOC	K1911934-002.01	0.7151 ppm	0.1165 ppm	16.2900%	2020/01/01 04:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7974	7.9741	14.21	17.98	3.77	50.03	10:28
2	TOC	0.6327	6.3270	13.09	16.84	3.74	50.02	10:29

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
18	TOC	K1911980-001.01	3.9289 ppm	0.0122 ppm	0.3100%	2020/01/01 04:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9375	39.3754	35.53	39.23	3.70	50.03	10:28
2	TOC	3.9203	39.2030	35.41	39.09	3.68	50.03	10:25

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
19	TOC	K1911981-001.01	3.5048 ppm	0.0034 ppm	0.1000%	2020/01/01 05:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5072	35.0721	32.61	36.21	3.61	50.02	10:30
2	TOC	3.5024	35.0235	32.57	36.34	3.77	50.01	10:27

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
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♦	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.0346 ppm (PASS)	0.0000 ppm	0%	2020/01/01 05:48
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0346	240.3461	172.61	176.27	3.66	50.03	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 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
♦	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/01 06:03
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.34	9.85	3.50	50.01	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 80

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
♦	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/01 06:18	
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.53	9.23	3.70	50.02	10:30
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		

Sample Type: Check Standard --> LCS From Schedule Version 80

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)	25.0849 ppm (PASS)	0.0000 ppm	0%	2020/01/01 06:32
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.0849	250.8486	179.74	183.47	3.74	50.04	10:29

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

Sample Type: Sample

From Schedule Version 80

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
21	TOC	K1912105-001.01	2.3905 ppm	0.0923 ppm	3.8600%	2020/01/01 06:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4558	24.5579	25.47	29.13	3.66	50.00	10:28
2	TOC	2.3253	23.2526	24.58	28.29	3.70	50.01	10:27

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7992 (IC) (v1333)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
22	TOC	K1912105-001.01 ms	28.1332 ppm	0.0000 ppm	0.0000%	2020/01/01 07:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.1332	281.3324	199.77	203.34	3.58	50.01	10:31

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7992 (IC) (v1333)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
23	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/01 07:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.30	10.96	3.66	50.03	10:31

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7992 (IC) (v1333)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
24	TOC	K1911912-001.01	1.3018 ppm	0.0289 ppm	2.2200%	2020/01/01 07:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3222	13.2216	17.77	21.47	3.70	50.03	10:28
2	TOC	1.2814	12.8135	17.50	21.26	3.76	50.02	10:25

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7992 (IC) (v1333)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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

◆	25	TOC	K1911912-002.01	0.4133 ppm	0.0138 ppm	3.3300%	2020/01/01 08:12
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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4231	4.2307	11.67	15.28	3.60	50.04	10:26
2	TOC	0.4036	4.0362	11.54	15.27	3.73	50.03	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7992 (IC) (v1333) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	26	TOC	K1911912-003.01	0.6258 ppm	0.0079 ppm	1.2700%	2020/01/01 08:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6202	6.2018	13.01	16.67	3.66	50.04	10:28
2	TOC	0.6314	6.3138	13.08	16.79	3.70	50.02	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7992 (IC) (v1333) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	27	TOC	K1911912-004.01	0.3476 ppm	0.0006 ppm	0.1800%	2020/01/01 09:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3481	3.4808	11.16	14.86	3.70	50.03	10:26
2	TOC	0.3472	3.4720	11.16	14.61	3.45	50.01	10:28

Dilution 1:10 **Blank Contribution** (TC) 8.7992 (IC) (v1333) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	28	TOC	K1911968-004.01	1.1812 ppm	0.0446 ppm	3.7700%	2020/01/01 09:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1497	11.4965	16.60	20.31	3.71	50.03	10:30
2	TOC	1.2127	12.1270	17.03	20.61	3.57	50.02	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.7992 (IC) (v1333) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.9870 ppm (PASS)	0.0000 ppm	0%	2020/01/01 10:04

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9870	239.8703	172.28	176.01	3.73	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 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev. (ppm)	RSD	Start Time	
♦	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/01 10:19
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.23	10.09	3.86	50.04	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 80

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
♦	29	TOC	K1911968-005.01	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/01 10:34	
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.30	10.10	3.80	50.04	10:30
2	TOC	0.0000	0.0000	6.26	9.91	3.66	50.05	10:26
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
♦	30	TOC	K1912074-003.01	7.1478 ppm	0.0402 ppm	0.5600%	2020/01/01 11:02	
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.1194	71.1935	57.12	60.83	3.70	50.03	10:28
2	TOC	7.1762	71.7622	57.51	61.16	3.65	50.03	10:27
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
♦	31	TOC	K1912140-001.01	7.3546 ppm	0.0080 ppm	0.1100%	2020/01/01 11:30	

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.3602	73.6022	58.76	62.25	3.49	50.02	10:30
2	TOC	7.3489	73.4888	58.68	62.37	3.69	50.03	10:25

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
32	TOC	FB 12/20/19 1501	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/01 11:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.83	10.55	3.72	50.02	10:31

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
33	TOC	K1911963-001.01 doc	2.3762 ppm	0.0331 ppm	1.3900%	2020/01/01 12:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3997	23.9966	25.09	28.67	3.58	50.02	10:25
2	TOC	2.3528	23.5281	24.77	28.44	3.67	50.03	10:29

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
34	TOC	K1911963-002.01 doc	2.3673 ppm	0.0236 ppm	1.0000%	2020/01/01 12:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3840	23.8405	24.98	28.84	3.86	50.04	10:27
2	TOC	2.3506	23.5060	24.76	28.37	3.61	50.03	10:25

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
35	TOC	K1911963-003.01 doc	0.5096 ppm	0.0047 ppm	0.9200%	2020/01/01 13:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5063	5.0630	12.24	16.00	3.76	50.02	10:29
2	TOC	0.5129	5.1293	12.28	15.83	3.55	50.02	10:24

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
36	TOC	K1911963-004.01 doc	1.5474 ppm	0.0310 ppm	2.0100%	2020/01/01 13:37		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5694	15.6937	19.45	23.25	3.80	50.02	10:26
2	TOC	1.5255	15.2546	19.15	22.81	3.66	50.03	10:29
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
37	TOC	K1911963-005.01 doc	1.4530 ppm	0.0733 ppm	5.0500%	2020/01/01 14:05		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5048	15.0484	19.01	22.69	3.68	50.05	10:30
2	TOC	1.4011	14.0113	18.31	22.18	3.87	50.03	10:24
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
38	TOC	K1911963-006.01 doc	1.9425 ppm	0.0184 ppm	0.9500%	2020/01/01 14:33		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9555	19.5549	22.07	25.96	3.89	50.07	10:27
2	TOC	1.9294	19.2942	21.90	25.73	3.84	50.03	10:25
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.6980 ppm (PASS)	0.0000 ppm	0%	2020/01/01 15:01	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6980	236.9798	170.32	174.08	3.75	50.05	10:32
<u>Completion State</u>		<u>Success Action</u>		<u>Method</u>	<u>Calibration</u>		<u>STD Conc - Pos B</u>			
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)		50 ppmC			

Sample Type: Check Standard --> CCB

From Schedule Version 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/01 15:15

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.31	10.01	3.71	50.03	10:29

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

From Schedule Version 80

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆ 39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/01 15:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.21	9.12	3.91	50.03	10:33

Dilution 1:10	Blank Contribution (TC) 8.7992 (IC) (v1333)	Method CAS_salt_010711 (v4)	Calibration CAS_salt_010711 (v30)
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Sample Type: Check Standard --> LCS

From Schedule Version 80

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)	24.8695 ppm (PASS)	0.0000 ppm	0%	2020/01/01 15:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.8695	248.6947	178.28	182.07	3.80	50.03	10:31

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

From Schedule Version 80

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆ 40	TOC	K1911963-007.01 doc	2.0700 ppm	0.0933 ppm	4.5100%	2020/01/01 16:00

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

1	TOC	2.1360	21.3596	23.30	27.18	3.88	50.03	10:29
2	TOC	2.0040	20.0396	22.40	26.30	3.90	50.06	10:29

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
41	TOC	K1911963-008.01 doc	1.9025 ppm	0.0215 ppm	1.1300%	2020/01/01 16:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9176	19.1763	21.82	25.60	3.79	50.04	10:30
2	TOC	1.8873	18.8728	21.61	25.29	3.68	50.05	10:26

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
42	TOC	K1911963-009.01 doc	1.8852 ppm	0.0954 ppm	5.0600%	2020/01/01 16:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9527	19.5269	22.05	25.78	3.72	50.07	10:27
2	TOC	1.8177	18.1775	21.14	24.92	3.79	50.08	10:30

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
43	TOC	K1911963-010.01 doc	1.9715 ppm	0.0951 ppm	4.8200%	2020/01/01 17:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0387	20.3873	22.64	26.35	3.71	50.05	10:24
2	TOC	1.9042	19.0422	21.72	25.60	3.87	50.04	10:27

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
44	TOC	K1911963-011.01 doc	1.9039 ppm	0.0315 ppm	1.6500%	2020/01/01 17:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9262	19.2617	21.87	25.48	3.60	50.05	10:29
2	TOC	1.8817	18.8168	21.57	25.40	3.83	50.04	10:26

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
45	TOC	K1911963-012.01 doc	0.4572 ppm	0.0020 ppm	0.4300%	2020/01/01 18:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4558	4.5577	11.89	15.63	3.73	50.04	10:26
2	TOC	0.4586	4.5857	11.91	15.54	3.63	50.04	10:28

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
46	TOC	K1911963-012.01 ms doc	27.1795 ppm	0.0000 ppm	0.0000%	2020/01/01 18:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.1795	271.7949	193.29	197.03	3.73	50.05	10:29

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
47	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/01 19:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.24	10.00	3.76	50.05	10:28
2	TOC	0.0000	0.0000	6.14	9.84	3.70	50.05	10:30

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.7970 ppm (PASS)	0.0000 ppm	0%	2020/01/01 19:32

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.7970	237.9698	170.99	174.59	3.59	50.06	10:29

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

Sample Type: Check Standard --> CCB

From Schedule Version 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/01 19:46

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.81	9.46	3.65	50.06	10:35

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

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1332	6.2033	2.5850	0.0000	0.0000	0.0000	2019/12/27 19:09	Fusion1 (Fusion1)
v1333	1.4150	1.3570	0.0000	0.0000	0.0000	2019/12/31 18:14	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v30
 Calibration curve formula: TOC: $y = 6.788x + 9.463$
 Ver Creation: 2019/03/05 17:42
 r^2 value: TOC: $r^2 = 0.99963$
 Comment:
 Operator: Fusion1 (Fusion1)
 Basic Analysis Type: TOC

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version: v4

Operator: Fusion1 (Fusion1)

Ver Creation: 2019/02/21 17:57

Comment:

Parameter	Value	Advanced Parameter	Value
SampleVolume	10.0 mL	NeedleRinseVolume	5.0 ml
Dilution	1:10	VialPrimeVolume	2.0 ml
AcidVolume	0.5 ml	ICSamplePrimeVolume	2.0 ml
ReagentVolume	2.0 ml	ICSpurgeRinseVolume	12.0 ml
UVReactorPrerinse	Off	BaselineStabilizeTime	0.70 min
UVReactorPrerinseVolume	5.0	DetectorPressureFlow	150 ml/min
NumberOfUVReactorPrerinses	1	SyringeSpeedWaste	10
ICSpurgeTime	1.00 mins	SyringeSpeedAcid	7
DetectorSweepFlow	500 ml/min	SyringeSpeedReagent	7
PreSpurgeTime	2.00 mins	SyringeSpeedDIWater	7
SystemFlow	500 ml/min	NDIRPressurization	60 psig
		SyringeSpeedSampleDispense	5
		SyringeSpeedSampleAspirate	4
		SyringeSpeedUVDispense	5
		SyringeSpeedUVAspirate	5
		SyringeSpeedICDispense	5
		SyringeSpeedICAspirate	5
		NDIRPressureStabilize	1.75 min
		SampleMixing	Off
		SampleMixingCycles	1
		SampleMixingVolume	10.0
		LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date

1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2020/01/01 20:01
---	-------------------	--------------------	--------------------	------------------

ALS Environmental

StarLIMS Run: 665302, 665303, 665304
 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-05-83H

21 % H₃PO₄: 11-GEN-05-83I

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By: <u>Bob</u>	Date Analyzed: <u>12/31/19</u>
Reviewed By: <u>[Signature]</u>	Date Reviewed: <u>12/01/03/20</u>

JH



Case Narrative

Method: 6850

Analysis: Perchlorate

Analysis SOP: LC-MS-CLO4

ALS WO ID(s): 1935912; 1935913; 1935914;
1935915; 1936106

Client: ALS Laboratories (Houston, TX)

Matrix: Water

ELMS Batch (HBN): 2336 (254688)

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

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

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50 μL 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 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 690689) was less than 1/2 the CRDL. The recovery for the LCS (690686) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on samples 1935915002/03 and 1935915007/08 (Client ID's: C09_121719 and MW18_121719). 3.0 μ L of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3. μ g/L. The MS/MSD (1935912002/03) failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected. The relative percent difference (RPD) failed acceptance criteria for MS/MSD 1935915007/08.

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

NC/CAR(s): NA

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

where: A = Analyte concentration from the standard curve (μ g/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 – 690687) is reported from the analysis of the Laboratory Control Sample (LCS – 690686) at a level of 3.0 μ g/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).

Thomas Bosch January 06, 2020
Analyst Date



ANALYTICAL REPORT

Report Date: January 06, 2020

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

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1935912**

Project ID: HS19121001

Purchase Order: HS19121001

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_121719_BIX	1935912001	12/17/19	12/20/19	

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ANALYTICAL REPORT

Workorder: **34-1935912**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: LH18/24-SP650_121719_BIX	Sampling Site: NA	Collected: 12/17/2019				
Lab ID: 1935912001	Media: 125 mL Nalgene	Received: 12/20/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2336 (HBN: 254688) Analyzed: 01/02/2020 14:07	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	1.7	1.0	2.0	4.0	1	J

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 254688)

Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. 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 01/03/2020 13:16	/S/ Stephen Brose 01/06/2020 10:58

Laboratory Contact Information

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

Phone: (801) 266-7700
Email: als@alst.com
Web: www.alst.com



ANALYTICAL REPORT

Workorder: 34-1935912

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: 1935912
Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2336 (HBN: 254688)
Analyzed By: Thomas Bosch

Blank

LMB: 690689 Analyzed: 01/02/2020 13:54 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 690686 Analyzed: 01/02/2020 13:26 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.19	3.00	106	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1935915001 Analyzed: 01/02/2020 14:49 Dilution: 1 Units: ug/L		MS: 1935915002 Analyzed: 01/02/2020 15:03 Dilution: 1 Units: ug/L				MSD: 1935915003 Analyzed: 01/02/2020 15:17 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	1.50	4.34	3	# 145	78.8 123.8	3.81	# 127	13	0.0 20.0
Sample: 1935915006 Analyzed: 01/02/2020 15:59 Dilution: 1 Units: ug/L		MS: 1935915007 Analyzed: 01/02/2020 16:27 Dilution: 1 Units: ug/L				MSD: 1935915008 Analyzed: 01/02/2020 16:41 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	2.46	3	81.9	78.8 123.8	3.35	112	# 30.7	0.0 20.0

Comments

Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

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

Analyt	Peer Review
/S/ Thomas Bosch 01/06/2020 08:23	/S/ Stephen Brose 01/06/2020 10:58

Symbols and Definitions

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

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



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Subcontract Chain of Custody

18688/#2

SAMPLING STATE: Dept of Defense

COC ID: 12897

SUBCONTRACT TO:

1935912

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: HS19121001
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19121001-02	LH18/24-SP650_121719_BIX	Water	17 Dec 2019 14:00
SUB_Perch-6850			27 Dec 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: [Signature]
Received By: [Signature]
Cooler ID(s): _____

Date/Time: 12-19-19 18:00
Date/Time: 12-20-19 1006
Temperature(s): _____



ALS Environmental CHAIN-OF-CUSTODY

00959663

Project / Job / Task: HS19121001		Split:		Workorder ID: 1935912		Level: ENV_LVL4		Requested Analysis											
Client: ALS Environmental (Houston)				Account: 8101		Type: 125Poly		EPA 6850, DOD QSM											
Comments:						Preservatives													
						COOL													
								Containers											
Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Count												
1	12/17/2019 14:00	LH18/24-SP650_121719_BIX	1935912001		Water	A	1	A											
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			

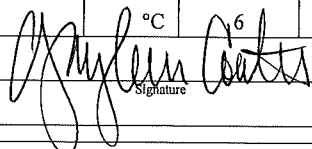
ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY				SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY			
				Sample Prep / Analysis for: _____		Lab Notebook No.: _____	
				Prepared / Analyzed by: _____		Date / Time: _____	
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location	Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	12/20/2019 10:06	ALS Sample Receiving	Sample Login				
<i>Julie Warath</i>	12/20/2019 10:00	KC	storage				
R-33-1	12-22-19 11:22	T. Bosch	anal analysis				

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: <u>ALS HOUSTON</u>		Project/Task/Site: <u>1935912</u>				
Date/Time of Receipt: <u>12.20.19 1006</u>		Number of Coolers Received: <u>1</u>				
Condition of Coolers: <u>Acceptable/Unacceptable</u>		Temperature Control: Present/ <u>Not</u> Included				
Cooler Custody Seals: <u>Present/Absent/NA</u>		Location Temp Taken: Control/ <u>Between</u> Samples				
Container Custody Seals: <u>Intact/Broken/NA</u>		Are all temperatures within project specific guidelines? <u>Yes/No/NA</u>				
Ice Present: <u>Yes/No/NA</u>		VOA Headspace Present? Yes/No/ <u>NA</u>				
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	<u>GOOD</u>	<u>3</u> °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C	6		°C	9		°C

Taken By:  GAYLEEN COATES 12.20.19
Signature Printed Name Date

CLIENT-RELATED INFORMATION

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

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

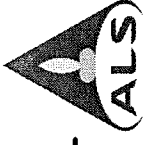
Client Notified? YES NO

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

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



Batch Worklist

HBN: 254688

Instrument:

Created: 1/2/2020 13:05

Batch: ELMS/ 2336



Status: WP

Analyst: T. Bosch

Rule: EPA 6850, DoD QSM Water

- Workorder: 1935912 [ENV_LVL4]
- Workorder: 1935913 [ENV_LVL4]
- Workorder: 1935914 [ENV_LVL4]
- Workorder: 1935915 [ENV_LVL4]
- Workorder: 1936106 [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	690685	CCV for HBN 254688 [ELMS/2336]				CCV	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	
2	690686	LCS for HBN 254688 [ELMS/2336]				LCS	3	E6850Q413Q	E6850Q413Q	5311	1/6/2020	1/6/2020	
3	690687	RLVS for HBN 254688 [ELMS/2336]				RLVS	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	
4	690688	ICS for HBN 254688 [ELMS/2336]				ICS	3	E6850.D3Q	E6850.D3Q	5311	1/6/2020	1/6/2020	
5	690689	LMB for HBN 254688 [ELMS/2336]				LMB	3	E6850Q413Q	E6850Q413Q	5311	1/6/2020	1/6/2020	
6	1935912001	LH18/24-SP650_121719_BIX				SAMPLE	3	1935912001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
7	1935913001	LH18/24-SP140_121719				SAMPLE	3	1935913001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
8	1935914001	LH18/24-SP650_121719_BIX				SAMPLE	3	1935914001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
9	1935915001	C09_121719				SAMPLE	3	1935915001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
10	1935915002	C09_121719MS				MS	3	1935915002-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
11	1935915003	C09_121719MSD				MSD	3	1935915003-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
12	1935915004	126_121719				SAMPLE	3	1935915004-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
13	1935915005	126_121719_a				SAMPLE	3	1935915005-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
14	1935915006	MW18_121719				SAMPLE	3	1935915006-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
15	690690	CCV for HBN 254688 [ELMS/2336]				CCV	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	
16	1935915007	MW18_121719MS				MS	3	1935915007-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
17	1935915008	MW18_121719MSD				MSD	3	1935915008-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
18	1935915009	120_121719				SAMPLE	3	1935915009-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
19	1935915010	MW14_121719				SAMPLE	3	1935915010-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
20	1935915011	18CPTMW04SW_121719				SAMPLE	3	1935915011-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
21	1935915012	18CPTMW04_121719				SAMPLE	3	1935915012-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
22	1936106001	HS19121315-02				SAMPLE	3	1936106001-A	E6850Q41.3	5480	1/20/2020	1/8/2020	
23	690691	CCV for HBN 254688 [ELMS/2336]				CCV	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #()'s: 1935912 (001); 1935913 (001); 1935914 (001); 1935915 (001-12); 1936106 (001)
 ELMS Batch/HBN ID: 2336 (254688)
 Prep Date: 01/02/2020 Analysis Date: 01/02/2020 Analyst: Tom Bosch
 Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
 Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2020\JAN\02JAN20D.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 690686; Target = 3.0µg/L. ASTM type II water was used for LMB 690689.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on samples 1935915002/03 and 1935915007/08 (Client ID's: C09_121719 and MW18_121719). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L. Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD (1935912002/03) failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected. The relative percent difference (RPD) failed acceptance criteria for MS/MSD 1935915007/08.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2020\JAN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2020\DOD\254688-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 690687) is reported from the analysis of the Laboratory Control Sample (LCS – 690686) 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).

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	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2336 HBN: 254688</u> <u>1935915 / 1936106</u>		
Sample Set IDs if Applicable: <u>1935912 / 1935913 / 1935914</u>		
<u>Sample positions on autosampler verified against instrument sequence</u>	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



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

CERTIFICATE OF ANALYSIS



AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: Refer to SDS for complete safety information

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



Signal Word: None

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, Inorganic QC Manager



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013

Lot Number: CP-0860

S



36748

Lot Issue Date: 29-Feb 2016

Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:

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

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

Solvent: water (low TOC, < 50 ppb)

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

Traceability:

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

Estimation of Uncertainties:

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

Homogeneity:

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

Intended Use:

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

Instructions for Use:

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

Hazards:

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

Expiration of Certification:

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



ISO 9001 Registered Quality System – TUV USA

Page 1 of 2



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013

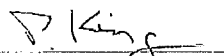
Lot Issue Date: 29-Feb 2016

Lot Number: CP-0860

Expiration Date: 31-Mar 2020

Maintenance of Certification:

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


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


Daniel J. Lamendola
Director of QA/RA



ISO 9001 Registered Quality System – TUV USA

Page 2 of 2



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis



Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

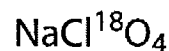
Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl^*O_4

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

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

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

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)

CIL subscribes to the following standards for different products: ISO Guide 34, ISO/IEC 17025, ISO 13485 and cGMP as appropriate.



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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	Perchlorate RT	Perchlorate Amount	
#*	690685	CCV@25	Vial 71	1	Control	1	1.55994e6	7.560	28.36838
#*	690686	QC@3.0	Vial 72	1	Control	2	1.77411e5	7.259	3.19399
#*	690688	ICS@3.0	Vial 73	1	Control	3	1.21919e5	7.244	2.98982
#*	690689	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1935912001		Vial 75	1	Sample	5	1.13186e5	7.256	1.69696
#*	1935913001	1K	Vial 76	1	Sample	6	7.50336e5	7.600	13.85381 × 1,000.
#*	1935914001		Vial 77	1	Sample	7	1.16448e5	7.271	1.93064
#*	1935915001		Vial 78	1	Sample	8	6.26357e4	7.202	1.53061
#*	1935915002	MS	Vial 79	1	Sample	9	1.67718e5	7.194	4.34105
#*	1935915003	MSD	Vial 80	1	Sample	10	1.70226e5	7.204	3.80971
#*	1935915004		Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1935915005		Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1935915006		Vial 83	1	Sample	13	0.00000	0.000	0.00000
#*	690690	CCV@25	Vial 71	1	Control	14	1.55697e6	7.430	25.18198
#*	1935915007	MS	Vial 84	1	Sample	15	1.31015e5	7.176	2.45647
#*	1935915008	MSD	Vial 85	1	Sample	16	1.32260e5	7.185	3.34662
#*	1935915009	1K	Vial 86	1	Sample	17	1.32009e6	7.615	2.26282e4
#*	1935915010	10K	Vial 87	1	Sample	18	7.68865e5	7.605	1.30447e5
#*	1935915011		Vial 88	1	Sample	19	7.20051e4	7.345	1.12833
#*	1936106001		Vial 90	1	Sample	21	3.75684e5	7.220	6.65265
#*	1935915012	10X	Vial 91	1	Sample	22	3.40719e6	7.485	516.14517
*	690691	CCV@25	Vial 71	1	Control	23	1.84092e6	7.431	26.50237

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
#*	690685	CCV@25	Vial 71	1	Control	1	1.85309e5	7.581	5.00000
#*	690686	QC@3.0	Vial 72	1	Control	2	2.04529e5	7.274	5.00000
#*	690688	ICS@3.0	Vial 73	1	Control	3	1.50034e5	7.270	5.00000
#*	690689	LMB	Vial 74	1	Control	4	1.97614e5	7.421	5.00000
#*	1935912001		Vial 75	1	Sample	5	2.41857e5	7.281	5.00000
#*	1935913001	1K	Vial 76	1	Sample	6	1.93760e5	7.618	5.00000
#*	1935914001		Vial 77	1	Sample	7	2.19726e5	7.292	5.00000
#*	1935915001		Vial 78	1	Sample	8	1.47744e5	7.212	5.00000
#*	1935915002	MS	Vial 79	1	Sample	9	1.42468e5	7.219	5.00000
#*	1935915003	MSD	Vial 80	1	Sample	10	1.64739e5	7.223	5.00000
#*	1935915004		Vial 81	1	Sample	11	8.26190e4	7.086	5.00000
#*	1935915005		Vial 82	1	Sample	12	8.16375e4	7.053	5.00000
#*	1935915006		Vial 83	1	Sample	13	1.75700e5	7.224	5.00000
#*	690690	CCV@25	Vial 71	1	Control	14	2.11105e5	7.446	5.00000
#*	1935915007	MS	Vial 84	1	Sample	15	1.95563e5	7.198	5.00000
#*	1935915008	MSD	Vial 85	1	Sample	16	1.45588e5	7.205	5.00000
#*	1935915009	1K	Vial 86	1	Sample	17	2.01300e5	7.637	5000.00000
#*	1935915010	10K	Vial 87	1	Sample	18	2.11546e5	7.628	5.00000e4
#*	1935915011		Vial 88	1	Sample	19	2.26624e5	7.350	5.00000
#*	1936106001		Vial 90	1	Sample	21	2.07387e5	7.238	5.00000
#*	1935915012	10X	Vial 91	1	Sample	22	2.02952e5	7.505	50.00000
*	690691	CCV@25	Vial 71	1	Control	23	2.35883e5	7.456	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
#*	690685	CCV@25	Vial 71	1	Control	1	4.57213e5	7.577	27.40050
#*	690686	QC@3.0	Vial 72	1	Control	2	5.95825e4	7.268	3.42868
#*	690688	ICS@3.0	Vial 73	1	Control	3	4.72946e4	7.260	3.71890
#*	690689	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1935912001		Vial 75	1	Sample	5	4.05294e4	7.272	1.91502
#*	1935913001	1K	Vial 76	1	Sample	6	2.24222e5	7.618	13.51424
#*	1935914001		Vial 77	1	Sample	7	4.06777e4	7.281	2.13096
#*	1935915001		Vial 78	1	Sample	8	2.50802e4	7.216	1.94184

Batch Report: C:\HPCHEM\1\DATA\02JAN20D\02JAN20S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
#*	1935915002	MS	Vial 79	1	Sample	9	6.04977e4	7.206	5.03782
#*	1935915003	MSD	Vial 80	1	Sample	10	6.53036e4	7.210	4.69891
#*	1935915004		Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1935915005		Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1935915006		Vial 83	1	Sample	13	0.00000	0.000	0.00000
#*	690690	CCV@25	Vial 71	1	Control	14	4.73141e5	7.448	25.10439
#*	1935915007	MS	Vial 84	1	Sample	15	4.35554e4	7.182	2.59201
#*	1935915008	MSD	Vial 85	1	Sample	16	4.64932e4	7.193	3.76884
#*	1935915009	1K	Vial 86	1	Sample	17	3.97734e5	7.628	2.23585e4
#*	1935915010	10K	Vial 87	1	Sample	18	2.35180e5	7.624	1.30045e5
#*	1935915011		Vial 88	1	Sample	19	2.59057e4	7.372	1.25727
#*	1936106001		Vial 90	1	Sample	21	1.25368e5	7.239	7.17456
#*	1935915012	10X	Vial 91	1	Sample	22	9.99390e5	7.502	502.85057
*	690691	CCV@25	Vial 71	1	Control	23	5.41119e5	7.448	25.64372

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	690685	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	690686	QC@3.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	690688	ICS@3.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	690689	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1935912001		CLO4-AQN	1	Sample	
6	Vial 76	1935913001	1K	CLO4-AQN	1	Sample	
7	Vial 77	1935914001		CLO4-AQN	1	Sample	
8	Vial 78	1935915001		CLO4-AQN	1	Sample	
9	Vial 79	1935915002	MS	CLO4-AQN	1	Sample	
10	Vial 80	1935915003	MSD	CLO4-AQN	1	Sample	
11	Vial 81	1935915004		CLO4-AQN	1	Sample	
12	Vial 82	1935915005		CLO4-AQN	1	Sample	
13	Vial 83	1935915006		CLO4-AQN	1	Sample	
14	Vial 71	690690	CCV@25	CLO4-AQN	1	Ctrl Samp	
15	Vial 84	1935915007	MS	CLO4-AQN	1	Sample	
16	Vial 85	1935915008	MSD	CLO4-AQN	1	Sample	
17	Vial 86	1935915009	1K	CLO4-AQN	1	Sample	
18	Vial 87	1935915010	10K	CLO4-AQN	1	Sample	
19	Vial 88	1935915011		CLO4-AQN	1	Sample	
20	Vial 89	1935915012	100	CLO4-AQN	1	Sample	
21	Vial 90	1936106001		CLO4-AQN	1	Sample	
22	Vial 91	1935915012	10X	CLO4-AQN	1	Sample	
23	Vial 71	690691	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND01.D

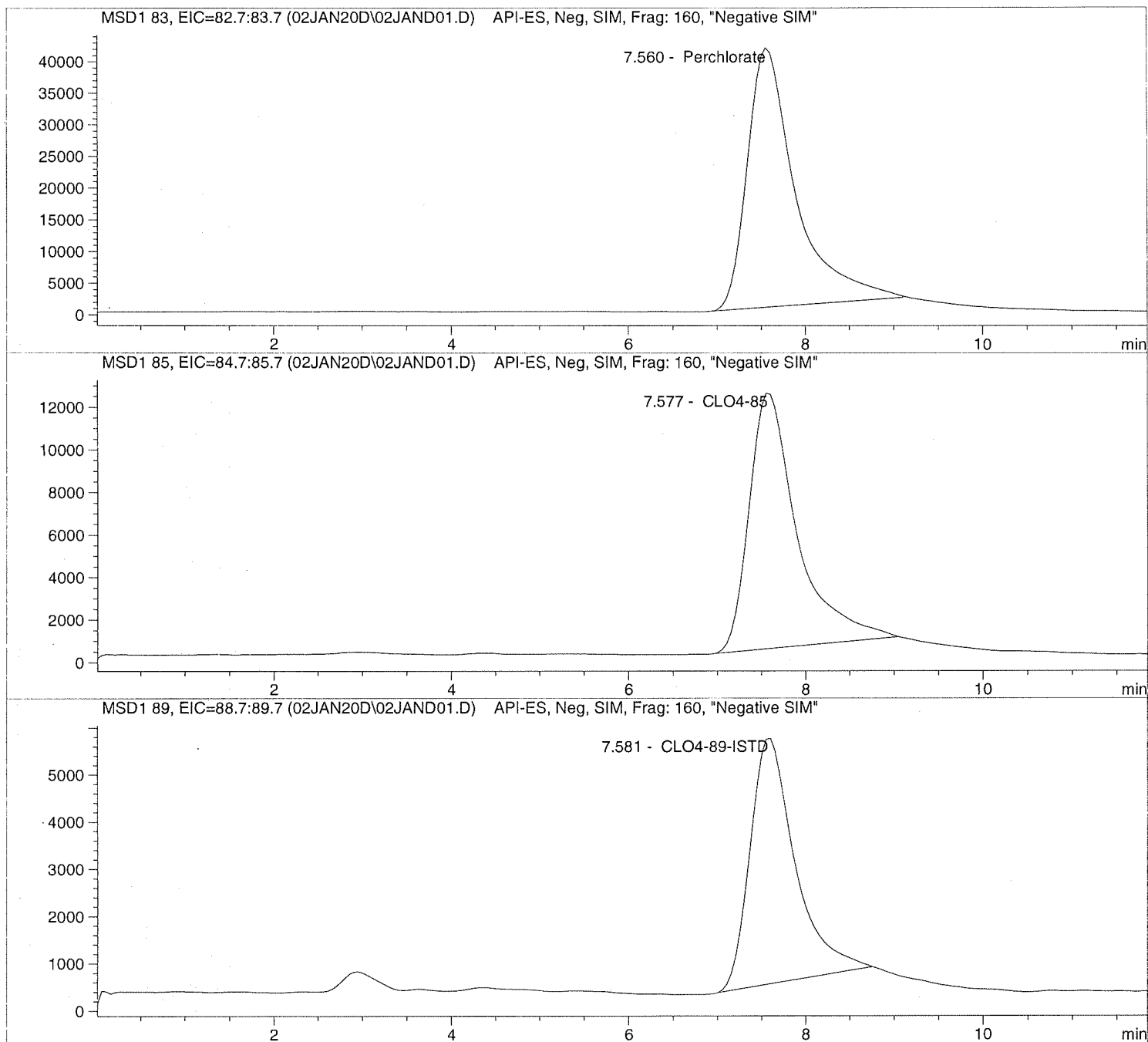
Sample Name: 690685 CCV@25

=====
Injection Date: 1/02/2020 13:11:53
Sample Name: 690685 CCV@25
Acq Operator: TNB

Seq Line: 1
Location: Vial 71
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\02JAN20D\02JAND01.D Sample Name: 690685 CCV@25

```

=====
Injection Date: 1/02/2020 13:11:53      Seq Line: 1
Sample Name: 690685 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
7.560	PBA	1559941.9	28.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.577	PBA	457213.1	27.4005	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.581	PBA	185309.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND02.D

Sample Name: 690686 QC@3.0

Injection Date: 1/02/2020 13:26:12

Seq Line: 2

Sample Name: 690686 QC@3.0

Location: Vial 72

Acq Operator: TNB

Inj. No.: 1

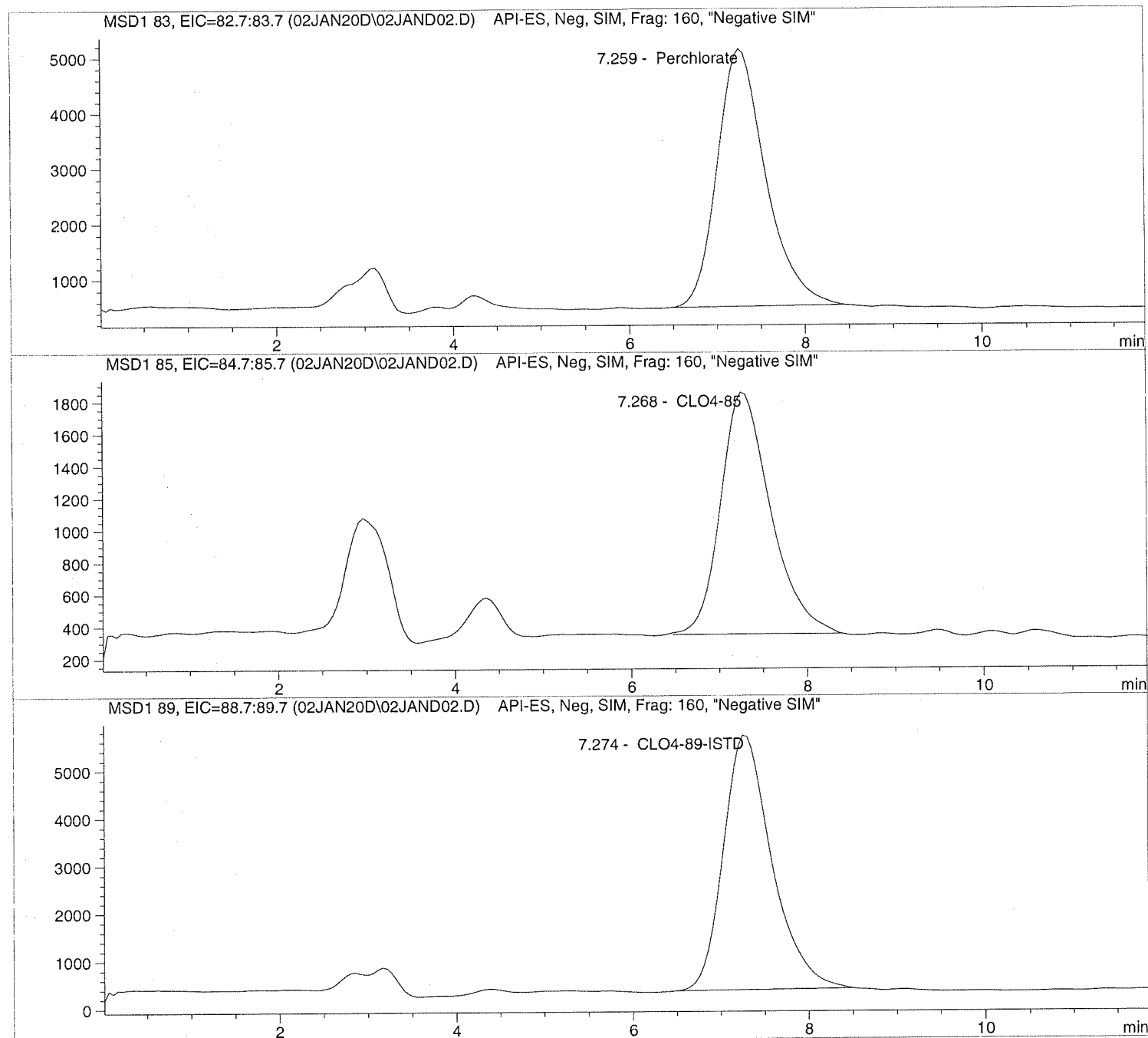
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND02.D Sample Name: 690686 QC@3.0

```

=====
Injection Date: 1/02/2020 13:26:12      Seq Line:           2
Sample Name:   690686 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
7.259	BBA	177410.8	3.1940	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.268	BBA	59582.5	3.4287	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.274	BBA	204529.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND03.D

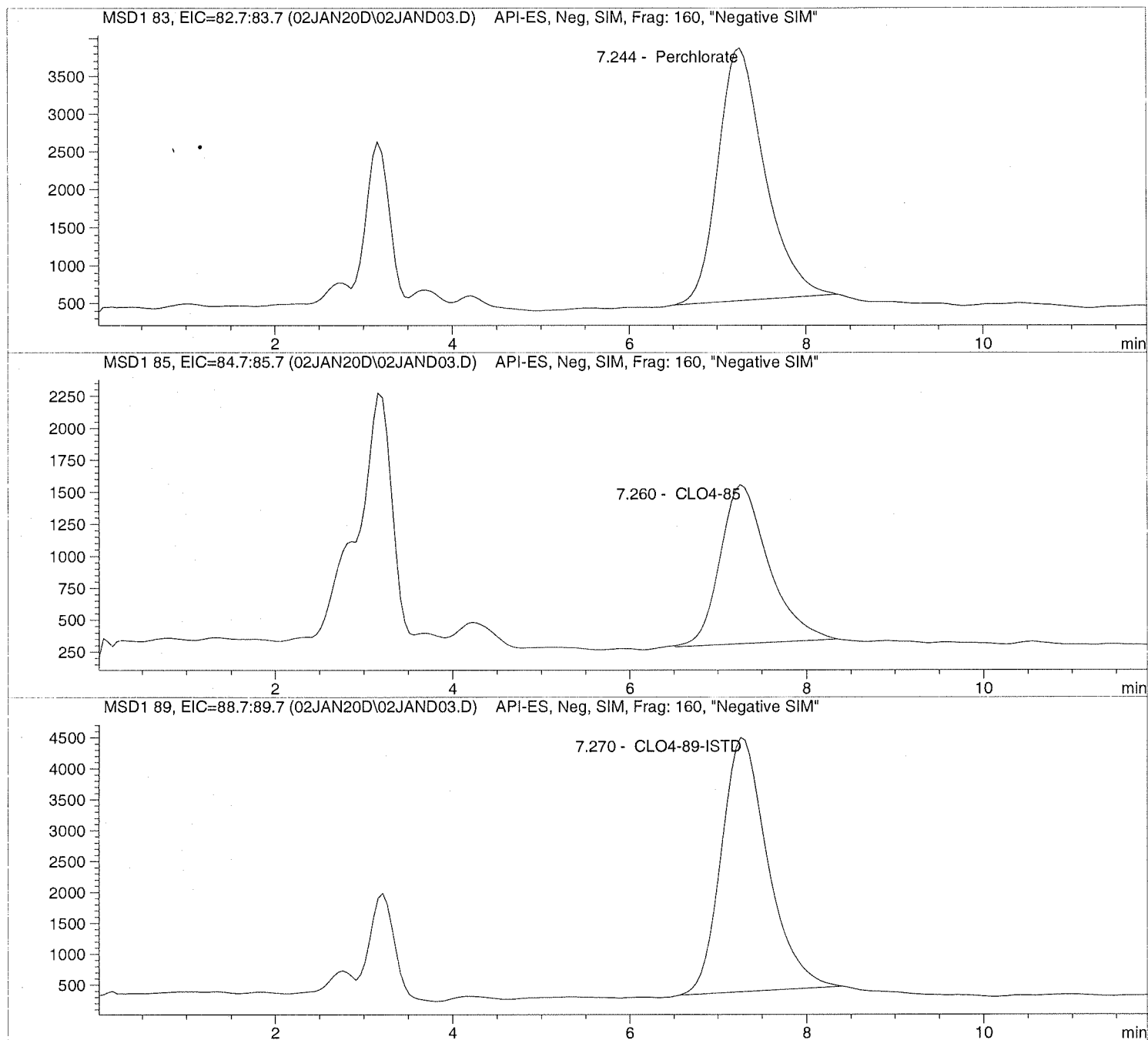
Sample Name: 690688 ICS@3.0

Injection Date: 1/02/2020 13:40:06
Sample Name: 690688 ICS@3.0
Acq Operator: TNB

Seq Line: 3
Location: Vial 73
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND03.D

Sample Name: 690688 ICS@3.0

```

=====
Injection Date: 1/02/2020 13:40:06      Seq Line:          3
Sample Name:   690688 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
7.244	BBA	121919.3	2.9898	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.260	BBA	47294.6	3.7189	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.270	PBA	150034.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND04.D

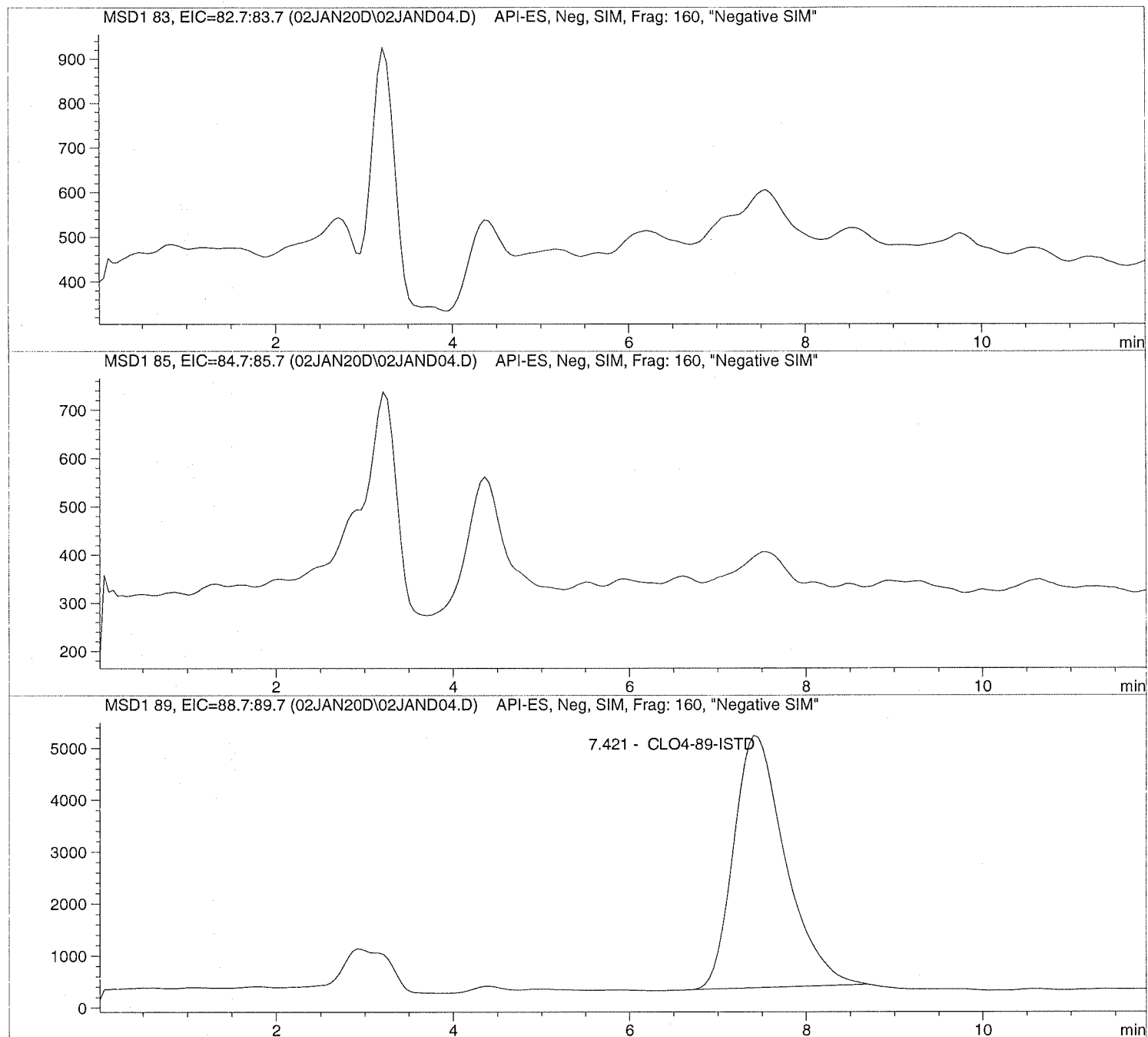
Sample Name: 690689 LMB

Injection Date: 1/02/2020 13:54:01
Sample Name: 690689 LMB
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND04.D Sample Name: 690689 LMB

```

=====
Injection Date: 1/02/2020 13:54:01      Seq Line: 4
Sample Name: 690689 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
7.421	PBA	197614.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND05.D

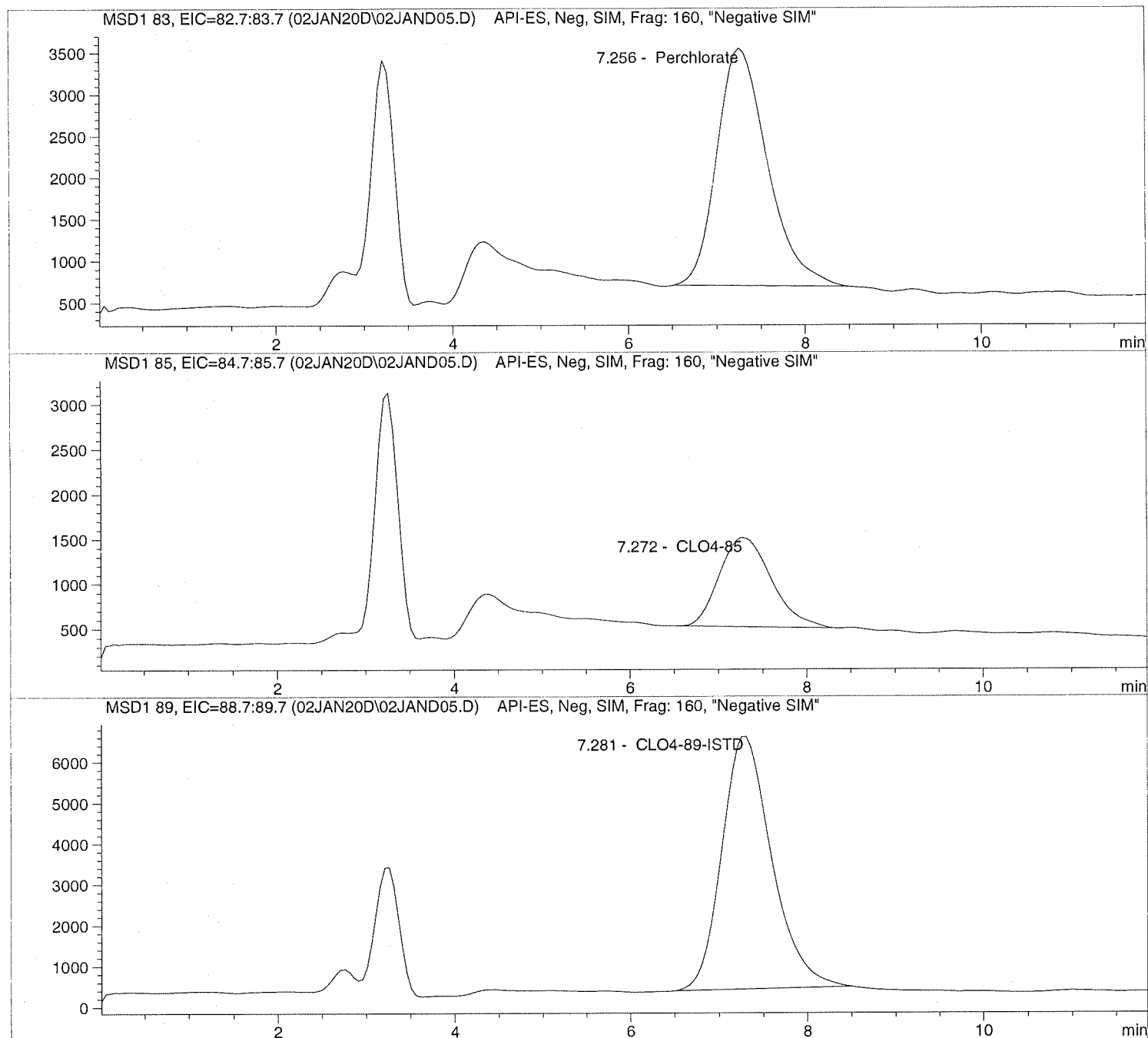
Sample Name: 1935912001

Injection Date: 1/02/2020 14:07:55
Sample Name: 1935912001
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND05.D

Sample Name: 1935912001

```

=====
Injection Date: 1/02/2020 14:07:55      Seq Line: 5
Sample Name: 1935912001                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
7.256	PBA	113185.7	1.6970	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.272	PBA	40529.4	1.9150	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.281	PBA	241856.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND06.D

Sample Name: 1935913001 1K

Injection Date: 1/02/2020 14:21:57

Seq Line: 6

Sample Name: 1935913001 1K

Location: Vial 76

Acq Operator: TNB

Inj. No.: 1

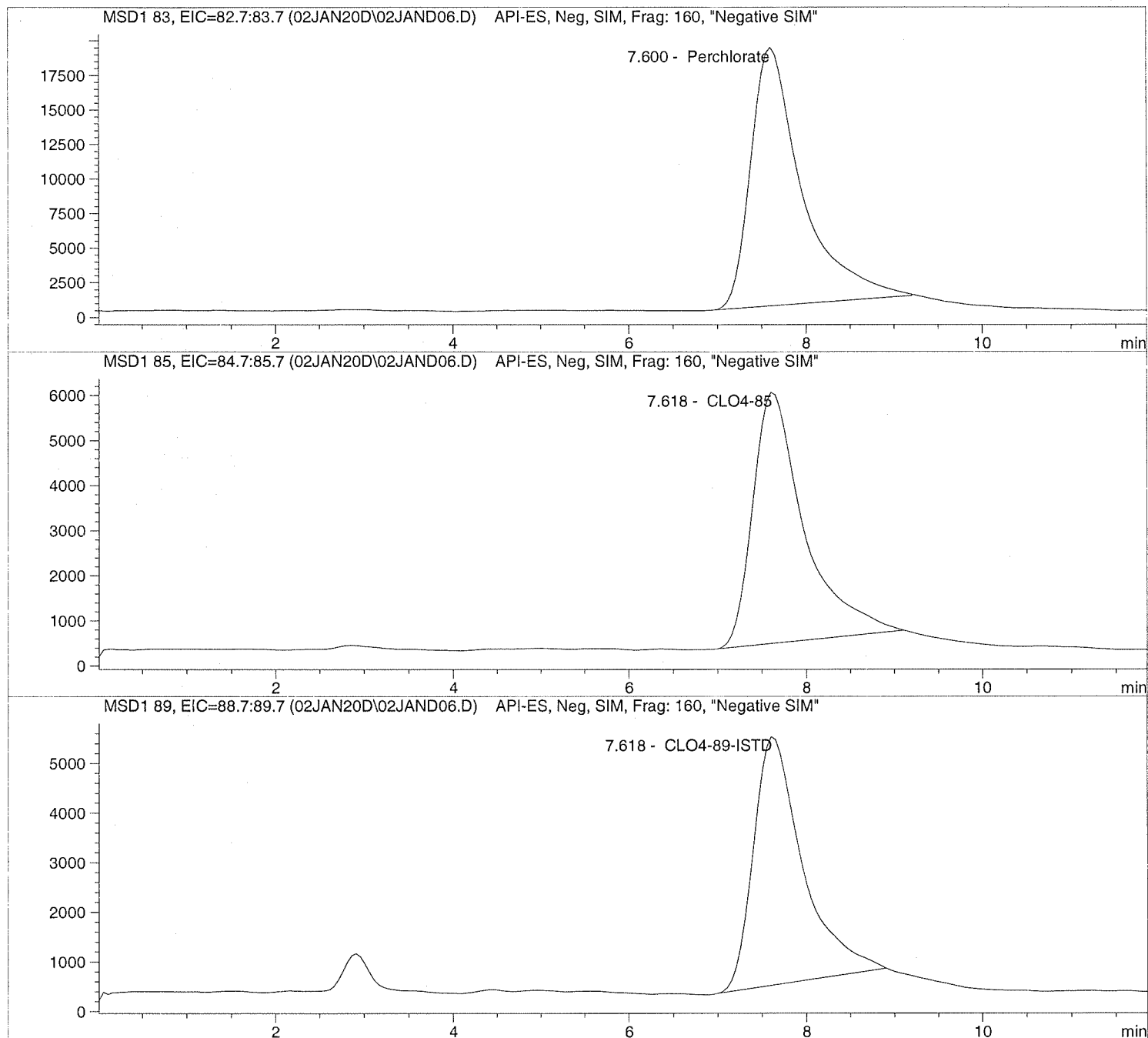
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND06.D Sample Name: 1935913001 1K

```

=====
Injection Date: 1/02/2020 14:21:57      Seq Line:      6
Sample Name:    1935913001 1K           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
7.600	PBA	750336.3	13.8538	Perchlorate <i>γ</i> 1,000. DILUTION

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.618	PBA	224222.5	13.5142	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.618	PBA	193759.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND07.D

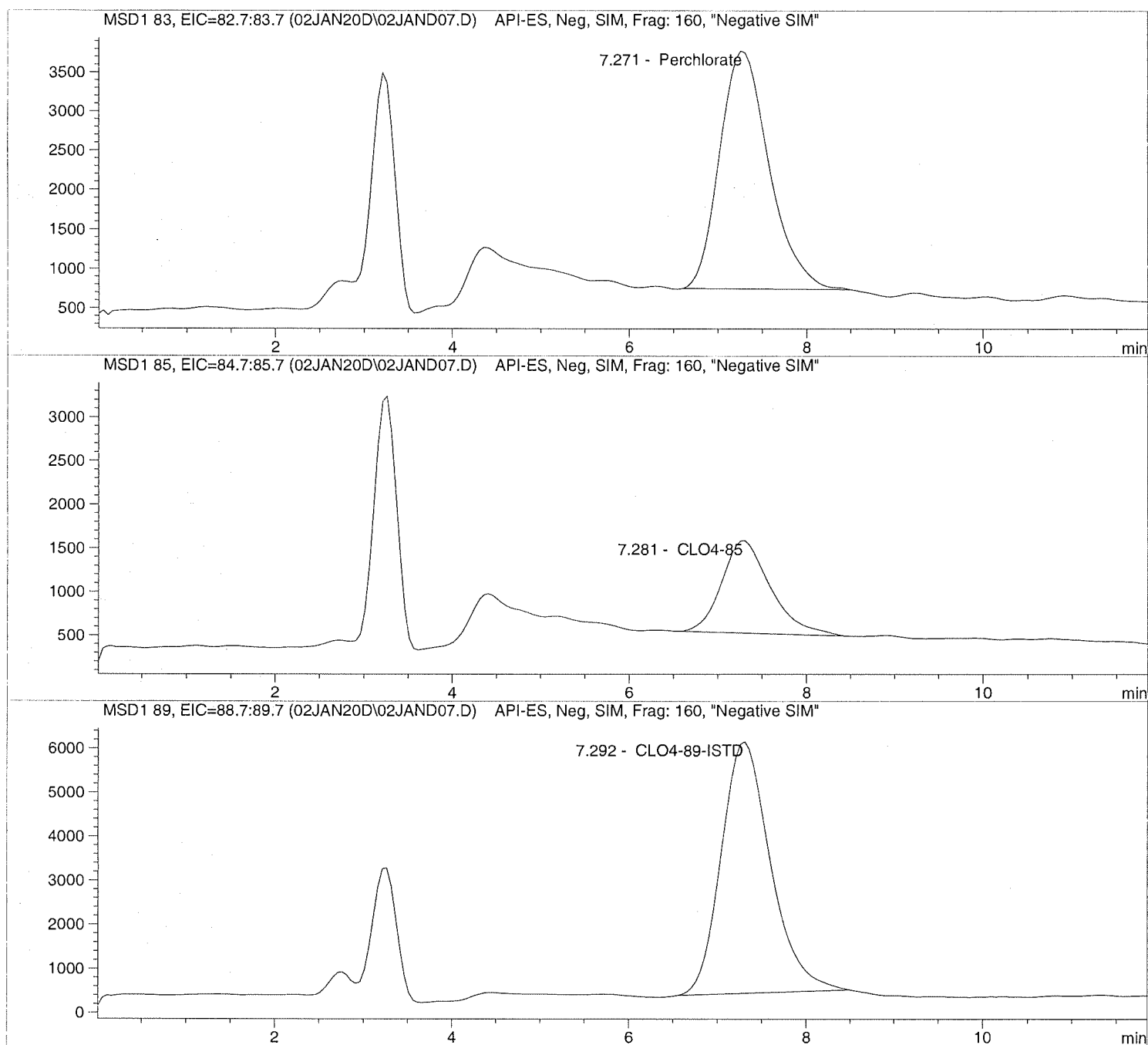
Sample Name: 1935914001

Injection Date: 1/02/2020 14:35:49
Sample Name: 1935914001
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND07.D

Sample Name: 1935914001

```

=====
Injection Date: 1/02/2020 14:35:49      Seq Line: 7
Sample Name: 1935914001                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
7.271	PBA	116448.2	1.9306	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.281	PBA	40677.7	2.1310	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.292	PBA	219725.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND08.D

Sample Name: 1935915001

Injection Date: 1/02/2020 14:49:42

Seq Line: 8

Sample Name: 1935915001

Location: Vial 78

Acq Operator: TNB

Inj. No.: 1

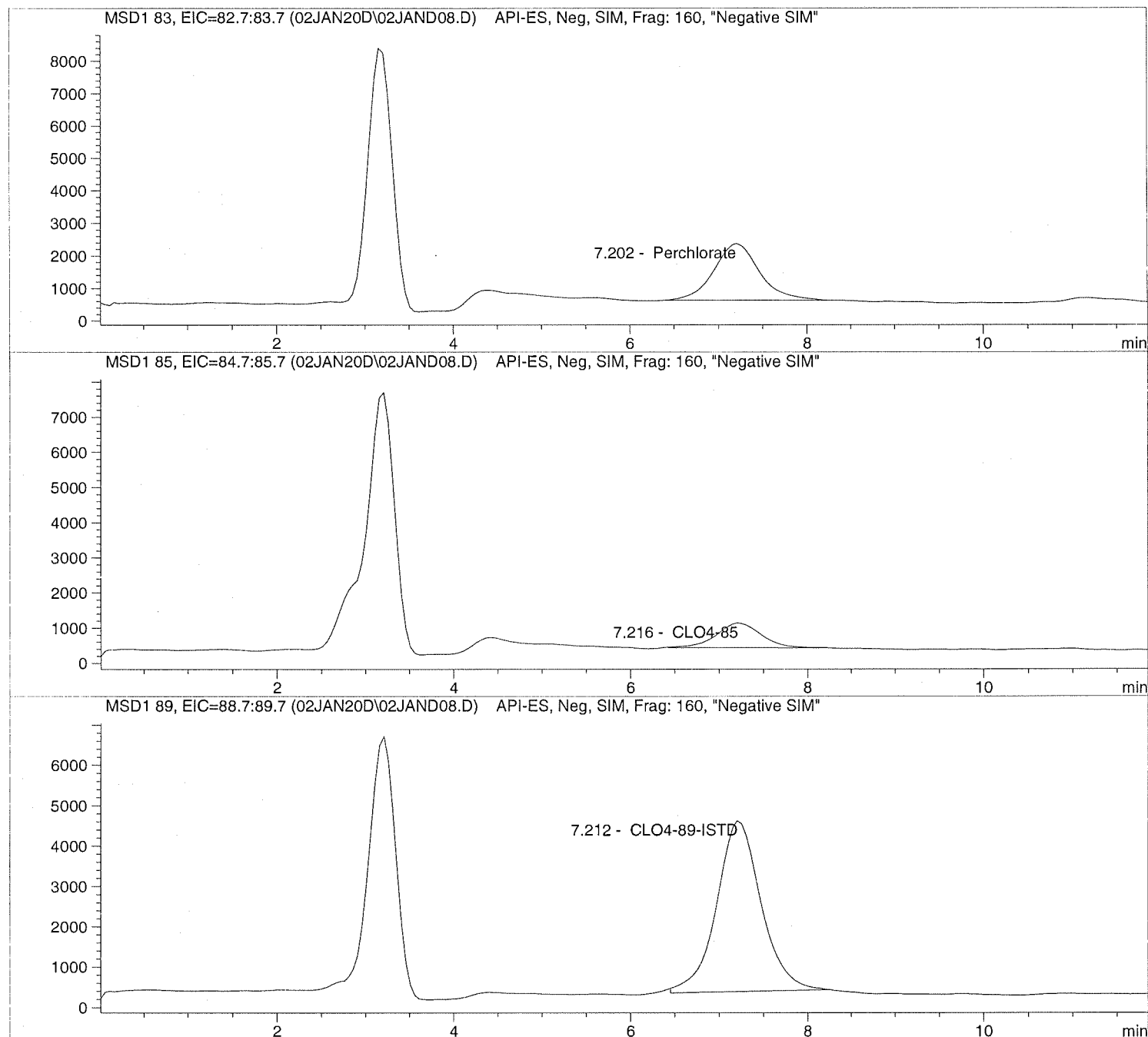
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND08.D

Sample Name: 1935915001

```

=====
Injection Date: 1/02/2020 14:49:42      Seq Line:      8
Sample Name:   1935915001                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
7.202	PBA	62635.7	1.5306	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.216	BBA	25080.2	1.9418	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.212	BBA	147744.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND09.D

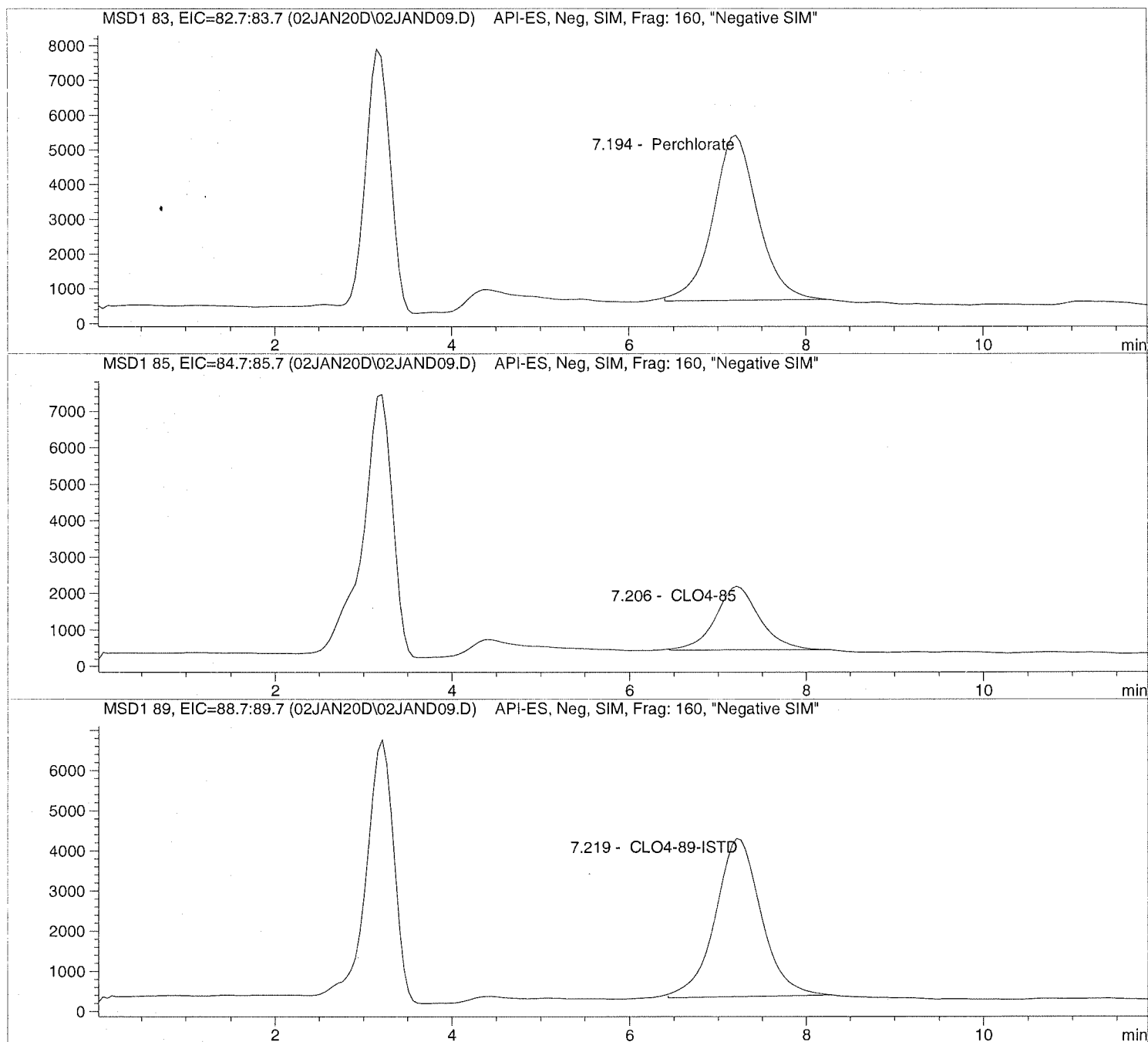
Sample Name: 1935915002 MS

Injection Date: 1/02/2020 15:03:34
Sample Name: 1935915002 MS
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND09.D Sample Name: 1935915002 MS

```

=====
Injection Date: 1/02/2020 15:03:34      Seq Line:          9
Sample Name:    1935915002  MS          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
7.194	BBA	167717.7	4.3410	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.206	BBA	60497.7	5.0378	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.219	BBA	142468.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND10.D

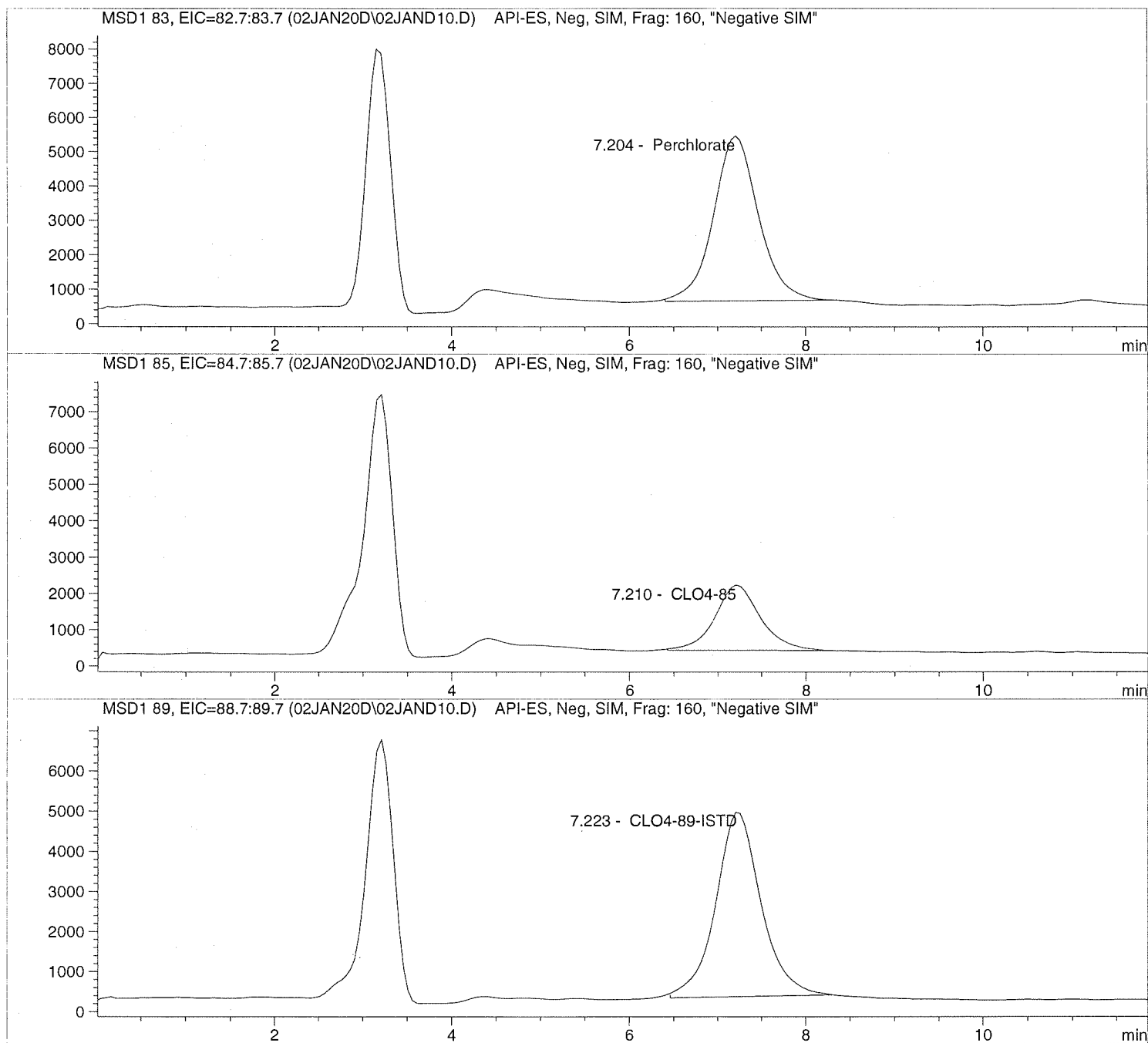
Sample Name: 1935915003 MSD

Injection Date: 1/02/2020 15:17:28
Sample Name: 1935915003 MSD
Acq Operator: TNB

Seq Line: 10
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND10.D Sample Name: 1935915003 MSD

```

=====
Injection Date: 1/02/2020 15:17:28      Seq Line:      10
Sample Name:    1935915003  MSD          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
7.204	BBA	170226.0	3.8097	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.210	BBA	65303.6	4.6989	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.223	BBA	164738.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND11.D

Sample Name: 1935915004

Injection Date: 1/02/2020 15:31:32

Seq Line: 11

Sample Name: 1935915004

Location: Vial 81

Acq Operator: TNB

Inj. No.: 1

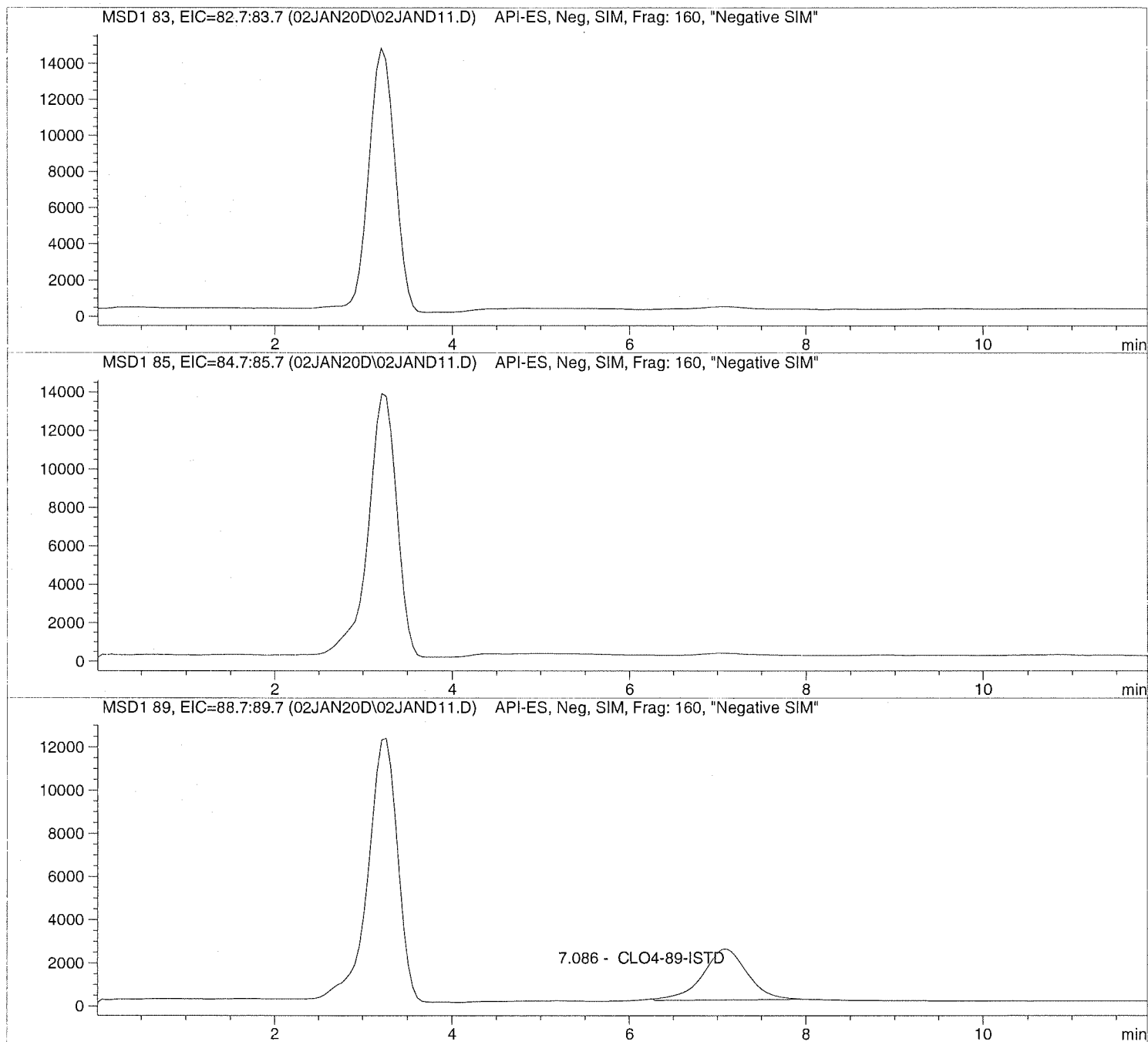
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND11.D Sample Name: 1935915004

```

=====
Injection Date: 1/02/2020 15:31:32      Seq Line:      11
Sample Name:    1935915004              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:       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
7.086	BBA	82619.0	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND12.D

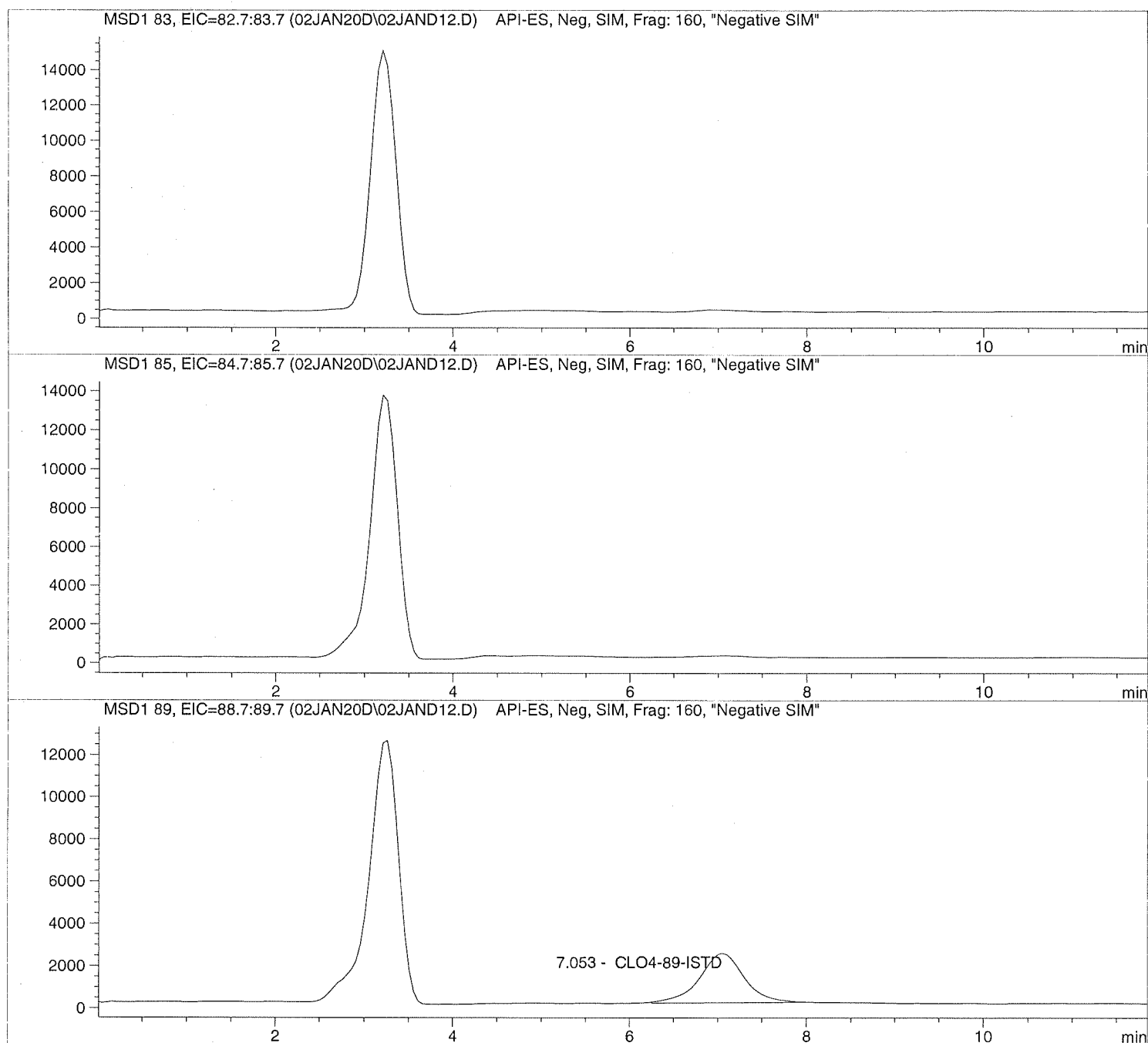
Sample Name: 1935915005

Injection Date: 1/02/2020 15:45:23
Sample Name: 1935915005
Acq Operator: TNB

Seq Line: 12
Location: Vial 82
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND12.D

Sample Name: 1935915005

```

=====
Injection Date: 1/02/2020 15:45:23      Seq Line:      12
Sample Name:   1935915005              Location:      Vial 82
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
7.053	BBA	81637.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND13.D

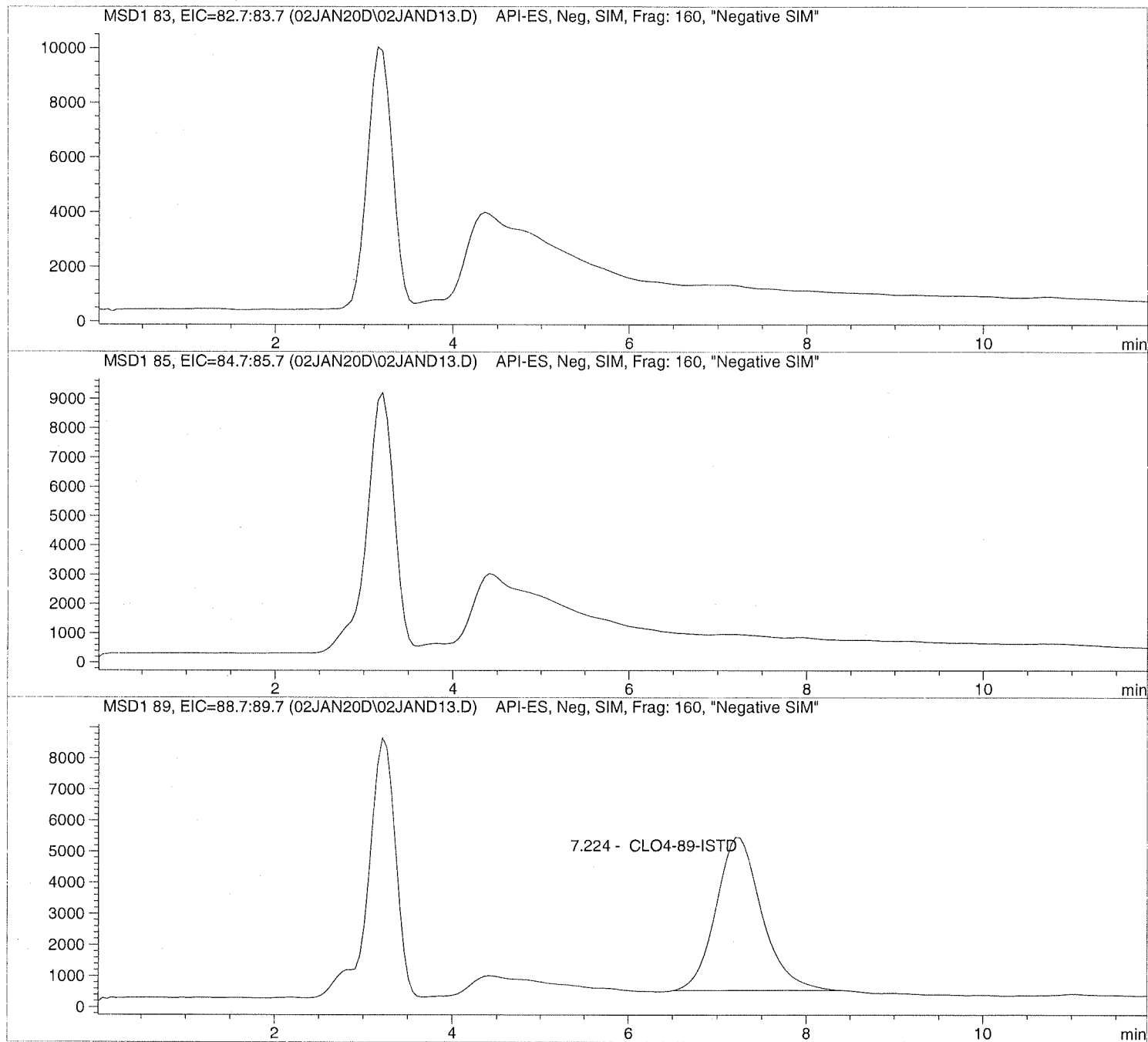
Sample Name: 1935915006

Injection Date: 1/02/2020 15:59:22
Sample Name: 1935915006
Acq Operator: TNB

Seq Line: 13
Location: Vial 83
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND13.D

Sample Name: 1935915006

```

=====
Injection Date: 1/02/2020 15:59:22      Seq Line:          13
Sample Name:   1935915006                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:           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
7.224	PBA	175700.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND14.D

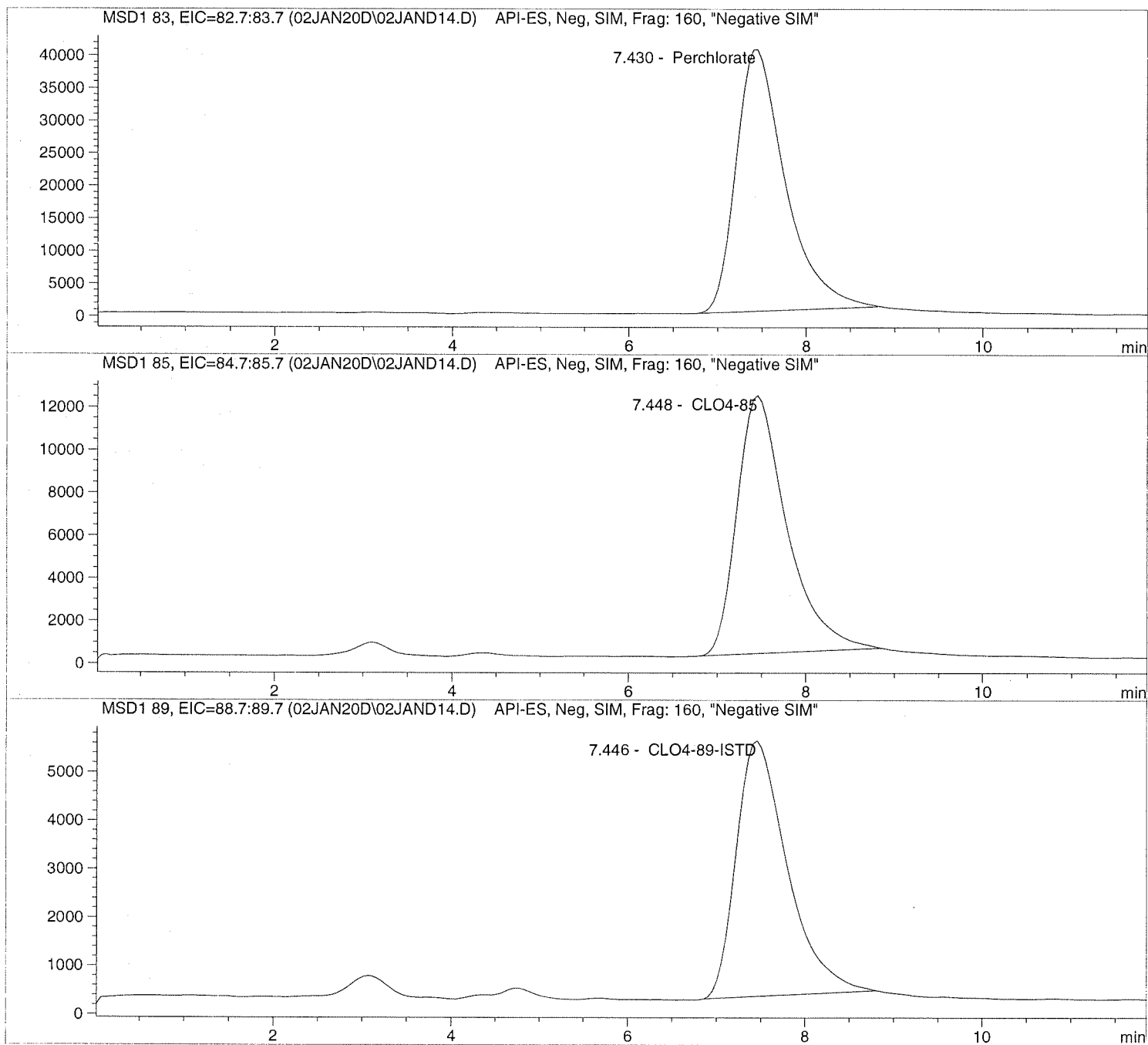
Sample Name: 690690 CCV@25

Injection Date: 1/02/2020 16:13:13
Sample Name: 690690 CCV@25
Acq Operator: TNB

Seq Line: 14
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND14.D Sample Name: 690690 CCV@25

```

=====
Injection Date: 1/02/2020 16:13:13      Seq Line:      14
Sample Name:    690690  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
7.430	PBA	1556973.9	25.1820	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.448	PBA	473140.5	25.1044	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.446	PBA	211105.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND15.D

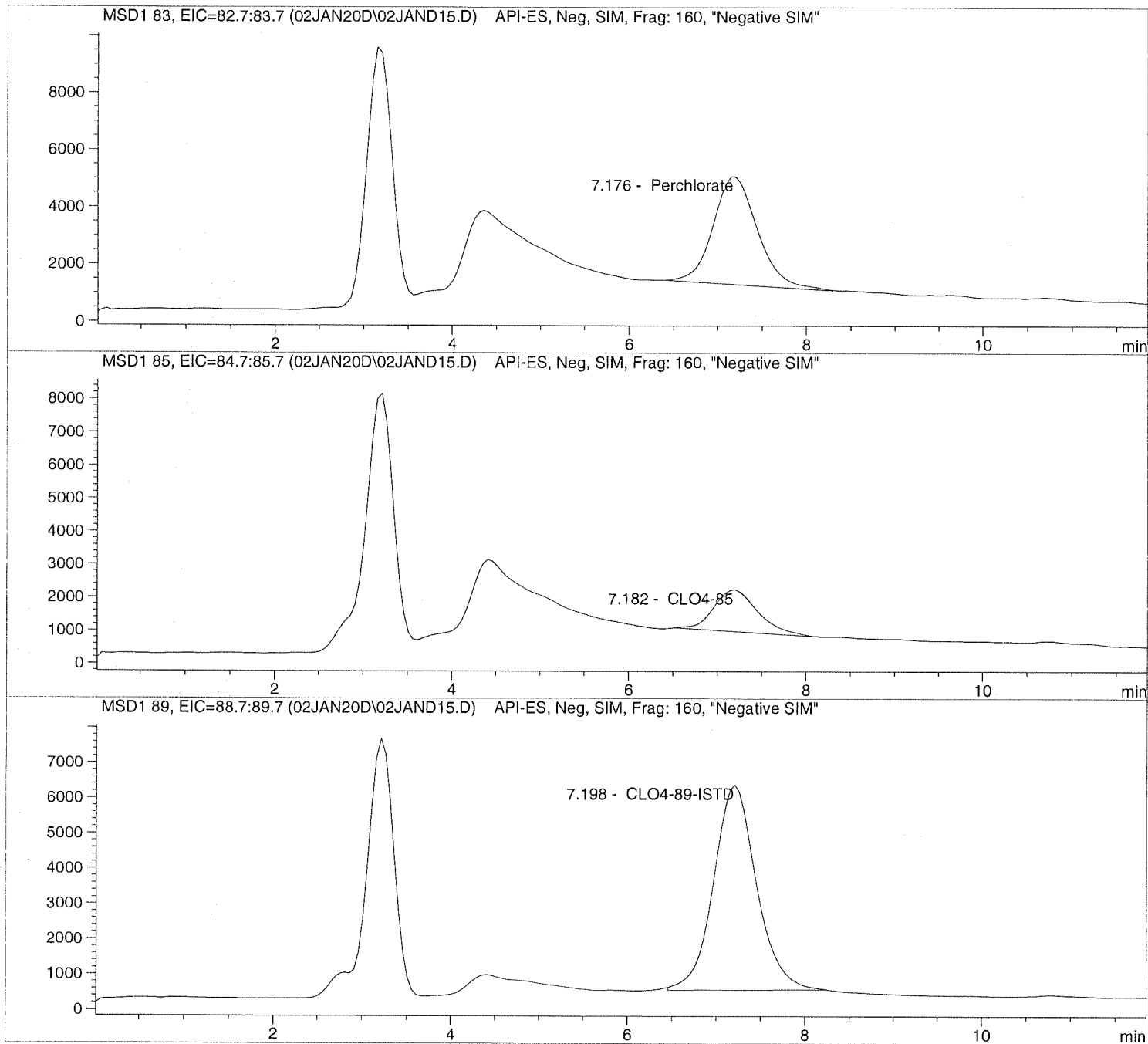
Sample Name: 1935915007 MS

Injection Date: 1/02/2020 16:27:04
Sample Name: 1935915007 MS
Acq Operator: TNB

Seq Line: 15
Location: Vial 84
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\02JAN20D\02JAND15.D Sample Name: 1935915007 MS

```

=====
Injection Date: 1/02/2020 16:27:04      Seq Line: 15
Sample Name: 1935915007      MS      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: 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
7.176	BBA	131015.0	2.4565	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.182	PBA	43555.4	2.5920	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.198	BBA	195563.0	5.0000	CLO4-89-ISTD

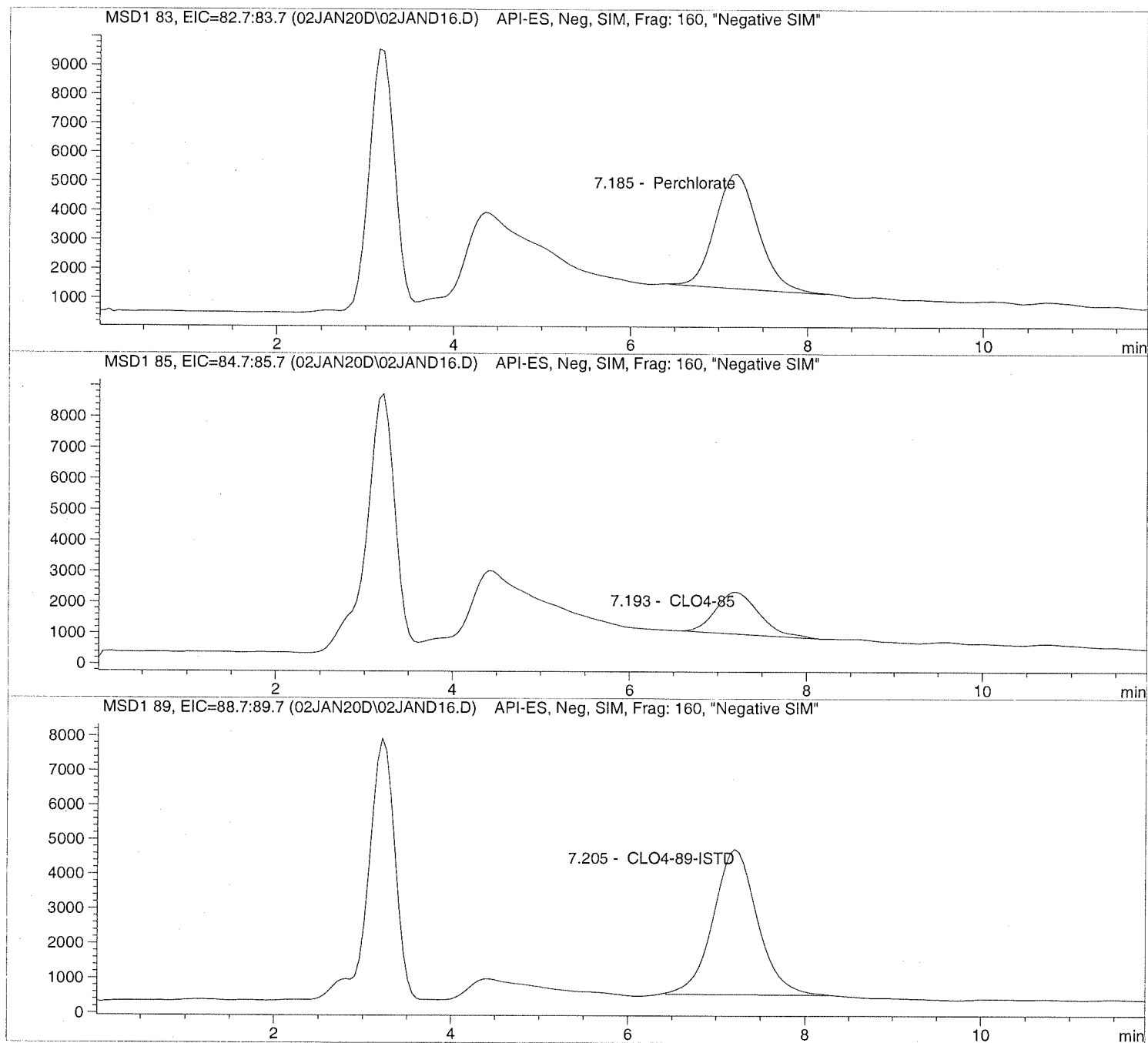
=====
*** End of Report ***
=====

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND16.D Sample Name: 1935915008 MSD

=====
Injection Date: 1/02/2020 16:41:07 Seq Line: 16
Sample Name: 1935915008 MSD 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\02JAN20D\02JAND16.D Sample Name: 1935915008 MSD

```

=====
Injection Date: 1/02/2020 16:41:07      Seq Line:      16
Sample Name:   1935915008  MSD          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:      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
7.185	BBA	132259.5	3.3466	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.193	PBA	46493.2	3.7688	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.205	BBA	145588.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

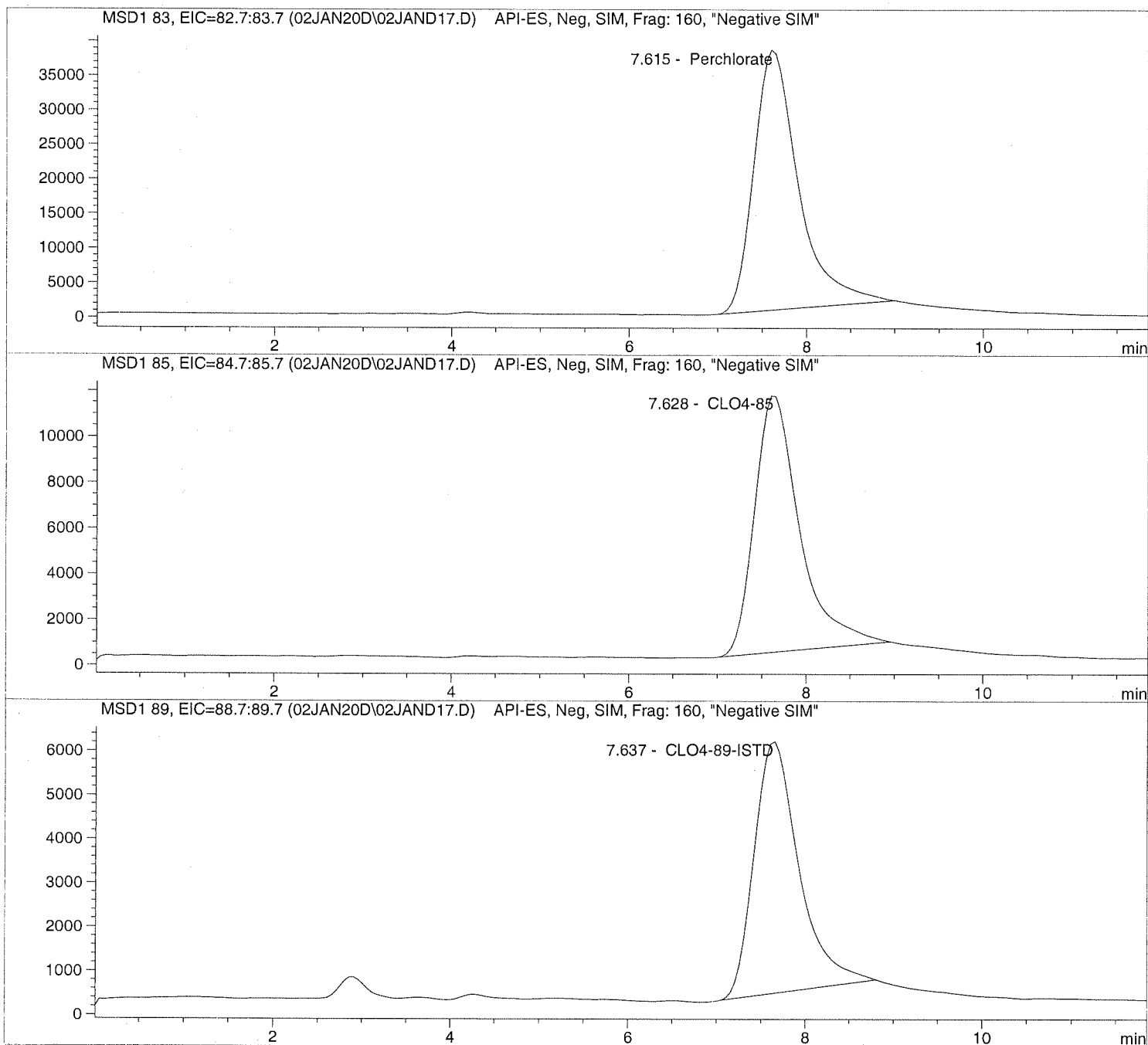
```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND17.D Sample Name: 1935915009 1K

=====
Injection Date: 1/02/2020 16:54:59 Seq Line: 17
Sample Name: 1935915009 1K 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\02JAN20D\02JAND17.D Sample Name: 1935915009 1K

```
=====
Injection Date: 1/02/2020 16:54:59      Seq Line:      17
Sample Name:    1935915009 1K           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:      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
7.615	PBA	1320092.9	22628.1935	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.628	PBA	397733.8	22358.4905	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.637	PBA	201299.8	5000.0000	CLO4-89-ISTD

=====
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND18.D

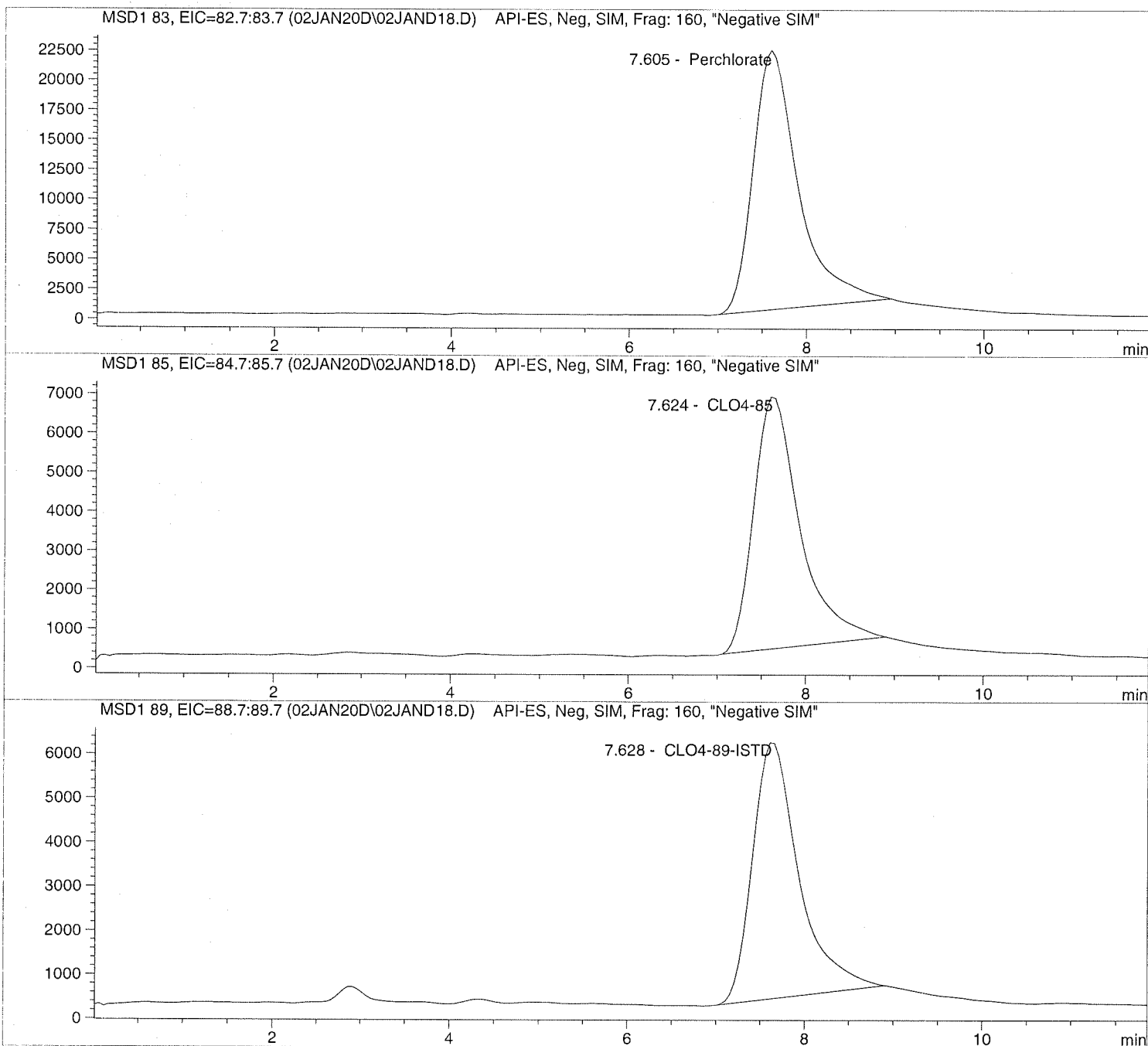
Sample Name: 1935915010 10K

Injection Date: 1/02/2020 17:08:52
Sample Name: 1935915010 10K
Acq Operator: TNB

Seq Line: 18
Location: Vial 87
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND18.D Sample Name: 1935915010 10K

```

=====
Injection Date: 1/02/2020 17:08:52      Seq Line:      18
Sample Name:   1935915010 10K          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:      10000.000000
Sample Amount: 0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.605	PBA	768865.3	130446.8924	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.624	PBA	235180.4	130044.7637	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.628	PBA	211545.7	50000.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND19.D

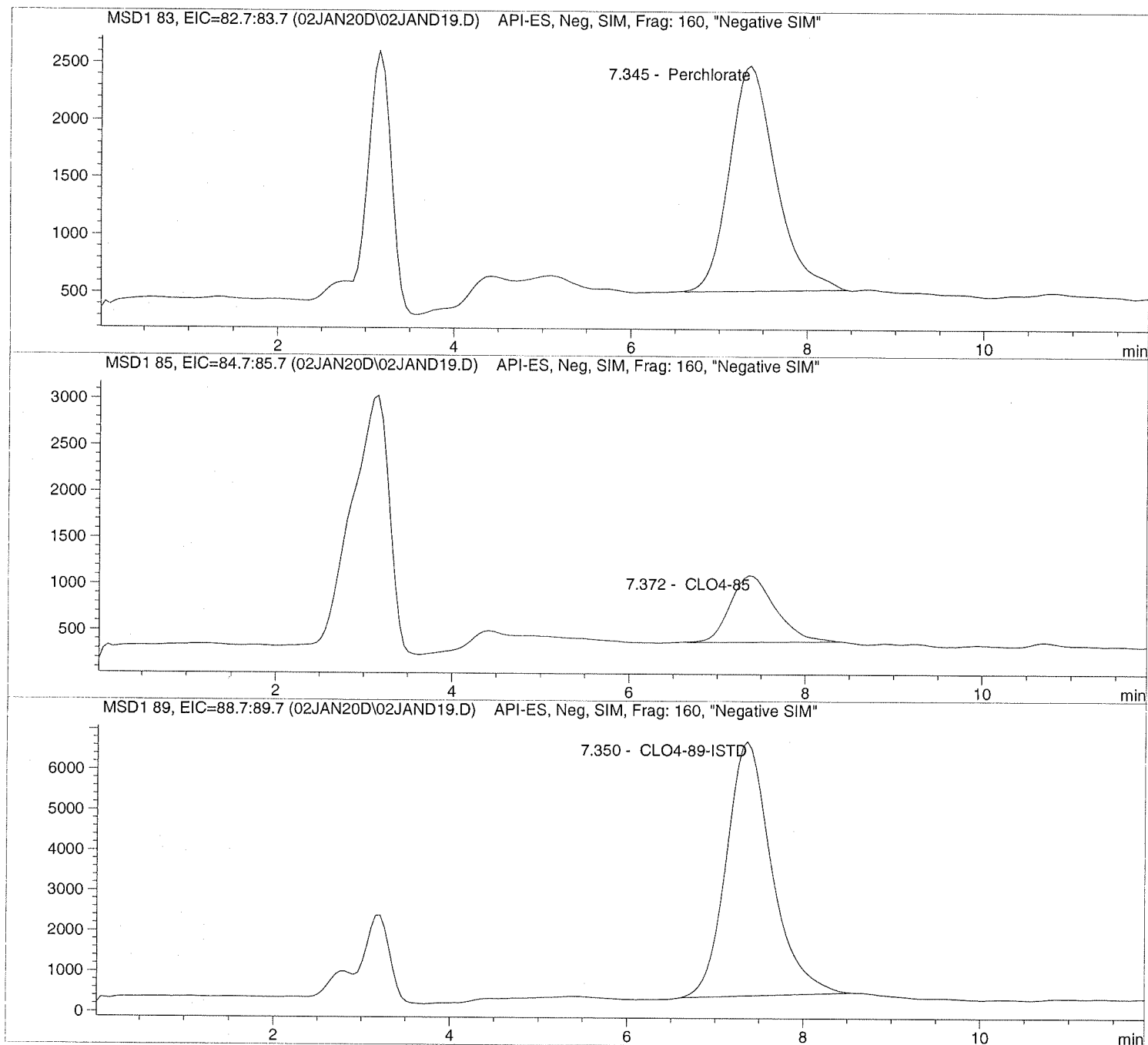
Sample Name: 1935915011

Injection Date: 1/02/2020 17:22:48
Sample Name: 1935915011
Acq Operator: TNB

Seq Line: 19
Location: Vial 88
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\02JAN20D\02JAND19.D Sample Name: 1935915011

```

=====
Injection Date: 1/02/2020 17:22:48      Seq Line: 19
Sample Name: 1935915011                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: 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
7.345	BBA	72005.1	1.1283	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.372	BBA	25905.7	1.2573	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.350	BBA	226623.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND21.D

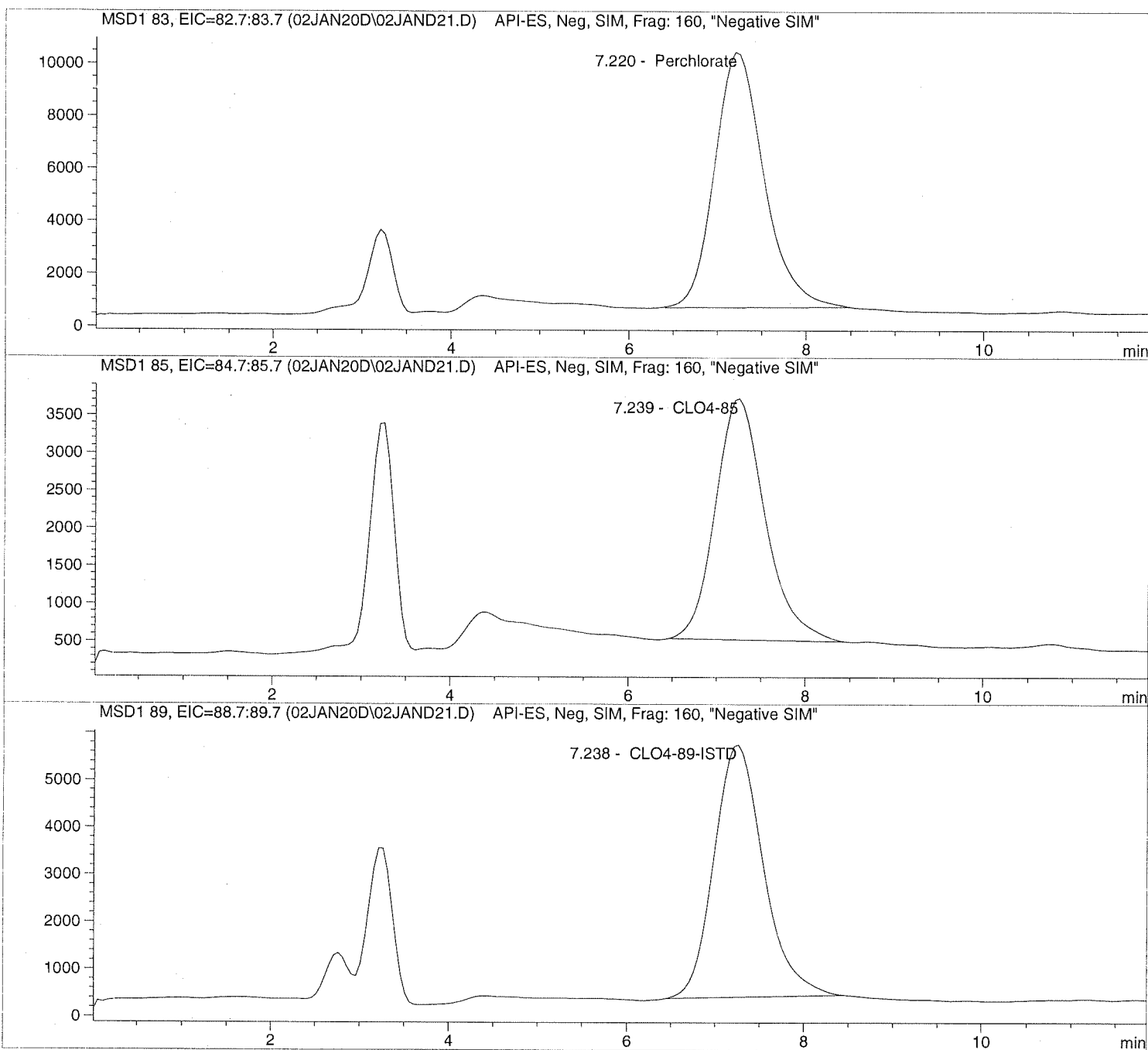
Sample Name: 1936106001

=====
Injection Date: 1/02/2020 17:50:37
Sample Name: 1936106001
Acq Operator: TNB

Seq Line: 21
Location: Vial 90
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\02JAN20D\02JAND21.D

Sample Name: 1936106001

```

=====
Injection Date: 1/02/2020 17:50:37      Seq Line:      21
Sample Name:   1936106001                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
7.220	PBA	375683.7	6.6527	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.239	PBA	125368.0	7.1746	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.238	BBA	207387.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND22.D

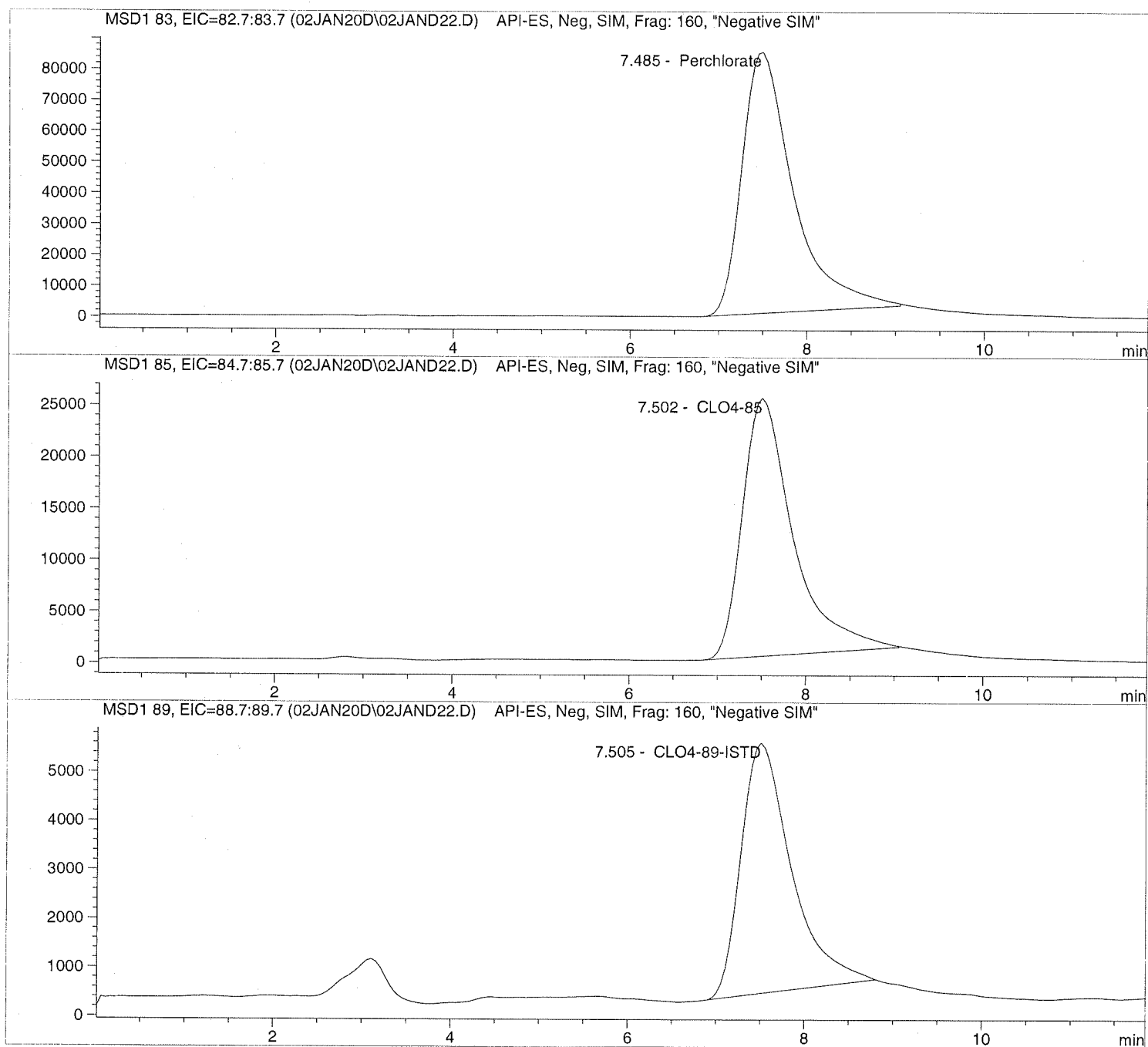
Sample Name: 1935915012 10X

Injection Date: 1/02/2020 18:04:36
Sample Name: 1935915012 10X
Acq Operator: TNB

Seq Line: 22
Location: Vial 91
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\02JAN20D\02JAND22.D Sample Name: 1935915012 10X

```

=====
Injection Date: 1/02/2020 18:04:36      Seq Line:      22
Sample Name:   1935915012 10X          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:      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
7.485	PBA	3407190.3	516.1452	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.502	PBA	999389.8	502.8506	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.505	PBA	202951.9	50.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND23.D

Sample Name: 690691 CCV@25

Injection Date: 1/02/2020 18:18:27

Seq Line: 23

Sample Name: 690691 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

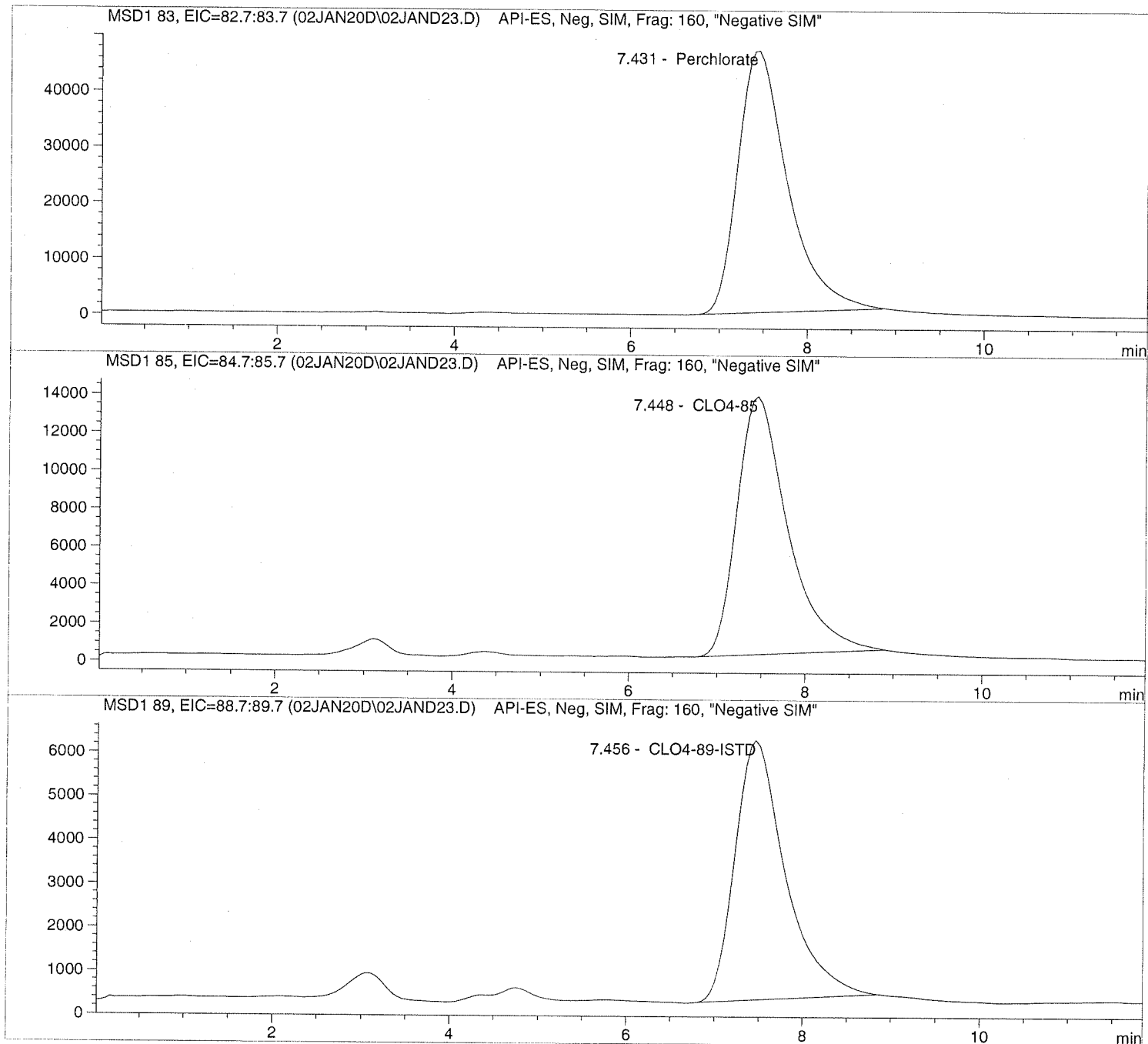
Inj. Vol.: 35 µl

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\02JAN20D\02JAND23.D

Sample Name: 690691 CCV@25

Injection Date: 1/02/2020 18:18:27
 Sample Name: 690691 CCV@25
 Acq Operator: TNB

Seq Line: 23
 Location: Vial 71
 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
7.431	PBA	1840917.4	26.5024	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.448	PBA	541119.1	25.6437	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.456	PBA	235883.1	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	ISTD Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
 Signal 2: MSD1 85, EIC=84.7:85.7
 Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref	Grp Name
7.750	1 3	1.00000	5.39218e4	1.85454e-5	1	Perchlorate
	4	2.00000	1.32825e5	1.50574e-5		
	5	5.00000	2.76271e5	1.80982e-5		
	6	10.00000	5.61298e5	1.78159e-5		
	7	25.00000	1.51820e6	1.64669e-5		
	8	50.00000	3.31156e6	1.50986e-5		
	9	75.00000	5.23914e6	1.43153e-5		
7.767	3 3	5.00000	2.14568e5	2.33026e-5	+I1	CLO4-89-ISTD
	4	5.00000	2.04758e5	2.44190e-5		
	5	5.00000	2.13407e5	2.34294e-5		
	6	5.00000	2.09246e5	2.38953e-5		
	7	5.00000	2.07403e5	2.41077e-5		
	8	5.00000	2.02929e5	2.46391e-5		
	9	5.00000	1.97933e5	2.52611e-5		
7.778	2 3	1.00000	1.70436e4	5.86732e-5	1	CLO4-85
	4	2.00000	4.20754e4	4.75337e-5		
	5	5.00000	9.24707e4	5.40712e-5		
	6	10.00000	1.68622e5	5.93041e-5		
	7	25.00000	4.63724e5	5.39114e-5		
	8	50.00000	9.95933e5	5.02042e-5		

RetTime [min]	Lvl Sig	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

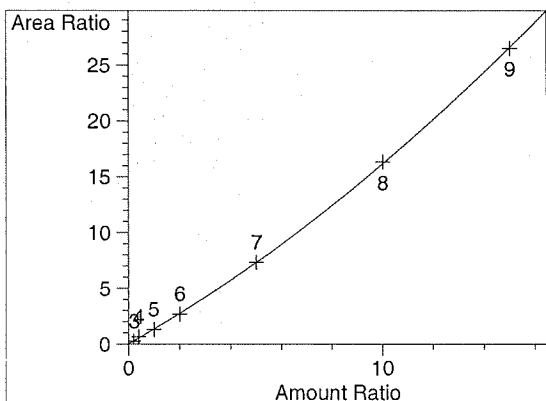
Compound: CLO4-85

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

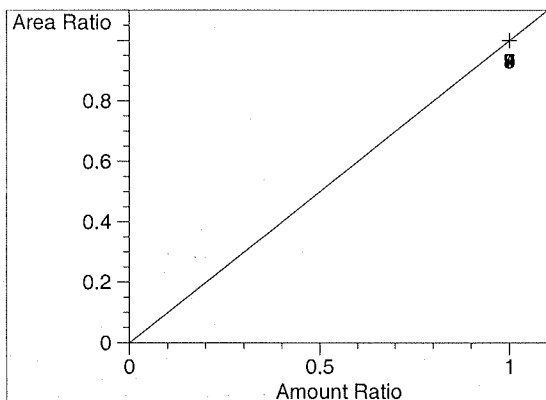
=====
 Peak Sum Table
 =====

No Entries in table
 =====

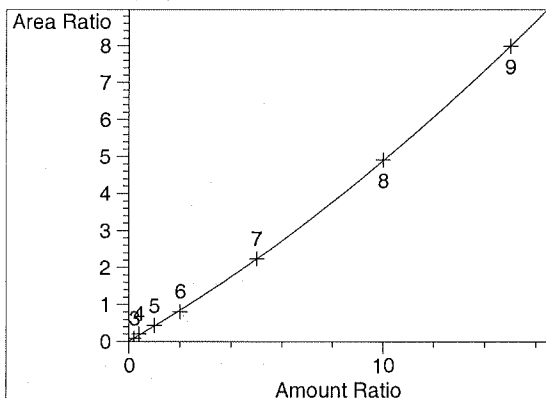
=====
 Calibration Curves
 =====



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

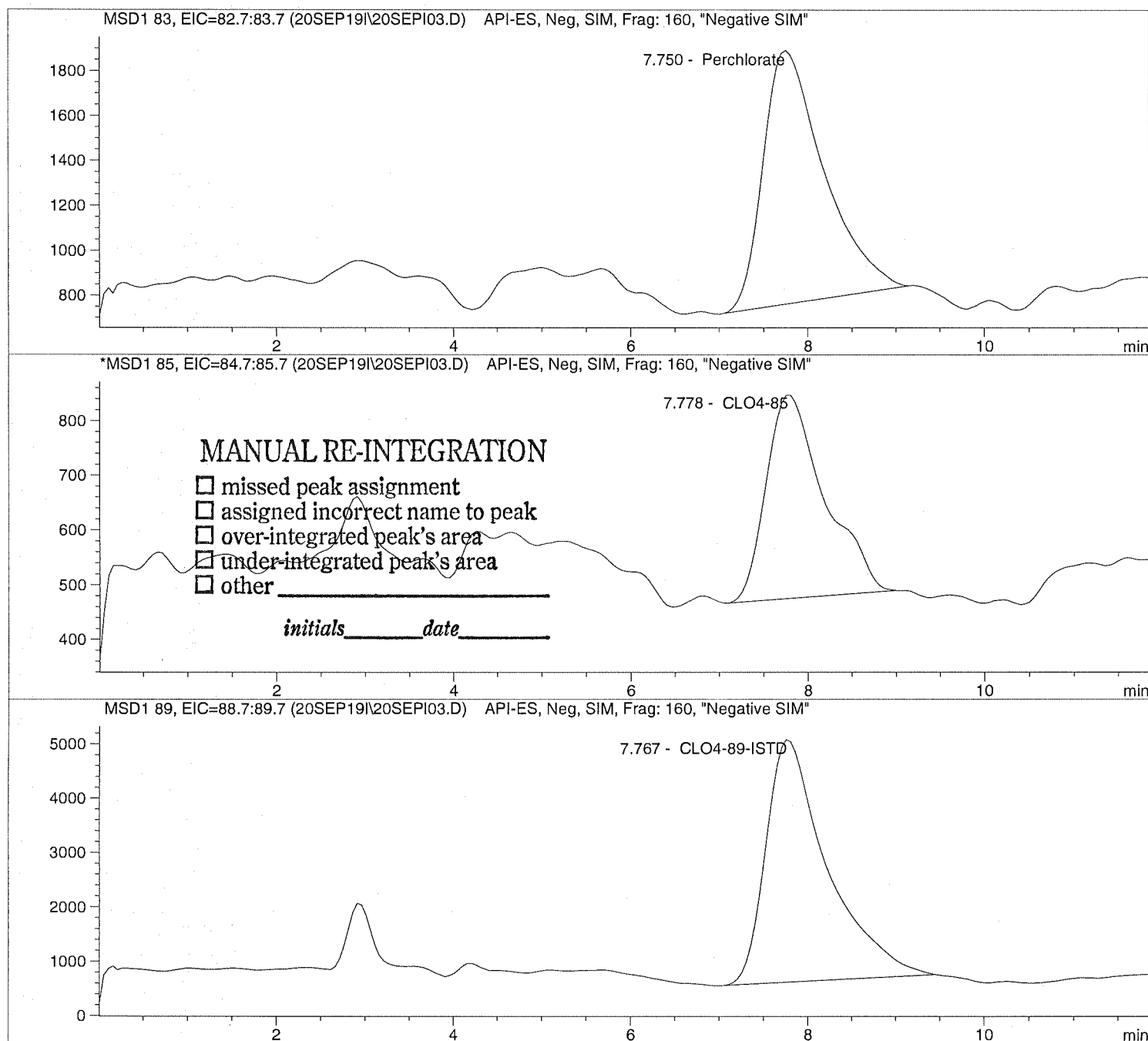
Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05
 Sample Name: CLO4@ 1.0ug/L
 Acq Operator: TNB

Seq Line: 3
 Location: Vial 73
 Inj. No.: 1
 Inj. Vol.: 30 μ l

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

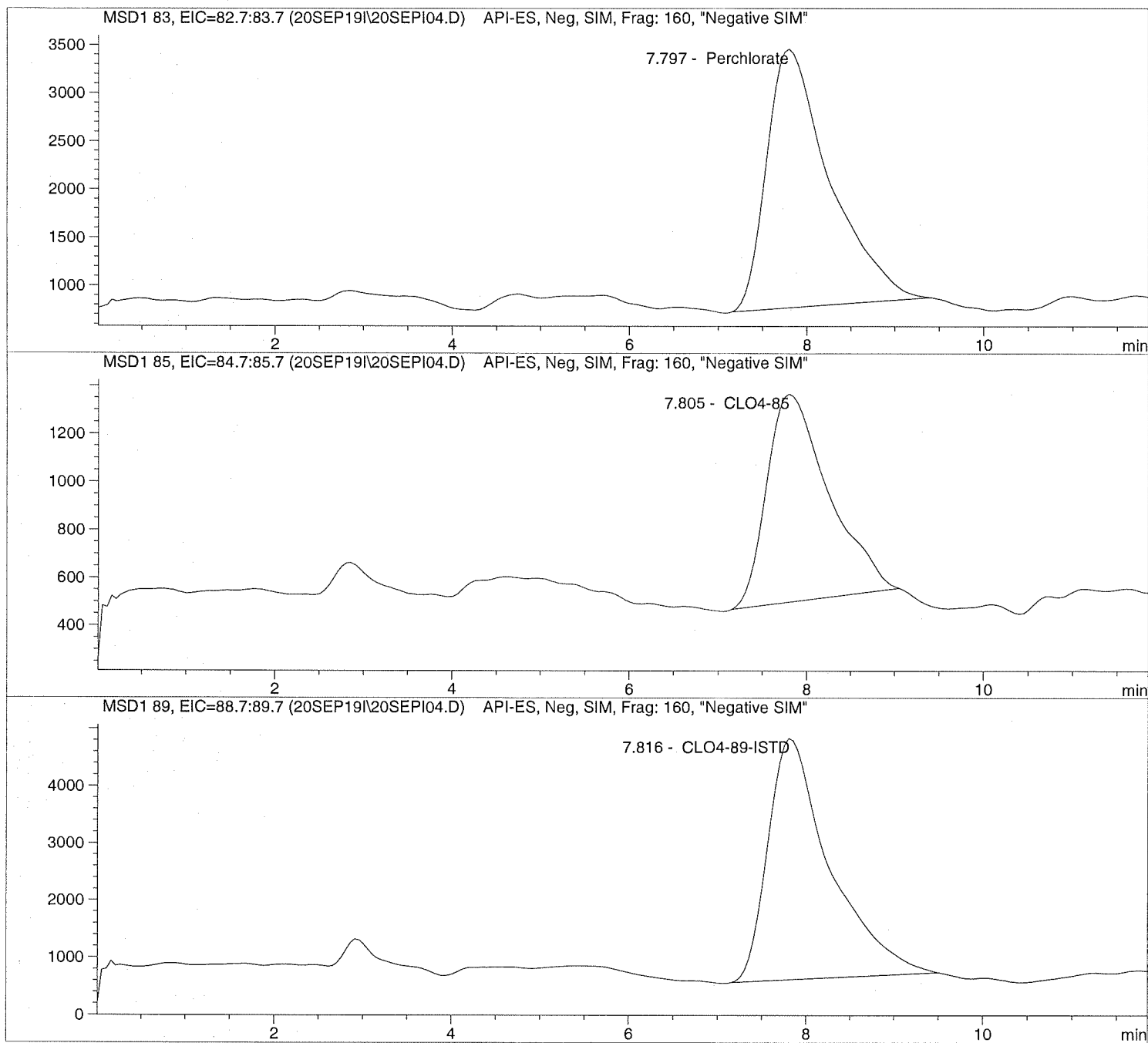
Sample Name: CLO4@ 2.0ug/L

Injection Date: 9/20/2019 09:37:58
Sample Name: CLO4@ 2.0ug/L
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
Inj. No.: 1
Inj. Vol.: 30 μ l

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

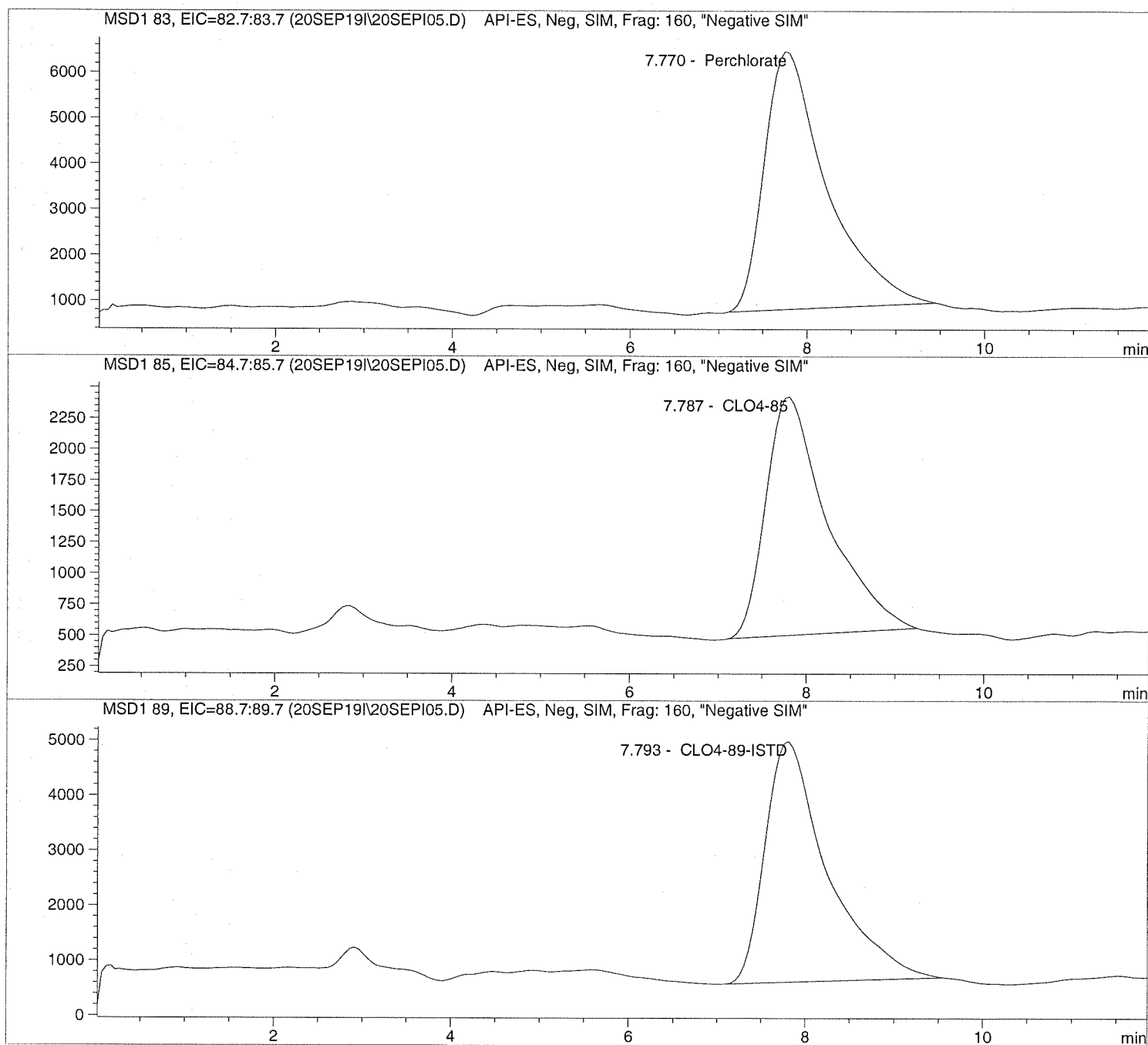
Sample Name: CLO4@ 5.0ug/L

=====
Injection Date: 9/20/2019 09:51:49
Sample Name: CLO4@ 5.0ug/L
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
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\20SEP19\20SEPI06.D

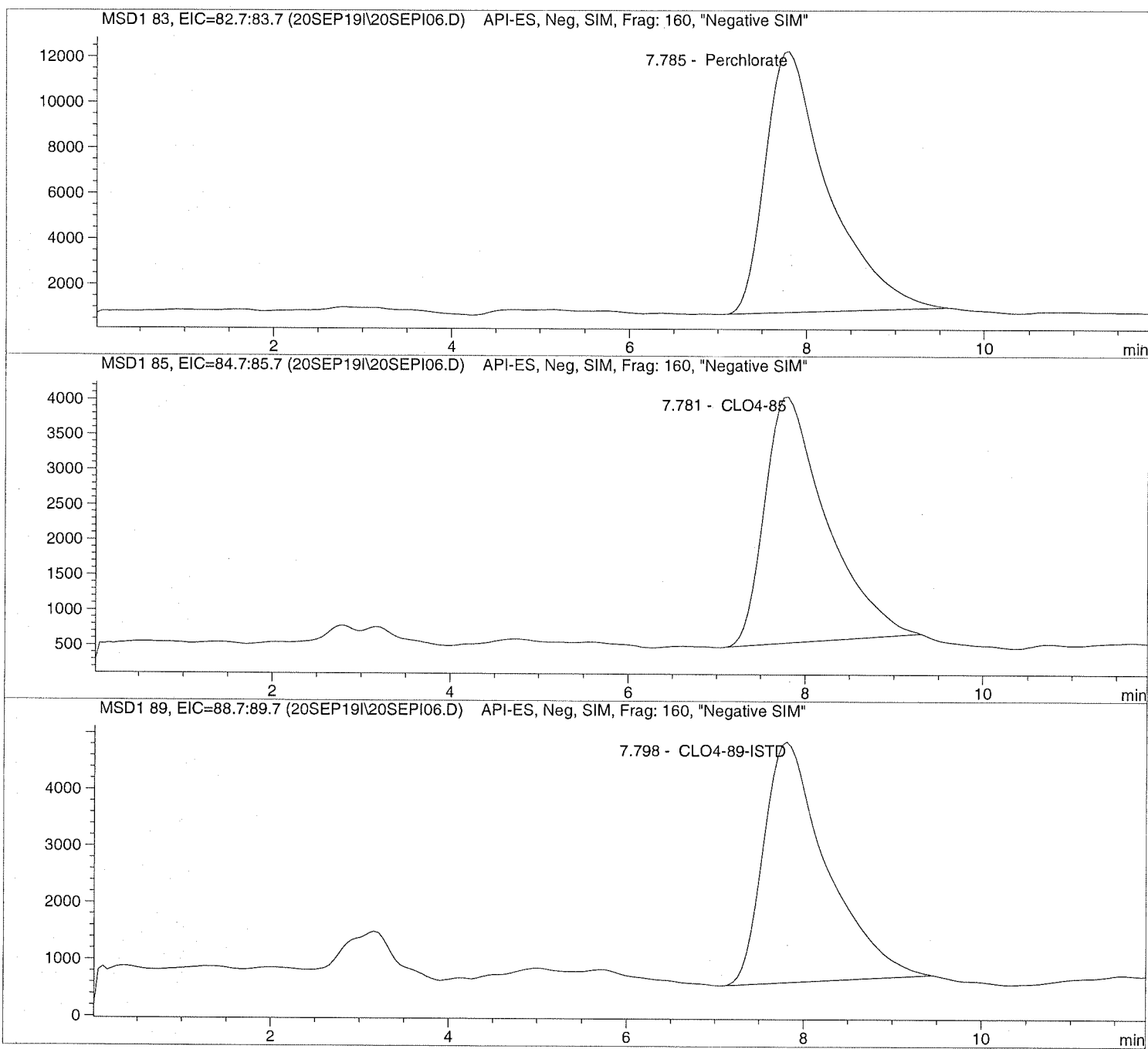
Sample Name: CLO4@ 10.ug/L

=====
Injection Date: 9/20/2019 10:05:36
Sample Name: CLO4@ 10.ug/L
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
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

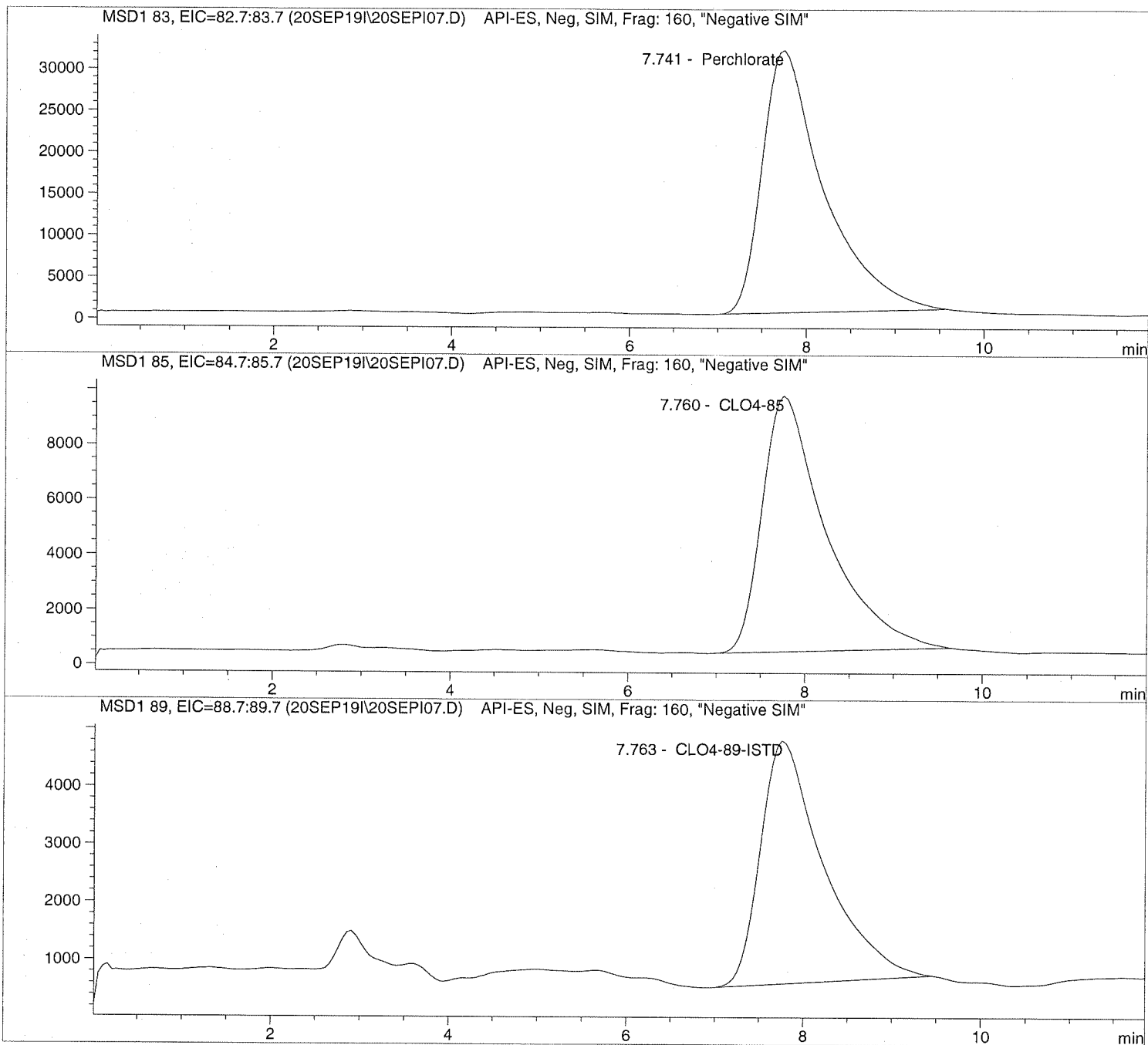
Inj. Vol.: 30 μ l

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

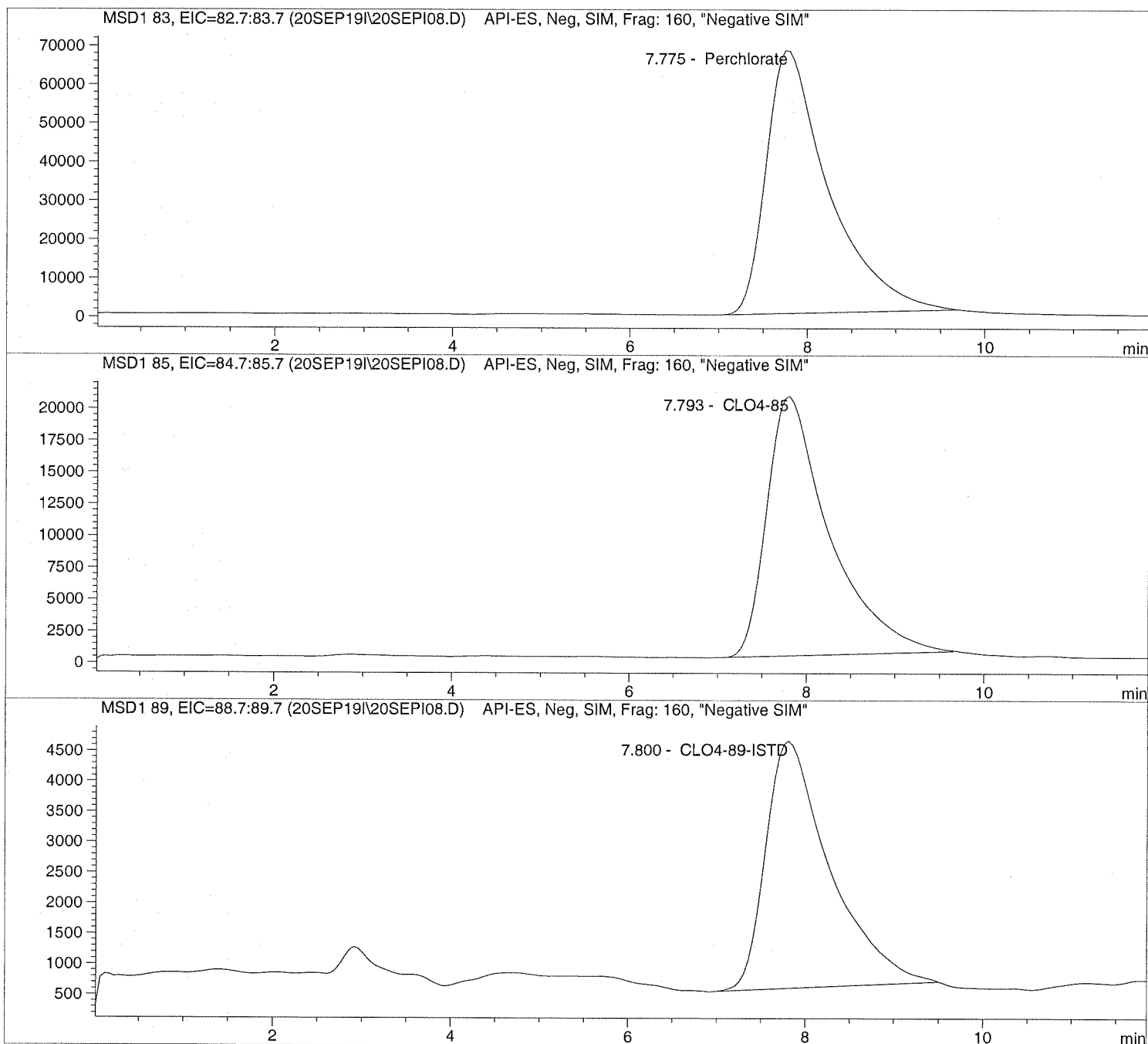
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



```

=====
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 ***
=====

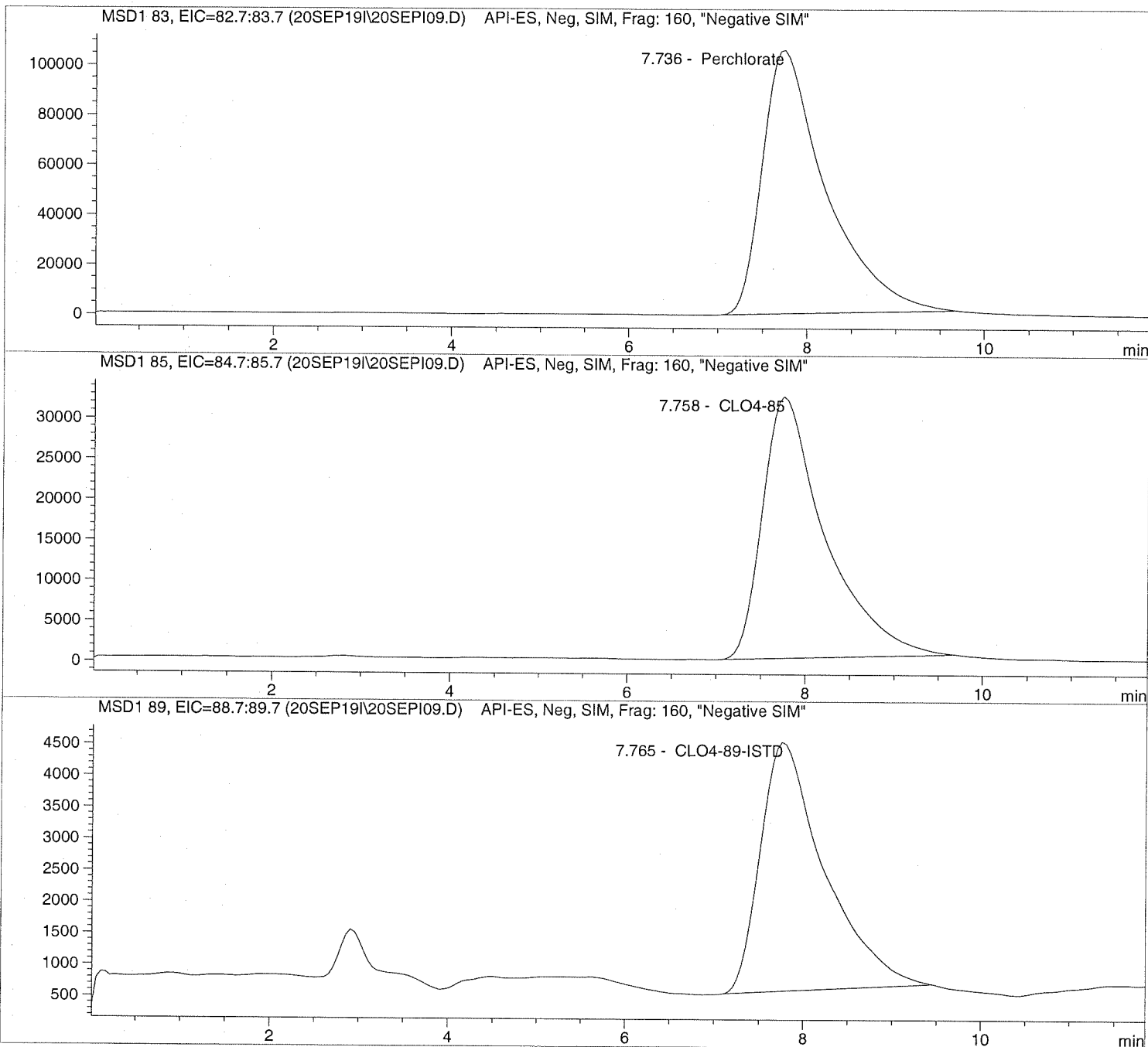
```

Injection Date: 9/20/2019 10:47:05
Sample Name: CLO4@ 75.ug/L
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
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



```

=====
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

```

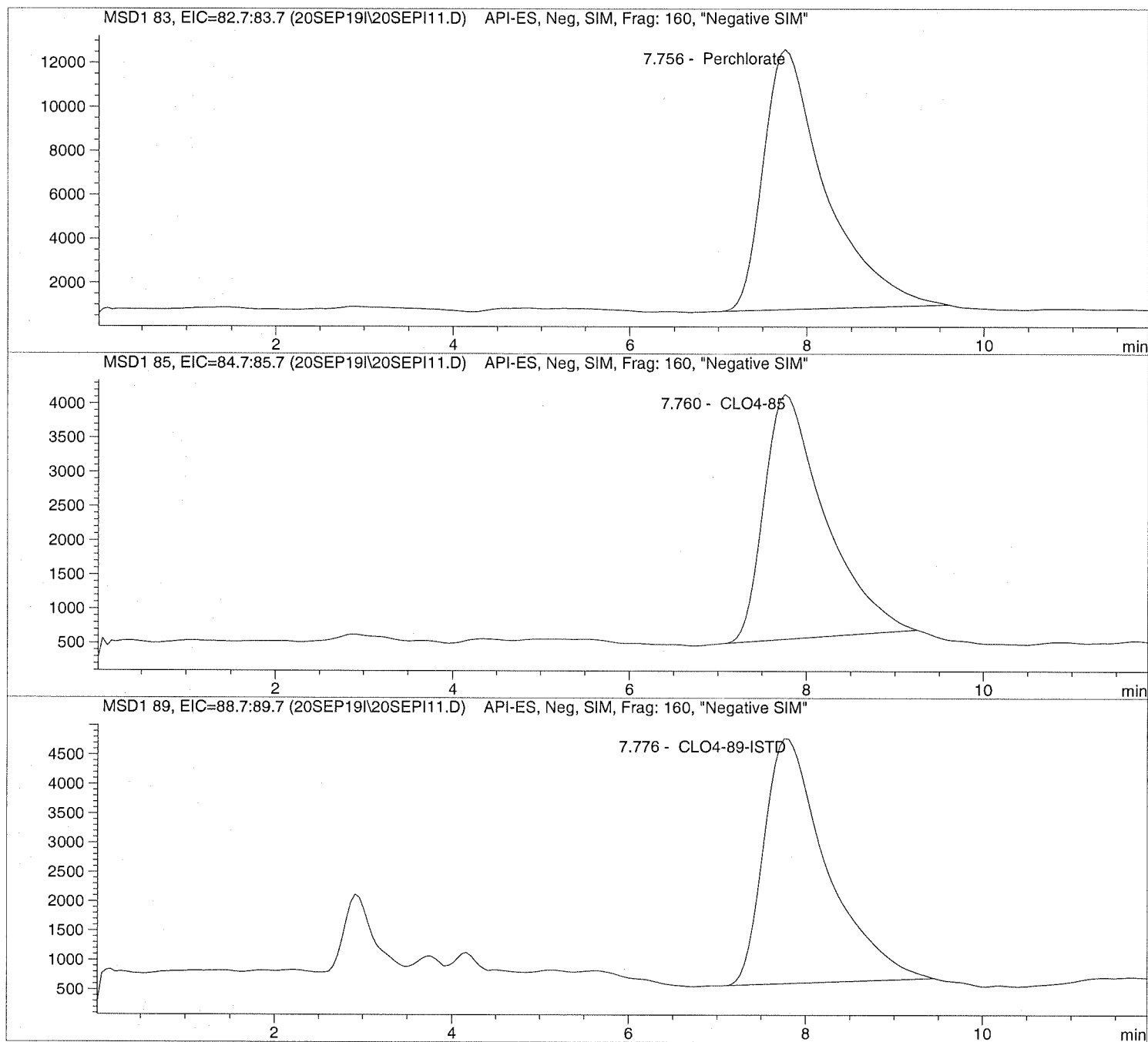
=====
*** End of Report ***
=====

```

=====
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

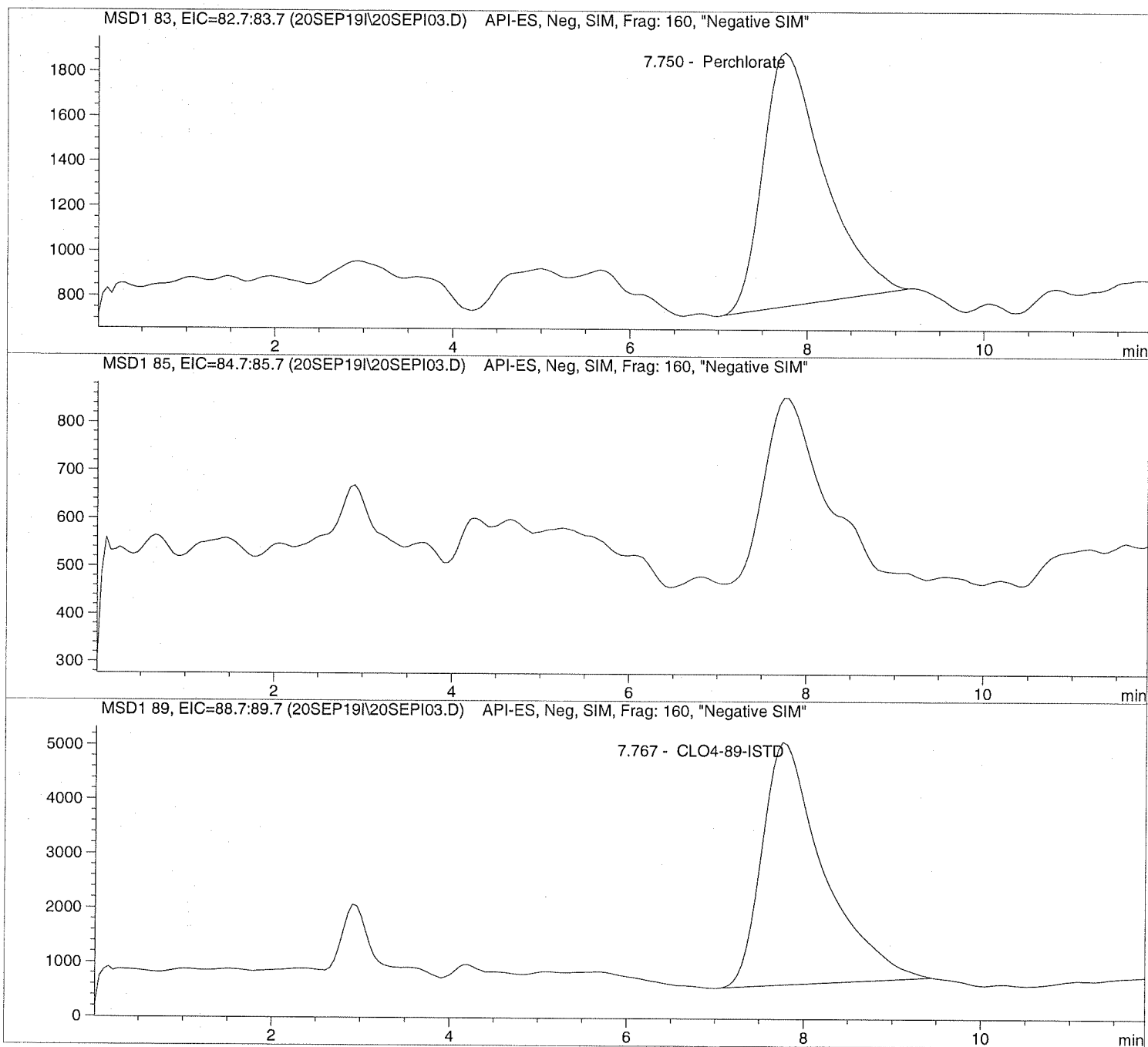
Inj. Vol.: 30 µl

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 ***



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T: +1 281 530 5656
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January 07, 2020

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

Work Order: **HS19121028**

Laboratory Results for: **Groundwater Treatment Plant Quarterly Influent Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Dec 18, 2019 for the analysis presented in the following report.

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

Regards,

A handwritten signature in black ink, appearing to read 'Raj. P. Modashia', enclosed in a circular scribble.

Generated By: **RJ.MODASHIA**
RJ Modashia
Project Manager

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
Work Order: HS19121028

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19121028-01	LH18/24-SP140_121719	Water		17-Dec-2019 14:00	18-Dec-2019 10:50	<input type="checkbox"/>
HS19121028-02	Trip Blank	Water		17-Dec-2019 14:00	18-Dec-2019 10:50	<input type="checkbox"/>

Revision:1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
Work Order: HS19121028

CASE NARRATIVE

Work Order Comments

- Revised to update the Mercury results to mg/L
- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

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

GCMS Semivolatiles by Method SW8270SIM**Batch ID: 149052**

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

GCMS Volatiles by Method SW8260**Batch ID: R352981****Sample ID: CCV**

- 1,2,3-Trichlorobenzene exceeded %D limits for CCV. Samples are ND for this compound.

Sample ID: VLCSW-191219

- 1,2,3-Trichlorobenzene and 1,2,4-Trichlorobenzene exceeded QC limits fro LCS.

Sample ID: HS19121036-04MS, HS19121036-01MS

- MS and MSD are for an unrelated sample

Metals by Method SW7470**Batch ID: 149399**

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

Metals by Method SW6020**Batch ID: 149161****Sample ID: HS19121036-01MS**

- MS and MSD are for an unrelated sample

WetChemistry by Method E1664A**Batch ID: R353627**

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

WetChemistry by Method SW9056**Batch ID: R353307**

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

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
Work Order: HS19121028

CASE NARRATIVE**WetChemistry by Method E410.4****Batch ID: R352964**

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

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Influent Samples
 Sample ID: LH18/24-SP140_121719
 Collection Date: 17-Dec-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19121028
 Lab ID:HS19121028-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
1,1,1-Trichloroethane	10	U	4.0	10	20	UG/L	20	19-Dec-2019 20:08	
1,1,2,2-Tetrachloroethane	10	U	10	10	20	UG/L	20	19-Dec-2019 20:08	
1,1,2-Trichloroethane	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
1,1-Dichloroethane	8.5	J	4.0	10	20	UG/L	20	19-Dec-2019 20:08	
1,1-Dichloroethene	10	U	4.0	10	20	UG/L	20	19-Dec-2019 20:08	
1,1-Dichloropropene	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
1,2,3-Trichlorobenzene	10	U	8.0	10	20	UG/L	20	19-Dec-2019 20:08	
1,2,3-Trichloropropane	10	U	10	10	20	UG/L	20	19-Dec-2019 20:08	
1,2,4-Trichlorobenzene	10	U	10	10	20	UG/L	20	19-Dec-2019 20:08	
1,2,4-Trimethylbenzene	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
1,2-Dibromo-3-chloropropane	10	U	4.0	10	20	UG/L	20	19-Dec-2019 20:08	
1,2-Dibromoethane	10	U	4.0	10	20	UG/L	20	19-Dec-2019 20:08	
1,2-Dichlorobenzene	10	U	10	10	20	UG/L	20	19-Dec-2019 20:08	
1,2-Dichloroethane	43		4.0	10	20	UG/L	20	19-Dec-2019 20:08	
1,2-Dichloropropane	10	U	10	10	20	UG/L	20	19-Dec-2019 20:08	
1,3,5-Trimethylbenzene	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
1,3-Dichlorobenzene	10	U	8.0	10	20	UG/L	20	19-Dec-2019 20:08	
1,3-Dichloropropane	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
1,4-Dichlorobenzene	10	U	8.0	10	20	UG/L	20	19-Dec-2019 20:08	
2,2-Dichloropropane	10	U	4.0	10	20	UG/L	20	19-Dec-2019 20:08	
2-Butanone	20	U	10	20	40	UG/L	20	19-Dec-2019 20:08	
2-Chlorotoluene	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
2-Hexanone	20	U	20	20	40	UG/L	20	19-Dec-2019 20:08	
4-Chlorotoluene	10	U	8.0	10	20	UG/L	20	19-Dec-2019 20:08	
4-Isopropyltoluene	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
4-Methyl-2-pentanone	20	U	14	20	40	UG/L	20	19-Dec-2019 20:08	
Acetone	20	U	8.0	20	40	UG/L	20	19-Dec-2019 20:08	
Benzene	10	U	4.0	10	20	UG/L	20	19-Dec-2019 20:08	
Bromobenzene	10	U	8.0	10	20	UG/L	20	19-Dec-2019 20:08	
Bromochloromethane	10	U	4.0	10	20	UG/L	20	19-Dec-2019 20:08	
Bromodichloromethane	10	U	4.0	10	20	UG/L	20	19-Dec-2019 20:08	
Bromoform	10	U	8.0	10	20	UG/L	20	19-Dec-2019 20:08	
Bromomethane	10	U	8.0	10	20	UG/L	20	19-Dec-2019 20:08	
Carbon disulfide	20	U	12	20	40	UG/L	20	19-Dec-2019 20:08	
Carbon tetrachloride	10	U	10	10	20	UG/L	20	19-Dec-2019 20:08	
Chlorobenzene	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
Chloroethane	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
Chloroform	10	U	4.0	10	20	UG/L	20	19-Dec-2019 20:08	

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

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Influent Samples
 Sample ID: LH18/24-SP140_121719
 Collection Date: 17-Dec-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19121028
 Lab ID:HS19121028-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	10	U	4.0	10	20	UG/L	20	19-Dec-2019 20:08	
cis-1,2-Dichloroethene	3,200		4.0	10	20	UG/L	20	19-Dec-2019 20:08	
cis-1,3-Dichloropropene	10	U	2.0	10	20	UG/L	20	19-Dec-2019 20:08	
Dibromochloromethane	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
Dibromomethane	10	U	4.0	10	20	UG/L	20	19-Dec-2019 20:08	
Dichlorodifluoromethane	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
Ethylbenzene	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
Hexachlorobutadiene	10	U	20	10	20	UG/L	20	19-Dec-2019 20:08	
Isopropylbenzene	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
m,p-Xylene	20	U	10	20	40	UG/L	20	19-Dec-2019 20:08	
Methylene chloride	510		8.0	20	40	UG/L	20	19-Dec-2019 20:08	
n-Butylbenzene	10	U	8.0	10	20	UG/L	20	19-Dec-2019 20:08	
n-Propylbenzene	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
Naphthalene	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
o-Xylene	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
sec-Butylbenzene	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
Styrene	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
tert-Butylbenzene	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
Tetrachloroethene	35		6.0	10	20	UG/L	20	19-Dec-2019 20:08	
Toluene	10	U	4.0	10	20	UG/L	20	19-Dec-2019 20:08	
trans-1,2-Dichloroethene	12	J	4.0	10	20	UG/L	20	19-Dec-2019 20:08	
trans-1,3-Dichloropropene	10	U	4.0	10	20	UG/L	20	19-Dec-2019 20:08	
Trichloroethene	5,400		40	100	200	UG/L	200	19-Dec-2019 20:32	
Trichlorofluoromethane	10	U	6.0	10	20	UG/L	20	19-Dec-2019 20:08	
Vinyl chloride	130		4.0	10	20	UG/L	20	19-Dec-2019 20:08	
Surr: 1,2-Dichloroethane-d4	91.7			0	81-118	%REC	20	19-Dec-2019 20:08	
Surr: 1,2-Dichloroethane-d4	92.5			0	81-118	%REC	200	19-Dec-2019 20:32	
Surr: 4-Bromofluorobenzene	99.6			0	85-114	%REC	20	19-Dec-2019 20:08	
Surr: 4-Bromofluorobenzene	99.4			0	85-114	%REC	200	19-Dec-2019 20:32	
Surr: Dibromofluoromethane	91.7			0	80-119	%REC	20	19-Dec-2019 20:08	
Surr: Dibromofluoromethane	91.6			0	80-119	%REC	200	19-Dec-2019 20:32	
Surr: Toluene-d8	101			0	89-112	%REC	20	19-Dec-2019 20:08	
Surr: Toluene-d8	100			0	89-112	%REC	200	19-Dec-2019 20:32	
SEMIVOLATILES SIM		Method:SW8270SIM						Prep:SW3510 / 23-Dec-2019 Analyst: LG	
1,4-Dioxane	20		1.0	1.0	1.0	ug/L	100	03-Jan-2020 11:22	
Surr: 2-Fluorobiphenyl	132			0	40-140	%REC	100	03-Jan-2020 11:22	
Surr: 4-Terphenyl-d14	104			0	40-140	%REC	100	03-Jan-2020 11:22	
Surr: Nitrobenzene-d5	118			0	40-140	%REC	100	03-Jan-2020 11:22	

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

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Influent Samples
 Sample ID: LH18/24-SP140_121719
 Collection Date: 17-Dec-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19121028
 Lab ID:HS19121028-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 27-Dec-2019		Analyst: JHD
Aluminum	0.0275		0.00180	0.00500	0.0100	mg/L	1	03-Jan-2020 12:05
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:05
Arsenic	0.000872	J	0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:05
Barium	0.766		0.00190	0.00250	0.00500	mg/L	1	03-Jan-2020 12:05
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 12:05
Cadmium	0.000223	J	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 12:05
Calcium	44.3		0.0340	0.0500	0.500	mg/L	1	03-Jan-2020 12:05
Chromium	0.00121	J	0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:05
Cobalt	0.00820		0.000100	0.000500	0.00500	mg/L	1	03-Jan-2020 12:05
Iron	0.478		0.0120	0.0500	0.200	mg/L	1	03-Jan-2020 12:05
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:05
Magnesium	34.2		0.0100	0.0500	0.200	mg/L	1	03-Jan-2020 12:05
Manganese	0.542		0.000700	0.00250	0.00500	mg/L	1	03-Jan-2020 12:05
Nickel	0.0146		0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:05
Potassium	1.21		0.0180	0.0500	0.200	mg/L	1	03-Jan-2020 12:05
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	03-Jan-2020 12:05
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	03-Jan-2020 12:05
Sodium	211		0.280	1.00	4.00	mg/L	20	03-Jan-2020 14:30
Thallium	0.000326	J	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 12:05
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:05
Zinc	0.0549		0.00200	0.00250	0.00500	mg/L	1	03-Jan-2020 12:05
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 06-Jan-2020		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	06-Jan-2020 16:21
OIL & GREASE (HEM) BY E1664A			Method:E1664A					Analyst: KAH
Oil and Grease	1.00	U	0.610	1.00	2.00	mg/L	1	31-Dec-2019 10:50
CHEMICAL OXYGEN DEMAND BY E410.4			Method:E410.4					Analyst: TH
Chemical Oxygen Demand	15.0		5.00	15.0	15.0	mg/L	1	19-Dec-2019 18:00
ANIONS BY SW9056A			Method:SW9056					Analyst: KMU
Chloride	446		2.00	5.00	5.00	mg/L	10	26-Dec-2019 17:22
Sulfate	26.6		2.00	5.00	5.00	mg/L	10	26-Dec-2019 17:22
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA					Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jan-2020 14:07

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

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Influent Samples
 Sample ID: Trip Blank
 Collection Date: 17-Dec-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19121028
 Lab ID:HS19121028-02
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 12:32	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	19-Dec-2019 12:32	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	19-Dec-2019 12:32	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	19-Dec-2019 12:32	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Dec-2019 12:32	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:32	

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

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Influent Samples
 Sample ID: Trip Blank
 Collection Date: 17-Dec-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19121028
 Lab ID:HS19121028-02
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 12:32	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	19-Dec-2019 12:32	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:32	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.2</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 12:32</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 12:32</i>	
<i>Surr: Dibromofluoromethane</i>	<i>93.3</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 12:32</i>	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 12:32</i>	

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

Revision: 1

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

Batch ID: 149052 **Start Date:** 23 Dec 2019 10:00 **End Date:** 23 Dec 2019 18:00
Method: SV AQ SEP FUN EXTRACT-LOWLEV - 3510C **Prep Code:** 3510_B_SIM

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19121028-01	1	1000 (mL)	1 (mL)	0.001

Batch ID: 149161 **Start Date:** 27 Dec 2019 09:00 **End Date:** 27 Dec 2019 13:00
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19121028-01		10 (mL)	10 (mL)	1

Batch ID: 149282 **Start Date:** 31 Dec 2019 10:30 **End Date:** 31 Dec 2019 12:30
Method: MERCURY PREP BY 7470A- WATER **Prep Code:** HG_WPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19121028-01		10 (mL)	10 (mL)	1

Batch ID: 149399 **Start Date:** 06 Jan 2020 10:30 **End Date:** 06 Jan 2020 12:30
Method: MERCURY PREP BY 7470A- WATER **Prep Code:** HG_WPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19121028-01		10 (mL)	10 (mL)	1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 149052 (0)		Test Name : SEMIVOLATILES SIM			Matrix: Water	
HS19121028-01	LH18/24-SP140_121719	17 Dec 2019 14:00		23 Dec 2019 16:50	03 Jan 2020 11:22	100
Batch ID: 149161 (0)		Test Name : METALS BY ICPMS BY SW6020A			Matrix: Water	
HS19121028-01	LH18/24-SP140_121719	17 Dec 2019 14:00		27 Dec 2019 13:00	03 Jan 2020 14:30	20
HS19121028-01	LH18/24-SP140_121719	17 Dec 2019 14:00		27 Dec 2019 13:00	03 Jan 2020 12:05	1
Batch ID: 149399 (0)		Test Name : MERCURY BY SW7470A			Matrix: Water	
HS19121028-01	LH18/24-SP140_121719	17 Dec 2019 14:00		06 Jan 2020 10:30	06 Jan 2020 16:21	1
Batch ID: R352964 (0)		Test Name : CHEMICAL OXYGEN DEMAND BY E410.4			Matrix: Water	
HS19121028-01	LH18/24-SP140_121719	17 Dec 2019 14:00			19 Dec 2019 18:00	1
Batch ID: R352981 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19121028-01	LH18/24-SP140_121719	17 Dec 2019 14:00			19 Dec 2019 20:32	200
HS19121028-01	LH18/24-SP140_121719	17 Dec 2019 14:00			19 Dec 2019 20:08	20
HS19121028-02	Trip Blank	17 Dec 2019 14:00			19 Dec 2019 12:32	1
Batch ID: R353307 (0)		Test Name : ANIONS BY SW9056A			Matrix: Water	
HS19121028-01	LH18/24-SP140_121719	17 Dec 2019 14:00			26 Dec 2019 17:22	10
Batch ID: R353627 (0)		Test Name : OIL & GREASE (HEM) BY E1664A			Matrix: Water	
HS19121028-01	LH18/24-SP140_121719	17 Dec 2019 14:00			31 Dec 2019 10:50	1
Batch ID: R353891 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Water	
HS19121028-01	LH18/24-SP140_121719	17 Dec 2019 14:00			06 Jan 2020 14:07	1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID: 149161 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MBLK	Sample ID: MBLK-149161	Units: mg/L			Analysis Date: 03-Jan-2020 12:00					
Client ID:	Run ID: ICPMS05_353764	SeqNo: 5423038	PrepDate: 27-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.002931	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.001014	0.00500								J
Nickel	0.00100	0.00500								U
Potassium	0.0184	0.200								J
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.02161	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00245	0.00500								J

Revision: 1

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ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID: 149161 (0)		Instrument: ICPMS05			Method: METALS BY ICPMS BY SW6020A					
LCS	Sample ID: LCS-149161	Units: mg/L			Analysis Date: 03-Jan-2020 12:03					
Client ID:	Run ID: ICPMS05_353764	SeqNo: 5423039		PrepDate: 27-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1102	0.0100	0.1	0	110	84 - 117				
Antimony	0.0493	0.00500	0.05	0	98.6	85 - 117				
Arsenic	0.05072	0.00500	0.05	0	101	84 - 116				
Barium	0.04802	0.00500	0.05	0	96.0	86 - 114				
Beryllium	0.04659	0.00200	0.05	0	93.2	83 - 121				
Cadmium	0.05061	0.00200	0.05	0	101	87 - 115				
Calcium	5.169	0.500	5	0	103	87 - 118				
Chromium	0.05067	0.00500	0.05	0	101	85 - 116				
Cobalt	0.04913	0.00500	0.05	0	98.3	86 - 115				
Iron	5.272	0.200	5	0	105	87 - 118				
Lead	0.04497	0.00500	0.05	0	89.9	88 - 115				
Magnesium	5.263	0.200	5	0	105	83 - 118				
Manganese	0.05123	0.00500	0.05	0	102	87 - 115				
Nickel	0.05142	0.00500	0.05	0	103	85 - 117				
Potassium	5.331	0.200	5	0	107	87 - 115				
Selenium	0.05073	0.00500	0.05	0	101	80 - 120				
Silver	0.04571	0.00500	0.05	0	91.4	85 - 116				
Sodium	5.164	0.200	5	0	103	85 - 117				
Thallium	0.0429	0.00200	0.05	0	85.8	82 - 116				
Vanadium	0.05011	0.00500	0.05	0	100	86 - 115				
Zinc	0.05326	0.00500	0.05	0	107	83 - 119				

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID: 149161 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MS	Sample ID: HS19121036-01MS	Units: mg/L			Analysis Date: 03-Jan-2020 12:14					
Client ID:	Run ID: ICPMS05_353764	SeqNo: 5423044	PrepDate: 27-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.3471	0.0100	0.2	0.1494	98.9	84 - 117				
Antimony	0.04798	0.00500	0.05	0	96.0	85 - 117				
Arsenic	0.04954	0.00500	0.05	0	99.1	84 - 116				
Barium	1.028	0.00500	0.05	0.948	160	86 - 114				SO
Beryllium	0.04682	0.00200	0.05	0	93.6	83 - 121				
Cadmium	0.04785	0.00200	0.05	0.000207	95.3	87 - 115				
Calcium	234.3	0.500	5	228.5	115	87 - 118				EO
Chromium	0.05164	0.00500	0.05	0.002556	98.2	85 - 116				
Cobalt	0.0471	0.00500	0.05	0.001038	92.1	86 - 115				
Iron	5.167	0.200	5	0.1594	100	87 - 118				
Lead	0.04824	0.00500	0.05	0	96.5	88 - 115				
Magnesium	84.46	0.200	5	79.11	107	83 - 118				O
Manganese	0.2187	0.00500	0.05	0.1694	98.6	87 - 115				
Nickel	0.07377	0.00500	0.05	0.02497	97.6	85 - 117				
Potassium	6.101	0.200	5	0.977	102	87 - 115				
Selenium	0.04827	0.00500	0.05	0	96.5	80 - 120				
Silver	0.04288	0.00500	0.05	0	85.8	85 - 116				
Sodium	251.3	0.200	5	246.4	98.0	85 - 117				EO
Thallium	0.04508	0.00200	0.05	0	90.2	82 - 116				
Vanadium	0.05112	0.00500	0.05	0	102	86 - 115				
Zinc	0.05699	0.00500	0.05	0.007335	99.3	83 - 119				

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Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID: 149161 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MSD	Sample ID: HS19121036-01MSD	Units: mg/L			Analysis Date: 03-Jan-2020 12:17					
Client ID:	Run ID: ICPMS05_353764	SeqNo: 5423045	PrepDate: 27-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.3514	0.0100	0.2	0.1494	101	84 - 117	0.3471	1.21	20	
Antimony	0.04736	0.00500	0.05	0	94.7	85 - 117	0.04798	1.29	20	
Arsenic	0.04823	0.00500	0.05	0	96.5	84 - 116	0.04954	2.68	20	
Barium	1.013	0.00500	0.05	0.948	129	86 - 114	1.028	1.49	20	SO
Beryllium	0.04523	0.00200	0.05	0	90.5	83 - 121	0.04682	3.47	20	
Cadmium	0.04711	0.00200	0.05	0.000207	93.8	87 - 115	0.04785	1.56	20	
Calcium	224.9	0.500	5	228.5	-73.1	87 - 118	234.3	4.1	20	SEO
Chromium	0.05033	0.00500	0.05	0.002556	95.5	85 - 116	0.05164	2.57	20	
Cobalt	0.04592	0.00500	0.05	0.001038	89.8	86 - 115	0.0471	2.53	20	
Iron	5.065	0.200	5	0.1594	98.1	87 - 118	5.167	2	20	
Lead	0.04721	0.00500	0.05	0	94.4	88 - 115	0.04824	2.15	20	
Magnesium	82.16	0.200	5	79.11	61.1	83 - 118	84.46	2.76	20	SO
Manganese	0.215	0.00500	0.05	0.1694	91.2	87 - 115	0.2187	1.71	20	
Nickel	0.06998	0.00500	0.05	0.02497	90.0	85 - 117	0.07377	5.27	20	
Potassium	5.945	0.200	5	0.977	99.4	87 - 115	6.101	2.59	20	
Selenium	0.04721	0.00500	0.05	0	94.4	80 - 120	0.04827	2.22	20	
Silver	0.04207	0.00500	0.05	0	84.1	85 - 116	0.04288	1.9	20	S
Sodium	246.8	0.200	5	246.4	6.88	85 - 117	251.3	1.83	20	SEO
Thallium	0.04504	0.00200	0.05	0	90.1	82 - 116	0.04508	0.107	20	
Vanadium	0.04999	0.00500	0.05	0	100.0	86 - 115	0.05112	2.23	20	
Zinc	0.05446	0.00500	0.05	0.007335	94.2	83 - 119	0.05699	4.55	20	

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Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID: 149161 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A					
PDS	Sample ID: HS19121036-01PDS	Units: mg/L			Analysis Date: 03-Jan-2020 12:19				
Client ID:	Run ID: ICPMS05_353764	SeqNo: 5423046		PrepDate: 27-Dec-2019		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Aluminum	0.3168	0.0100	0.2	0.1494	83.7	80 - 120			
Antimony	0.08414	0.00500	0.1	0	84.1	80 - 120			
Arsenic	0.09811	0.00500	0.1	0	98.1	80 - 120			
Barium	1.036	0.00500	0.1	0.948	87.5	80 - 120			O
Beryllium	0.08608	0.00200	0.1	0	86.1	80 - 120			
Cadmium	0.09617	0.00200	0.1	0.000207	96.0	80 - 120			
Chromium	0.09735	0.00500	0.1	0.002556	94.8	80 - 120			
Cobalt	0.09065	0.00500	0.1	0.001038	89.6	80 - 120			
Iron	9.775	0.200	10	0.1594	96.2	80 - 120			
Lead	0.09409	0.00500	0.1	0	94.1	80 - 120			
Magnesium	87.73	0.200	10	79.11	86.2	80 - 120			O
Manganese	0.26	0.00500	0.1	0.1694	90.6	80 - 120			
Nickel	0.1244	0.00500	0.1	0.02497	99.4	80 - 120			
Potassium	10.82	0.200	10	0.977	98.4	80 - 120			
Selenium	0.09604	0.00500	0.1	0	96.0	80 - 120			
Silver	0.08248	0.00500	0.1	0	82.5	80 - 120			
Thallium	0.09582	0.00200	0.1	0	95.8	80 - 120			
Vanadium	0.09789	0.00500	0.1	0	97.9	80 - 120			
Zinc	0.1015	0.00500	0.1	0.007335	94.1	80 - 120			
PDS	Sample ID: HS19121036-01PDS	Units: mg/L			Analysis Date: 03-Jan-2020 14:39				
Client ID:	Run ID: ICPMS05_353764	SeqNo: 5423162		PrepDate: 27-Dec-2019		DF: 20			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Calcium	423.5	10.0	200	235.8	93.9	80 - 120			
Sodium	442.3	4.00	200	256.4	93.0	80 - 120			

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Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID: 149161 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
SD	Sample ID: HS19121036-01SD	Units: mg/L			Analysis Date: 03-Jan-2020 12:12					
Client ID:	Run ID: ICPMS05_353764	SeqNo: 5423043		PrepDate: 27-Dec-2019		DF: 5				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit Qual	
Antimony	0.00250	0.0250					0.00029	0 10	U	
Arsenic	0.00250	0.0250					0.000238	0 10	U	
Barium	0.9045	0.0250					0.948	4.59 10		
Beryllium	0.00250	0.0100					0.000023	0 10	U	
Cadmium	0.00250	0.0100					0.000207	0 10	U	
Chromium	0.002444	0.0250					0.002556	0 10	J	
Cobalt	0.001044	0.0250					0.001038	0 10	J	
Iron	0.1589	1.00					0.1594	0 10	J	
Lead	0.00500	0.0250					0.000231	0 10	U	
Magnesium	78.8	1.00					79.11	0.391 10		
Manganese	0.1734	0.0250					0.1694	2.4 10		
Nickel	0.02591	0.0250					0.02497	0 10		
Potassium	1.019	1.00					0.977	0 10		
Selenium	0.0125	0.0250					-0.000016	0 10	U	
Silver	0.00250	0.0250					0.000017	0 10	U	
Thallium	0.00250	0.0100					0.00004	0 10	U	
Vanadium	0.004047	0.0250					0.000523	0 10	J	
Zinc	0.01053	0.0250					0.007335	0 10	J	
SD	Sample ID: HS19121036-01SD	Units: mg/L			Analysis Date: 03-Jan-2020 14:36					
Client ID:	Run ID: ICPMS05_353764	SeqNo: 5423161		PrepDate: 27-Dec-2019		DF: 100				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit Qual	
Calcium	246	50.0					235.8	4.33 10		
Sodium	273.8	20.0					256.4	6.79 10		

The following samples were analyzed in this batch: HS19121028-01

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Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
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QC BATCH REPORT

Batch ID:	149399 (0)	Instrument:	HG03	Method:	MERCURY BY SW7470A					
MBLK	Sample ID: MBLK-149399			Units: mg/L	Analysis Date: 06-Jan-2020 15:37					
Client ID:		Run ID: HG03_353907		SeqNo: 5425586	PrepDate: 06-Jan-2020	DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U
LCS	Sample ID: LCS-149399			Units: mg/L	Analysis Date: 06-Jan-2020 15:39					
Client ID:		Run ID: HG03_353907		SeqNo: 5425587	PrepDate: 06-Jan-2020	DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Mercury	0.00509	0.000200	0.005	0	102	80 - 120				
MS	Sample ID: HS19121250-21MS			Units: mg/L	Analysis Date: 06-Jan-2020 15:42					
Client ID:		Run ID: HG03_353907		SeqNo: 5425589	PrepDate: 06-Jan-2020	DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Mercury	0.00506	0.000200	0.005	0.00001800	101	75 - 125				
MSD	Sample ID: HS19121250-21MSD			Units: mg/L	Analysis Date: 06-Jan-2020 15:44					
Client ID:		Run ID: HG03_353907		SeqNo: 5425590	PrepDate: 06-Jan-2020	DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Mercury	0.00515	0.000200	0.005	0.00001800	103	75 - 125	0.005060	1.76	20	

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QC BATCH REPORT

Batch ID: 149052 (0)		Instrument: SV-6		Method: SEMIVOLATILES SIM						
MBLK	Sample ID: MBLK-149052	Units: ug/L			Analysis Date: 03-Jan-2020 08:09					
Client ID:	Run ID: SV-6_353793	SeqNo: 5422856		PrepDate: 23-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.010	0.010							U	
Surr: 2-Fluorobiphenyl	0.0793	0	0.08	0	99.1	40 - 140				
Surr: 4-Terphenyl-d14	0.07561	0	0.08	0	94.5	40 - 140				
Surr: Nitrobenzene-d5	0.09516	0	0.08	0	119	40 - 140				
LCS	Sample ID: LCS-149052	Units: ug/L			Analysis Date: 03-Jan-2020 08:30					
Client ID:	Run ID: SV-6_353793	SeqNo: 5422857		PrepDate: 23-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.08925	0.010	0.08	0	112	40 - 140				
Surr: 2-Fluorobiphenyl	0.07233	0	0.08	0	90.4	40 - 140				
Surr: 4-Terphenyl-d14	0.07642	0	0.08	0	95.5	40 - 140				
Surr: Nitrobenzene-d5	0.08855	0	0.08	0	111	40 - 140				
LCSD	Sample ID: LCSD-149052	Units: ug/L			Analysis Date: 03-Jan-2020 08:49					
Client ID:	Run ID: SV-6_353793	SeqNo: 5422858		PrepDate: 23-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.08544	0.010	0.08	0	107	40 - 140	0.08925	4.36	20	
Surr: 2-Fluorobiphenyl	0.08515	0	0.08	0	106	40 - 140	0.07233	16.3	20	
Surr: 4-Terphenyl-d14	0.0791	0	0.08	0	98.9	40 - 140	0.07642	3.44	20	
Surr: Nitrobenzene-d5	0.08955	0	0.08	0	112	40 - 140	0.08855	1.13	20	

The following samples were analyzed in this batch: HS19121028-01

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Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
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QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191219	Units: UG/L			Analysis Date: 19-Dec-2019 12:08					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402183	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-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
Bromomethane	0.50	1.0								U

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Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191219	Units: UG/L			Analysis Date: 19-Dec-2019 12:08					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402183	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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	45.73	1.0	50	0	91.5	81 - 118				
Surr: 4-Bromofluorobenzene	48.64	1.0	50	0	97.3	85 - 114				
Surr: Dibromofluoromethane	46.18	1.0	50	0	92.4	80 - 119				
Surr: Toluene-d8	51.75	1.0	50	0	103	89 - 112				

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Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191219	Units: UG/L			Analysis Date: 19-Dec-2019 11:19					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402182	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	19.14	1.0	20	0	95.7	78 - 124				
1,1,1-Trichloroethane	18.87	1.0	20	0	94.4	74 - 131				
1,1,2,2-Tetrachloroethane	20.89	1.0	20	0	104	71 - 121				
1,1,2-Trichloroethane	20.08	1.0	20	0	100	80 - 119				
1,1-Dichloroethane	20.88	1.0	20	0	104	77 - 125				
1,1-Dichloroethene	15.74	1.0	20	0	78.7	71 - 131				
1,1-Dichloropropene	18.62	1.0	20	0	93.1	78 - 125				
1,2,3-Trichlorobenzene	31.42	1.0	20	0	157	69 - 129				S
1,2,3-Trichloropropane	21.66	1.0	20	0	108	73 - 122				
1,2,4-Trichlorobenzene	26.27	1.0	20	0	131	69 - 130				S
1,2,4-Trimethylbenzene	21.06	1.0	20	0	105	76 - 124				
1,2-Dibromo-3-chloropropane	22.22	1.0	20	0	111	62 - 128				
1,2-Dibromoethane	19.76	1.0	20	0	98.8	77 - 121				
1,2-Dichlorobenzene	20.08	1.0	20	0	100	80 - 119				
1,2-Dichloroethane	19.23	1.0	20	0	96.2	73 - 128				
1,2-Dichloropropane	20.1	1.0	20	0	101	78 - 122				
1,3,5-Trimethylbenzene	21.42	1.0	20	0	107	75 - 124				
1,3-Dichlorobenzene	20.37	1.0	20	0	102	80 - 119				
1,3-Dichloropropane	20.15	1.0	20	0	101	80 - 119				
1,4-Dichlorobenzene	20.18	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	19.17	1.0	20	0	95.8	60 - 139				
2-Butanone	42.22	2.0	40	0	106	56 - 143				
2-Chlorotoluene	22.06	1.0	20	0	110	79 - 122				
2-Hexanone	39.63	2.0	40	0	99.1	57 - 139				
4-Chlorotoluene	20.89	1.0	20	0	104	78 - 122				
4-Isopropyltoluene	20.51	1.0	20	0	103	77 - 127				
4-Methyl-2-pentanone	40.44	2.0	40	0	101	67 - 130				
Acetone	35.12	2.0	40	0	87.8	39 - 160				
Benzene	20.65	1.0	20	0	103	79 - 120				
Bromobenzene	20.49	1.0	20	0	102	80 - 120				
Bromochloromethane	20.09	1.0	20	0	100	78 - 123				
Bromodichloromethane	19.6	1.0	20	0	98.0	79 - 125				
Bromoform	19.07	1.0	20	0	95.4	66 - 130				
Bromomethane	16.32	1.0	20	0	81.6	53 - 141				

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Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
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QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191219	Units: UG/L			Analysis Date: 19-Dec-2019 11:19					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402182	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	43.35	2.0	40	0	108	64 - 133				
Carbon tetrachloride	17.19	1.0	20	0	85.9	72 - 136				
Chlorobenzene	19.18	1.0	20	0	95.9	82 - 118				
Chloroethane	16.32	1.0	20	0	81.6	60 - 138				
Chloroform	18.93	1.0	20	0	94.7	79 - 124				
Chloromethane	15.6	1.0	20	0	78.0	50 - 139				
cis-1,2-Dichloroethene	21.34	1.0	20	0	107	78 - 123				
cis-1,3-Dichloropropene	20.24	1.0	20	0	101	75 - 124				
Dibromochloromethane	19.47	1.0	20	0	97.4	74 - 126				
Dibromomethane	19.11	1.0	20	0	95.6	79 - 123				
Dichlorodifluoromethane	18.21	1.0	20	0	91.1	32 - 152				
Ethylbenzene	19.65	1.0	20	0	98.3	79 - 121				
Hexachlorobutadiene	25.4	1.0	20	0	127	66 - 134				
Isopropylbenzene	19.28	1.0	20	0	96.4	72 - 131				
m,p-Xylene	39.21	2.0	40	0	98.0	80 - 121				
Methylene chloride	19.78	2.0	20	0	98.9	74 - 124				
Naphthalene	24.37	1.0	20	0	122	61 - 128				
n-Butylbenzene	20.18	1.0	20	0	101	75 - 128				
n-Propylbenzene	20.78	1.0	20	0	104	76 - 126				
o-Xylene	19.57	1.0	20	0	97.8	78 - 122				
sec-Butylbenzene	20.66	1.0	20	0	103	77 - 126				
Styrene	19.44	1.0	20	0	97.2	78 - 123				
tert-Butylbenzene	20.72	1.0	20	0	104	78 - 124				
Tetrachloroethene	18.14	1.0	20	0	90.7	74 - 129				
Toluene	19.82	1.0	20	0	99.1	80 - 121				
trans-1,2-Dichloroethene	20.86	1.0	20	0	104	75 - 124				
trans-1,3-Dichloropropene	19.9	1.0	20	0	99.5	73 - 127				
Trichloroethene	19.48	1.0	20	0	97.4	79 - 123				
Trichlorofluoromethane	15.03	1.0	20	0	75.1	65 - 141				
Vinyl chloride	16.63	1.0	20	0	83.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	46.66	1.0	50	0	93.3	81 - 118				
Surr: 4-Bromofluorobenzene	47.21	1.0	50	0	94.4	85 - 114				
Surr: Dibromofluoromethane	46.77	1.0	50	0	93.5	80 - 119				
Surr: Toluene-d8	44.52	1.0	50	0	89.0	89 - 112				

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19121036-04MS	Units: UG/L			Analysis Date: 19-Dec-2019 17:20					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402196	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	19.4	1.0	20	0	97.0	78 - 124				
1,1,1-Trichloroethane	17.71	1.0	20	0	88.6	74 - 131				
1,1,2,2-Tetrachloroethane	20.78	1.0	20	0	104	71 - 121				
1,1,2-Trichloroethane	19.77	1.0	20	0	98.9	80 - 119				
1,1-Dichloroethane	18.05	1.0	20	0	90.3	77 - 125				
1,1-Dichloroethene	13.2	1.0	20	0	66.0	71 - 131				S
1,1-Dichloropropene	18.71	1.0	20	0	93.5	78 - 125				
1,2,3-Trichlorobenzene	23.01	1.0	20	0	115	69 - 129				
1,2,3-Trichloropropane	21.15	1.0	20	0	106	73 - 122				
1,2,4-Trichlorobenzene	20.17	1.0	20	0	101	69 - 130				
1,2,4-Trimethylbenzene	21.92	1.0	20	0	110	76 - 124				
1,2-Dibromo-3-chloropropane	19.8	1.0	20	0	99.0	62 - 128				
1,2-Dibromoethane	19.39	1.0	20	0	96.9	77 - 121				
1,2-Dichlorobenzene	20.29	1.0	20	0	101	80 - 119				
1,2-Dichloroethane	17.6	1.0	20	0	88.0	73 - 128				
1,2-Dichloropropane	18.64	1.0	20	0	93.2	78 - 122				
1,3,5-Trimethylbenzene	22.44	1.0	20	0	112	75 - 124				
1,3-Dichlorobenzene	21.03	1.0	20	0	105	80 - 119				
1,3-Dichloropropane	20.05	1.0	20	0	100	80 - 119				
1,4-Dichlorobenzene	20.62	1.0	20	0	103	79 - 118				
2,2-Dichloropropane	17.33	1.0	20	0	86.6	60 - 139				
2-Butanone	33.34	2.0	40	0	83.3	56 - 143				
2-Chlorotoluene	22.97	1.0	20	0	115	79 - 122				
2-Hexanone	36.79	2.0	40	0	92.0	57 - 139				
4-Chlorotoluene	21.68	1.0	20	0	108	78 - 122				
4-Isopropyltoluene	22.05	1.0	20	0	110	77 - 127				
4-Methyl-2-pentanone	38.47	2.0	40	0	96.2	67 - 130				
Acetone	21.11	2.0	40	0	52.8	39 - 160				
Benzene	19.51	1.0	20	0	97.6	79 - 120				
Bromobenzene	21.28	1.0	20	0	106	80 - 120				
Bromochloromethane	17.18	1.0	20	0	85.9	78 - 123				
Bromodichloromethane	18.05	1.0	20	0	90.2	79 - 125				
Bromoform	18.6	1.0	20	0	93.0	66 - 130				
Bromomethane	8.02	1.0	20	0	40.1	53 - 141				S

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19121036-04MS	Units: UG/L			Analysis Date: 19-Dec-2019 17:20					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402196	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	31.05	2.0	40	0	77.6	64 - 133				
Carbon tetrachloride	17.87	1.0	20	0	89.4	72 - 136				
Chlorobenzene	19.53	1.0	20	0	97.7	82 - 118				
Chloroethane	10.31	1.0	20	0	51.5	60 - 138				S
Chloroform	16.9	1.0	20	0	84.5	79 - 124				
Chloromethane	4.721	1.0	20	0	23.6	50 - 139				S
cis-1,2-Dichloroethene	19.32	1.0	20	0.8057	92.6	78 - 123				
cis-1,3-Dichloropropene	18.77	1.0	20	0	93.9	75 - 124				
Dibromochloromethane	19.14	1.0	20	0	95.7	74 - 126				
Dibromomethane	17.65	1.0	20	0	88.2	79 - 123				
Dichlorodifluoromethane	2.281	1.0	20	0	11.4	32 - 152				S
Ethylbenzene	20.58	1.0	20	0	103	79 - 121				
Hexachlorobutadiene	20.21	1.0	20	0	101	66 - 134				
Isopropylbenzene	20.66	1.0	20	0	103	72 - 131				
m,p-Xylene	40.67	2.0	40	0	102	80 - 121				
Methylene chloride	16.6	2.0	20	0	83.0	74 - 124				
Naphthalene	20.02	1.0	20	0	100	61 - 128				
n-Butylbenzene	21.64	1.0	20	0	108	75 - 128				
n-Propylbenzene	22.55	1.0	20	0	113	76 - 126				
o-Xylene	20.22	1.0	20	0	101	78 - 122				
sec-Butylbenzene	22.65	1.0	20	0	113	77 - 126				
Styrene	19.99	1.0	20	0	100.0	78 - 123				
tert-Butylbenzene	22.63	1.0	20	0	113	78 - 124				
Tetrachloroethene	19.55	1.0	20	0	97.7	74 - 129				
Toluene	20.51	1.0	20	0	103	80 - 121				
trans-1,2-Dichloroethene	17.82	1.0	20	0	89.1	75 - 124				
trans-1,3-Dichloropropene	18.06	1.0	20	0	90.3	73 - 127				
Trichloroethene	32.47	1.0	20	12.97	97.5	79 - 123				
Trichlorofluoromethane	11.65	1.0	20	0	58.3	65 - 141				S
Vinyl chloride	7.24	1.0	20	0	36.2	58 - 137				S
Surr: 1,2-Dichloroethane-d4	45.06	1.0	50	0	90.1	81 - 118				
Surr: 4-Bromofluorobenzene	50.29	1.0	50	0	101	85 - 114				
Surr: Dibromofluoromethane	45.9	1.0	50	0	91.8	80 - 119				
Surr: Toluene-d8	51.51	1.0	50	0	103	89 - 112				

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19121036-01MS	Units: UG/L			Analysis Date: 19-Dec-2019 16:32					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402194	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	18.81	1.0	20	0	94.0	78 - 124				
1,1,1-Trichloroethane	17.47	1.0	20	0	87.3	74 - 131				
1,1,2,2-Tetrachloroethane	19.54	1.0	20	0	97.7	71 - 121				
1,1,2-Trichloroethane	18.87	1.0	20	0	94.3	80 - 119				
1,1-Dichloroethane	18.12	1.0	20	0	90.6	77 - 125				
1,1-Dichloroethene	13.26	1.0	20	0	66.3	71 - 131				S
1,1-Dichloropropene	18.92	1.0	20	0	94.6	78 - 125				
1,2,3-Trichlorobenzene	22.05	1.0	20	0	110	69 - 129				
1,2,3-Trichloropropane	19.84	1.0	20	0	99.2	73 - 122				
1,2,4-Trichlorobenzene	20.8	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	20.4	1.0	20	0	102	76 - 124				
1,2-Dibromo-3-chloropropane	18.75	1.0	20	0	93.7	62 - 128				
1,2-Dibromoethane	18.62	1.0	20	0	93.1	77 - 121				
1,2-Dichlorobenzene	18.95	1.0	20	0	94.7	80 - 119				
1,2-Dichloroethane	17.08	1.0	20	0	85.4	73 - 128				
1,2-Dichloropropane	18.72	1.0	20	0	93.6	78 - 122				
1,3,5-Trimethylbenzene	21.04	1.0	20	0	105	75 - 124				
1,3-Dichlorobenzene	19.41	1.0	20	0	97.0	80 - 119				
1,3-Dichloropropane	19.03	1.0	20	0	95.2	80 - 119				
1,4-Dichlorobenzene	19.16	1.0	20	0	95.8	79 - 118				
2,2-Dichloropropane	17.33	1.0	20	0	86.6	60 - 139				
2-Butanone	32.49	2.0	40	0	81.2	56 - 143				
2-Chlorotoluene	21.44	1.0	20	0	107	79 - 122				
2-Hexanone	35.63	2.0	40	0	89.1	57 - 139				
4-Chlorotoluene	20.26	1.0	20	0	101	78 - 122				
4-Isopropyltoluene	20.61	1.0	20	0	103	77 - 127				
4-Methyl-2-pentanone	36.71	2.0	40	0	91.8	67 - 130				
Acetone	20.74	2.0	40	0	51.9	39 - 160				
Benzene	19.32	1.0	20	0	96.6	79 - 120				
Bromobenzene	19.97	1.0	20	0	99.9	80 - 120				
Bromochloromethane	17.11	1.0	20	0	85.6	78 - 123				
Bromodichloromethane	17.8	1.0	20	0	89.0	79 - 125				
Bromoform	17.79	1.0	20	0	89.0	66 - 130				
Bromomethane	8.471	1.0	20	0	42.4	53 - 141				S

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19121036-01MS	Units: UG/L			Analysis Date: 19-Dec-2019 16:32					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402194	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	30.91	2.0	40	0	77.3	64 - 133				
Carbon tetrachloride	17.89	1.0	20	0	89.5	72 - 136				
Chlorobenzene	18.74	1.0	20	0	93.7	82 - 118				
Chloroethane	10.26	1.0	20	0	51.3	60 - 138				S
Chloroform	16.81	1.0	20	0	84.0	79 - 124				
Chloromethane	4.904	1.0	20	0	24.5	50 - 139				S
cis-1,2-Dichloroethene	18.25	1.0	20	0	91.2	78 - 123				
cis-1,3-Dichloropropene	18.68	1.0	20	0	93.4	75 - 124				
Dibromochloromethane	18.5	1.0	20	0	92.5	74 - 126				
Dibromomethane	17.5	1.0	20	0	87.5	79 - 123				
Dichlorodifluoromethane	2.343	1.0	20	0	11.7	32 - 152				S
Ethylbenzene	19.82	1.0	20	0	99.1	79 - 121				
Hexachlorobutadiene	21.08	1.0	20	0	105	66 - 134				
Isopropylbenzene	19.75	1.0	20	0	98.7	72 - 131				
m,p-Xylene	39.43	2.0	40	0	98.6	80 - 121				
Methylene chloride	16.71	2.0	20	0	83.6	74 - 124				
Naphthalene	18.98	1.0	20	0	94.9	61 - 128				
n-Butylbenzene	20.21	1.0	20	0	101	75 - 128				
n-Propylbenzene	21.15	1.0	20	0	106	76 - 126				
o-Xylene	19.38	1.0	20	0	96.9	78 - 122				
sec-Butylbenzene	20.87	1.0	20	0	104	77 - 126				
Styrene	19.01	1.0	20	0	95.0	78 - 123				
tert-Butylbenzene	20.94	1.0	20	0	105	78 - 124				
Tetrachloroethene	18.84	1.0	20	0	94.2	74 - 129				
Toluene	19.81	1.0	20	0	99.0	80 - 121				
trans-1,2-Dichloroethene	17.88	1.0	20	0	89.4	75 - 124				
trans-1,3-Dichloropropene	17.93	1.0	20	0	89.7	73 - 127				
Trichloroethene	19.97	1.0	20	0	99.9	79 - 123				
Trichlorofluoromethane	11.81	1.0	20	0	59.0	65 - 141				S
Vinyl chloride	7.34	1.0	20	0	36.7	58 - 137				S
Surr: 1,2-Dichloroethane-d4	46.32	1.0	50	0	92.6	81 - 118				
Surr: 4-Bromofluorobenzene	49.95	1.0	50	0	99.9	85 - 114				
Surr: Dibromofluoromethane	46.16	1.0	50	0	92.3	80 - 119				
Surr: Toluene-d8	50.34	1.0	50	0	101	89 - 112				

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6			Method: VOLATILES ORGANICS BY METHOD 8260C					
MSD	Sample ID: HS19121036-04MSD	Units: UG/L			Analysis Date: 19-Dec-2019 17:44					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402197		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	18.86	1.0	20	0	94.3	78 - 124	19.4	2.81	20	
1,1,1-Trichloroethane	16.86	1.0	20	0	84.3	74 - 131	17.71	4.92	20	
1,1,2,2-Tetrachloroethane	20.23	1.0	20	0	101	71 - 121	20.78	2.7	20	
1,1,2-Trichloroethane	19.33	1.0	20	0	96.7	80 - 119	19.77	2.27	20	
1,1-Dichloroethane	17.16	1.0	20	0	85.8	77 - 125	18.05	5.05	20	
1,1-Dichloroethene	12.55	1.0	20	0	62.7	71 - 131	13.2	5.06	20	S
1,1-Dichloropropene	18.06	1.0	20	0	90.3	78 - 125	18.71	3.51	20	
1,2,3-Trichlorobenzene	24.69	1.0	20	0	123	69 - 129	23.01	7.03	20	
1,2,3-Trichloropropane	20.27	1.0	20	0	101	73 - 122	21.15	4.28	20	
1,2,4-Trichlorobenzene	20.81	1.0	20	0	104	69 - 130	20.17	3.12	20	
1,2,4-Trimethylbenzene	20.73	1.0	20	0	104	76 - 124	21.92	5.56	20	
1,2-Dibromo-3-chloropropane	21.26	1.0	20	0	106	62 - 128	19.8	7.11	20	
1,2-Dibromoethane	19.09	1.0	20	0	95.4	77 - 121	19.39	1.58	20	
1,2-Dichlorobenzene	19.61	1.0	20	0	98.1	80 - 119	20.29	3.42	20	
1,2-Dichloroethane	17.16	1.0	20	0	85.8	73 - 128	17.6	2.54	20	
1,2-Dichloropropane	18.07	1.0	20	0	90.3	78 - 122	18.64	3.15	20	
1,3,5-Trimethylbenzene	21.51	1.0	20	0	108	75 - 124	22.44	4.27	20	
1,3-Dichlorobenzene	20.23	1.0	20	0	101	80 - 119	21.03	3.91	20	
1,3-Dichloropropane	19.48	1.0	20	0	97.4	80 - 119	20.05	2.86	20	
1,4-Dichlorobenzene	19.82	1.0	20	0	99.1	79 - 118	20.62	3.97	20	
2,2-Dichloropropane	16.14	1.0	20	0	80.7	60 - 139	17.33	7.11	20	
2-Butanone	33.42	2.0	40	0	83.5	56 - 143	33.34	0.236	20	
2-Chlorotoluene	21.79	1.0	20	0	109	79 - 122	22.97	5.3	20	
2-Hexanone	37.19	2.0	40	0	93.0	57 - 139	36.79	1.08	20	
4-Chlorotoluene	20.77	1.0	20	0	104	78 - 122	21.68	4.29	20	
4-Isopropyltoluene	20.96	1.0	20	0	105	77 - 127	22.05	5.05	20	
4-Methyl-2-pentanone	37.41	2.0	40	0	93.5	67 - 130	38.47	2.8	20	
Acetone	21.56	2.0	40	0	53.9	39 - 160	21.11	2.1	20	
Benzene	18.81	1.0	20	0	94.1	79 - 120	19.51	3.63	20	
Bromobenzene	20.21	1.0	20	0	101	80 - 120	21.28	5.15	20	
Bromochloromethane	16.65	1.0	20	0	83.3	78 - 123	17.18	3.09	20	
Bromodichloromethane	17.66	1.0	20	0	88.3	79 - 125	18.05	2.17	20	
Bromoform	18.29	1.0	20	0	91.5	66 - 130	18.6	1.66	20	
Bromomethane	7.386	1.0	20	0	36.9	53 - 141	8.02	8.23	20	S

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19121036-04MSD	Units: UG/L			Analysis Date: 19-Dec-2019 17:44					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402197	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	29.17	2.0	40	0	72.9	64 - 133	31.05	6.27	20	
Carbon tetrachloride	17.14	1.0	20	0	85.7	72 - 136	17.87	4.21	20	
Chlorobenzene	18.75	1.0	20	0	93.8	82 - 118	19.53	4.07	20	
Chloroethane	9.716	1.0	20	0	48.6	60 - 138	10.31	5.93	20	S
Chloroform	16.43	1.0	20	0	82.1	79 - 124	16.9	2.82	20	
Chloromethane	4.642	1.0	20	0	23.2	50 - 139	4.721	1.67	20	S
cis-1,2-Dichloroethene	18.7	1.0	20	0.8057	89.5	78 - 123	19.32	3.25	20	
cis-1,3-Dichloropropene	18.44	1.0	20	0	92.2	75 - 124	18.77	1.77	20	
Dibromochloromethane	18.8	1.0	20	0	94.0	74 - 126	19.14	1.8	20	
Dibromomethane	17.47	1.0	20	0	87.3	79 - 123	17.65	1.03	20	
Dichlorodifluoromethane	2.182	1.0	20	0	10.9	32 - 152	2.281	4.47	20	S
Ethylbenzene	19.55	1.0	20	0	97.7	79 - 121	20.58	5.15	20	
Hexachlorobutadiene	19.9	1.0	20	0	99.5	66 - 134	20.21	1.58	20	
Isopropylbenzene	19.69	1.0	20	0	98.5	72 - 131	20.66	4.83	20	
m,p-Xylene	38.9	2.0	40	0	97.2	80 - 121	40.67	4.47	20	
Methylene chloride	16.3	2.0	20	0	81.5	74 - 124	16.6	1.8	20	
Naphthalene	21.56	1.0	20	0	108	61 - 128	20.02	7.4	20	
n-Butylbenzene	20.69	1.0	20	0	103	75 - 128	21.64	4.48	20	
n-Propylbenzene	21.27	1.0	20	0	106	76 - 126	22.55	5.86	20	
o-Xylene	19.29	1.0	20	0	96.5	78 - 122	20.22	4.69	20	
sec-Butylbenzene	21.17	1.0	20	0	106	77 - 126	22.65	6.78	20	
Styrene	18.57	1.0	20	0	92.9	78 - 123	19.99	7.36	20	
tert-Butylbenzene	21.41	1.0	20	0	107	78 - 124	22.63	5.56	20	
Tetrachloroethene	18.46	1.0	20	0	92.3	74 - 129	19.55	5.75	20	
Toluene	19.5	1.0	20	0	97.5	80 - 121	20.51	5.03	20	
trans-1,2-Dichloroethene	17.04	1.0	20	0	85.2	75 - 124	17.82	4.47	20	
trans-1,3-Dichloropropene	17.63	1.0	20	0	88.2	73 - 127	18.06	2.41	20	
Trichloroethene	31.02	1.0	20	12.97	90.3	79 - 123	32.47	4.55	20	
Trichlorofluoromethane	10.99	1.0	20	0	54.9	65 - 141	11.65	5.87	20	S
Vinyl chloride	6.735	1.0	20	0	33.7	58 - 137	7.24	7.23	20	S
Surr: 1,2-Dichloroethane-d4	45.16	1.0	50	0	90.3	81 - 118	45.06	0.232	20	
Surr: 4-Bromofluorobenzene	50	1.0	50	0	100.0	85 - 114	50.29	0.579	20	
Surr: Dibromofluoromethane	45.87	1.0	50	0	91.7	80 - 119	45.9	0.0709	20	
Surr: Toluene-d8	51.04	1.0	50	0	102	89 - 112	51.51	0.907	20	

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6			Method: VOLATILES ORGANICS BY METHOD 8260C					
MSD	Sample ID: HS19121036-01MSD	Units: UG/L			Analysis Date: 19-Dec-2019 16:56					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402195		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	18.56	1.0	20	0	92.8	78 - 124	18.81	1.32	20	
1,1,1-Trichloroethane	17.03	1.0	20	0	85.2	74 - 131	17.47	2.55	20	
1,1,2,2-Tetrachloroethane	20.22	1.0	20	0	101	71 - 121	19.54	3.42	20	
1,1,2-Trichloroethane	19.19	1.0	20	0	95.9	80 - 119	18.87	1.68	20	
1,1-Dichloroethane	17.21	1.0	20	0	86.0	77 - 125	18.12	5.17	20	
1,1-Dichloroethene	12.6	1.0	20	0	63.0	71 - 131	13.26	5.11	20	S
1,1-Dichloropropene	18.23	1.0	20	0	91.1	78 - 125	18.92	3.72	20	
1,2,3-Trichlorobenzene	23.7	1.0	20	0	119	69 - 129	22.05	7.24	20	
1,2,3-Trichloropropane	20.11	1.0	20	0	101	73 - 122	19.84	1.34	20	
1,2,4-Trichlorobenzene	20.64	1.0	20	0	103	69 - 130	20.8	0.749	20	
1,2,4-Trimethylbenzene	21.09	1.0	20	0	105	76 - 124	20.4	3.29	20	
1,2-Dibromo-3-chloropropane	20.58	1.0	20	0	103	62 - 128	18.75	9.32	20	
1,2-Dibromoethane	18.41	1.0	20	0	92.0	77 - 121	18.62	1.12	20	
1,2-Dichlorobenzene	19.56	1.0	20	0	97.8	80 - 119	18.95	3.16	20	
1,2-Dichloroethane	16.87	1.0	20	0	84.4	73 - 128	17.08	1.21	20	
1,2-Dichloropropane	17.96	1.0	20	0	89.8	78 - 122	18.72	4.14	20	
1,3,5-Trimethylbenzene	21.57	1.0	20	0	108	75 - 124	21.04	2.49	20	
1,3-Dichlorobenzene	20.38	1.0	20	0	102	80 - 119	19.41	4.88	20	
1,3-Dichloropropane	18.91	1.0	20	0	94.5	80 - 119	19.03	0.654	20	
1,4-Dichlorobenzene	20.07	1.0	20	0	100	79 - 118	19.16	4.66	20	
2,2-Dichloropropane	16.57	1.0	20	0	82.9	60 - 139	17.33	4.45	20	
2-Butanone	32.49	2.0	40	0	81.2	56 - 143	32.49	0.00115	20	
2-Chlorotoluene	22.06	1.0	20	0	110	79 - 122	21.44	2.88	20	
2-Hexanone	36.09	2.0	40	0	90.2	57 - 139	35.63	1.28	20	
4-Chlorotoluene	20.89	1.0	20	0	104	78 - 122	20.26	3.04	20	
4-Isopropyltoluene	21.38	1.0	20	0	107	77 - 127	20.61	3.69	20	
4-Methyl-2-pentanone	36.93	2.0	40	0	92.3	67 - 130	36.71	0.6	20	
Acetone	21.38	2.0	40	0	53.4	39 - 160	20.74	3.02	20	
Benzene	18.77	1.0	20	0	93.8	79 - 120	19.32	2.89	20	
Bromobenzene	20.24	1.0	20	0	101	80 - 120	19.97	1.33	20	
Bromochloromethane	17.02	1.0	20	0	85.1	78 - 123	17.11	0.56	20	
Bromodichloromethane	17.47	1.0	20	0	87.4	79 - 125	17.8	1.87	20	
Bromoform	17.64	1.0	20	0	88.2	66 - 130	17.79	0.833	20	
Bromomethane	7.464	1.0	20	0	37.3	53 - 141	8.471	12.6	20	S

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6			Method: VOLATILES ORGANICS BY METHOD 8260C					
MSD	Sample ID: HS19121036-01MSD	Units: UG/L			Analysis Date: 19-Dec-2019 16:56					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402195		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	29.65	2.0	40	0	74.1	64 - 133	30.91	4.17	20	
Carbon tetrachloride	17.14	1.0	20	0	85.7	72 - 136	17.89	4.28	20	
Chlorobenzene	18.53	1.0	20	0	92.7	82 - 118	18.74	1.09	20	
Chloroethane	10.13	1.0	20	0	50.7	60 - 138	10.26	1.24	20	S
Chloroform	16.14	1.0	20	0	80.7	79 - 124	16.81	4.04	20	
Chloromethane	4.69	1.0	20	0	23.4	50 - 139	4.904	4.48	20	S
cis-1,2-Dichloroethene	17.81	1.0	20	0	89.0	78 - 123	18.25	2.46	20	
cis-1,3-Dichloropropene	18.14	1.0	20	0	90.7	75 - 124	18.68	2.96	20	
Dibromochloromethane	18.43	1.0	20	0	92.1	74 - 126	18.5	0.389	20	
Dibromomethane	17.38	1.0	20	0	86.9	79 - 123	17.5	0.658	20	
Dichlorodifluoromethane	2.234	1.0	20	0	11.2	32 - 152	2.343	4.77	20	S
Ethylbenzene	19.26	1.0	20	0	96.3	79 - 121	19.82	2.88	20	
Hexachlorobutadiene	19.05	1.0	20	0	95.2	66 - 134	21.08	10.2	20	
Isopropylbenzene	19.53	1.0	20	0	97.6	72 - 131	19.75	1.12	20	
m,p-Xylene	38.47	2.0	40	0	96.2	80 - 121	39.43	2.47	20	
Methylene chloride	16.32	2.0	20	0	81.6	74 - 124	16.71	2.39	20	
Naphthalene	21.18	1.0	20	0	106	61 - 128	18.98	11	20	
n-Butylbenzene	20.87	1.0	20	0	104	75 - 128	20.21	3.2	20	
n-Propylbenzene	21.64	1.0	20	0	108	76 - 126	21.15	2.28	20	
o-Xylene	19.02	1.0	20	0	95.1	78 - 122	19.38	1.9	20	
sec-Butylbenzene	21.58	1.0	20	0	108	77 - 126	20.87	3.3	20	
Styrene	18.73	1.0	20	0	93.6	78 - 123	19.01	1.49	20	
tert-Butylbenzene	21.6	1.0	20	0	108	78 - 124	20.94	3.11	20	
Tetrachloroethene	18.45	1.0	20	0	92.3	74 - 129	18.84	2.1	20	
Toluene	19.36	1.0	20	0	96.8	80 - 121	19.81	2.28	20	
trans-1,2-Dichloroethene	16.99	1.0	20	0	84.9	75 - 124	17.88	5.12	20	
trans-1,3-Dichloropropene	17.71	1.0	20	0	88.6	73 - 127	17.93	1.23	20	
Trichloroethene	18.6	1.0	20	0	93.0	79 - 123	19.97	7.11	20	
Trichlorofluoromethane	11.15	1.0	20	0	55.7	65 - 141	11.81	5.71	20	S
Vinyl chloride	6.862	1.0	20	0	34.3	58 - 137	7.34	6.73	20	S
Surr: 1,2-Dichloroethane-d4	45.04	1.0	50	0	90.1	81 - 118	46.32	2.8	20	
Surr: 4-Bromofluorobenzene	49.45	1.0	50	0	98.9	85 - 114	49.95	1	20	
Surr: Dibromofluoromethane	45.81	1.0	50	0	91.6	80 - 119	46.16	0.749	20	
Surr: Toluene-d8	50.59	1.0	50	0	101	89 - 112	50.34	0.509	20	

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT**Batch ID:** R352981 (0)**Instrument:** VOA6**Method:** VOLATILES ORGANICS BY METHOD
8260C

The following samples were analyzed in this batch: HS19121028-01 HS19121028-02

Revision: 1

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ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID:	R352964 (0)	Instrument:	WetChem_HS	Method:	CHEMICAL OXYGEN DEMAND BY E410.4					
MBLK	Sample ID: MBLK-R352964	Units:	mg/L	Analysis Date:	19-Dec-2019 18:00					
Client ID:	Run ID: WetChem_HS_352964	SeqNo:	5401921	PrepDate:	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	15.0	15.0								U
LCS	Sample ID: LCS-R352964	Units:	mg/L	Analysis Date:	19-Dec-2019 18:00					
Client ID:	Run ID: WetChem_HS_352964	SeqNo:	5401920	PrepDate:	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	105	15.0	100	0	105	85 - 115				
LCSD	Sample ID: LCSD-R352964	Units:	mg/L	Analysis Date:	19-Dec-2019 18:00					
Client ID:	Run ID: WetChem_HS_352964	SeqNo:	5401919	PrepDate:	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	103	15.0	100	0	103	85 - 115	105	1.92	20	
MS	Sample ID: HS19120979-01MS	Units:	mg/L	Analysis Date:	19-Dec-2019 18:00					
Client ID:	Run ID: WetChem_HS_352964	SeqNo:	5401923	PrepDate:	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	63	15.0	50	14	98.0	80 - 120				
MSD	Sample ID: HS19120979-01MSD	Units:	mg/L	Analysis Date:	19-Dec-2019 18:00					
Client ID:	Run ID: WetChem_HS_352964	SeqNo:	5401922	PrepDate:	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	62	15.0	50	14	96.0	80 - 120	63	1.6	20	
The following samples were analyzed in this batch: <input type="text" value="HS19121028-01"/>										

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID: R353307 (0)		Instrument: ICS-Integrion		Method: ANIONS BY SW9056A						
MBLK	Sample ID: WBLKW1-122619	Units: mg/L			Analysis Date: 26-Dec-2019 10:37					
Client ID:	Run ID: ICS-Integrion_353307	SeqNo: 5409816		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	0.500	0.500							U	
Sulfate	0.500	0.500							U	
LCS	Sample ID: WLCSW1-122619	Units: mg/L			Analysis Date: 26-Dec-2019 10:54					
Client ID:	Run ID: ICS-Integrion_353307	SeqNo: 5409817		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	19.7	0.500	20	0	98.5	80 - 120				
Sulfate	19.39	0.500	20	0	97.0	80 - 120				
LCSD	Sample ID: WLCSDW1-122619	Units: mg/L			Analysis Date: 26-Dec-2019 11:10					
Client ID:	Run ID: ICS-Integrion_353307	SeqNo: 5409818		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	19.69	0.500	20	0	98.5	80 - 120	19.7	0.0305	20	
Sulfate	19.32	0.500	20	0	96.6	80 - 120	19.39	0.351	20	
MS	Sample ID: HS19121313-04MS	Units: mg/L			Analysis Date: 26-Dec-2019 12:33					
Client ID:	Run ID: ICS-Integrion_353307	SeqNo: 5409823		PrepDate:			DF: 500			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	4892	250	5000	102	95.8	80 - 120				
Sulfate	4728	250	5000	34.95	93.9	80 - 120				
MS	Sample ID: HS19120760-11MS	Units: mg/L			Analysis Date: 26-Dec-2019 18:29					
Client ID:	Run ID: ICS-Integrion_353307	SeqNo: 5412209		PrepDate:			DF: 500			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	14800	250	5000	10110	93.8	80 - 120				
Sulfate	5883	250	5000	1099	95.7	80 - 120				

Revision: 1

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ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID: R353307 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MSD		Sample ID: HS19121313-04MSD		Units: mg/L		Analysis Date: 26-Dec-2019 12:50			
Client ID:		Run ID: ICS-Integrion_353307		SeqNo: 5409824		PrepDate:		DF: 500	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Chloride	4849	250	5000	102	94.9	80 - 120	4892	0.883	20
Sulfate	4687	250	5000	34.95	93.0	80 - 120	4728	0.86	20

MSD		Sample ID: HS19120760-11MSD		Units: mg/L		Analysis Date: 26-Dec-2019 18:45			
Client ID:		Run ID: ICS-Integrion_353307		SeqNo: 5412210		PrepDate:		DF: 500	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual
Chloride	14830	250	5000	10110	94.3	80 - 120	14800	0.179	20
Sulfate	5914	250	5000	1099	96.3	80 - 120	5883	0.529	20

The following samples were analyzed in this batch: HS19121028-01

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19121028

QC BATCH REPORT

Batch ID: R353627 (0)		Instrument: Balance1		Method: OIL & GREASE (HEM) BY E1664A						
MBLK	Sample ID: WBLKW-123119	Units: mg/L		Analysis Date: 31-Dec-2019 10:50						
Client ID:	Run ID: Balance1_353627	SeqNo: 5418531		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Oil and Grease	1.00	2.00							U	
LCS	Sample ID: WLCSW-123119	Units: mg/L		Analysis Date: 31-Dec-2019 10:50						
Client ID:	Run ID: Balance1_353627	SeqNo: 5418533		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Oil and Grease	40.8	2.00	40	0	102	78 - 114				
LCSD	Sample ID: WLCSDW-123119	Units: mg/L		Analysis Date: 31-Dec-2019 10:50						
Client ID:	Run ID: Balance1_353627	SeqNo: 5418532		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Oil and Grease	40	2.00	40	0	100	78 - 114	40.8	1.98	18	
MS	Sample ID: HS19121318-01MS	Units: mg/L		Analysis Date: 31-Dec-2019 10:50						
Client ID:	Run ID: Balance1_353627	SeqNo: 5418529		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Oil and Grease	45.83	2.00	40	9.167	91.7	78 - 114				

The following samples were analyzed in this batch: HS19121028-01

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client:	Bhate Environmental Associates, Inc.	QUALIFIERS, ACRONYMS, UNITS
Project:	Groundwater Treatment Plant Quarterly Influent Samples	
WorkOrder:	HS19121028	

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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS, ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
Work Order: HS19121028

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19121028-01	LH18/24-SP140_121719	Login	12/18/2019 10:36:23 PM	NDR	Sub
HS19121028-01	LH18/24-SP140_121719	Login	12/18/2019 10:36:23 PM	NDR	Disposed
HS19121028-01	LH18/24-SP140_121719	Login	12/18/2019 10:36:23 PM	NDR	Disposed
HS19121028-01	LH18/24-SP140_121719	Login	12/18/2019 10:36:23 PM	NDR	Disposed
HS19121028-01	LH18/24-SP140_121719	Login	12/18/2019 10:36:23 PM	NDR	Disposed
HS19121028-01	LH18/24-SP140_121719	Login	12/18/2019 10:36:23 PM	NDR	MET037
HS19121028-01	LH18/24-SP140_121719	Login	12/18/2019 10:36:23 PM	NDR	Disposed
HS19121028-02	Trip Blank	Login	12/18/2019 10:36:23 PM	NDR	Disposed

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19121028

Date/Time Received: **18-Dec-2019 10:50**
 Received by: **JRM**

Checklist completed by: Nilesh D. Ranchod 18-Dec-2019 Reviewed by: Corey Grandits 19-Dec-2019
 eSignature Date eSignature Date

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

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes No Not Present
- Chain of custody present? Yes No 1 Page(s)
- Chain of custody signed when relinquished and received? Yes No COC IDs:N/A
- Samplers name present on COC? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s):

1.7c C/UC	IR 11
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Cooler(s)/Kit(s):

45576

Date/Time sample(s) sent to storage:

12/18/2019 10:50pm

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:

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Login Notes:

Trip Blank received 2 vials, 2 COC. Logged in 1 vials per COC. Trip Blanks split between W/O HS19121029
--

Client Contacted: _____ Date Contacted: _____ Person Contacted: _____
 Contacted By: _____ Regarding: _____

Comments:

--

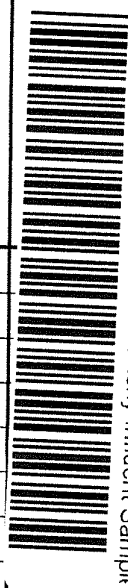
Corrective Action:

--

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd., Suite 210 Houston, Tx. 77099 ATTN: RJ Modashia

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS			Project No. NWO1312.0150.0 16.0001			Analyses										Remarks (Preservatives, etc.)		
Job: GROUNDWATER TREATMENT PLANT QUARTERLY INFLUENT SAMPLES						MS / MSD	No. OF CONTAINERS	ROD Volatiles	Total Metals	Oil & Grease	Chemical Oxygen Demand	Chloride & Sulfate	1, 4 - DIOXANE	Perchlorate				
Prepared By: Scott Beesinger			P. O. Number															
Field Sample I.D.	Sample Matrix	Date / Time																
LH18/24-SP140_121719	Water	12/17/19 / 14:00	4	3	1													HCL
LH18/24-SP140_121719	Water	12/17/19 / 14:00	1	1														HNO3
LH18/24-SP140_121719	Water	12/17/19 / 14:00	2						1	1								NONE
LH18/24-SP140_121719	Water	12/17/19 / 14:00	1					1										H2SO4
LH18/24-SP140_121719	Water	12/17/19 / 14:00	1							1								NONE
Trip Blank	Water	12/17/19 / 14:00	2	2														HCL



Bhate Environmental Associates, Inc.
Groundwater Treatment Plant Quarterly Influent Sample

HS19121028

Additional Remarks: STANDARD TURN AROUND TIME

Relinquished By: <i>Scott Beesinger</i>	Date: 12/17/19	Time: 14:30	Received By:	Date:	Time:	Relinquished By:	Date:	Time:	Received By:	Date:	Time:
---	--------------------------	-----------------------	---------------------	--------------	--------------	-------------------------	--------------	--------------	---------------------	--------------	--------------

Received At Lab By: <i>J. M...</i>	Date: 12/18/19	Time: 10:50	Airbill No.:	For Lab Use Only							
Remarks: Cooler 95576 1211 Temp 1.7 C/O.O			Opened By:	Date:	Time:	Temp of Container:	Seal No.:	Condition:			

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

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

CUSTODY SEAL

Date:	12/17/19	Time:	1430
Name:	Scott S. S. S. S.		
Company:	S. S. S. S.		

12/

FedEx
 TRK# 0221 4380 9533 6736
AB SGRA
WED - 18 DEC 10:30A
PRIORITY OVERNIGHT
 77099
 TX-US
 IAH



FID 162785 17DEC19 G6GA 56AC2/100D/85A2



Case Narrative

Method: 6850

Analysis: Perchlorate

Analysis SOP: LC-MS-CLO4

ALS WO ID(s): 1935912; 1935913; 1935914;
1935915; 1936106

Client: ALS Laboratories (Houston, TX)

Matrix: Water

ELMS Batch (HBN): 2336 (254688)

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

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

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50 μL 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 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 690689) was less than 1/2 the CRDL. The recovery for the LCS (690686) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on samples 1935915002/03 and 1935915007/08 (Client ID's: C09_121719 and MW18_121719). 3.0 μ L of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3. μ g/L. The MS/MSD (1935912002/03) failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected. The relative percent difference (RPD) failed acceptance criteria for MS/MSD 1935915007/08.

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

NC/CAR(s): NA

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

where: A = Analyte concentration from the standard curve (μ g/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 – 690687) is reported from the analysis of the Laboratory Control Sample (LCS – 690686) at a level of 3.0 μ g/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).

Thomas Bosch January 06, 2020
Analyst Date



ANALYTICAL REPORT

Report Date: January 06, 2020

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

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1935913**

Project ID: HS19121028

Purchase Order: HS19121028

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP140_121719	1935913001	12/17/19	12/20/19	

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

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Environmental 

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RIGHT SOLUTIONS | RIGHT PARTNER



ANALYTICAL REPORT

Workorder: **34-1935913**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: LH18/24-SP140_121719	Sampling Site: NA	Collected: 12/17/2019				
Lab ID: 1935913001	Media: 125 mL Nalgene	Received: 12/20/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2336 (HBN: 254688) Analyzed: 01/02/2020 14:21	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	14000	1000	2000	4000	1000	

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 254688)

Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. 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 01/03/2020 13:16	/S/ Stephen Brose 01/06/2020 10:58

Laboratory Contact Information

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

Phone: (801) 266-7700
Email: als@alst.com
Web: www.alst.com



ANALYTICAL REPORT

Workorder: 34-1935913

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.pjlab.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlab.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.pjlab.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlab.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: 1935913
Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2336 (HBN: 254688)
Analyzed By: Thomas Bosch

Blank

LMB: 690689 Analyzed: 01/02/2020 13:54 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 690686 Analyzed: 01/02/2020 13:26 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.19	3.00	106	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1935915001 Analyzed: 01/02/2020 14:49 Dilution: 1 Units: ug/L		MS: 1935915002 Analyzed: 01/02/2020 15:03 Dilution: 1 Units: ug/L				MSD: 1935915003 Analyzed: 01/02/2020 15:17 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	1.50	4.34	3	# 145	78.8 123.8	3.81	# 127	13	0.0 20.0
Sample: 1935915006 Analyzed: 01/02/2020 15:59 Dilution: 1 Units: ug/L		MS: 1935915007 Analyzed: 01/02/2020 16:27 Dilution: 1 Units: ug/L				MSD: 1935915008 Analyzed: 01/02/2020 16:41 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	2.46	3	81.9	78.8 123.8	3.35	112	# 30.7	0.0 20.0

Comments

Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

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

Analyt	Peer Review
/S/ Thomas Bosch 01/06/2020 08:23	/S/ Stephen Brose 01/06/2020 10:58

Symbols and Definitions

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

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



W 1935913

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Houston, TX 77099
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Subcontract Chain of Custody

18698/#2

SAMPLING STATE: Colorado

COC ID: 12903

SUBCONTRACT TO:

1935913

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: HS19121028
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19121028-01	LH18/24-SP140_121719	Water	17 Dec 2019 14:00
	SUB_Perch-6850		03 Jan 2020

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: [Signature]
Received By: [Signature]
Cooler ID(s): _____

Date/Time: 12-19-19 18:00
Date/Time: 12-20-19 1006
Temperature(s): _____

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

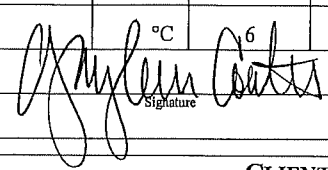
1935913

Client Name: ALS HOUSTON Project/Task/Site: _____
 Date/Time of Receipt: 12.20.19 1006 Number of Coolers Received: 1

Condition of Coolers: Acceptable/Unacceptable Temperature Control: Present/Not Included
 Cooler Custody Seals: Present/Absent/NA
 Container Custody Seals: Present/Absent/NA Location Temp Taken: Control/Between Samples
 Ice Present: Yes/No/NA Are all temperatures within project specific guidelines? 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	<u>GOOD</u>	<u>3</u> °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C	6		°C	9		°C

Taken By:  GAYLEEN COATES 12.20.19
Signature Printed Name Date

CLIENT-RELATED INFORMATION

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

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

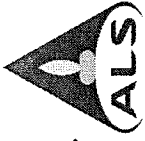
Client Notified? Yes No

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

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



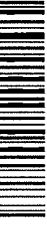
Batch Worklist

HBN: 254688

Instrument:

Created: 1/2/2020 13:05

Batch: ELMS/ 2336



Status: WP

Analyst: T. Bosch

Rule: EPA 6850, DoD QSM Water

- Workorder: 1935912 [ENV_LVL4]
- Workorder: 1935913 [ENV_LVL4]
- Workorder: 1935914 [ENV_LVL4]
- Workorder: 1935915 [ENV_LVL4]
- Workorder: 1936106 [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	690685	CCV for HBN 254688 [ELMS/2336]				CCV	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	
2	690686	LCS for HBN 254688 [ELMS/2336]				LCS	3	E6850Q413Q	E6850Q413Q	5311	1/6/2020	1/6/2020	
3	690687	RLVS for HBN 254688 [ELMS/2336]				RLVS	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	
4	690688	ICS for HBN 254688 [ELMS/2336]				ICS	3	E6850.D3Q	E6850.D3Q	5311	1/6/2020	1/6/2020	
5	690689	LMB for HBN 254688 [ELMS/2336]				LMB	3	E6850Q413Q	E6850Q413Q	5311	1/6/2020	1/6/2020	
6	1935912001	LH18/24-SP650_121719_BIX				SAMPLE	3	1935912001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
7	1935913001	LH18/24-SP140_121719				SAMPLE	3	1935913001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
8	1935914001	LH18/24-SP650_121719_BIX				SAMPLE	3	1935914001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
9	1935915001	C09_121719				SAMPLE	3	1935915001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
10	1935915002	C09_121719MSD				MS	3	1935915002-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
11	1935915003	C09_121719MSD				MSD	3	1935915003-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
12	1935915004	126_121719				SAMPLE	3	1935915004-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
13	1935915005	126_121719_a				SAMPLE	3	1935915005-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
14	1935915006	MW18_121719				SAMPLE	3	1935915006-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
15	690690	CCV for HBN 254688 [ELMS/2336]				CCV	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	
16	1935915007	MW18_121719MS				MS	3	1935915007-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
17	1935915008	MW18_121719MSD				MSD	3	1935915008-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
18	1935915009	120_121719				SAMPLE	3	1935915009-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
19	1935915010	MW14_121719				SAMPLE	3	1935915010-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
20	1935915011	18CPTMW04SW_121719				SAMPLE	3	1935915011-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
21	1935915012	18CPTMW04_121719				SAMPLE	3	1935915012-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
22	1936106001	HS19121315-02				SAMPLE	3	1936106001-A	E6850Q41.3	5480	1/20/2020	1/8/2020	
23	690691	CCV for HBN 254688 [ELMS/2336]				CCV	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #()'s: 1935912 (001); 1935913 (001); 1935914 (001); 1935915 (001-12);
 1936106 (001) ELMS Batch/HBN ID: 2336 (254688)
 Prep Date: 01/02/2020 Analysis Date: 01/02/2020 Analyst: Tom Bosch
 Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
 Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2020\JAN\02JAN20D.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 690686; Target = 3.0µg/L. ASTM type II water was used for LMB 690689.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on samples 1935915002/03 and 1935915007/08 (Client ID's: C09_121719 and MW18_121719). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L. Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD (1935912002/03) failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected. The relative percent difference (RPD) failed acceptance criteria for MS/MSD 1935915007/08.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALS\TWS013\LCMS\LCMS04\2020\JAN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\als\TWS013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2020\DOD\254688-DoD-ALS-Hstn LCMS4 or through \\ALS\TWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 690687) is reported from the analysis of the Laboratory Control Sample (LCS – 690686) 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).

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	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2336 HBN: 254688</u> <u>1935915 / 1936106</u>		
Sample Set IDs if Applicable: <u>1935912 / 1935913 / 1935914</u>		
<u>Sample positions on autosampler verified against instrument sequence</u>	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



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

CERTIFICATE OF ANALYSIS



AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: Refer to SDS for complete safety information

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



Signal Word: None

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, 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



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



S

36748

Product Name: Perchlorate IC Standard

Description:

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

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

Solvent: water (low TOC, < 50 ppb)

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

Traceability:

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

Estimation of Uncertainties:

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

Homogeneity:

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

Intended Use:

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

Instructions for Use:

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

Hazards:

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

Expiration of Certification:

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



ISO 9001 Registered Quality System – TUV USA

Page 1 of 2



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013

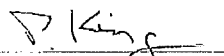
Lot Issue Date: 29-Feb 2016

Lot Number: CP-0860

Expiration Date: 31-Mar 2020

Maintenance of Certification:

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


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


Daniel J. Lamendola
Director of QA/RA



ISO 9001 Registered Quality System – TUV USA

Page 2 of 2



Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

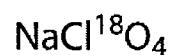
Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl*O4

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

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

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

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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	Perchlorate RT	Perchlorate Amount	
#*	690685	CCV@25	Vial 71	1	Control	1	1.55994e6	7.560	28.36838
#*	690686	QC@3.0	Vial 72	1	Control	2	1.77411e5	7.259	3.19399
#*	690688	ICS@3.0	Vial 73	1	Control	3	1.21919e5	7.244	2.98982
#*	690689	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1935912001		Vial 75	1	Sample	5	1.13186e5	7.256	1.69696
#*	1935913001	1K	Vial 76	1	Sample	6	7.50336e5	7.600	13.85381 × 1,000.
#*	1935914001		Vial 77	1	Sample	7	1.16448e5	7.271	1.93064
#*	1935915001		Vial 78	1	Sample	8	6.26357e4	7.202	1.53061
#*	1935915002	MS	Vial 79	1	Sample	9	1.67718e5	7.194	4.34105
#*	1935915003	MSD	Vial 80	1	Sample	10	1.70226e5	7.204	3.80971
#*	1935915004		Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1935915005		Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1935915006		Vial 83	1	Sample	13	0.00000	0.000	0.00000
#*	690690	CCV@25	Vial 71	1	Control	14	1.55697e6	7.430	25.18198
#*	1935915007	MS	Vial 84	1	Sample	15	1.31015e5	7.176	2.45647
#*	1935915008	MSD	Vial 85	1	Sample	16	1.32260e5	7.185	3.34662
#*	1935915009	1K	Vial 86	1	Sample	17	1.32009e6	7.615	2.26282e4
#*	1935915010	10K	Vial 87	1	Sample	18	7.68865e5	7.605	1.30447e5
#*	1935915011		Vial 88	1	Sample	19	7.20051e4	7.345	1.12833
#*	1936106001		Vial 90	1	Sample	21	3.75684e5	7.220	6.65265
#*	1935915012	10X	Vial 91	1	Sample	22	3.40719e6	7.485	516.14517
*	690691	CCV@25	Vial 71	1	Control	23	1.84092e6	7.431	26.50237

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
#*	690685	CCV@25	Vial 71	1	Control	1	1.85309e5	7.581	5.00000
#*	690686	QC@3.0	Vial 72	1	Control	2	2.04529e5	7.274	5.00000
#*	690688	ICS@3.0	Vial 73	1	Control	3	1.50034e5	7.270	5.00000
#*	690689	LMB	Vial 74	1	Control	4	1.97614e5	7.421	5.00000
#*	1935912001		Vial 75	1	Sample	5	2.41857e5	7.281	5.00000
#*	1935913001	1K	Vial 76	1	Sample	6	1.93760e5	7.618	5.00000
#*	1935914001		Vial 77	1	Sample	7	2.19726e5	7.292	5.00000
#*	1935915001		Vial 78	1	Sample	8	1.47744e5	7.212	5.00000
#*	1935915002	MS	Vial 79	1	Sample	9	1.42468e5	7.219	5.00000
#*	1935915003	MSD	Vial 80	1	Sample	10	1.64739e5	7.223	5.00000
#*	1935915004		Vial 81	1	Sample	11	8.26190e4	7.086	5.00000
#*	1935915005		Vial 82	1	Sample	12	8.16375e4	7.053	5.00000
#*	1935915006		Vial 83	1	Sample	13	1.75700e5	7.224	5.00000
#*	690690	CCV@25	Vial 71	1	Control	14	2.11105e5	7.446	5.00000
#*	1935915007	MS	Vial 84	1	Sample	15	1.95563e5	7.198	5.00000
#*	1935915008	MSD	Vial 85	1	Sample	16	1.45588e5	7.205	5.00000
#*	1935915009	1K	Vial 86	1	Sample	17	2.01300e5	7.637	5000.00000
#*	1935915010	10K	Vial 87	1	Sample	18	2.11546e5	7.628	5.00000e4
#*	1935915011		Vial 88	1	Sample	19	2.26624e5	7.350	5.00000
#*	1936106001		Vial 90	1	Sample	21	2.07387e5	7.238	5.00000
#*	1935915012	10X	Vial 91	1	Sample	22	2.02952e5	7.505	50.00000
*	690691	CCV@25	Vial 71	1	Control	23	2.35883e5	7.456	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
#*	690685	CCV@25	Vial 71	1	Control	1	4.57213e5	7.577	27.40050
#*	690686	QC@3.0	Vial 72	1	Control	2	5.95825e4	7.268	3.42868
#*	690688	ICS@3.0	Vial 73	1	Control	3	4.72946e4	7.260	3.71890
#*	690689	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1935912001		Vial 75	1	Sample	5	4.05294e4	7.272	1.91502
#*	1935913001	1K	Vial 76	1	Sample	6	2.24222e5	7.618	13.51424
#*	1935914001		Vial 77	1	Sample	7	4.06777e4	7.281	2.13096
#*	1935915001		Vial 78	1	Sample	8	2.50802e4	7.216	1.94184

Batch Report: C:\HPCHEM\1\DATA\02JAN20D\02JAN20S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
#*	1935915002	MS	Vial 79	1	Sample	9	6.04977e4	7.206	5.03782
#*	1935915003	MSD	Vial 80	1	Sample	10	6.53036e4	7.210	4.69891
#*	1935915004		Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1935915005		Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1935915006		Vial 83	1	Sample	13	0.00000	0.000	0.00000
#*	690690	CCV@25	Vial 71	1	Control	14	4.73141e5	7.448	25.10439
#*	1935915007	MS	Vial 84	1	Sample	15	4.35554e4	7.182	2.59201
#*	1935915008	MSD	Vial 85	1	Sample	16	4.64932e4	7.193	3.76884
#*	1935915009	1K	Vial 86	1	Sample	17	3.97734e5	7.628	2.23585e4
#*	1935915010	10K	Vial 87	1	Sample	18	2.35180e5	7.624	1.30045e5
#*	1935915011		Vial 88	1	Sample	19	2.59057e4	7.372	1.25727
#*	1936106001		Vial 90	1	Sample	21	1.25368e5	7.239	7.17456
#*	1935915012	10X	Vial 91	1	Sample	22	9.99390e5	7.502	502.85057
*	690691	CCV@25	Vial 71	1	Control	23	5.41119e5	7.448	25.64372

*** End of Report ***

Sequence Table:

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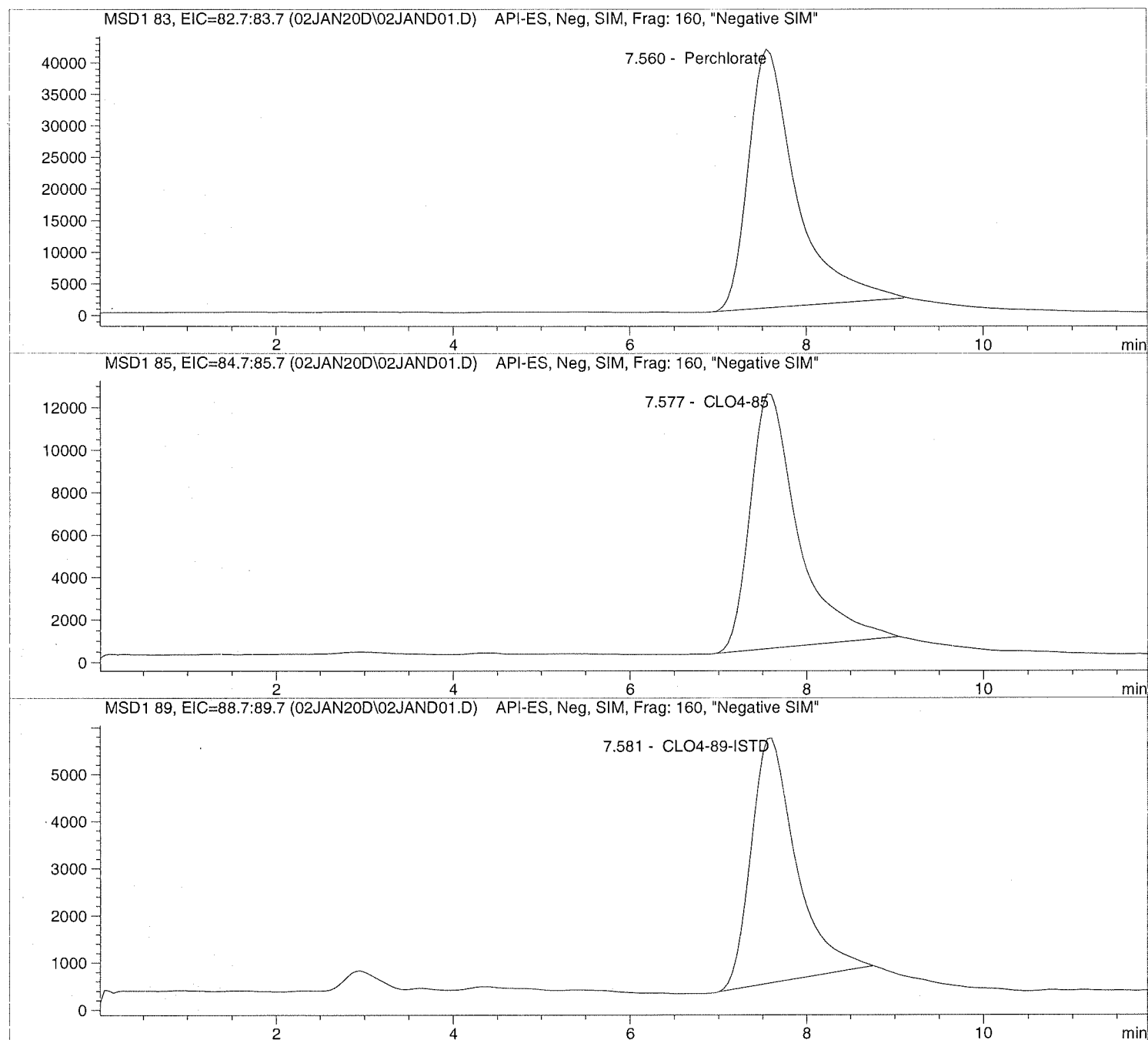
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	690685	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	690686	QC@3.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	690688	ICS@3.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	690689	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1935912001		CLO4-AQN	1	Sample	
6	Vial 76	1935913001	1K	CLO4-AQN	1	Sample	
7	Vial 77	1935914001		CLO4-AQN	1	Sample	
8	Vial 78	1935915001		CLO4-AQN	1	Sample	
9	Vial 79	1935915002	MS	CLO4-AQN	1	Sample	
10	Vial 80	1935915003	MSD	CLO4-AQN	1	Sample	
11	Vial 81	1935915004		CLO4-AQN	1	Sample	
12	Vial 82	1935915005		CLO4-AQN	1	Sample	
13	Vial 83	1935915006		CLO4-AQN	1	Sample	
14	Vial 71	690690	CCV@25	CLO4-AQN	1	Ctrl Samp	
15	Vial 84	1935915007	MS	CLO4-AQN	1	Sample	
16	Vial 85	1935915008	MSD	CLO4-AQN	1	Sample	
17	Vial 86	1935915009	1K	CLO4-AQN	1	Sample	
18	Vial 87	1935915010	10K	CLO4-AQN	1	Sample	
19	Vial 88	1935915011		CLO4-AQN	1	Sample	
20	Vial 89	1935915012	100	CLO4-AQN	1	Sample	
21	Vial 90	1936106001		CLO4-AQN	1	Sample	
22	Vial 91	1935915012	10X	CLO4-AQN	1	Sample	
23	Vial 71	690691	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND01.D Sample Name: 690685 CCV@25

```
=====
Injection Date: 1/02/2020 13:11:53      Seq Line: 1
Sample Name: 690685 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\02JAN20D\02JAND01.D Sample Name: 690685 CCV@25

```

=====
Injection Date: 1/02/2020 13:11:53 Seq Line: 1
Sample Name: 690685 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
7.560	PBA	1559941.9	28.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.577	PBA	457213.1	27.4005	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.581	PBA	185309.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND02.D

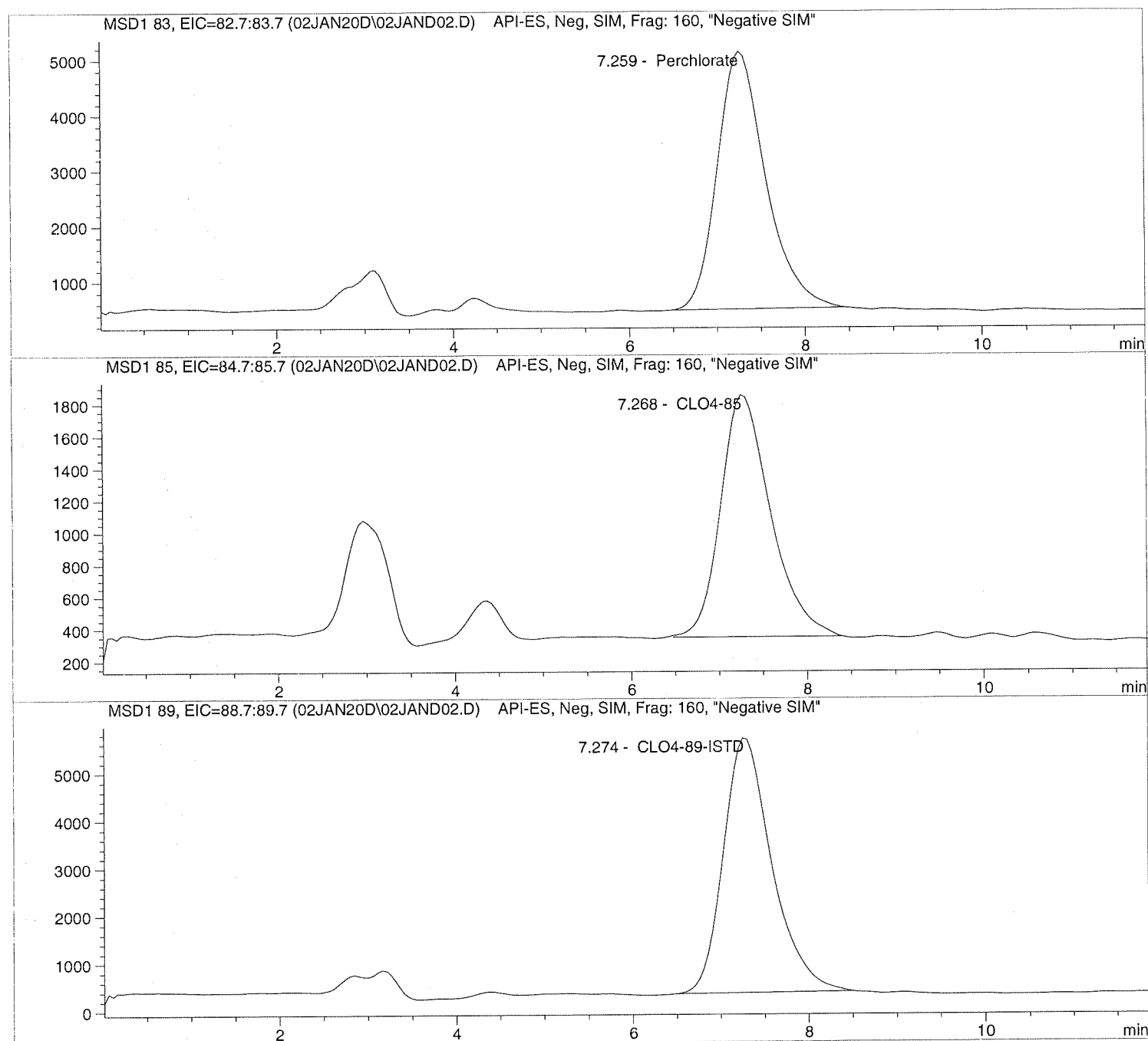
Sample Name: 690686 QC@3.0

Injection Date: 1/02/2020 13:26:12
Sample Name: 690686 QC@3.0
Acq Operator: TNB

Seq Line: 2
Location: Vial 72
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND02.D Sample Name: 690686 QC@3.0

=====
 Injection Date: 1/02/2020 13:26:12 Seq Line: 2
 Sample Name: 690686 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
7.259	BBA	177410.8	3.1940	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.268	BBA	59582.5	3.4287	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.274	BBA	204529.1	5.0000	CLO4-89-ISTD

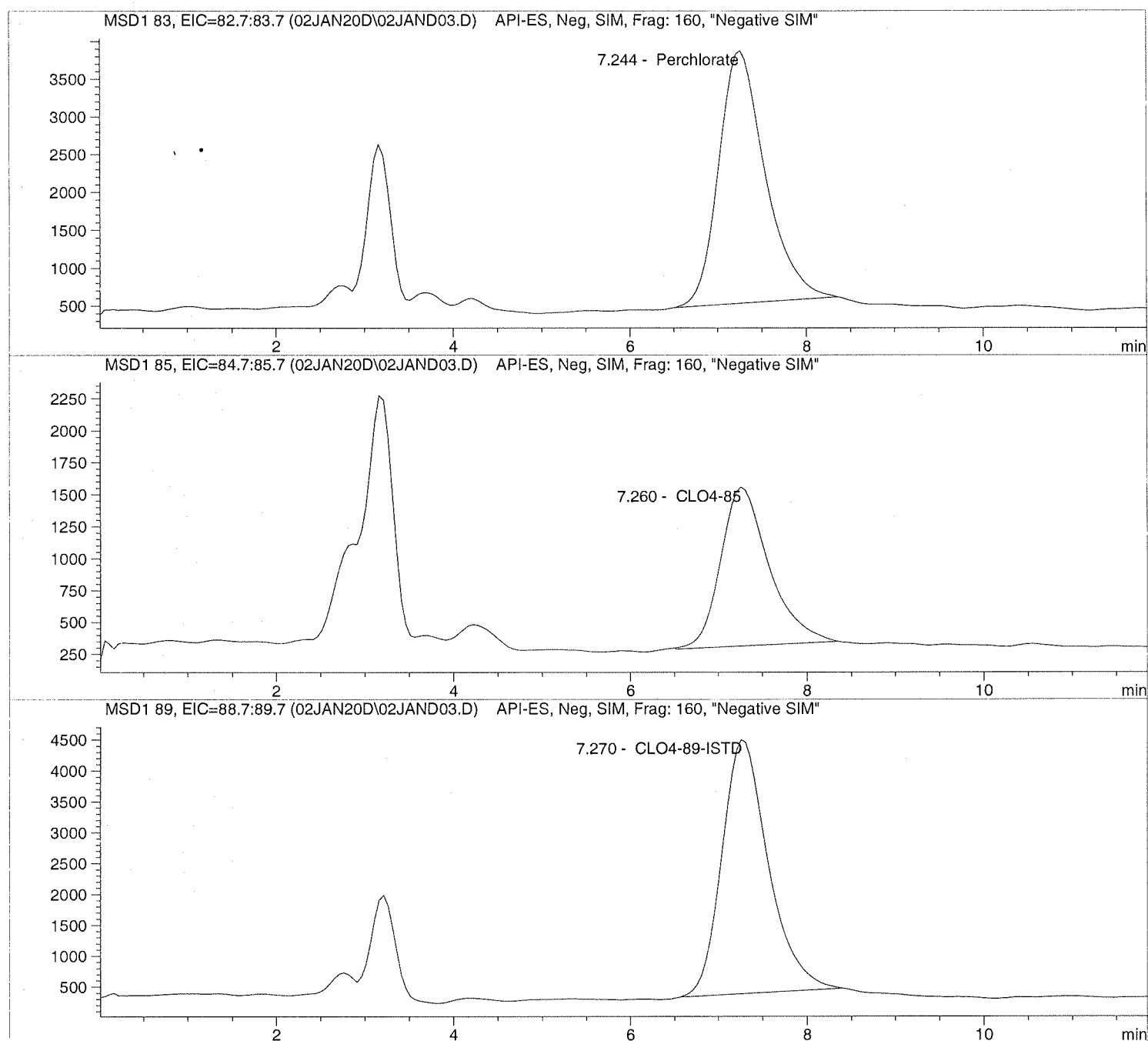
=====
 *** End of Report ***
 =====

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND03.D Sample Name: 690688 ICS@3.0

=====
Injection Date: 1/02/2020 13:40:06 Seq Line: 3
Sample Name: 690688 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\02JAN20D\02JAND03.D Sample Name: 690688 ICS@3.0

```

=====
Injection Date: 1/02/2020 13:40:06      Seq Line: 3
Sample Name: 690688 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
7.244	BBA	121919.3	2.9898	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.260	BBA	47294.6	3.7189	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.270	PBA	150034.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND04.D

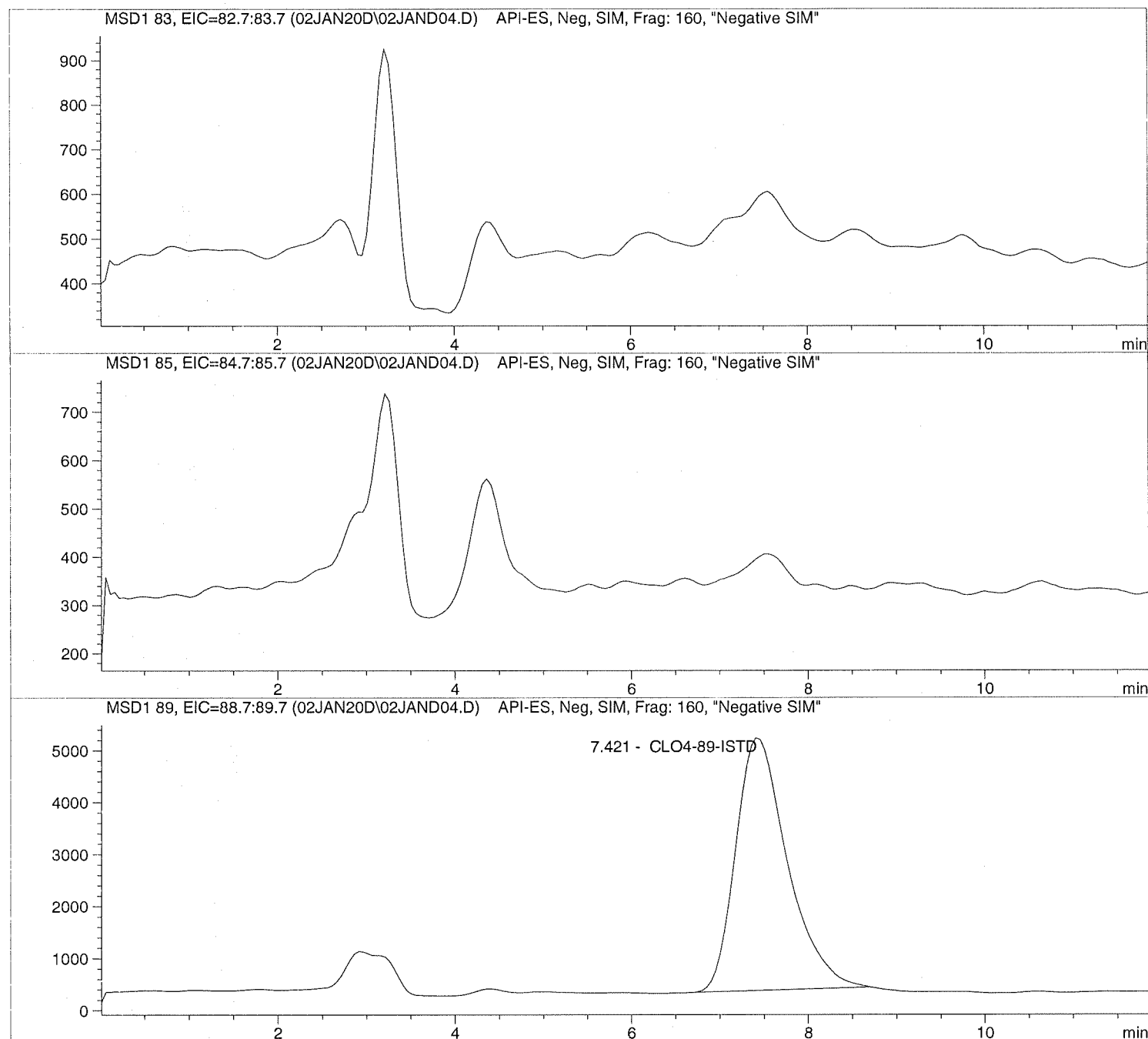
Sample Name: 690689 LMB

Injection Date: 1/02/2020 13:54:01
Sample Name: 690689 LMB
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
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\02JAN20D\02JAND04.D Sample Name: 690689 LMB

```

=====
Injection Date: 1/02/2020 13:54:01      Seq Line: 4
Sample Name:    690689 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
7.421	PBA	197614.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND05.D

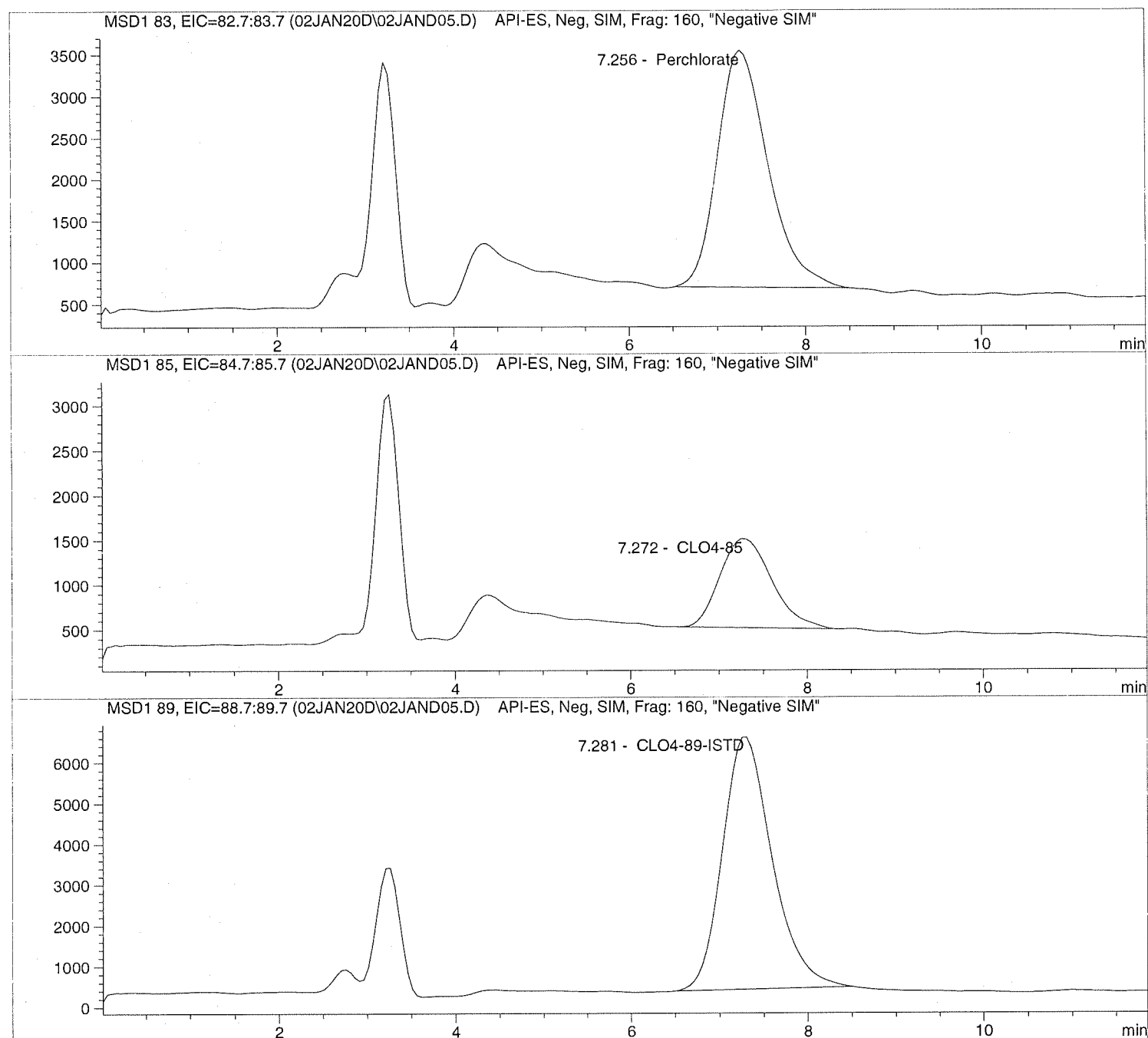
Sample Name: 1935912001

Injection Date: 1/02/2020 14:07:55
Sample Name: 1935912001
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
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\02JAN20D\02JAND05.D Sample Name: 1935912001

```

=====
Injection Date: 1/02/2020 14:07:55      Seq Line: 5
Sample Name: 1935912001                  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
7.256	PBA	113185.7	1.6970	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.272	PBA	40529.4	1.9150	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.281	PBA	241856.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

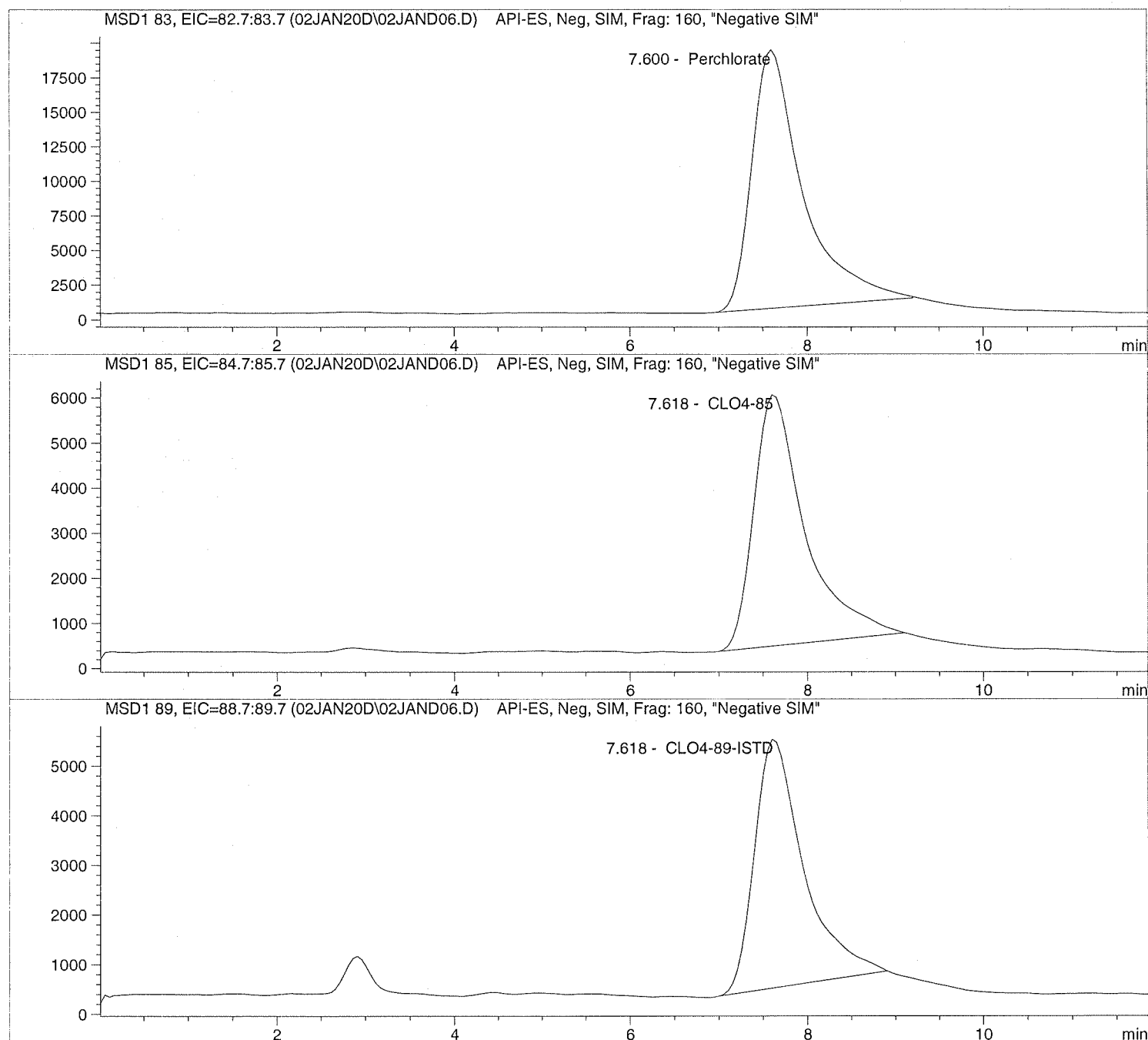
```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND06.D Sample Name: 1935913001 1K

```
=====
Injection Date: 1/02/2020 14:21:57      Seq Line: 6
Sample Name: 1935913001 1K              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\02JAN20D\02JAND06.D Sample Name: 1935913001 1K

```

=====
Injection Date: 1/02/2020 14:21:57      Seq Line: 6
Sample Name: 1935913001 1K              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
7.600	PBA	750336.3	13.8538	Perchlorate * 1,000. DILUTION

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.618	PBA	224222.5	13.5142	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.618	PBA	193759.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND07.D

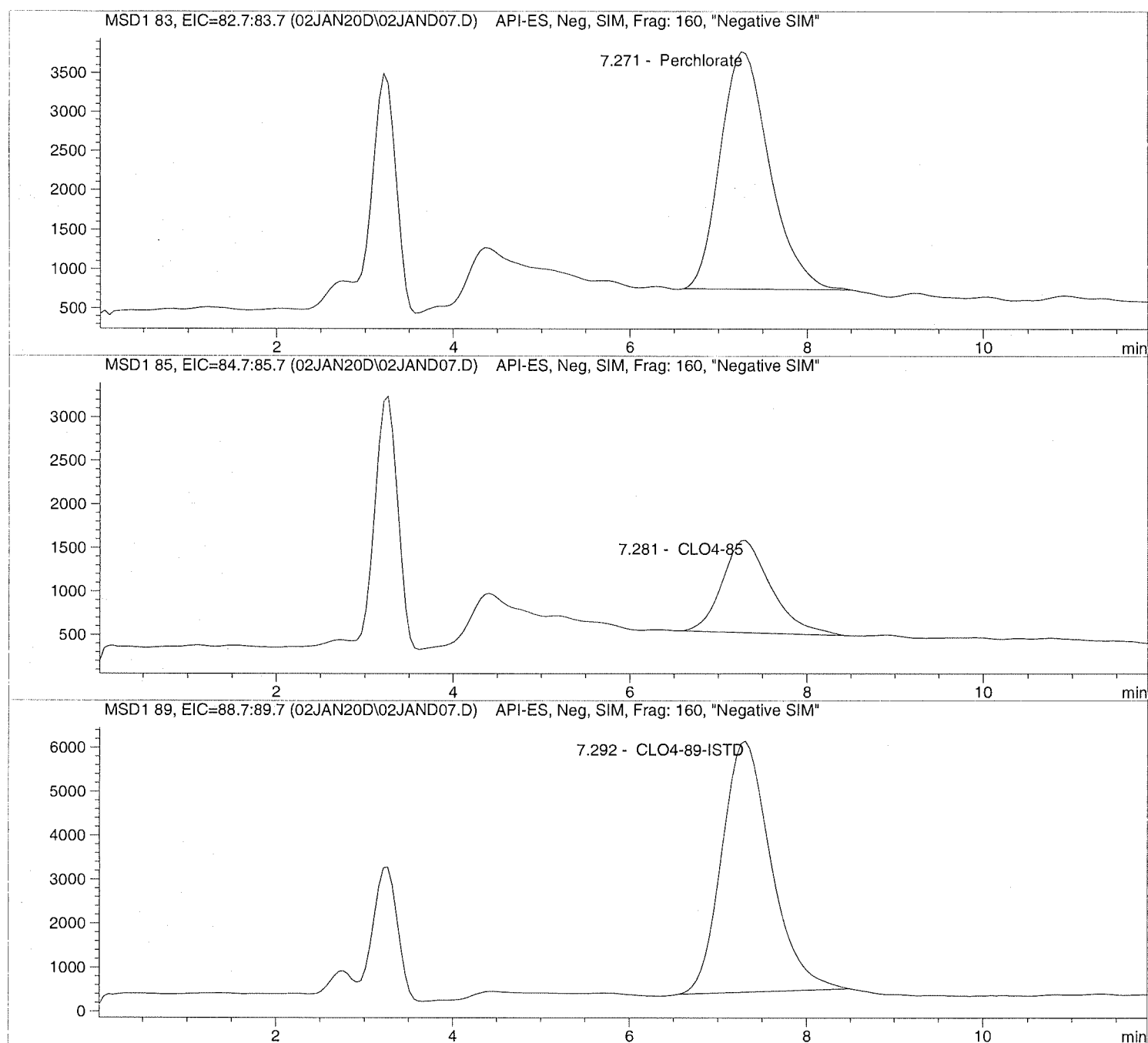
Sample Name: 1935914001

Injection Date: 1/02/2020 14:35:49
Sample Name: 1935914001
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
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\02JAN20D\02JAND07.D Sample Name: 1935914001

```

=====
Injection Date: 1/02/2020 14:35:49      Seq Line: 7
Sample Name: 1935914001                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
7.271	PBA	116448.2	1.9306	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.281	PBA	40677.7	2.1310	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.292	PBA	219725.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND08.D

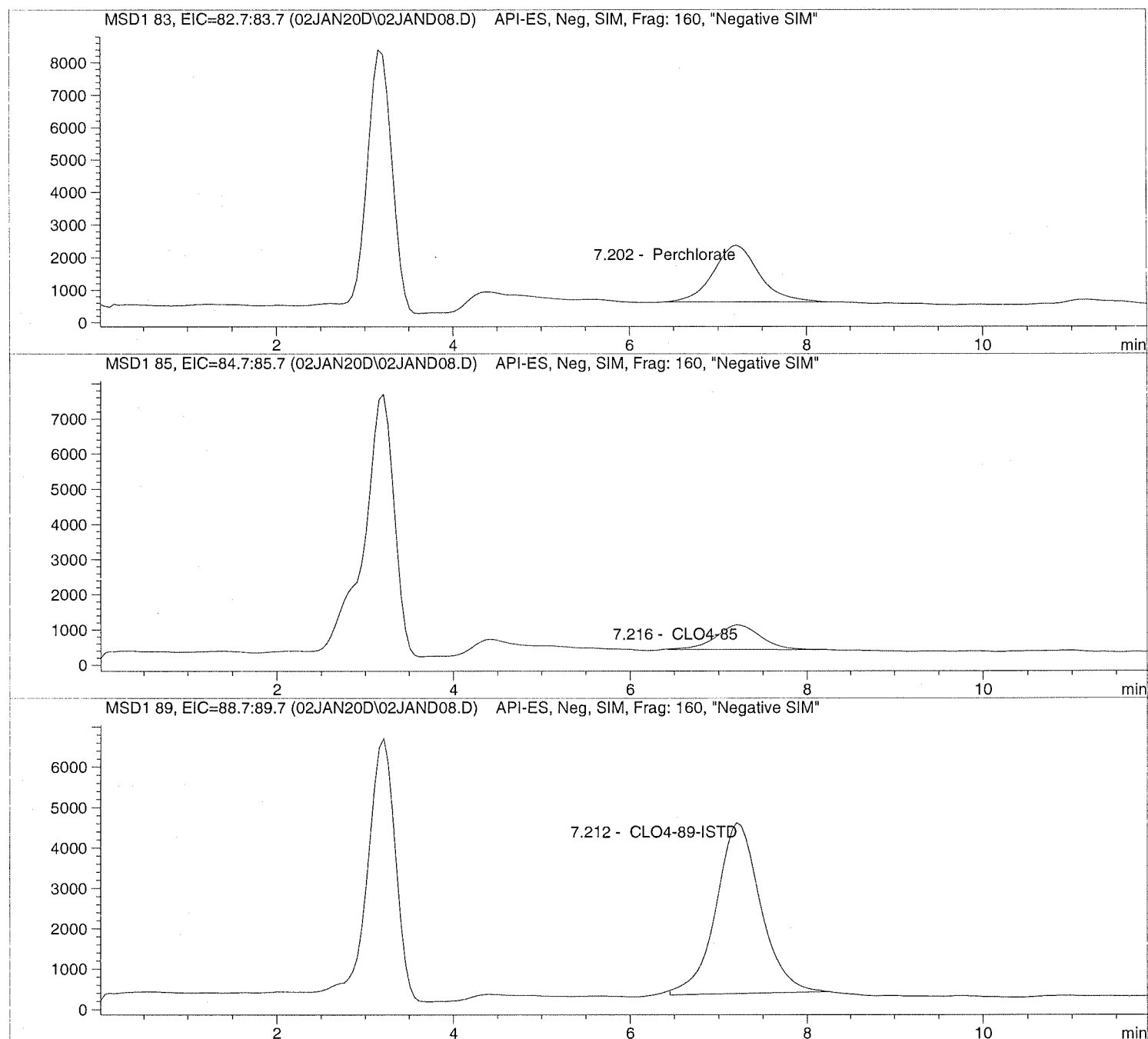
Sample Name: 1935915001

Injection Date: 1/02/2020 14:49:42
Sample Name: 1935915001
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND08.D

Sample Name: 1935915001

```

=====
Injection Date: 1/02/2020 14:49:42      Seq Line:      8
Sample Name:   1935915001              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
7.202	PBA	62635.7	1.5306	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.216	BBA	25080.2	1.9418	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.212	BBA	147744.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND09.D

Sample Name: 1935915002 MS

Injection Date: 1/02/2020 15:03:34

Seq Line: 9

Sample Name: 1935915002 MS

Location: Vial 79

Acq Operator: TNB

Inj. No.: 1

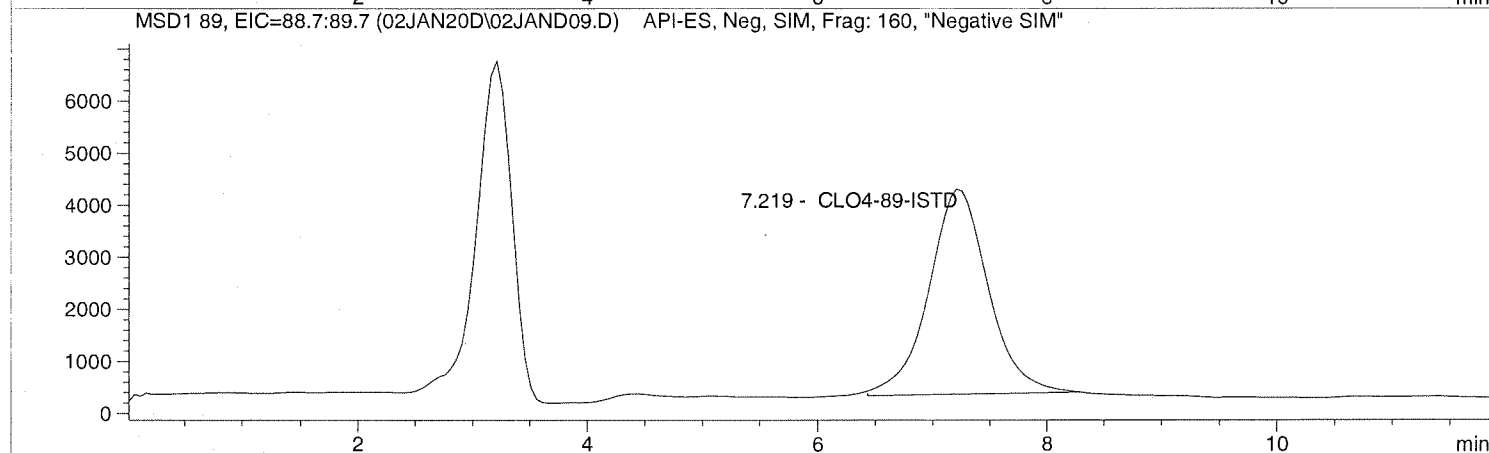
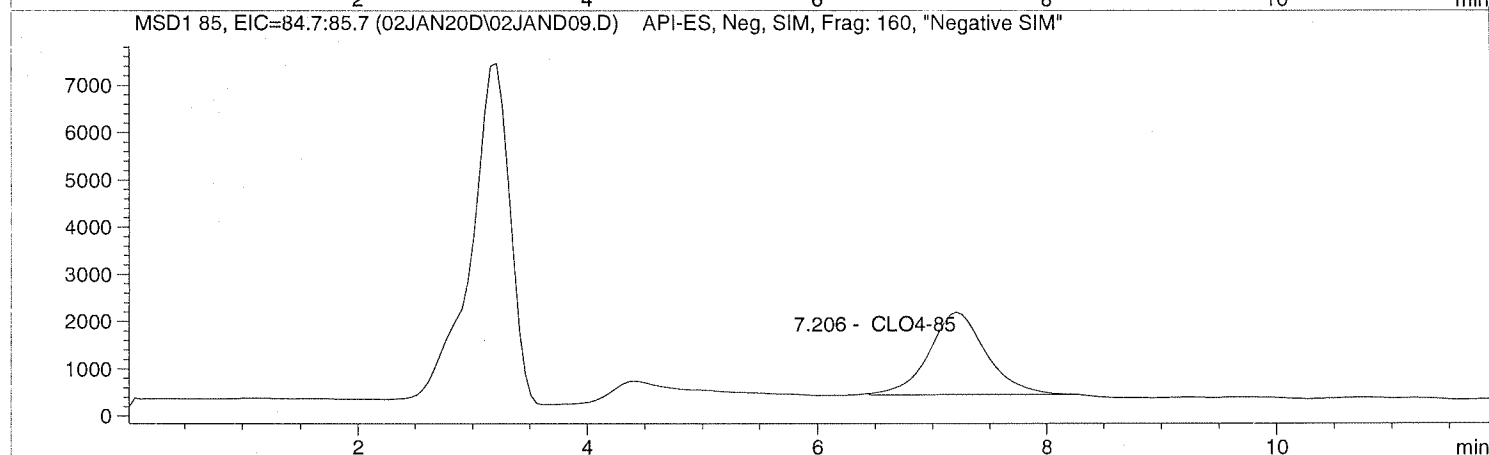
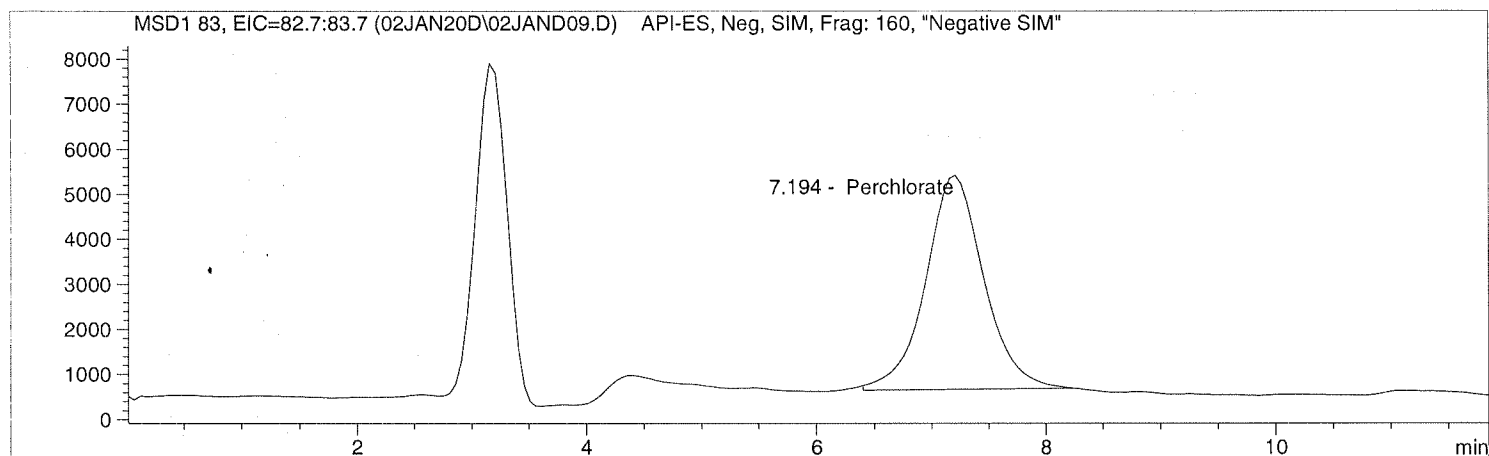
Inj. Vol.: 35 µl

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\02JAN20D\02JAND09.D Sample Name: 1935915002 MS

```

=====
Injection Date: 1/02/2020 15:03:34      Seq Line:          9
Sample Name:   1935915002 MS             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
7.194	BBA	167717.7	4.3410	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.206	BBA	60497.7	5.0378	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.219	BBA	142468.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

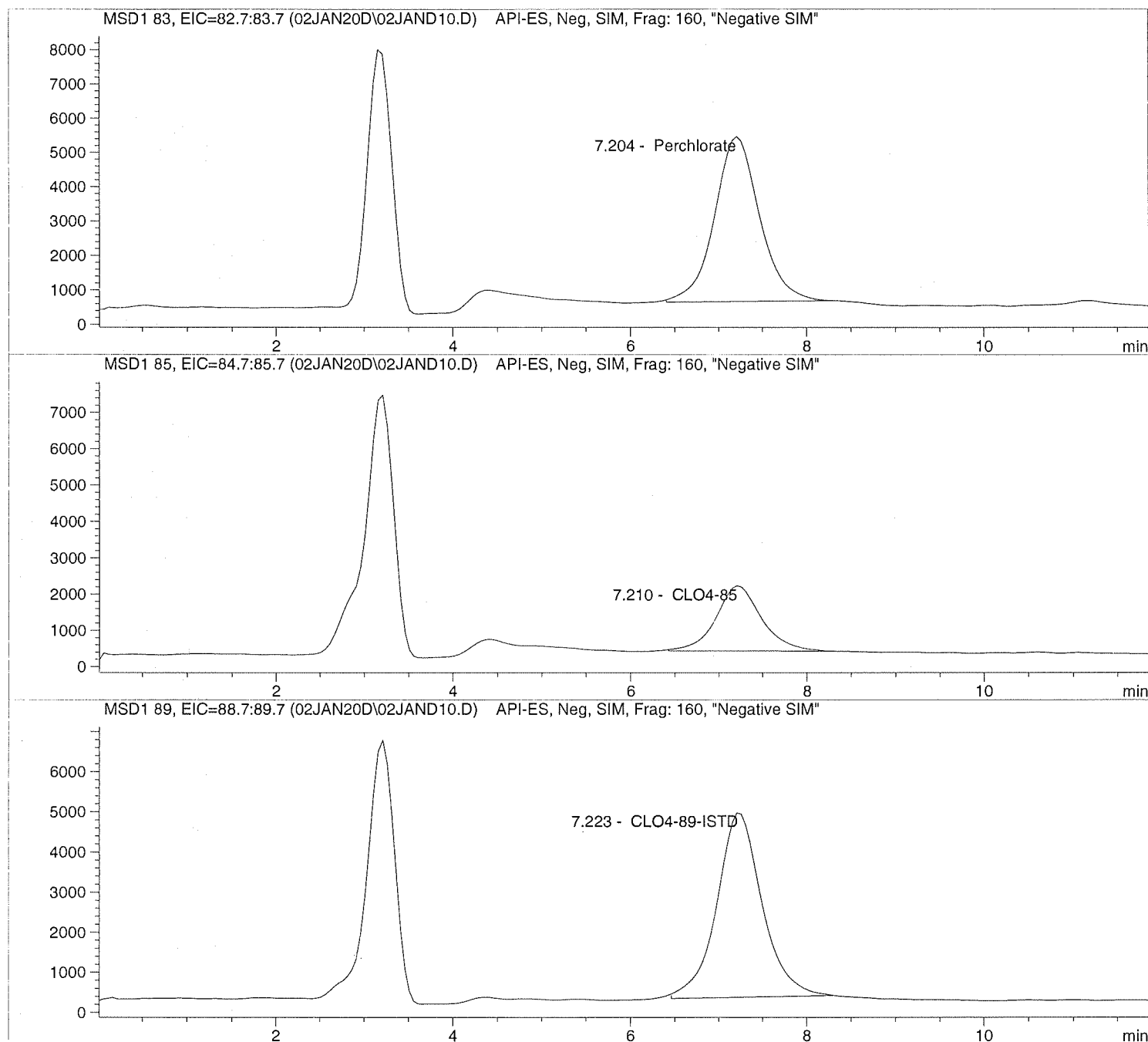
```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND10.D Sample Name: 1935915003 MSD

=====
Injection Date: 1/02/2020 15:17:28 Seq Line: 10
Sample Name: 1935915003 MSD 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\02JAN20D\02JAND10.D Sample Name: 1935915003 MSD

```

=====
Injection Date: 1/02/2020 15:17:28      Seq Line:          10
Sample Name:   1935915003  MSD          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
7.204	BBA	170226.0	3.8097	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.210	BBA	65303.6	4.6989	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.223	BBA	164738.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND11.D

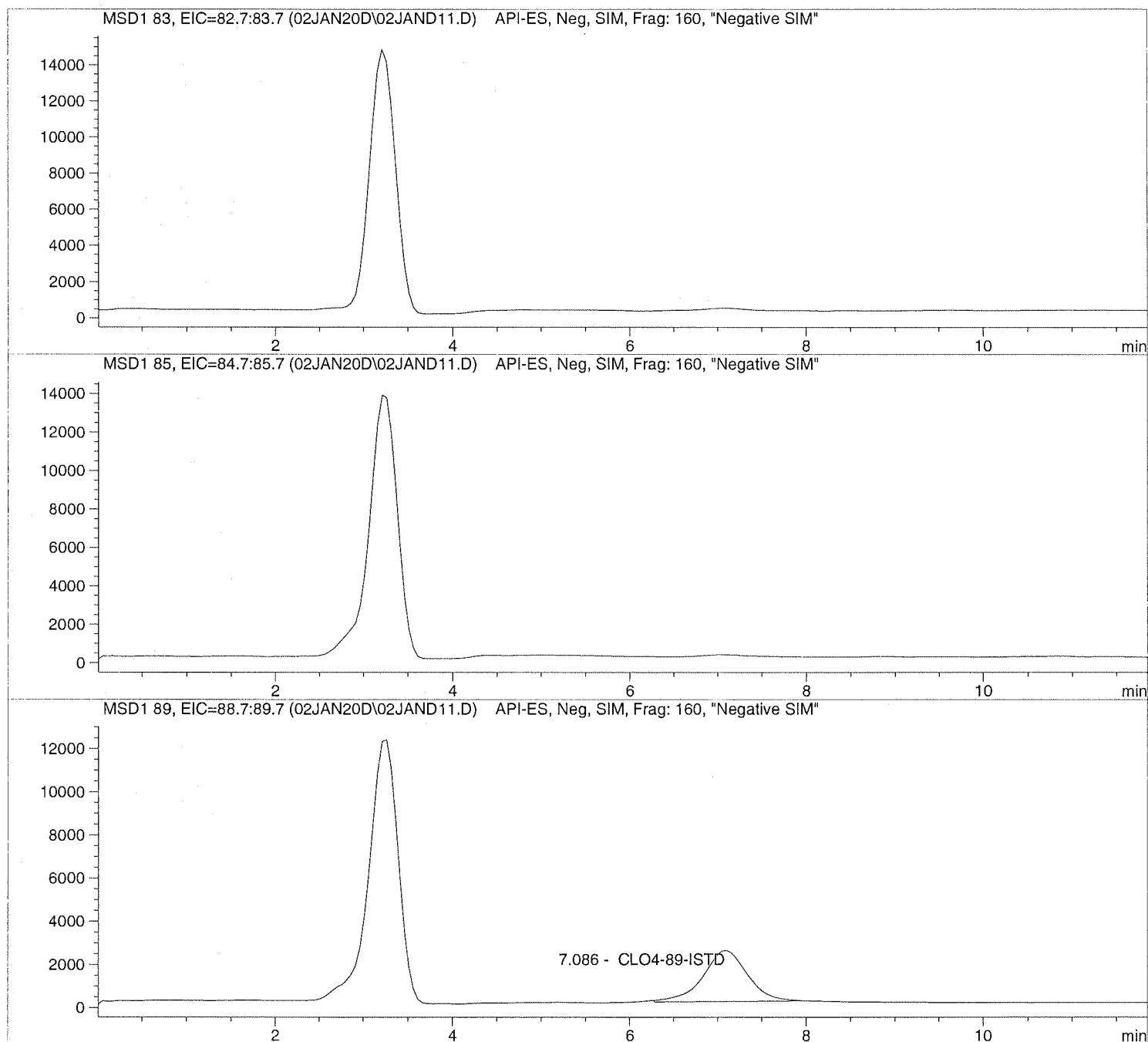
Sample Name: 1935915004

Injection Date: 1/02/2020 15:31:32
Sample Name: 1935915004
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND11.D

Sample Name: 1935915004

```

=====
Injection Date: 1/02/2020 15:31:32      Seq Line: 11
Sample Name:    1935915004              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:      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
7.086	BBA	82619.0	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND12.D

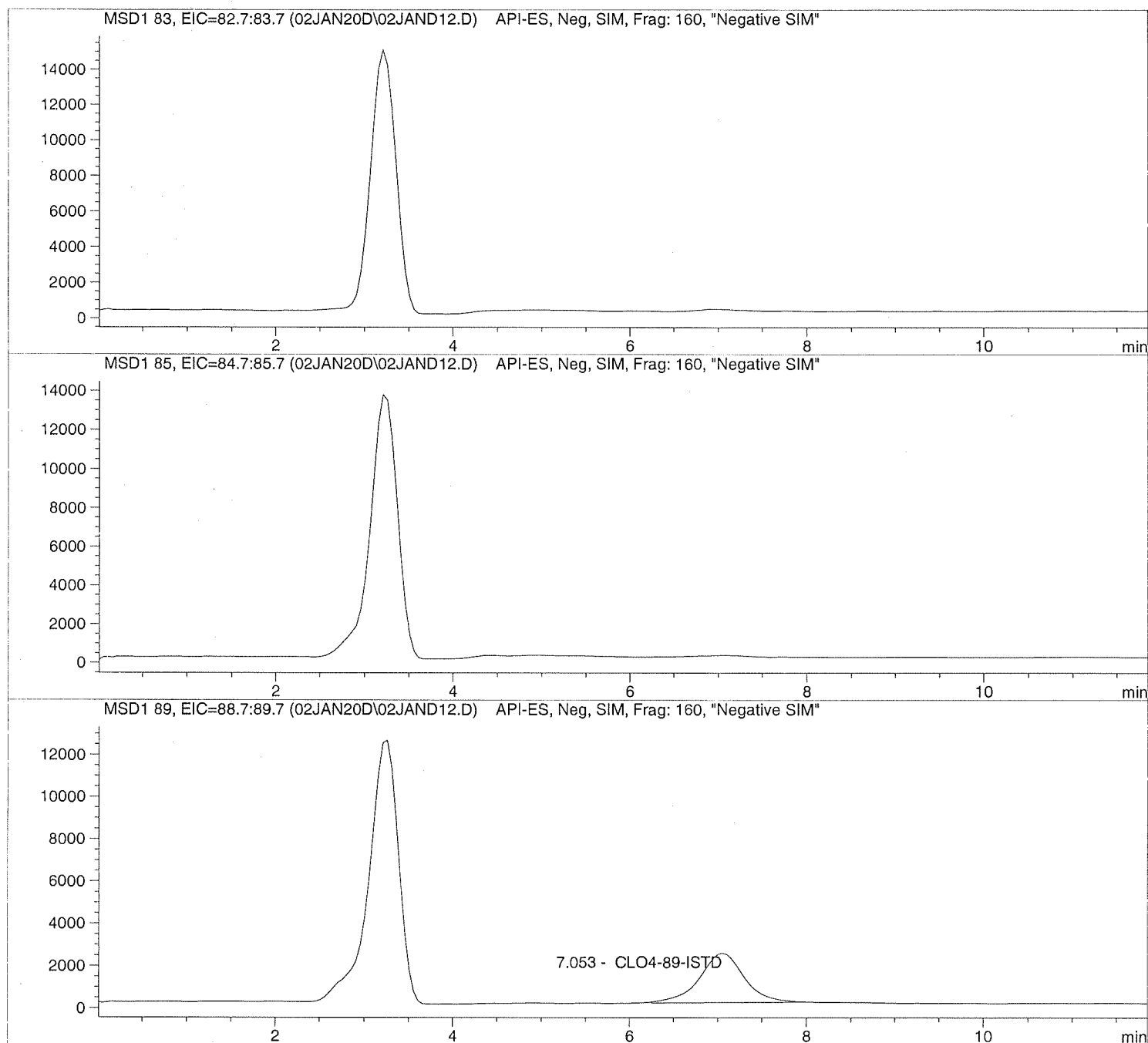
Sample Name: 1935915005

Injection Date: 1/02/2020 15:45:23
Sample Name: 1935915005
Acq Operator: TNB

Seq Line: 12
Location: Vial 82
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND12.D

Sample Name: 1935915005

```

=====
Injection Date: 1/02/2020 15:45:23      Seq Line:          12
Sample Name:   1935915005                Location:          Vial 82
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
7.053	BBA	81637.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND13.D

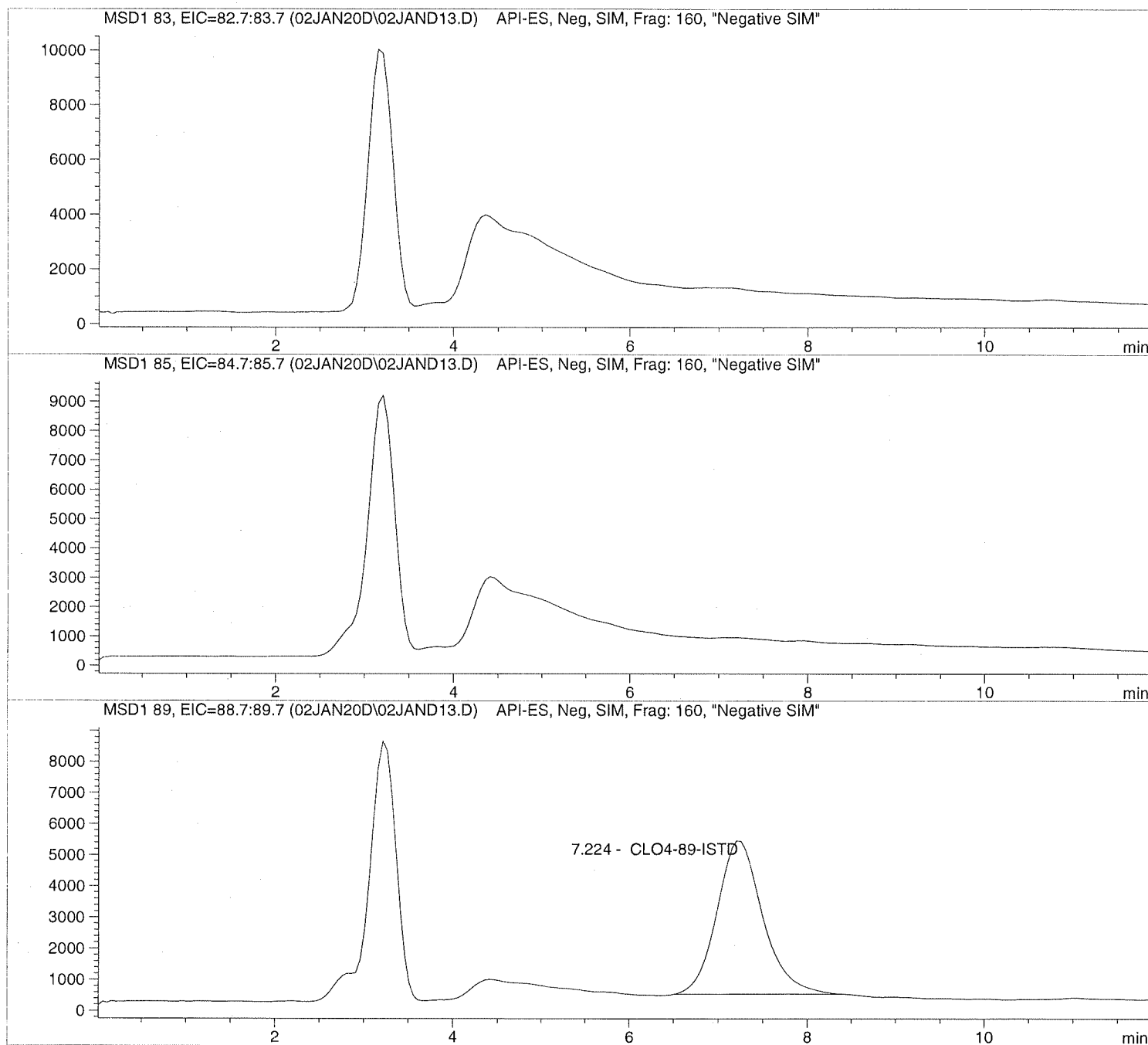
Sample Name: 1935915006

Injection Date: 1/02/2020 15:59:22
Sample Name: 1935915006
Acq Operator: TNB

Seq Line: 13
Location: Vial 83
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND13.D Sample Name: 1935915006

```

=====
Injection Date: 1/02/2020 15:59:22      Seq Line:      13
Sample Name:   1935915006                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:      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
7.224	PBA	175700.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND14.D

Sample Name: 690690 CCV@25

Injection Date: 1/02/2020 16:13:13

Seq Line: 14

Sample Name: 690690 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

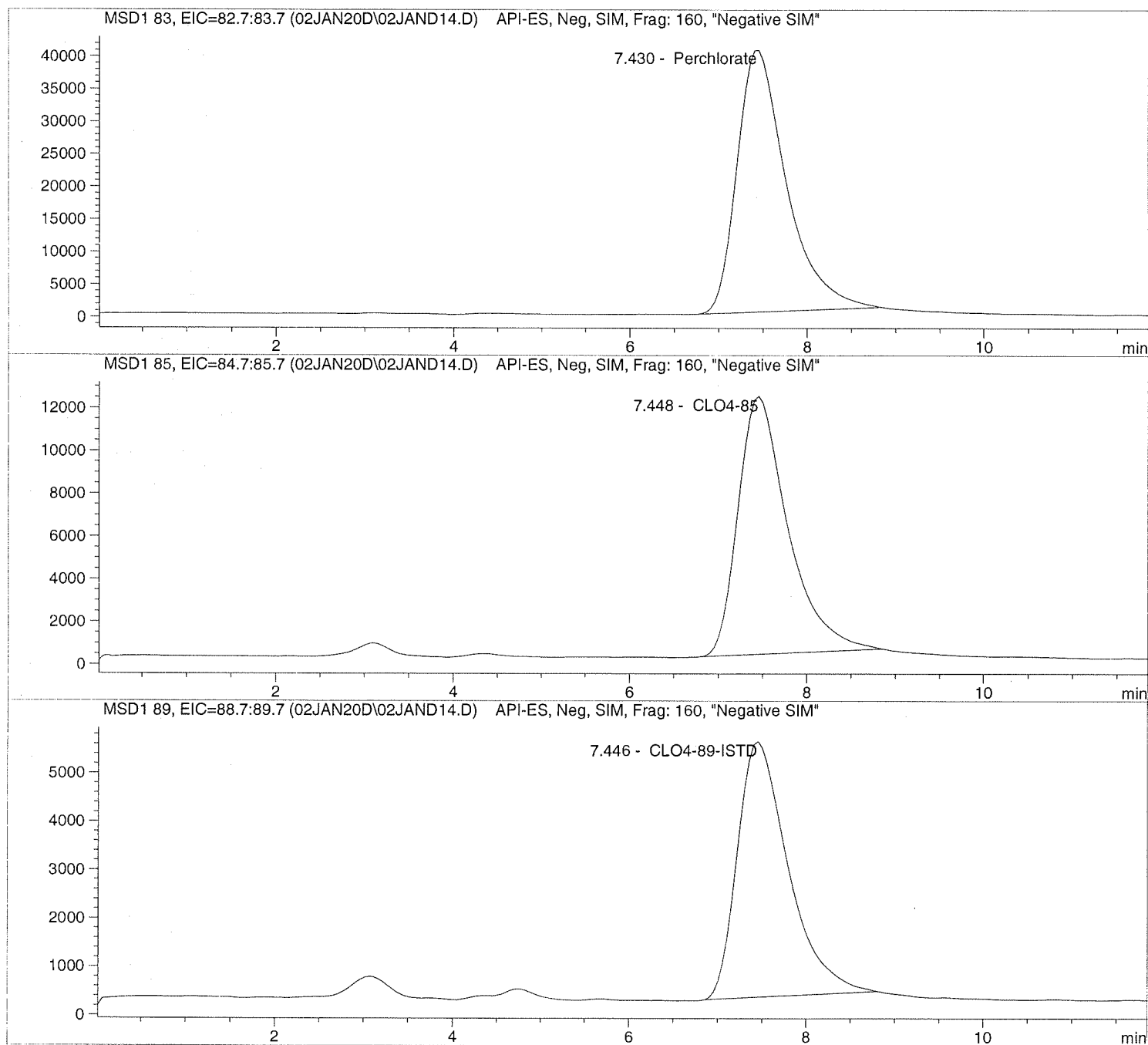
Inj. Vol.: 35 µl

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\02JAN20D\02JAND14.D Sample Name: 690690 CCV@25

```

=====
Injection Date:  1/02/2020  16:13:13      Seq Line:      14
Sample Name:    690690  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
7.430	PBA	1556973.9	25.1820	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.448	PBA	473140.5	25.1044	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.446	PBA	211105.3	5.0000	CLO4-89-ISTD

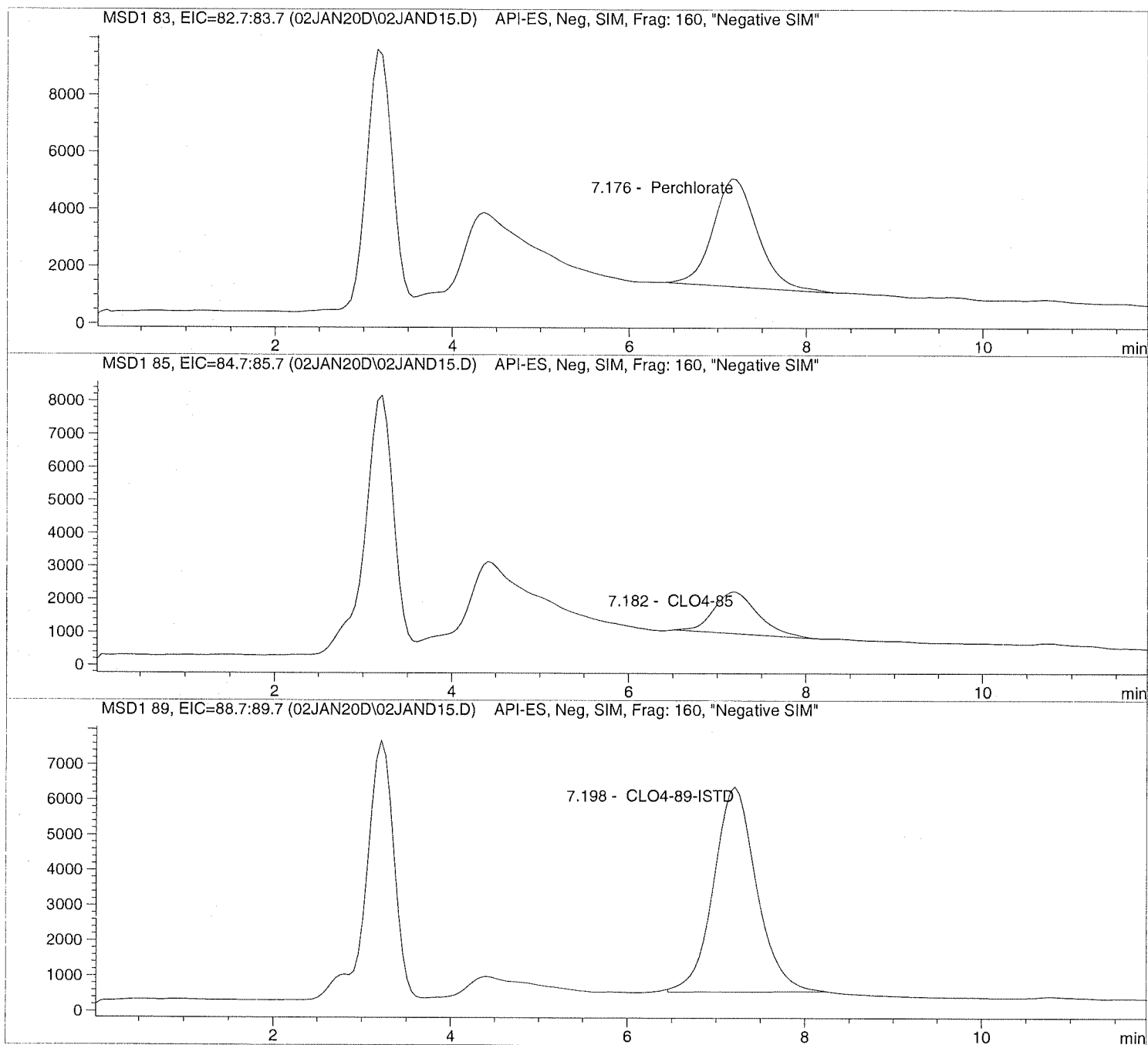
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND15.D Sample Name: 1935915007 MS

```
=====
Injection Date: 1/02/2020 16:27:04      Seq Line:      15
Sample Name:    1935915007 MS           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\02JAN20D\02JAND15.D Sample Name: 1935915007 MS

```

=====
Injection Date: 1/02/2020 16:27:04      Seq Line: 15
Sample Name: 1935915007 MS              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: 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
7.176	BBA	131015.0	2.4565	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.182	PBA	43555.4	2.5920	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.198	BBA	195563.0	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

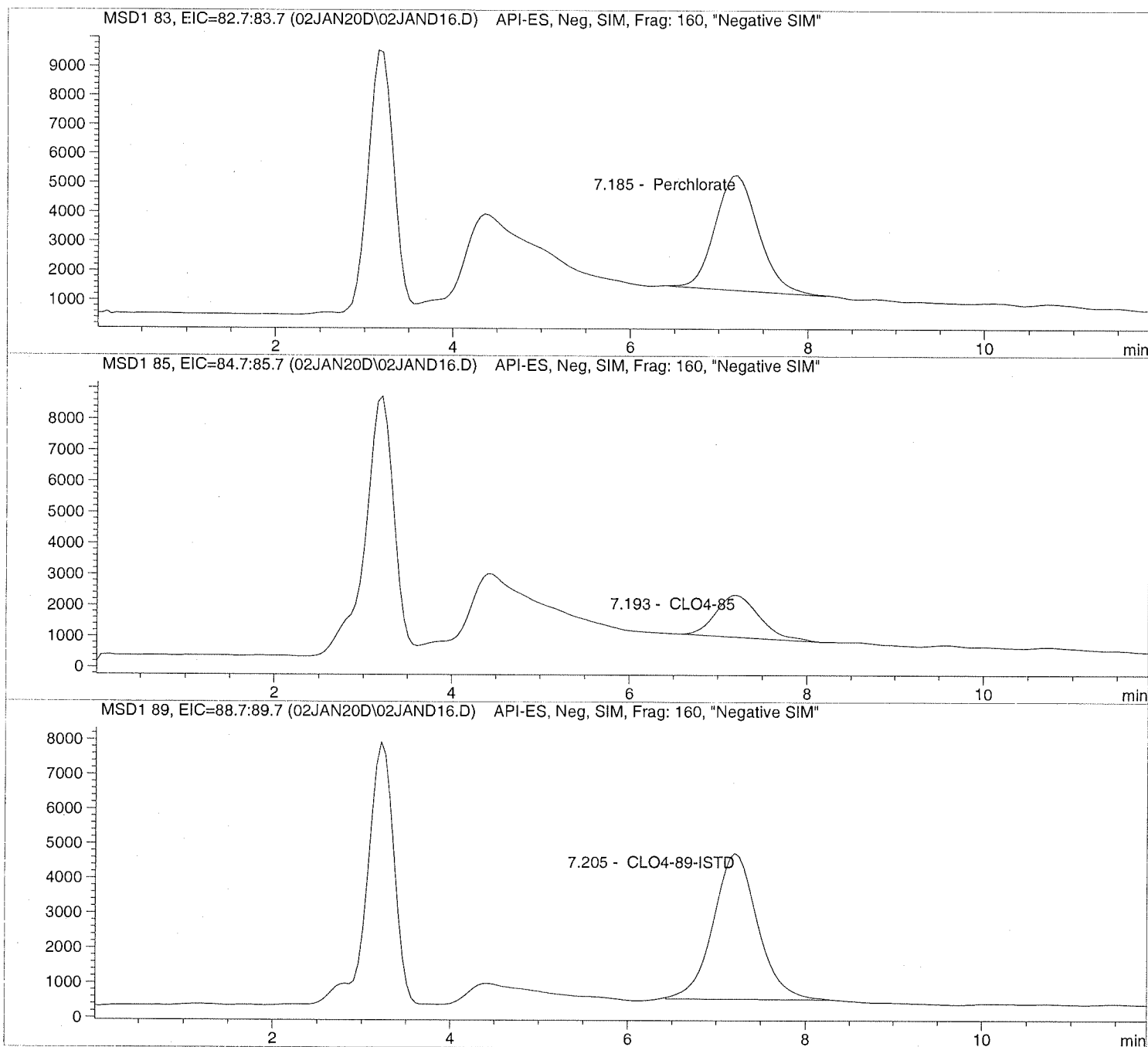
```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND16.D Sample Name: 1935915008 MSD

=====
Injection Date: 1/02/2020 16:41:07 Seq Line: 16
Sample Name: 1935915008 MSD 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\02JAN20D\02JAND16.D Sample Name: 1935915008 MSD

```

=====
Injection Date: 1/02/2020 16:41:07      Seq Line: 16
Sample Name: 1935915008 MSD             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: 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
7.185	BBA	132259.5	3.3466	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.193	PBA	46493.2	3.7688	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.205	BBA	145588.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

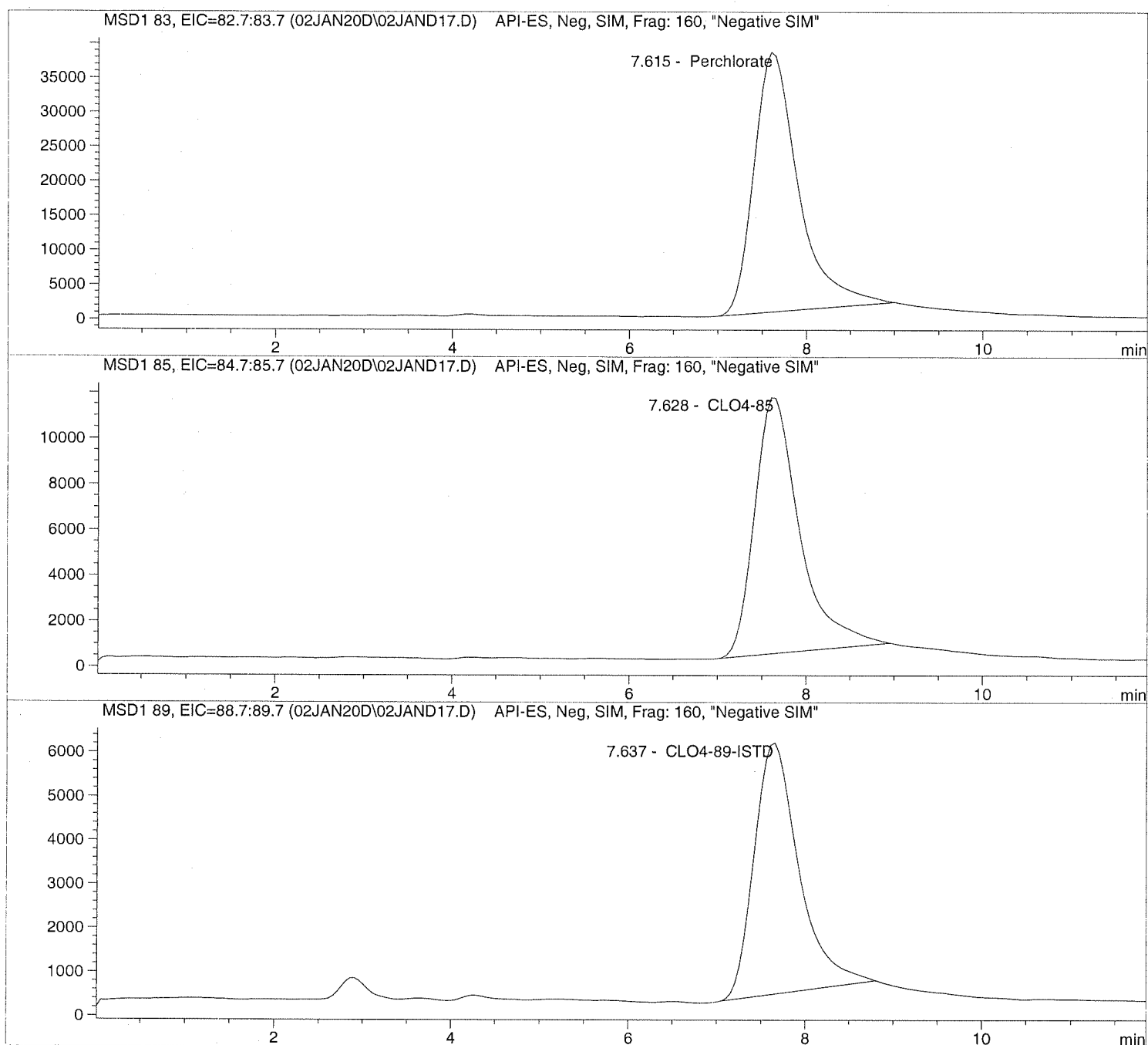
```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND17.D Sample Name: 1935915009 1K

```
=====
Injection Date: 1/02/2020 16:54:59      Seq Line:      17
Sample Name:    1935915009 1K           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\02JAN20D\02JAND17.D Sample Name: 1935915009 1K

```
=====
Injection Date: 1/02/2020 16:54:59      Seq Line:      17
Sample Name:   1935915009 1K           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:       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
7.615	PBA	1320092.9	22628.1935	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.628	PBA	397733.8	22358.4905	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.637	PBA	201299.8	5000.0000	CLO4-89-ISTD

*** End of Report ***

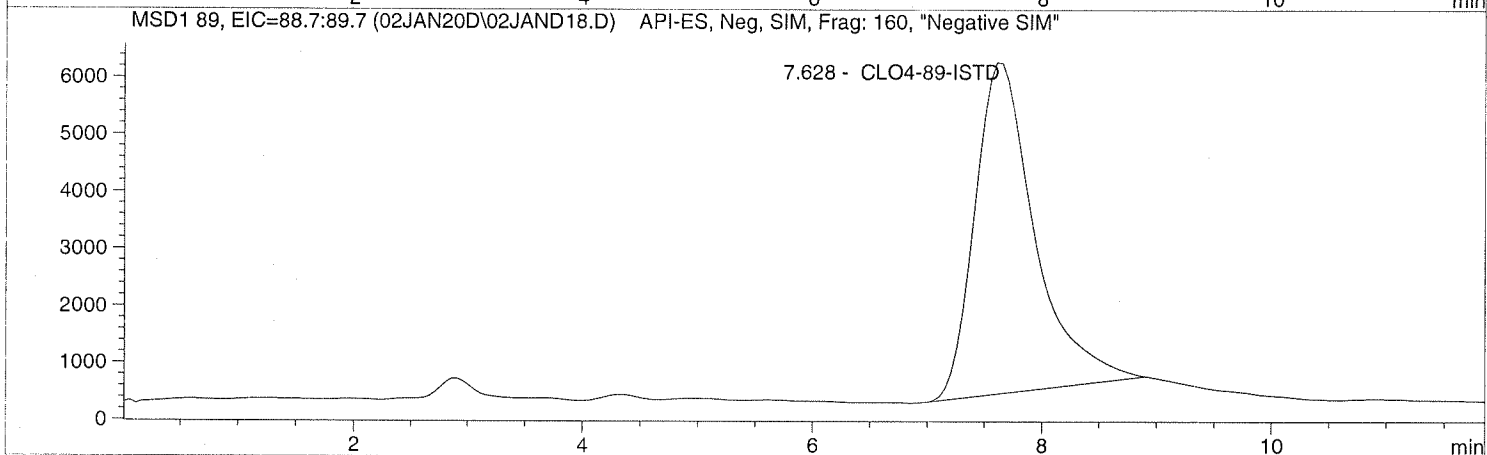
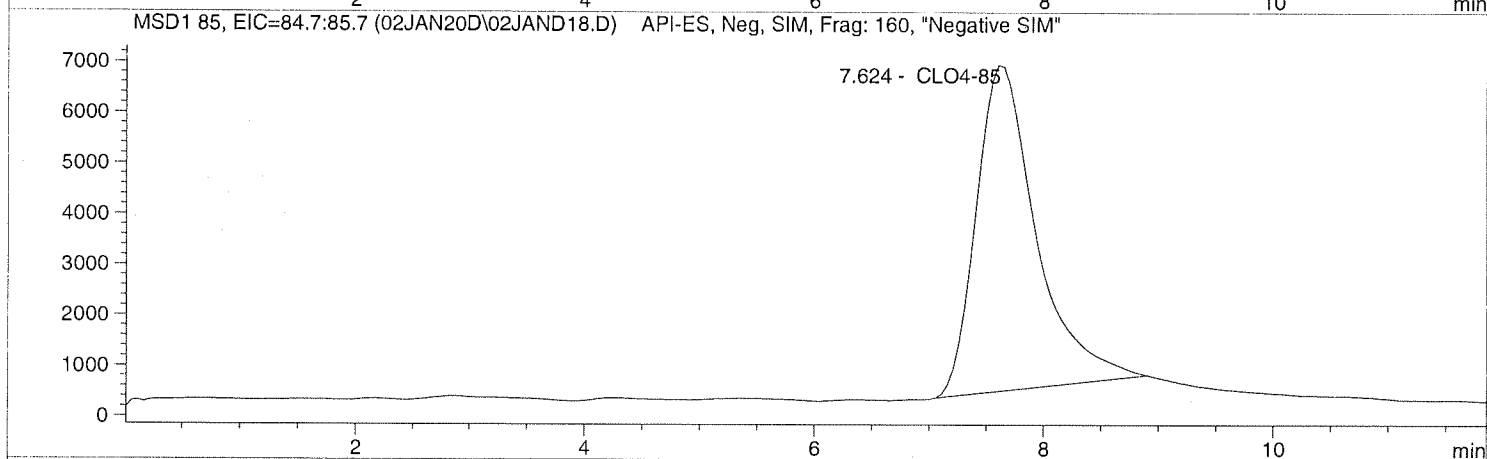
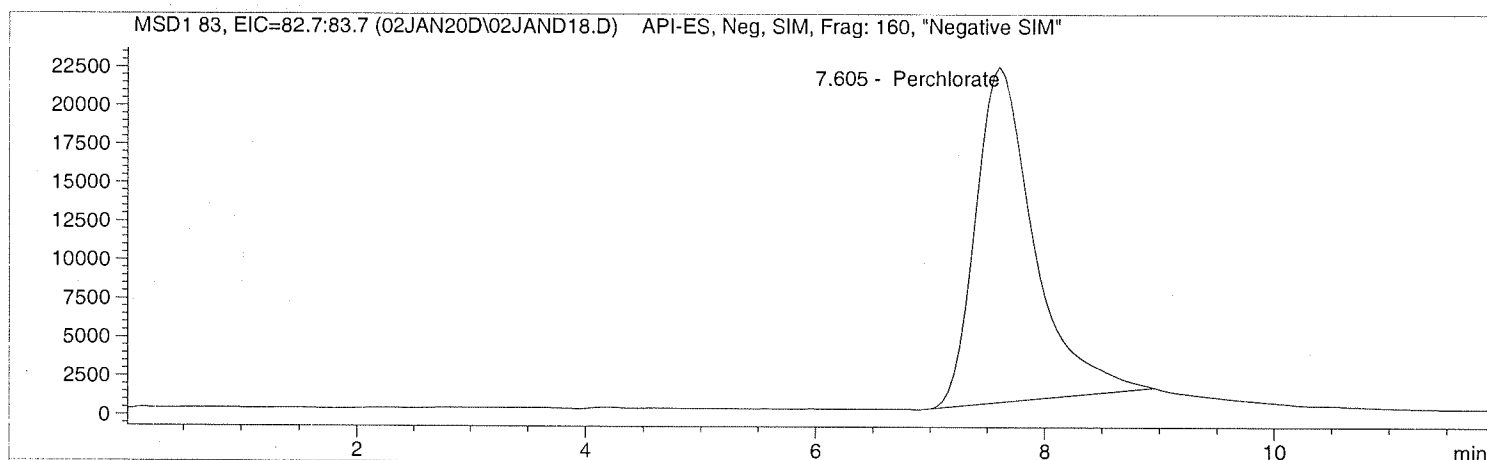
Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND18.D

Sample Name: 1935915010 10K

=====
Injection Date: 1/02/2020 17:08:52
Sample Name: 1935915010 10K
Acq Operator: TNB

Seq Line: 18
Location: Vial 87
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\02JAN20D\02JAND18.D Sample Name: 1935915010 10K

```
=====
Injection Date: 1/02/2020 17:08:52      Seq Line:      18
Sample Name:   1935915010 10K           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:       10000.000000
Sample Amount:  0.000
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.605	PBA	768865.3	130446.8924	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.624	PBA	235180.4	130044.7637	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.628	PBA	211545.7	50000.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND19.D

Sample Name: 1935915011

Injection Date: 1/02/2020 17:22:48

Seq Line: 19

Sample Name: 1935915011

Location: Vial 88

Acq Operator: TNB

Inj. No.: 1

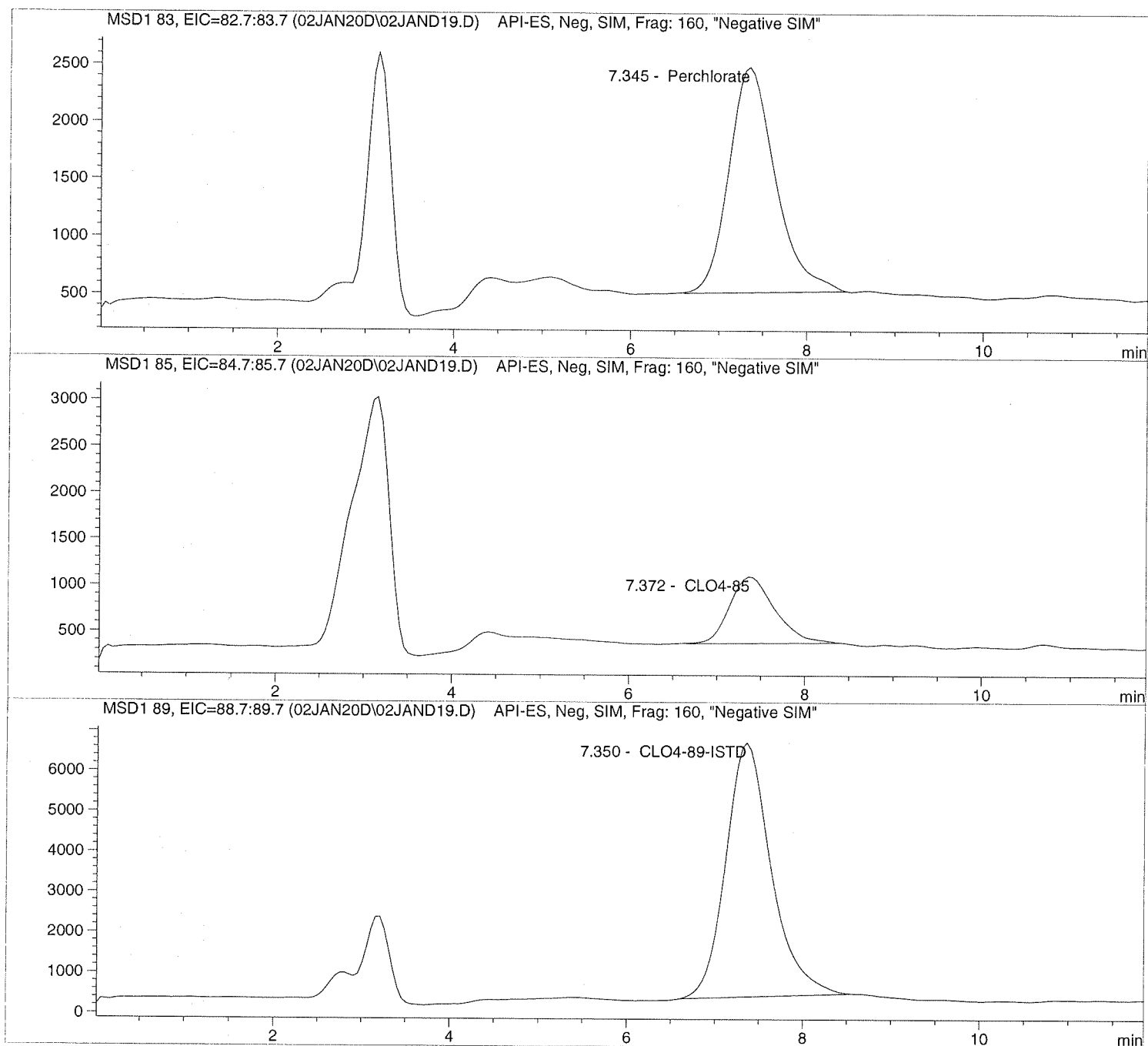
Inj. Vol.: 35 µl

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\02JAN20D\02JAND19.D Sample Name: 1935915011

```

=====
Injection Date: 1/02/2020 17:22:48      Seq Line: 19
Sample Name: 1935915011                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: 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
7.345	BBA	72005.1	1.1283	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.372	BBA	25905.7	1.2573	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.350	BBA	226623.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND21.D

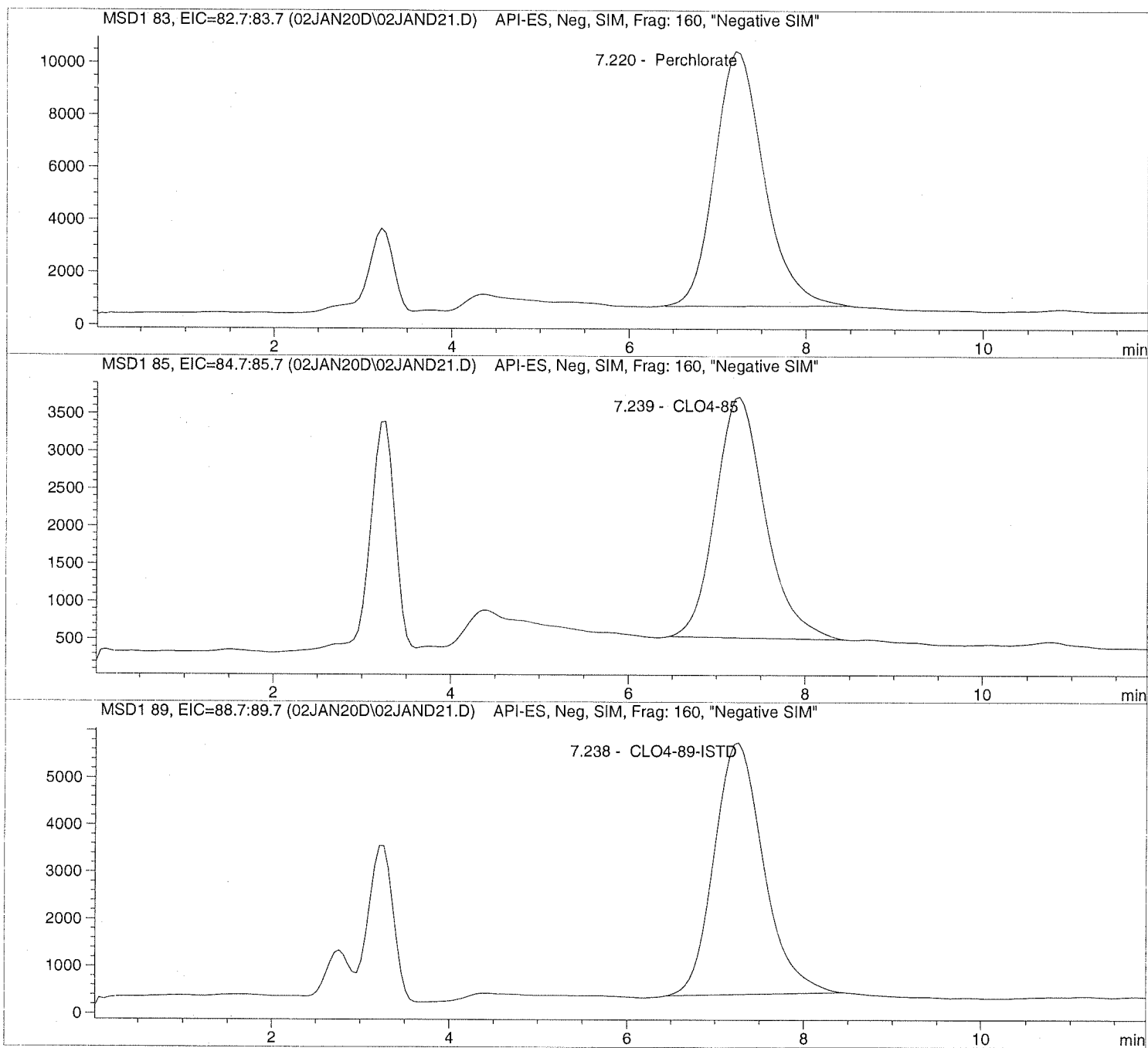
Sample Name: 1936106001

=====
Injection Date: 1/02/2020 17:50:37
Sample Name: 1936106001
Acq Operator: TNB

Seq Line: 21
Location: Vial 90
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\02JAN20D\02JAND21.D Sample Name: 1936106001

```
=====
Injection Date: 1/02/2020 17:50:37      Seq Line:      21
Sample Name:    1936106001              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
7.220	PBA	375683.7	6.6527	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.239	PBA	125368.0	7.1746	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.238	BBA	207387.2	5.0000	CLO4-89-ISTD

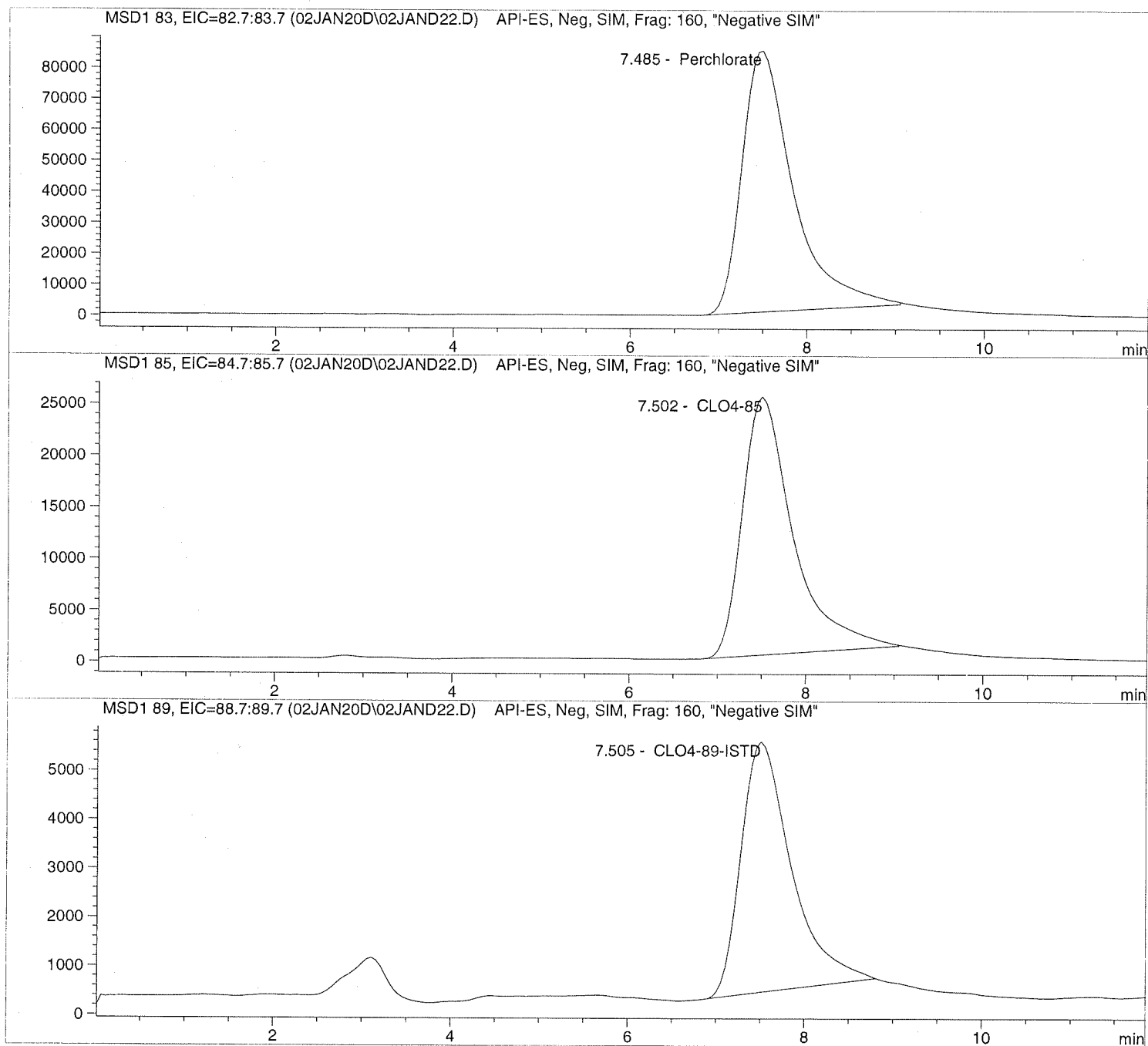
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND22.D Sample Name: 1935915012 10X

=====
Injection Date: 1/02/2020 18:04:36 Seq Line: 22
Sample Name: 1935915012 10X 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\02JAN20D\02JAND22.D Sample Name: 1935915012 10X

=====
 Injection Date: 1/02/2020 18:04:36 Seq Line: 22
 Sample Name: 1935915012 10X 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: 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
7.485	PBA	3407190.3	516.1452	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.502	PBA	999389.8	502.8506	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.505	PBA	202951.9	50.0000	CLO4-89-ISTD

=====
 *** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND23.D

Sample Name: 690691 CCV@25

Injection Date: 1/02/2020 18:18:27

Seq Line: 23

Sample Name: 690691 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

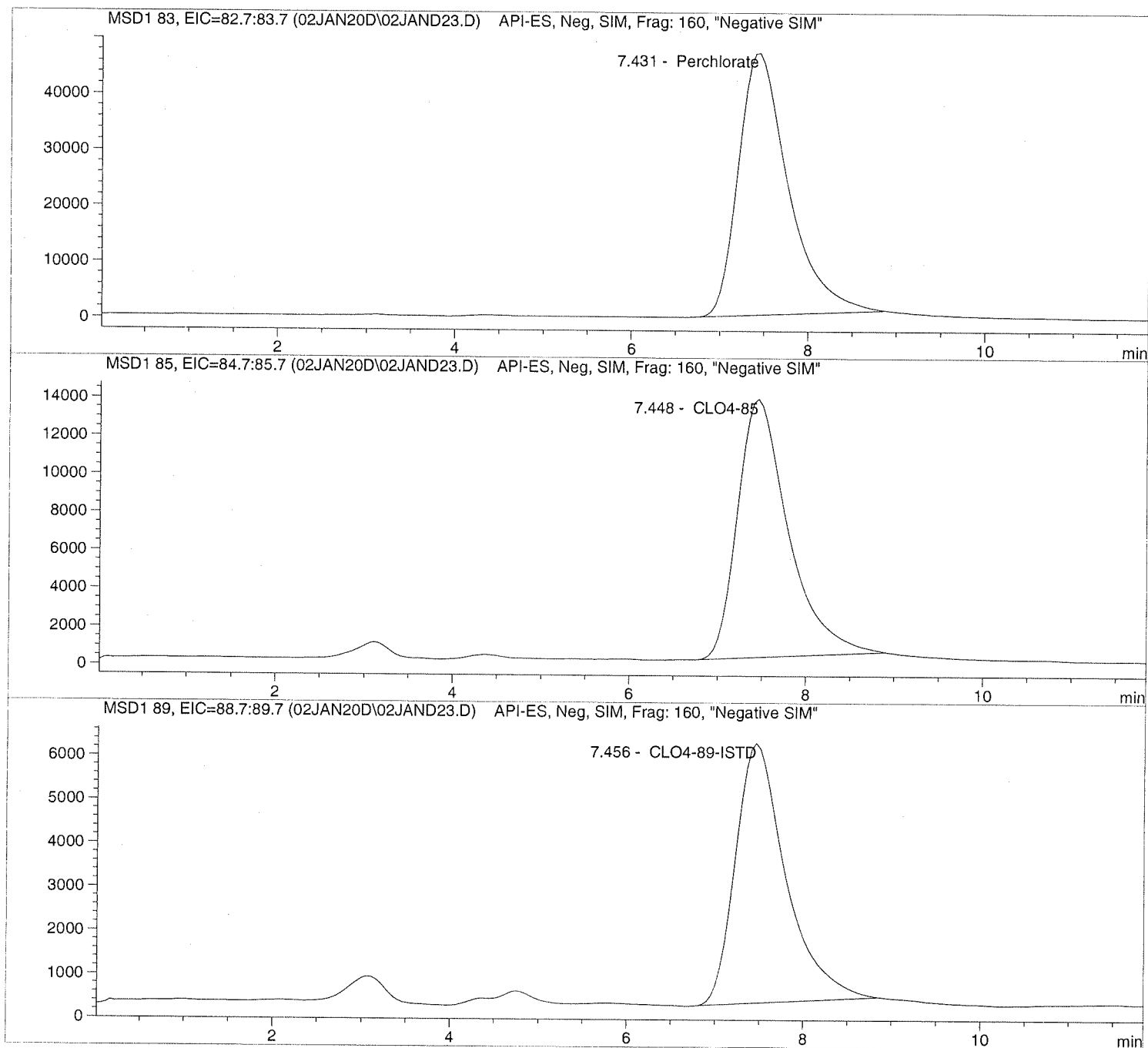
Inj. Vol.: 35 µl

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\02JAN20D\02JAND23.D Sample Name: 690691 CCV@25

=====
 Injection Date: 1/02/2020 18:18:27 Seq Line: 23
 Sample Name: 690691 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
7.431	PBA	1840917.4	26.5024	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.448	PBA	541119.1	25.6437	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.456	PBA	235883.1	5.0000	CLO4-89-ISTD

=====
 *** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

=====
 Calibration Table
 =====

Perchlorate

Calib. Data Modified : 9/23/2019 12:20:59 PM

Calculate : Internal Standard
 Based on : Peak Area

Rel. Reference Window : 20.000 %
 Abs. Reference Window : 0.000 min
 Rel. Non-ref. Window : 20.000 %
 Abs. Non-ref. Window : 0.000 min

Use Multiplier & Dilution Factor with ISTDs
 Uncalibrated Peaks : not reported
 Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
 Origin : Ignored (some peaks differ, see below)
 Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
 Average Response : Average all calibrations
 Average Retention Time: Floating Average New 75%

Calibration Report Options :
 Printout of recalibrations within a sequence:
 Calibration Table after Recalibration
 Normal Report after Recalibration
 If the sequence is done with bracketing:
 Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
 Signal 2: MSD1 85, EIC=84.7:85.7
 Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Lvl	Sig	Amount	Area	Amt/Area	Ref	Grp	Name
7.750	1	3	1.00000	5.39218e4	1.85454e-5	1		Perchlorate
		4	2.00000	1.32825e5	1.50574e-5			
		5	5.00000	2.76271e5	1.80982e-5			
		6	10.00000	5.61298e5	1.78159e-5			
		7	25.00000	1.51820e6	1.64669e-5			
		8	50.00000	3.31156e6	1.50986e-5			
		9	75.00000	5.23914e6	1.43153e-5			
7.767	3	3	5.00000	2.14568e5	2.33026e-5	+I1		CLO4-89-ISTD
		4	5.00000	2.04758e5	2.44190e-5			
		5	5.00000	2.13407e5	2.34294e-5			
		6	5.00000	2.09246e5	2.38953e-5			
		7	5.00000	2.07403e5	2.41077e-5			
		8	5.00000	2.02929e5	2.46391e-5			
		9	5.00000	1.97933e5	2.52611e-5			
7.778	2	3	1.00000	1.70436e4	5.86732e-5	1		CLO4-85
		4	2.00000	4.20754e4	4.75337e-5			
		5	5.00000	9.24707e4	5.40712e-5			
		6	10.00000	1.68622e5	5.93041e-5			
		7	25.00000	4.63724e5	5.39114e-5			
		8	50.00000	9.95933e5	5.02042e-5			

RetTime [min]	Lvl Sig	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

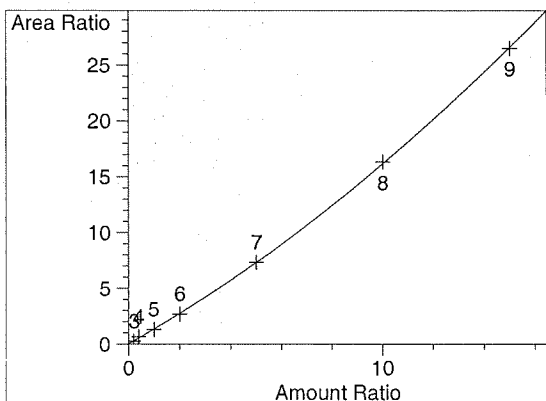
Compound: CLO4-85

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

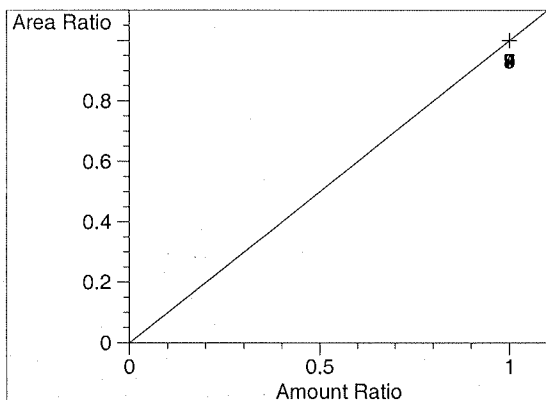
=====
 Peak Sum Table
 =====

No Entries in table
 =====

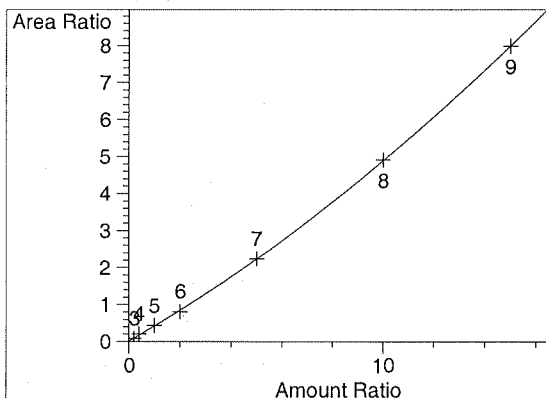
=====
 Calibration Curves
 =====



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\20SEP19\20SEPI03.D

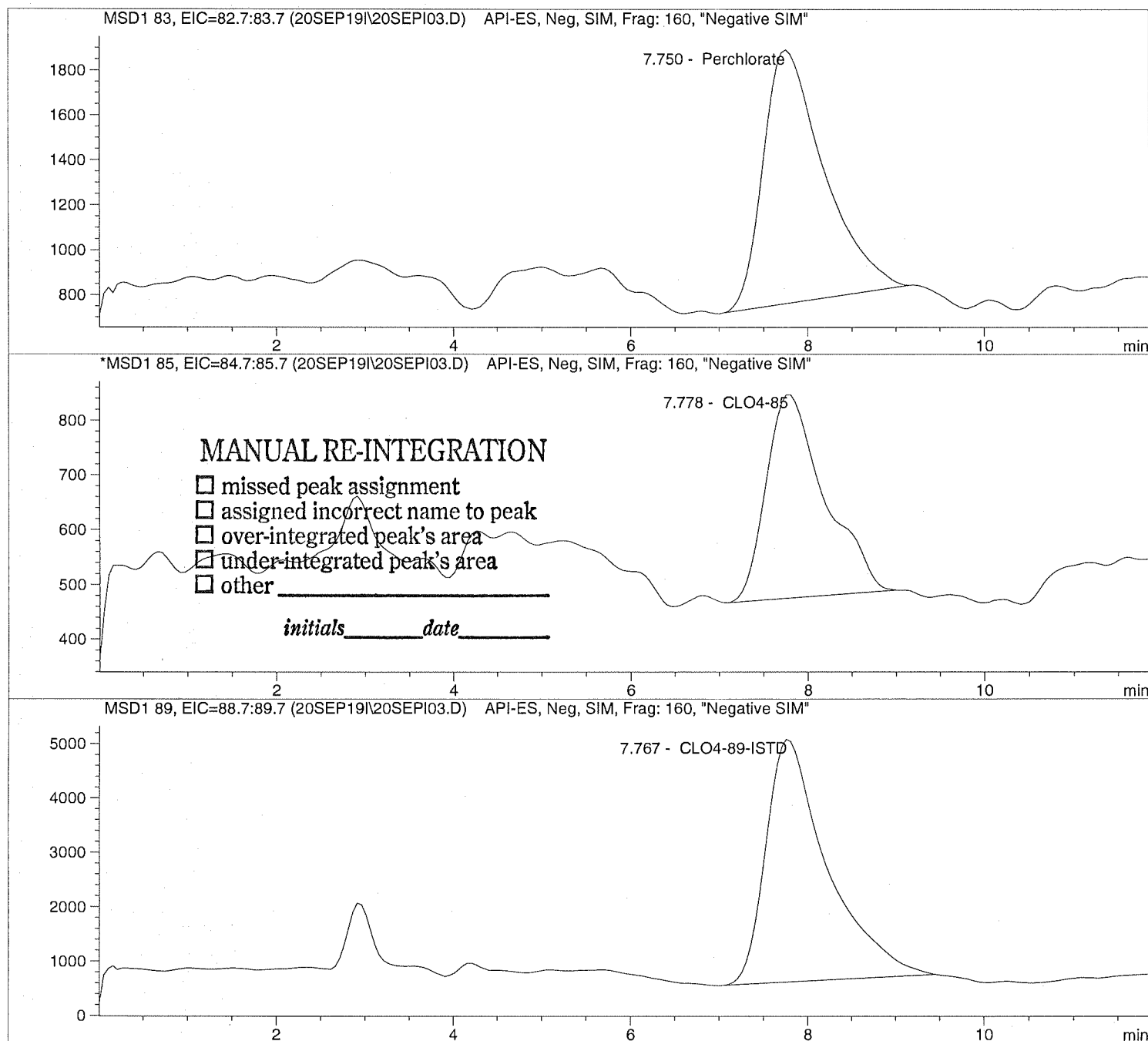
Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05
 Sample Name: CLO4@ 1.0ug/L
 Acq Operator: TNB

Seq Line: 3
 Location: Vial 73
 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

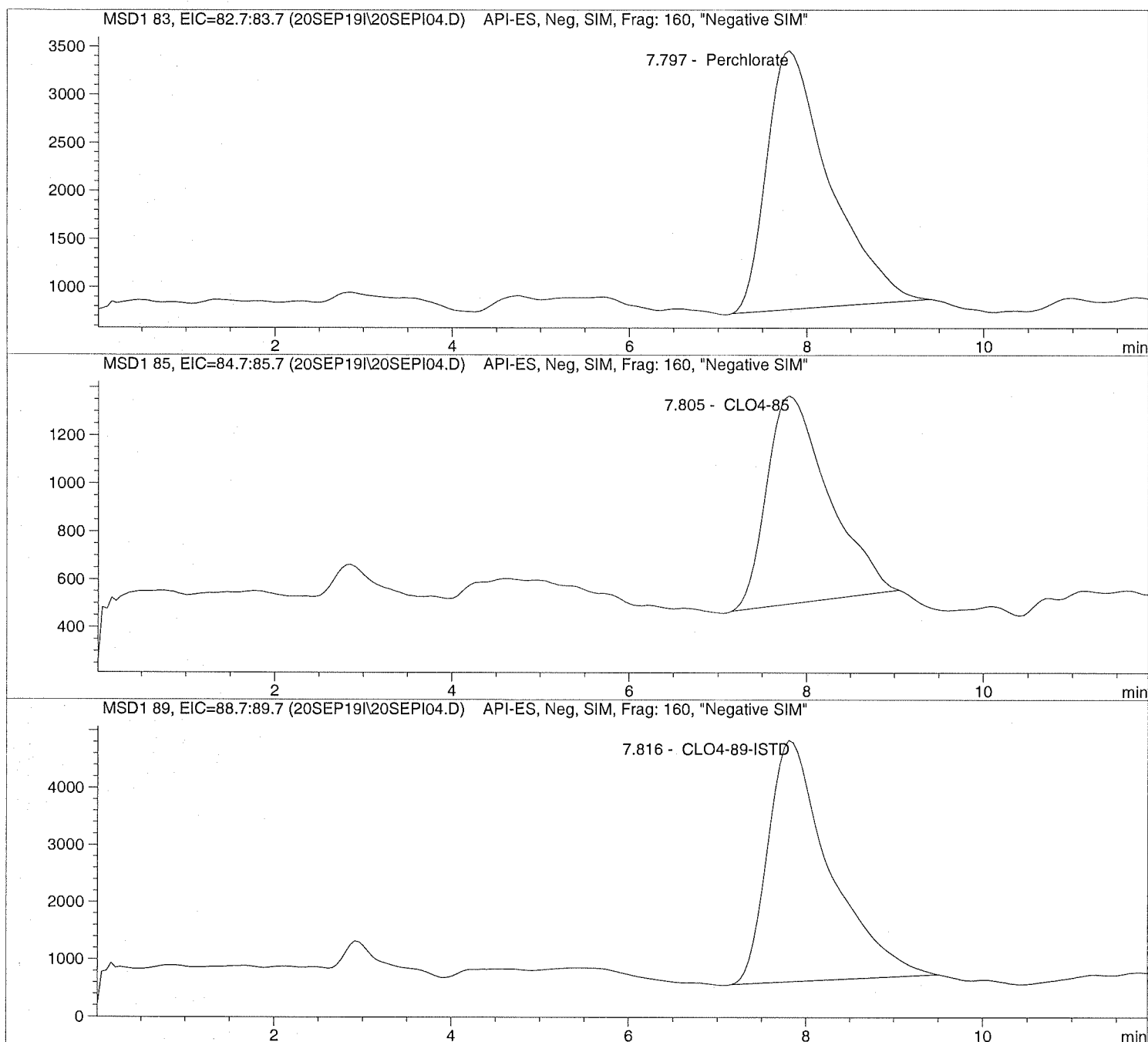
Inj. Vol.: 30 µl

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\20SEP19\20SEPI05.D

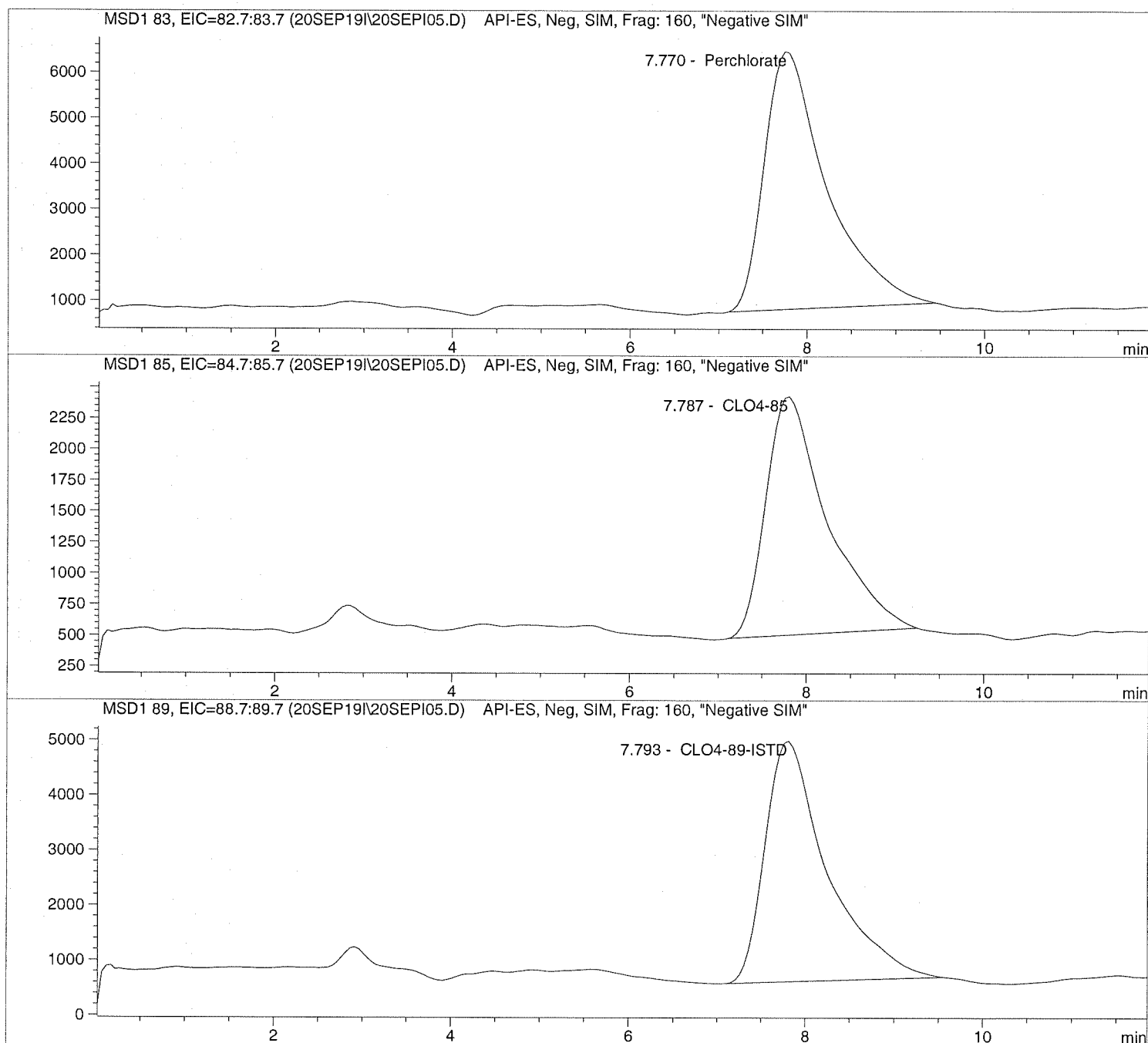
Sample Name: CLO4@ 5.0ug/L

Injection Date: 9/20/2019 09:51:49
Sample Name: CLO4@ 5.0ug/L
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 30 μ l

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

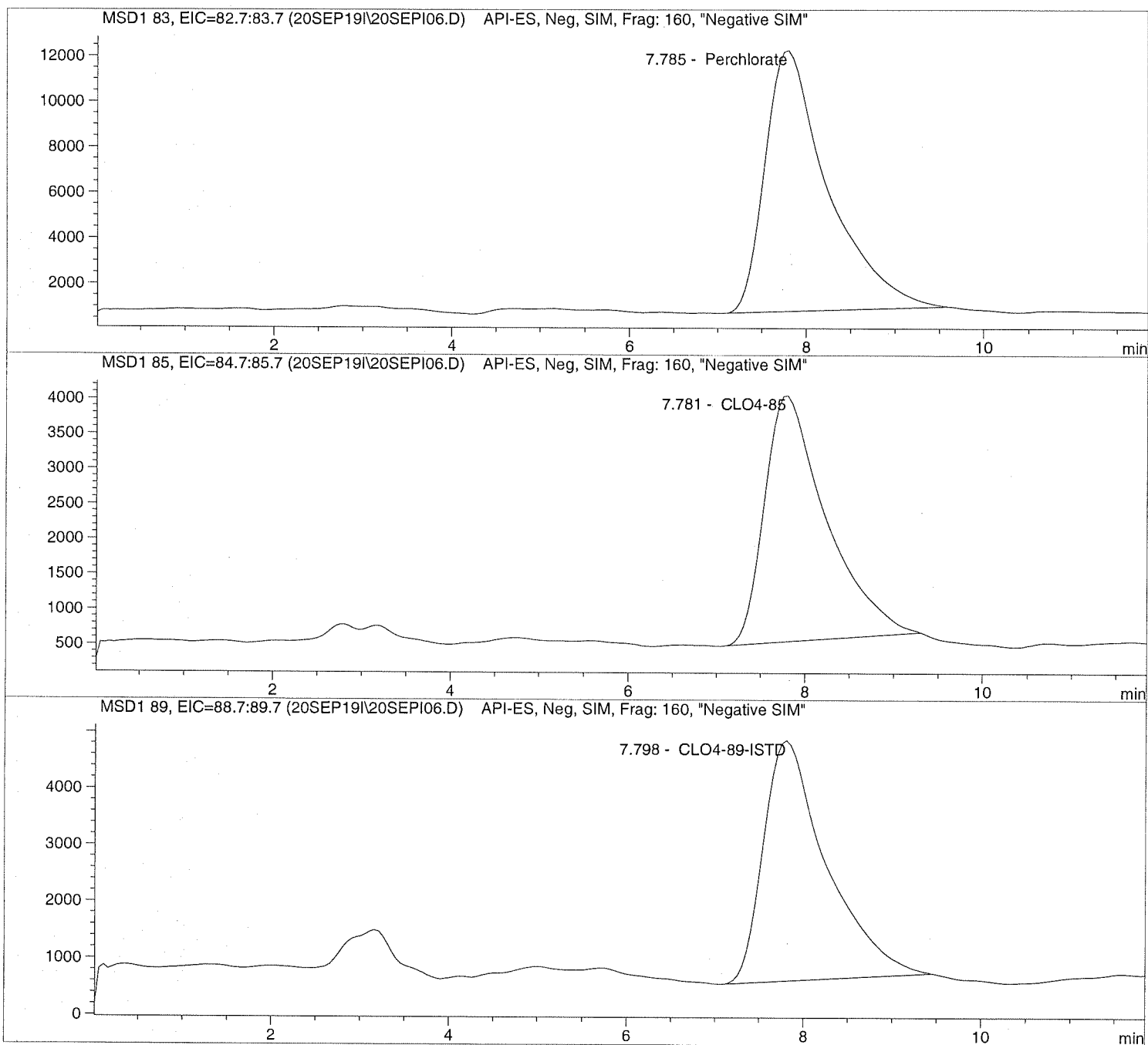
Inj. Vol.: 30 µl

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

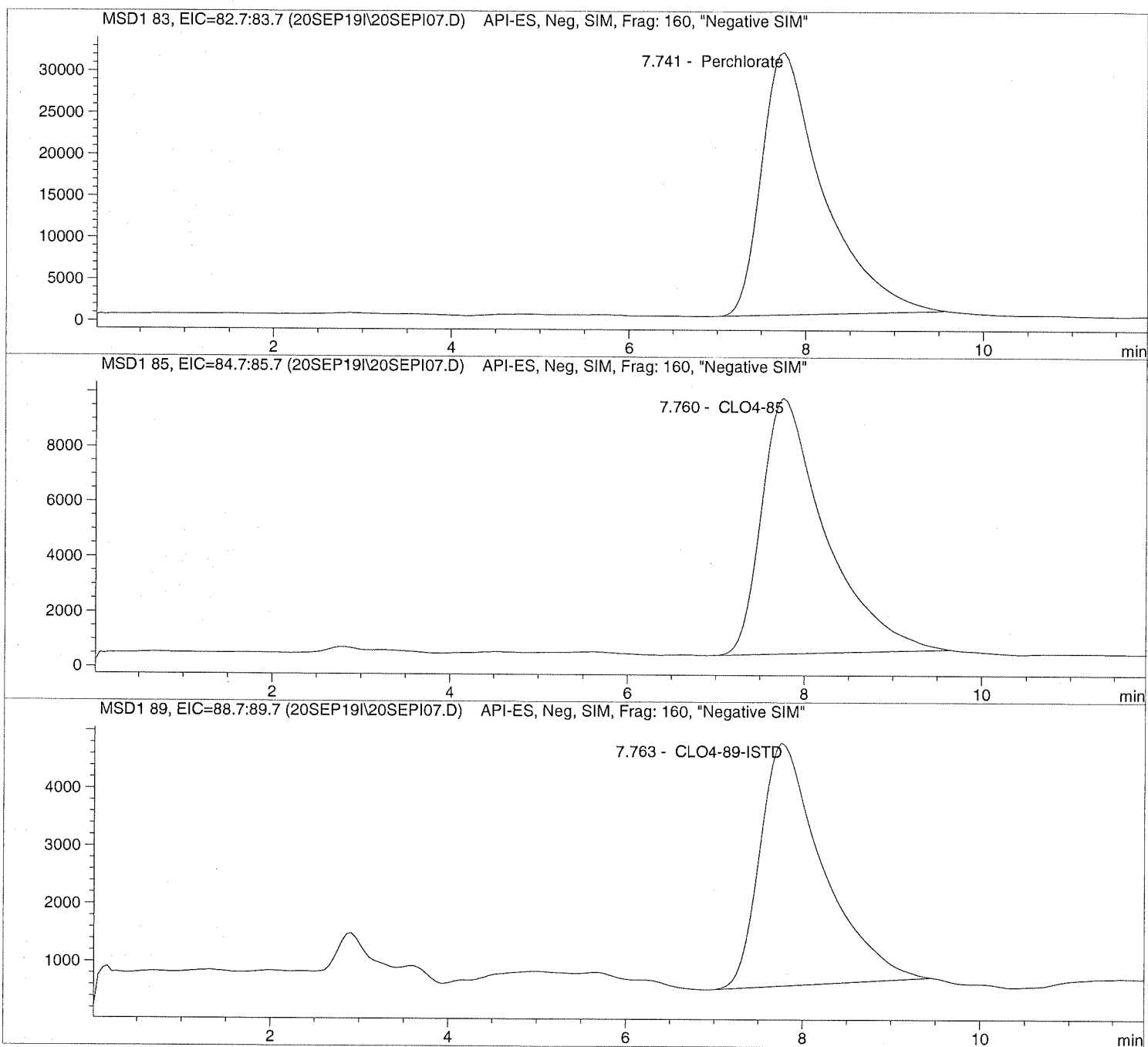
Inj. Vol.: 30 µl

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

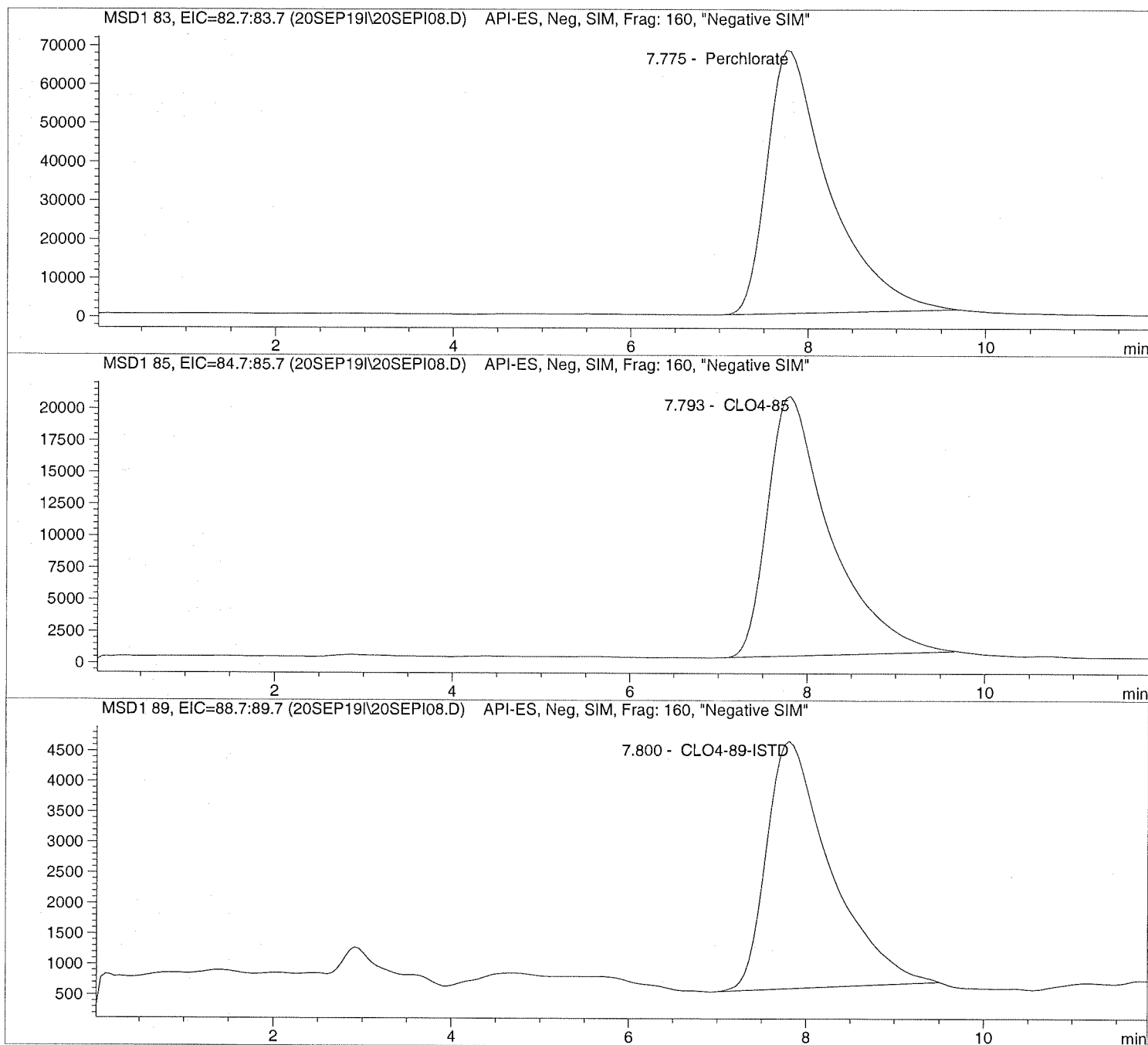
Sample Name: CLO4@ 50.ug/L

Injection Date: 9/20/2019 10:33:18
Sample Name: CLO4@ 50.ug/L
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
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

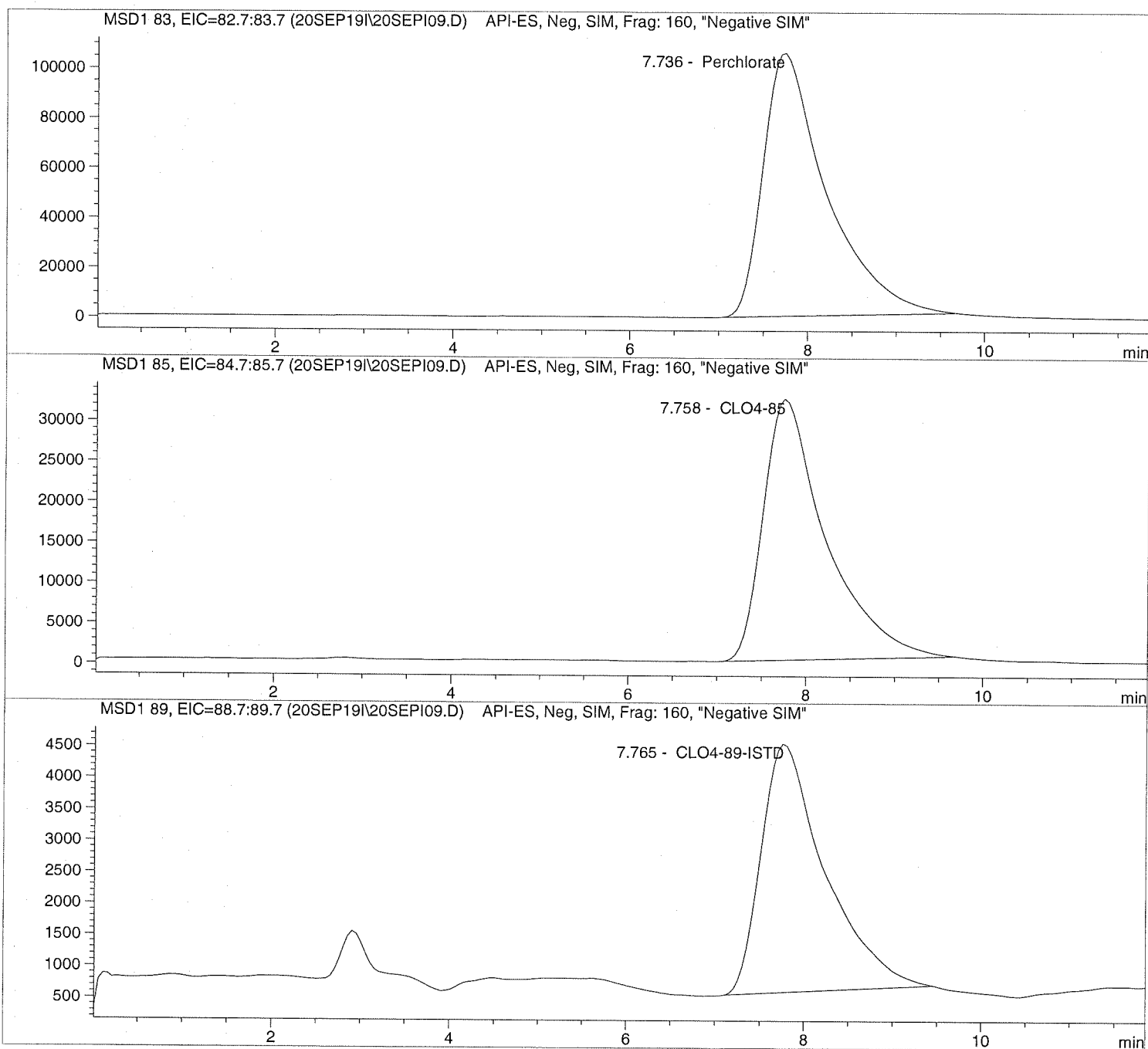
Inj. Vol.: 30 µl

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\20SEP19\20SEPI11.D

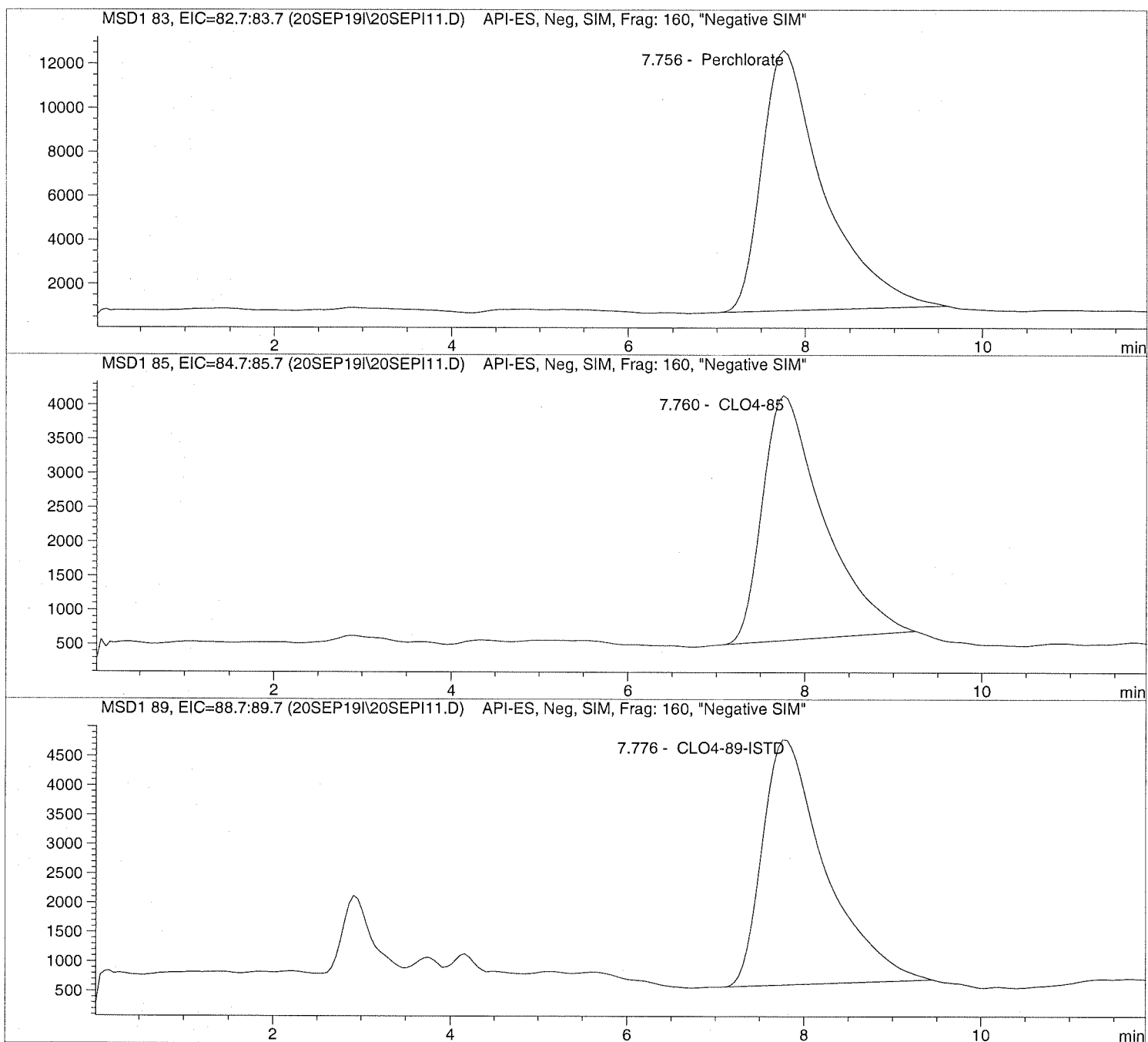
Sample Name: ICAL Verf@10ug/L

Injection Date: 9/20/2019 11:14:45
Sample Name: ICAL Verf@10ug/L
Acq Operator: TNB

Seq Line: 11
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



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

```

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

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 10.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.756	PBA	574879.4	10.1185	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	171000.4	9.7904	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.776	PBA	206243.3	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05

Seq Line: 3

Sample Name: CLO4@ 1.0ug/L

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

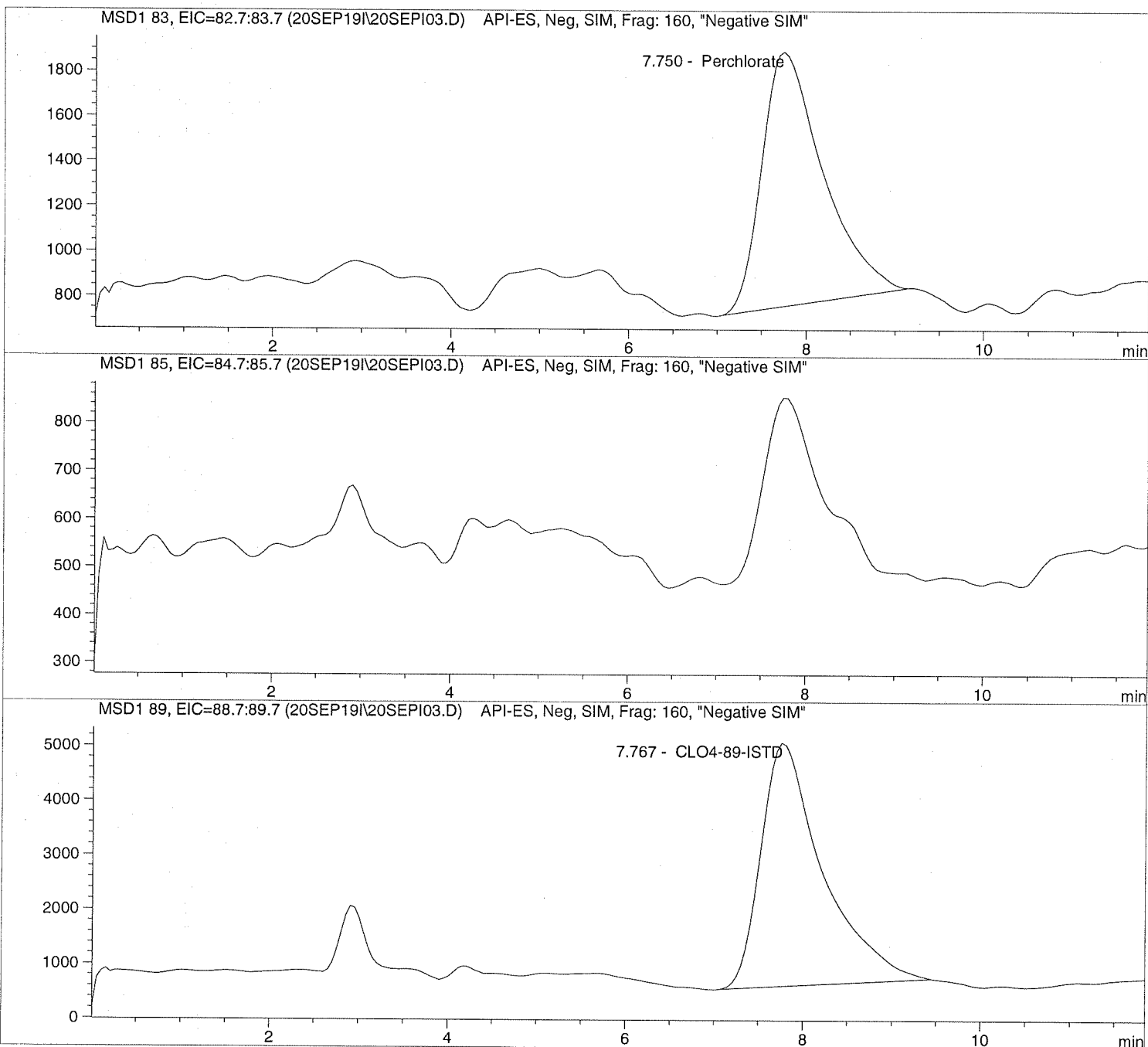
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line: 3
Sample Name:    CLO4@ 1.0ug/L          Location:  Vial 73
Acq Operator:   TNB                    Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:27:11
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```




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

January 07, 2020

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

Work Order: **HS19121029**

Laboratory Results for: **Groundwater Treatment Plant Quarterly Effluent Samples**

Dear Marcia,

ALS Environmental received 3 sample(s) on Dec 18, 2019 for the analysis presented in the following report.

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

Regards,

A handwritten signature in black ink, appearing to read "Raj. P. Modashia", enclosed in a circular scribble.

Generated By: **RJ.MODASHIA**
RJ Modashia
Project Manager

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
Work Order: HS19121029

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19121029-01	LH18/24-SP650_121719	Water		17-Dec-2019 14:00	18-Dec-2019 10:30	<input type="checkbox"/>
HS19121029-02	LH18/24-SP650_121719_BIX	Water		17-Dec-2019 14:00	18-Dec-2019 10:30	<input type="checkbox"/>
HS19121029-03	Trip Blank	Water		17-Dec-2019 00:00	18-Dec-2019 10:30	<input type="checkbox"/>

Revision:1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
Work Order: HS19121029

CASE NARRATIVE**Work Order Comments**

- Revised to update the Project name to Effluent and to report Mercury in mg/L
- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

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

GCMS Semivolatiles by Method SW8270SIM**Batch ID: 148874****Sample ID: LCSD-148874**

- The RPD between the LCS and LCSD was outside of the control limit.

GCMS Volatiles by Method SW8260**Batch ID: R352981****Sample ID: CCV**

- 1,2,3-Trichlorobenzene exceeded %D limits for CCV. Samples are ND for this compound.

Sample ID: VLCSW-191219

- 1,2,3-Trichlorobenzene and 1,2,4-Trichlorobenzene exceeded QC limits fro LCS.

Sample ID: HS19121036-01MS, HS19121036-04MS

- MS and MSD are for an unrelated sample

Metals by Method SW7470**Batch ID: 149399**

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

Metals by Method SW6020**Batch ID: 149161****Sample ID: HS19121036-01MS**

- MS and MSD are for an unrelated sample

WetChemistry by Method E1664A**Batch ID: R353320**

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

WetChemistry by Method SW9056**Batch ID: R353307**

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

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
Work Order: HS19121029

CASE NARRATIVE**WetChemistry by Method E410.4****Batch ID: R352964**

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

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Effluent Samples
 Sample ID: LH18/24-SP650_121719
 Collection Date: 17-Dec-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19121029
 Lab ID:HS19121029-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
1,2-Dichloroethane	1.5		0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 13:20	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	19-Dec-2019 13:20	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	19-Dec-2019 13:20	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	19-Dec-2019 13:20	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Dec-2019 13:20	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:20	

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

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Effluent Samples
 Sample ID: LH18/24-SP650_121719
 Collection Date: 17-Dec-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19121029
 Lab ID:HS19121029-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
cis-1,2-Dichloroethene	39		0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 13:20	
Methylene chloride	1.7	J	0.40	1.0	2.0	UG/L	1	19-Dec-2019 13:20	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Trichloroethene	6.8		0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Vinyl chloride	0.48	J	0.20	0.50	1.0	UG/L	1	19-Dec-2019 13:20	
Surr: 1,2-Dichloroethane-d4	92.5			0	81-118	%REC	1	19-Dec-2019 13:20	
Surr: 4-Bromofluorobenzene	99.3			0	85-114	%REC	1	19-Dec-2019 13:20	
Surr: Dibromofluoromethane	93.7			0	80-119	%REC	1	19-Dec-2019 13:20	
Surr: Toluene-d8	102			0	89-112	%REC	1	19-Dec-2019 13:20	
SEMIVOLATILES SIM		Method:SW8270SIM						Prep:SW3510 / 18-Dec-2019 Analyst: LG	
1,4-Dioxane	20		1.0	1.0	1.0	ug/L	100	23-Dec-2019 14:46	
Surr: 2-Fluorobiphenyl	107			0	40-140	%REC	100	23-Dec-2019 14:46	
Surr: 4-Terphenyl-d14	110			0	40-140	%REC	100	23-Dec-2019 14:46	
Surr: Nitrobenzene-d5	98.2			0	40-140	%REC	100	23-Dec-2019 14:46	

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

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Effluent Samples
 Sample ID: LH18/24-SP650_121719
 Collection Date: 17-Dec-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19121029
 Lab ID:HS19121029-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A			Method:SW6020			Prep:SW3010A / 27-Dec-2019		Analyst: JHD
Aluminum	0.0194		0.00180	0.00500	0.0100	mg/L	1	03-Jan-2020 12:08
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:08
Arsenic	0.000634	J	0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:08
Barium	0.0888		0.00190	0.00250	0.00500	mg/L	1	03-Jan-2020 12:08
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 12:08
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 12:08
Calcium	7.99		0.0340	0.0500	0.500	mg/L	1	03-Jan-2020 12:08
Chromium	0.000428	J	0.000400	0.000500	0.00500	mg/L	1	03-Jan-2020 12:08
Cobalt	0.00149	J	0.000100	0.000500	0.00500	mg/L	1	03-Jan-2020 12:08
Iron	0.108	J	0.0120	0.0500	0.200	mg/L	1	03-Jan-2020 12:08
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:08
Magnesium	24.0		0.0100	0.0500	0.200	mg/L	1	03-Jan-2020 12:08
Manganese	0.104		0.000700	0.00250	0.00500	mg/L	1	03-Jan-2020 12:08
Nickel	0.00372	J	0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:08
Potassium	1.29		0.0180	0.0500	0.200	mg/L	1	03-Jan-2020 12:08
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	03-Jan-2020 12:08
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	03-Jan-2020 12:08
Sodium	339		0.280	1.00	4.00	mg/L	20	03-Jan-2020 14:32
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	03-Jan-2020 12:08
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	03-Jan-2020 12:08
Zinc	0.0172		0.00200	0.00250	0.00500	mg/L	1	03-Jan-2020 12:08
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 06-Jan-2020		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	06-Jan-2020 16:23
OIL & GREASE (HEM) BY E1664A			Method:E1664A			Analyst: KAH		
Oil and Grease	1.00	U	0.610	1.00	2.00	mg/L	1	26-Dec-2019 13:20
CHEMICAL OXYGEN DEMAND BY E410.4			Method:E410.4			Analyst: TH		
Chemical Oxygen Demand	22.0		5.00	15.0	15.0	mg/L	1	19-Dec-2019 18:00
ANIONS BY SW9056A			Method:SW9056			Analyst: KMU		
Chloride	453		2.00	5.00	5.00	mg/L	10	26-Dec-2019 17:39
Sulfate	28.8		2.00	5.00	5.00	mg/L	10	26-Dec-2019 17:39

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

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Effluent Samples
 Sample ID: LH18/24-SP650_121719_BIX
 Collection Date: 17-Dec-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19121029
 Lab ID:HS19121029-02
 Matrix:Water

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	06-Jan-2020 14:07

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

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Effluent Samples
 Sample ID: Trip Blank
 Collection Date: 17-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19121029
 Lab ID:HS19121029-03
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 12:56	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	19-Dec-2019 12:56	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	19-Dec-2019 12:56	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	19-Dec-2019 12:56	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	19-Dec-2019 12:56	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:56	

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

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Effluent Samples
 Sample ID: Trip Blank
 Collection Date: 17-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19121029
 Lab ID:HS19121029-03
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	19-Dec-2019 12:56	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	19-Dec-2019 12:56	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	19-Dec-2019 12:56	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.1</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 12:56</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>100</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 12:56</i>	
<i>Surr: Dibromofluoromethane</i>	<i>93.2</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 12:56</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>19-Dec-2019 12:56</i>	

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

Revision: 1

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

Batch ID: 148874 **Start Date:** 18 Dec 2019 07:00 **End Date:** 18 Dec 2019 16:00
Method: SV AQ SEP FUN EXTRACT-LOWLEV - 3510C **Prep Code:** 3510_B_SIM

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19121029-01	1	1000 (mL)	1 (mL)	0.001

Batch ID: 149098 **Start Date:** 24 Dec 2019 10:00 **End Date:** 24 Dec 2019 12:00
Method: MERCURY PREP BY 7470A- WATER **Prep Code:** HG_WPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19121029-01		10 (mL)	10 (mL)	1

Batch ID: 149161 **Start Date:** 27 Dec 2019 09:00 **End Date:** 27 Dec 2019 13:00
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19121029-01		10 (mL)	10 (mL)	1

Batch ID: 149399 **Start Date:** 06 Jan 2020 10:30 **End Date:** 06 Jan 2020 12:30
Method: MERCURY PREP BY 7470A- WATER **Prep Code:** HG_WPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19121029-01		10 (mL)	10 (mL)	1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 148874 (0)		Test Name : SEMIVOLATILES SIM			Matrix: Water	
HS19121029-01	LH18/24-SP650_121719	17 Dec 2019 14:00		18 Dec 2019 07:00	23 Dec 2019 14:46	100
Batch ID: 149161 (0)		Test Name : METALS BY ICPMS BY SW6020A			Matrix: Water	
HS19121029-01	LH18/24-SP650_121719	17 Dec 2019 14:00		27 Dec 2019 13:00	03 Jan 2020 14:32	20
HS19121029-01	LH18/24-SP650_121719	17 Dec 2019 14:00		27 Dec 2019 13:00	03 Jan 2020 12:08	1
Batch ID: 149399 (0)		Test Name : MERCURY BY SW7470A			Matrix: Water	
HS19121029-01	LH18/24-SP650_121719	17 Dec 2019 14:00		06 Jan 2020 10:30	06 Jan 2020 16:23	1
Batch ID: R352964 (0)		Test Name : CHEMICAL OXYGEN DEMAND BY E410.4			Matrix: Water	
HS19121029-01	LH18/24-SP650_121719	17 Dec 2019 14:00			19 Dec 2019 18:00	1
Batch ID: R352981 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19121029-01	LH18/24-SP650_121719	17 Dec 2019 14:00			19 Dec 2019 13:20	1
HS19121029-03	Trip Blank	17 Dec 2019 00:00			19 Dec 2019 12:56	1
Batch ID: R353307 (0)		Test Name : ANIONS BY SW9056A			Matrix: Water	
HS19121029-01	LH18/24-SP650_121719	17 Dec 2019 14:00			26 Dec 2019 17:39	10
Batch ID: R353320 (0)		Test Name : OIL & GREASE (HEM) BY E1664A			Matrix: Water	
HS19121029-01	LH18/24-SP650_121719	17 Dec 2019 14:00			26 Dec 2019 13:20	1
Batch ID: R353891 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Water	
HS19121029-02	LH18/24-SP650_121719_BIX	17 Dec 2019 14:00			06 Jan 2020 14:07	1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: 149161 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MBLK	Sample ID: MBLK-149161	Units: mg/L			Analysis Date: 03-Jan-2020 12:00					
Client ID:	Run ID: ICPMS05_353764	SeqNo: 5423038	PrepDate: 27-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.002931	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.001014	0.00500								J
Nickel	0.00100	0.00500								U
Potassium	0.0184	0.200								J
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.02161	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00245	0.00500								J

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: 149161 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
LCS	Sample ID: LCS-149161	Units: mg/L			Analysis Date: 03-Jan-2020 12:03					
Client ID:	Run ID: ICPMS05_353764	SeqNo: 5423039	PrepDate: 27-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1102	0.0100	0.1	0	110	84 - 117				
Antimony	0.0493	0.00500	0.05	0	98.6	85 - 117				
Arsenic	0.05072	0.00500	0.05	0	101	84 - 116				
Barium	0.04802	0.00500	0.05	0	96.0	86 - 114				
Beryllium	0.04659	0.00200	0.05	0	93.2	83 - 121				
Cadmium	0.05061	0.00200	0.05	0	101	87 - 115				
Calcium	5.169	0.500	5	0	103	87 - 118				
Chromium	0.05067	0.00500	0.05	0	101	85 - 116				
Cobalt	0.04913	0.00500	0.05	0	98.3	86 - 115				
Iron	5.272	0.200	5	0	105	87 - 118				
Lead	0.04497	0.00500	0.05	0	89.9	88 - 115				
Magnesium	5.263	0.200	5	0	105	83 - 118				
Manganese	0.05123	0.00500	0.05	0	102	87 - 115				
Nickel	0.05142	0.00500	0.05	0	103	85 - 117				
Potassium	5.331	0.200	5	0	107	87 - 115				
Selenium	0.05073	0.00500	0.05	0	101	80 - 120				
Silver	0.04571	0.00500	0.05	0	91.4	85 - 116				
Sodium	5.164	0.200	5	0	103	85 - 117				
Thallium	0.0429	0.00200	0.05	0	85.8	82 - 116				
Vanadium	0.05011	0.00500	0.05	0	100	86 - 115				
Zinc	0.05326	0.00500	0.05	0	107	83 - 119				

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: 149161 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
MS	Sample ID: HS19121036-01MS	Units: mg/L			Analysis Date: 03-Jan-2020 12:14					
Client ID:	Run ID: ICPMS05_353764	SeqNo: 5423044	PrepDate: 27-Dec-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.3471	0.0100	0.2	0.1494	98.9	84 - 117				
Antimony	0.04798	0.00500	0.05	0	96.0	85 - 117				
Arsenic	0.04954	0.00500	0.05	0	99.1	84 - 116				
Barium	1.028	0.00500	0.05	0.948	160	86 - 114				SO
Beryllium	0.04682	0.00200	0.05	0	93.6	83 - 121				
Cadmium	0.04785	0.00200	0.05	0.000207	95.3	87 - 115				
Calcium	234.3	0.500	5	228.5	115	87 - 118				EO
Chromium	0.05164	0.00500	0.05	0.002556	98.2	85 - 116				
Cobalt	0.0471	0.00500	0.05	0.001038	92.1	86 - 115				
Iron	5.167	0.200	5	0.1594	100	87 - 118				
Lead	0.04824	0.00500	0.05	0	96.5	88 - 115				
Magnesium	84.46	0.200	5	79.11	107	83 - 118				O
Manganese	0.2187	0.00500	0.05	0.1694	98.6	87 - 115				
Nickel	0.07377	0.00500	0.05	0.02497	97.6	85 - 117				
Potassium	6.101	0.200	5	0.977	102	87 - 115				
Selenium	0.04827	0.00500	0.05	0	96.5	80 - 120				
Silver	0.04288	0.00500	0.05	0	85.8	85 - 116				
Sodium	251.3	0.200	5	246.4	98.0	85 - 117				EO
Thallium	0.04508	0.00200	0.05	0	90.2	82 - 116				
Vanadium	0.05112	0.00500	0.05	0	102	86 - 115				
Zinc	0.05699	0.00500	0.05	0.007335	99.3	83 - 119				

Revision: 1

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Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: 149161 (0)		Instrument: ICPMS05			Method: METALS BY ICPMS BY SW6020A					
MSD	Sample ID: HS19121036-01MSD	Units: mg/L			Analysis Date: 03-Jan-2020 12:17					
Client ID:	Run ID: ICPMS05_353764	SeqNo: 5423045			PrepDate: 27-Dec-2019		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.3514	0.0100	0.2	0.1494	101	84 - 117	0.3471	1.21	20	
Antimony	0.04736	0.00500	0.05	0	94.7	85 - 117	0.04798	1.29	20	
Arsenic	0.04823	0.00500	0.05	0	96.5	84 - 116	0.04954	2.68	20	
Barium	1.013	0.00500	0.05	0.948	129	86 - 114	1.028	1.49	20	SO
Beryllium	0.04523	0.00200	0.05	0	90.5	83 - 121	0.04682	3.47	20	
Cadmium	0.04711	0.00200	0.05	0.000207	93.8	87 - 115	0.04785	1.56	20	
Calcium	224.9	0.500	5	228.5	-73.1	87 - 118	234.3	4.1	20	SEO
Chromium	0.05033	0.00500	0.05	0.002556	95.5	85 - 116	0.05164	2.57	20	
Cobalt	0.04592	0.00500	0.05	0.001038	89.8	86 - 115	0.0471	2.53	20	
Iron	5.065	0.200	5	0.1594	98.1	87 - 118	5.167	2	20	
Lead	0.04721	0.00500	0.05	0	94.4	88 - 115	0.04824	2.15	20	
Magnesium	82.16	0.200	5	79.11	61.1	83 - 118	84.46	2.76	20	SO
Manganese	0.215	0.00500	0.05	0.1694	91.2	87 - 115	0.2187	1.71	20	
Nickel	0.06998	0.00500	0.05	0.02497	90.0	85 - 117	0.07377	5.27	20	
Potassium	5.945	0.200	5	0.977	99.4	87 - 115	6.101	2.59	20	
Selenium	0.04721	0.00500	0.05	0	94.4	80 - 120	0.04827	2.22	20	
Silver	0.04207	0.00500	0.05	0	84.1	85 - 116	0.04288	1.9	20	S
Sodium	246.8	0.200	5	246.4	6.88	85 - 117	251.3	1.83	20	SEO
Thallium	0.04504	0.00200	0.05	0	90.1	82 - 116	0.04508	0.107	20	
Vanadium	0.04999	0.00500	0.05	0	100.0	86 - 115	0.05112	2.23	20	
Zinc	0.05446	0.00500	0.05	0.007335	94.2	83 - 119	0.05699	4.55	20	

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Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: 149161 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A					
PDS	Sample ID: HS19121036-01PDS	Units: mg/L			Analysis Date: 03-Jan-2020 12:19				
Client ID:	Run ID: ICPMS05_353764	SeqNo: 5423046		PrepDate: 27-Dec-2019		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Aluminum	0.3168	0.0100	0.2	0.1494	83.7	80 - 120			
Antimony	0.08414	0.00500	0.1	0	84.1	80 - 120			
Arsenic	0.09811	0.00500	0.1	0	98.1	80 - 120			
Barium	1.036	0.00500	0.1	0.948	87.5	80 - 120			O
Beryllium	0.08608	0.00200	0.1	0	86.1	80 - 120			
Cadmium	0.09617	0.00200	0.1	0.000207	96.0	80 - 120			
Chromium	0.09735	0.00500	0.1	0.002556	94.8	80 - 120			
Cobalt	0.09065	0.00500	0.1	0.001038	89.6	80 - 120			
Iron	9.775	0.200	10	0.1594	96.2	80 - 120			
Lead	0.09409	0.00500	0.1	0	94.1	80 - 120			
Magnesium	87.73	0.200	10	79.11	86.2	80 - 120			O
Manganese	0.26	0.00500	0.1	0.1694	90.6	80 - 120			
Nickel	0.1244	0.00500	0.1	0.02497	99.4	80 - 120			
Potassium	10.82	0.200	10	0.977	98.4	80 - 120			
Selenium	0.09604	0.00500	0.1	0	96.0	80 - 120			
Silver	0.08248	0.00500	0.1	0	82.5	80 - 120			
Thallium	0.09582	0.00200	0.1	0	95.8	80 - 120			
Vanadium	0.09789	0.00500	0.1	0	97.9	80 - 120			
Zinc	0.1015	0.00500	0.1	0.007335	94.1	80 - 120			

PDS	Sample ID: HS19121036-01PDS	Units: mg/L			Analysis Date: 03-Jan-2020 14:39				
Client ID:	Run ID: ICPMS05_353764	SeqNo: 5423162		PrepDate: 27-Dec-2019		DF: 20			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Calcium	423.5	10.0	200	235.8	93.9	80 - 120			
Sodium	442.3	4.00	200	256.4	93.0	80 - 120			

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ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: 149161 (0)		Instrument: ICPMS05		Method: METALS BY ICPMS BY SW6020A						
SD	Sample ID: HS19121036-01SD	Units: mg/L			Analysis Date: 03-Jan-2020 12:12					
Client ID:	Run ID: ICPMS05_353764	SeqNo: 5423043		PrepDate: 27-Dec-2019		DF: 5				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit Qual	
Antimony	0.00250	0.0250					0.00029	0 10	U	
Arsenic	0.00250	0.0250					0.000238	0 10	U	
Barium	0.9045	0.0250					0.948	4.59 10		
Beryllium	0.00250	0.0100					0.000023	0 10	U	
Cadmium	0.00250	0.0100					0.000207	0 10	U	
Chromium	0.002444	0.0250					0.002556	0 10	J	
Cobalt	0.001044	0.0250					0.001038	0 10	J	
Iron	0.1589	1.00					0.1594	0 10	J	
Lead	0.00500	0.0250					0.000231	0 10	U	
Magnesium	78.8	1.00					79.11	0.391 10		
Manganese	0.1734	0.0250					0.1694	2.4 10		
Nickel	0.02591	0.0250					0.02497	0 10		
Potassium	1.019	1.00					0.977	0 10		
Selenium	0.0125	0.0250					-0.000016	0 10	U	
Silver	0.00250	0.0250					0.000017	0 10	U	
Thallium	0.00250	0.0100					0.00004	0 10	U	
Vanadium	0.004047	0.0250					0.000523	0 10	J	
Zinc	0.01053	0.0250					0.007335	0 10	J	

SD	Sample ID: HS19121036-01SD	Units: mg/L			Analysis Date: 03-Jan-2020 14:36				
Client ID:	Run ID: ICPMS05_353764	SeqNo: 5423161		PrepDate: 27-Dec-2019		DF: 100			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit Qual
Calcium	246	50.0					235.8	4.33 10	
Sodium	273.8	20.0					256.4	6.79 10	

The following samples were analyzed in this batch:

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Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: 149399 (0)		Instrument: HG03		Method: MERCURY BY SW7470A						
MBLK	Sample ID: MBLK-149399	Units: mg/L		Analysis Date: 06-Jan-2020 15:37						
Client ID:	Run ID: HG03_353907	SeqNo: 5425586		PrepDate: 06-Jan-2020		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.000100	0.000200							U	
LCS	Sample ID: LCS-149399	Units: mg/L		Analysis Date: 06-Jan-2020 15:39						
Client ID:	Run ID: HG03_353907	SeqNo: 5425587		PrepDate: 06-Jan-2020		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00509	0.000200	0.005	0	102	80 - 120				
MS	Sample ID: HS19121250-21MS	Units: mg/L		Analysis Date: 06-Jan-2020 15:42						
Client ID:	Run ID: HG03_353907	SeqNo: 5425589		PrepDate: 06-Jan-2020		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00506	0.000200	0.005	0.00001800	101	75 - 125				
MSD	Sample ID: HS19121250-21MSD	Units: mg/L		Analysis Date: 06-Jan-2020 15:44						
Client ID:	Run ID: HG03_353907	SeqNo: 5425590		PrepDate: 06-Jan-2020		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00515	0.000200	0.005	0.00001800	103	75 - 125	0.005060	1.76	20	

The following samples were analyzed in this batch: HS19121029-01

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Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: 148874 (0)		Instrument: SV-6		Method: SEMIVOLATILES SIM						
MBLK	Sample ID: MBLK-148874	Units: ug/L			Analysis Date: 23-Dec-2019 08:23					
Client ID:	Run ID: SV-6_353137	SeqNo: 5405871		PrepDate: 18-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	0.08477	0	0.08	0	106	40 - 140				
Surr: 4-Terphenyl-d14	0.07433	0	0.08	0	92.9	40 - 140				
Surr: Nitrobenzene-d5	0.09568	0	0.08	0	120	40 - 140				
LCS	Sample ID: LCS-148874	Units: ug/L			Analysis Date: 23-Dec-2019 08:42					
Client ID:	Run ID: SV-6_353137	SeqNo: 5405872		PrepDate: 18-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08006	0.010	0.08	0	100	40 - 140				
Surr: 2-Fluorobiphenyl	0.08232	0	0.08	0	103	40 - 140				
Surr: 4-Terphenyl-d14	0.07833	0	0.08	0	97.9	40 - 140				
Surr: Nitrobenzene-d5	0.08773	0	0.08	0	110	40 - 140				
LCSD	Sample ID: LCSD-148874	Units: ug/L			Analysis Date: 23-Dec-2019 09:02					
Client ID:	Run ID: SV-6_353137	SeqNo: 5405873		PrepDate: 18-Dec-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07024	0.010	0.08	0	87.8	40 - 140	0.08006	13.1	20	
Surr: 2-Fluorobiphenyl	0.1454	0	0.16	0	90.9	40 - 140	0.08232	55.4	20	R
Surr: 4-Terphenyl-d14	0.146	0	0.16	0	91.2	40 - 140	0.07833	60.3	20	R
Surr: Nitrobenzene-d5	0.1532	0	0.16	0	95.8	40 - 140	0.08773	54.4	20	R

The following samples were analyzed in this batch: HS19121029-01

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ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191219	Units: UG/L			Analysis Date: 19-Dec-2019 12:08					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402183	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-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
Bromomethane	0.50	1.0								U

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Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-191219	Units: UG/L			Analysis Date: 19-Dec-2019 12:08					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402183	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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	45.73	1.0	50	0	91.5	81 - 118				
Surr: 4-Bromofluorobenzene	48.64	1.0	50	0	97.3	85 - 114				
Surr: Dibromofluoromethane	46.18	1.0	50	0	92.4	80 - 119				
Surr: Toluene-d8	51.75	1.0	50	0	103	89 - 112				

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ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191219	Units: UG/L			Analysis Date: 19-Dec-2019 11:19					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402182	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	19.14	1.0	20	0	95.7	78 - 124				
1,1,1-Trichloroethane	18.87	1.0	20	0	94.4	74 - 131				
1,1,2,2-Tetrachloroethane	20.89	1.0	20	0	104	71 - 121				
1,1,2-Trichloroethane	20.08	1.0	20	0	100	80 - 119				
1,1-Dichloroethane	20.88	1.0	20	0	104	77 - 125				
1,1-Dichloroethene	15.74	1.0	20	0	78.7	71 - 131				
1,1-Dichloropropene	18.62	1.0	20	0	93.1	78 - 125				
1,2,3-Trichlorobenzene	31.42	1.0	20	0	157	69 - 129				S
1,2,3-Trichloropropane	21.66	1.0	20	0	108	73 - 122				
1,2,4-Trichlorobenzene	26.27	1.0	20	0	131	69 - 130				S
1,2,4-Trimethylbenzene	21.06	1.0	20	0	105	76 - 124				
1,2-Dibromo-3-chloropropane	22.22	1.0	20	0	111	62 - 128				
1,2-Dibromoethane	19.76	1.0	20	0	98.8	77 - 121				
1,2-Dichlorobenzene	20.08	1.0	20	0	100	80 - 119				
1,2-Dichloroethane	19.23	1.0	20	0	96.2	73 - 128				
1,2-Dichloropropane	20.1	1.0	20	0	101	78 - 122				
1,3,5-Trimethylbenzene	21.42	1.0	20	0	107	75 - 124				
1,3-Dichlorobenzene	20.37	1.0	20	0	102	80 - 119				
1,3-Dichloropropane	20.15	1.0	20	0	101	80 - 119				
1,4-Dichlorobenzene	20.18	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	19.17	1.0	20	0	95.8	60 - 139				
2-Butanone	42.22	2.0	40	0	106	56 - 143				
2-Chlorotoluene	22.06	1.0	20	0	110	79 - 122				
2-Hexanone	39.63	2.0	40	0	99.1	57 - 139				
4-Chlorotoluene	20.89	1.0	20	0	104	78 - 122				
4-Isopropyltoluene	20.51	1.0	20	0	103	77 - 127				
4-Methyl-2-pentanone	40.44	2.0	40	0	101	67 - 130				
Acetone	35.12	2.0	40	0	87.8	39 - 160				
Benzene	20.65	1.0	20	0	103	79 - 120				
Bromobenzene	20.49	1.0	20	0	102	80 - 120				
Bromochloromethane	20.09	1.0	20	0	100	78 - 123				
Bromodichloromethane	19.6	1.0	20	0	98.0	79 - 125				
Bromoform	19.07	1.0	20	0	95.4	66 - 130				
Bromomethane	16.32	1.0	20	0	81.6	53 - 141				

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Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
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QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-191219	Units: UG/L			Analysis Date: 19-Dec-2019 11:19					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402182	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	43.35	2.0	40	0	108	64 - 133				
Carbon tetrachloride	17.19	1.0	20	0	85.9	72 - 136				
Chlorobenzene	19.18	1.0	20	0	95.9	82 - 118				
Chloroethane	16.32	1.0	20	0	81.6	60 - 138				
Chloroform	18.93	1.0	20	0	94.7	79 - 124				
Chloromethane	15.6	1.0	20	0	78.0	50 - 139				
cis-1,2-Dichloroethene	21.34	1.0	20	0	107	78 - 123				
cis-1,3-Dichloropropene	20.24	1.0	20	0	101	75 - 124				
Dibromochloromethane	19.47	1.0	20	0	97.4	74 - 126				
Dibromomethane	19.11	1.0	20	0	95.6	79 - 123				
Dichlorodifluoromethane	18.21	1.0	20	0	91.1	32 - 152				
Ethylbenzene	19.65	1.0	20	0	98.3	79 - 121				
Hexachlorobutadiene	25.4	1.0	20	0	127	66 - 134				
Isopropylbenzene	19.28	1.0	20	0	96.4	72 - 131				
m,p-Xylene	39.21	2.0	40	0	98.0	80 - 121				
Methylene chloride	19.78	2.0	20	0	98.9	74 - 124				
Naphthalene	24.37	1.0	20	0	122	61 - 128				
n-Butylbenzene	20.18	1.0	20	0	101	75 - 128				
n-Propylbenzene	20.78	1.0	20	0	104	76 - 126				
o-Xylene	19.57	1.0	20	0	97.8	78 - 122				
sec-Butylbenzene	20.66	1.0	20	0	103	77 - 126				
Styrene	19.44	1.0	20	0	97.2	78 - 123				
tert-Butylbenzene	20.72	1.0	20	0	104	78 - 124				
Tetrachloroethene	18.14	1.0	20	0	90.7	74 - 129				
Toluene	19.82	1.0	20	0	99.1	80 - 121				
trans-1,2-Dichloroethene	20.86	1.0	20	0	104	75 - 124				
trans-1,3-Dichloropropene	19.9	1.0	20	0	99.5	73 - 127				
Trichloroethene	19.48	1.0	20	0	97.4	79 - 123				
Trichlorofluoromethane	15.03	1.0	20	0	75.1	65 - 141				
Vinyl chloride	16.63	1.0	20	0	83.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	46.66	1.0	50	0	93.3	81 - 118				
Surr: 4-Bromofluorobenzene	47.21	1.0	50	0	94.4	85 - 114				
Surr: Dibromofluoromethane	46.77	1.0	50	0	93.5	80 - 119				
Surr: Toluene-d8	44.52	1.0	50	0	89.0	89 - 112				

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19121036-04MS	Units: UG/L			Analysis Date: 19-Dec-2019 17:20					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402196		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	19.4	1.0	20	0	97.0	78 - 124				
1,1,1-Trichloroethane	17.71	1.0	20	0	88.6	74 - 131				
1,1,2,2-Tetrachloroethane	20.78	1.0	20	0	104	71 - 121				
1,1,2-Trichloroethane	19.77	1.0	20	0	98.9	80 - 119				
1,1-Dichloroethane	18.05	1.0	20	0	90.3	77 - 125				
1,1-Dichloroethene	13.2	1.0	20	0	66.0	71 - 131				S
1,1-Dichloropropene	18.71	1.0	20	0	93.5	78 - 125				
1,2,3-Trichlorobenzene	23.01	1.0	20	0	115	69 - 129				
1,2,3-Trichloropropane	21.15	1.0	20	0	106	73 - 122				
1,2,4-Trichlorobenzene	20.17	1.0	20	0	101	69 - 130				
1,2,4-Trimethylbenzene	21.92	1.0	20	0	110	76 - 124				
1,2-Dibromo-3-chloropropane	19.8	1.0	20	0	99.0	62 - 128				
1,2-Dibromoethane	19.39	1.0	20	0	96.9	77 - 121				
1,2-Dichlorobenzene	20.29	1.0	20	0	101	80 - 119				
1,2-Dichloroethane	17.6	1.0	20	0	88.0	73 - 128				
1,2-Dichloropropane	18.64	1.0	20	0	93.2	78 - 122				
1,3,5-Trimethylbenzene	22.44	1.0	20	0	112	75 - 124				
1,3-Dichlorobenzene	21.03	1.0	20	0	105	80 - 119				
1,3-Dichloropropane	20.05	1.0	20	0	100	80 - 119				
1,4-Dichlorobenzene	20.62	1.0	20	0	103	79 - 118				
2,2-Dichloropropane	17.33	1.0	20	0	86.6	60 - 139				
2-Butanone	33.34	2.0	40	0	83.3	56 - 143				
2-Chlorotoluene	22.97	1.0	20	0	115	79 - 122				
2-Hexanone	36.79	2.0	40	0	92.0	57 - 139				
4-Chlorotoluene	21.68	1.0	20	0	108	78 - 122				
4-Isopropyltoluene	22.05	1.0	20	0	110	77 - 127				
4-Methyl-2-pentanone	38.47	2.0	40	0	96.2	67 - 130				
Acetone	21.11	2.0	40	0	52.8	39 - 160				
Benzene	19.51	1.0	20	0	97.6	79 - 120				
Bromobenzene	21.28	1.0	20	0	106	80 - 120				
Bromochloromethane	17.18	1.0	20	0	85.9	78 - 123				
Bromodichloromethane	18.05	1.0	20	0	90.2	79 - 125				
Bromoform	18.6	1.0	20	0	93.0	66 - 130				
Bromomethane	8.02	1.0	20	0	40.1	53 - 141				S

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19121036-04MS	Units: UG/L			Analysis Date: 19-Dec-2019 17:20					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402196	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	31.05	2.0	40	0	77.6	64 - 133				
Carbon tetrachloride	17.87	1.0	20	0	89.4	72 - 136				
Chlorobenzene	19.53	1.0	20	0	97.7	82 - 118				
Chloroethane	10.31	1.0	20	0	51.5	60 - 138				S
Chloroform	16.9	1.0	20	0	84.5	79 - 124				
Chloromethane	4.721	1.0	20	0	23.6	50 - 139				S
cis-1,2-Dichloroethene	19.32	1.0	20	0.8057	92.6	78 - 123				
cis-1,3-Dichloropropene	18.77	1.0	20	0	93.9	75 - 124				
Dibromochloromethane	19.14	1.0	20	0	95.7	74 - 126				
Dibromomethane	17.65	1.0	20	0	88.2	79 - 123				
Dichlorodifluoromethane	2.281	1.0	20	0	11.4	32 - 152				S
Ethylbenzene	20.58	1.0	20	0	103	79 - 121				
Hexachlorobutadiene	20.21	1.0	20	0	101	66 - 134				
Isopropylbenzene	20.66	1.0	20	0	103	72 - 131				
m,p-Xylene	40.67	2.0	40	0	102	80 - 121				
Methylene chloride	16.6	2.0	20	0	83.0	74 - 124				
Naphthalene	20.02	1.0	20	0	100	61 - 128				
n-Butylbenzene	21.64	1.0	20	0	108	75 - 128				
n-Propylbenzene	22.55	1.0	20	0	113	76 - 126				
o-Xylene	20.22	1.0	20	0	101	78 - 122				
sec-Butylbenzene	22.65	1.0	20	0	113	77 - 126				
Styrene	19.99	1.0	20	0	100.0	78 - 123				
tert-Butylbenzene	22.63	1.0	20	0	113	78 - 124				
Tetrachloroethene	19.55	1.0	20	0	97.7	74 - 129				
Toluene	20.51	1.0	20	0	103	80 - 121				
trans-1,2-Dichloroethene	17.82	1.0	20	0	89.1	75 - 124				
trans-1,3-Dichloropropene	18.06	1.0	20	0	90.3	73 - 127				
Trichloroethene	32.47	1.0	20	12.97	97.5	79 - 123				
Trichlorofluoromethane	11.65	1.0	20	0	58.3	65 - 141				S
Vinyl chloride	7.24	1.0	20	0	36.2	58 - 137				S
Surr: 1,2-Dichloroethane-d4	45.06	1.0	50	0	90.1	81 - 118				
Surr: 4-Bromofluorobenzene	50.29	1.0	50	0	101	85 - 114				
Surr: Dibromofluoromethane	45.9	1.0	50	0	91.8	80 - 119				
Surr: Toluene-d8	51.51	1.0	50	0	103	89 - 112				

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19121036-01MS	Units: UG/L			Analysis Date: 19-Dec-2019 16:32					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402194	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	18.81	1.0	20	0	94.0	78 - 124				
1,1,1-Trichloroethane	17.47	1.0	20	0	87.3	74 - 131				
1,1,2,2-Tetrachloroethane	19.54	1.0	20	0	97.7	71 - 121				
1,1,2-Trichloroethane	18.87	1.0	20	0	94.3	80 - 119				
1,1-Dichloroethane	18.12	1.0	20	0	90.6	77 - 125				
1,1-Dichloroethene	13.26	1.0	20	0	66.3	71 - 131				S
1,1-Dichloropropene	18.92	1.0	20	0	94.6	78 - 125				
1,2,3-Trichlorobenzene	22.05	1.0	20	0	110	69 - 129				
1,2,3-Trichloropropane	19.84	1.0	20	0	99.2	73 - 122				
1,2,4-Trichlorobenzene	20.8	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	20.4	1.0	20	0	102	76 - 124				
1,2-Dibromo-3-chloropropane	18.75	1.0	20	0	93.7	62 - 128				
1,2-Dibromoethane	18.62	1.0	20	0	93.1	77 - 121				
1,2-Dichlorobenzene	18.95	1.0	20	0	94.7	80 - 119				
1,2-Dichloroethane	17.08	1.0	20	0	85.4	73 - 128				
1,2-Dichloropropane	18.72	1.0	20	0	93.6	78 - 122				
1,3,5-Trimethylbenzene	21.04	1.0	20	0	105	75 - 124				
1,3-Dichlorobenzene	19.41	1.0	20	0	97.0	80 - 119				
1,3-Dichloropropane	19.03	1.0	20	0	95.2	80 - 119				
1,4-Dichlorobenzene	19.16	1.0	20	0	95.8	79 - 118				
2,2-Dichloropropane	17.33	1.0	20	0	86.6	60 - 139				
2-Butanone	32.49	2.0	40	0	81.2	56 - 143				
2-Chlorotoluene	21.44	1.0	20	0	107	79 - 122				
2-Hexanone	35.63	2.0	40	0	89.1	57 - 139				
4-Chlorotoluene	20.26	1.0	20	0	101	78 - 122				
4-Isopropyltoluene	20.61	1.0	20	0	103	77 - 127				
4-Methyl-2-pentanone	36.71	2.0	40	0	91.8	67 - 130				
Acetone	20.74	2.0	40	0	51.9	39 - 160				
Benzene	19.32	1.0	20	0	96.6	79 - 120				
Bromobenzene	19.97	1.0	20	0	99.9	80 - 120				
Bromochloromethane	17.11	1.0	20	0	85.6	78 - 123				
Bromodichloromethane	17.8	1.0	20	0	89.0	79 - 125				
Bromoform	17.79	1.0	20	0	89.0	66 - 130				
Bromomethane	8.471	1.0	20	0	42.4	53 - 141				S

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ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19121036-01MS	Units: UG/L			Analysis Date: 19-Dec-2019 16:32					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402194	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	30.91	2.0	40	0	77.3	64 - 133				
Carbon tetrachloride	17.89	1.0	20	0	89.5	72 - 136				
Chlorobenzene	18.74	1.0	20	0	93.7	82 - 118				
Chloroethane	10.26	1.0	20	0	51.3	60 - 138				S
Chloroform	16.81	1.0	20	0	84.0	79 - 124				
Chloromethane	4.904	1.0	20	0	24.5	50 - 139				S
cis-1,2-Dichloroethene	18.25	1.0	20	0	91.2	78 - 123				
cis-1,3-Dichloropropene	18.68	1.0	20	0	93.4	75 - 124				
Dibromochloromethane	18.5	1.0	20	0	92.5	74 - 126				
Dibromomethane	17.5	1.0	20	0	87.5	79 - 123				
Dichlorodifluoromethane	2.343	1.0	20	0	11.7	32 - 152				S
Ethylbenzene	19.82	1.0	20	0	99.1	79 - 121				
Hexachlorobutadiene	21.08	1.0	20	0	105	66 - 134				
Isopropylbenzene	19.75	1.0	20	0	98.7	72 - 131				
m,p-Xylene	39.43	2.0	40	0	98.6	80 - 121				
Methylene chloride	16.71	2.0	20	0	83.6	74 - 124				
Naphthalene	18.98	1.0	20	0	94.9	61 - 128				
n-Butylbenzene	20.21	1.0	20	0	101	75 - 128				
n-Propylbenzene	21.15	1.0	20	0	106	76 - 126				
o-Xylene	19.38	1.0	20	0	96.9	78 - 122				
sec-Butylbenzene	20.87	1.0	20	0	104	77 - 126				
Styrene	19.01	1.0	20	0	95.0	78 - 123				
tert-Butylbenzene	20.94	1.0	20	0	105	78 - 124				
Tetrachloroethene	18.84	1.0	20	0	94.2	74 - 129				
Toluene	19.81	1.0	20	0	99.0	80 - 121				
trans-1,2-Dichloroethene	17.88	1.0	20	0	89.4	75 - 124				
trans-1,3-Dichloropropene	17.93	1.0	20	0	89.7	73 - 127				
Trichloroethene	19.97	1.0	20	0	99.9	79 - 123				
Trichlorofluoromethane	11.81	1.0	20	0	59.0	65 - 141				S
Vinyl chloride	7.34	1.0	20	0	36.7	58 - 137				S
Surr: 1,2-Dichloroethane-d4	46.32	1.0	50	0	92.6	81 - 118				
Surr: 4-Bromofluorobenzene	49.95	1.0	50	0	99.9	85 - 114				
Surr: Dibromofluoromethane	46.16	1.0	50	0	92.3	80 - 119				
Surr: Toluene-d8	50.34	1.0	50	0	101	89 - 112				

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6			Method: VOLATILES ORGANICS BY METHOD 8260C					
MSD	Sample ID: HS19121036-04MSD	Units: UG/L			Analysis Date: 19-Dec-2019 17:44					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402197		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	18.86	1.0	20	0	94.3	78 - 124	19.4	2.81	20	
1,1,1-Trichloroethane	16.86	1.0	20	0	84.3	74 - 131	17.71	4.92	20	
1,1,2,2-Tetrachloroethane	20.23	1.0	20	0	101	71 - 121	20.78	2.7	20	
1,1,2-Trichloroethane	19.33	1.0	20	0	96.7	80 - 119	19.77	2.27	20	
1,1-Dichloroethane	17.16	1.0	20	0	85.8	77 - 125	18.05	5.05	20	
1,1-Dichloroethene	12.55	1.0	20	0	62.7	71 - 131	13.2	5.06	20	S
1,1-Dichloropropene	18.06	1.0	20	0	90.3	78 - 125	18.71	3.51	20	
1,2,3-Trichlorobenzene	24.69	1.0	20	0	123	69 - 129	23.01	7.03	20	
1,2,3-Trichloropropane	20.27	1.0	20	0	101	73 - 122	21.15	4.28	20	
1,2,4-Trichlorobenzene	20.81	1.0	20	0	104	69 - 130	20.17	3.12	20	
1,2,4-Trimethylbenzene	20.73	1.0	20	0	104	76 - 124	21.92	5.56	20	
1,2-Dibromo-3-chloropropane	21.26	1.0	20	0	106	62 - 128	19.8	7.11	20	
1,2-Dibromoethane	19.09	1.0	20	0	95.4	77 - 121	19.39	1.58	20	
1,2-Dichlorobenzene	19.61	1.0	20	0	98.1	80 - 119	20.29	3.42	20	
1,2-Dichloroethane	17.16	1.0	20	0	85.8	73 - 128	17.6	2.54	20	
1,2-Dichloropropane	18.07	1.0	20	0	90.3	78 - 122	18.64	3.15	20	
1,3,5-Trimethylbenzene	21.51	1.0	20	0	108	75 - 124	22.44	4.27	20	
1,3-Dichlorobenzene	20.23	1.0	20	0	101	80 - 119	21.03	3.91	20	
1,3-Dichloropropane	19.48	1.0	20	0	97.4	80 - 119	20.05	2.86	20	
1,4-Dichlorobenzene	19.82	1.0	20	0	99.1	79 - 118	20.62	3.97	20	
2,2-Dichloropropane	16.14	1.0	20	0	80.7	60 - 139	17.33	7.11	20	
2-Butanone	33.42	2.0	40	0	83.5	56 - 143	33.34	0.236	20	
2-Chlorotoluene	21.79	1.0	20	0	109	79 - 122	22.97	5.3	20	
2-Hexanone	37.19	2.0	40	0	93.0	57 - 139	36.79	1.08	20	
4-Chlorotoluene	20.77	1.0	20	0	104	78 - 122	21.68	4.29	20	
4-Isopropyltoluene	20.96	1.0	20	0	105	77 - 127	22.05	5.05	20	
4-Methyl-2-pentanone	37.41	2.0	40	0	93.5	67 - 130	38.47	2.8	20	
Acetone	21.56	2.0	40	0	53.9	39 - 160	21.11	2.1	20	
Benzene	18.81	1.0	20	0	94.1	79 - 120	19.51	3.63	20	
Bromobenzene	20.21	1.0	20	0	101	80 - 120	21.28	5.15	20	
Bromochloromethane	16.65	1.0	20	0	83.3	78 - 123	17.18	3.09	20	
Bromodichloromethane	17.66	1.0	20	0	88.3	79 - 125	18.05	2.17	20	
Bromoform	18.29	1.0	20	0	91.5	66 - 130	18.6	1.66	20	
Bromomethane	7.386	1.0	20	0	36.9	53 - 141	8.02	8.23	20	S

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19121036-04MSD	Units: UG/L			Analysis Date: 19-Dec-2019 17:44					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402197	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	29.17	2.0	40	0	72.9	64 - 133	31.05	6.27	20	
Carbon tetrachloride	17.14	1.0	20	0	85.7	72 - 136	17.87	4.21	20	
Chlorobenzene	18.75	1.0	20	0	93.8	82 - 118	19.53	4.07	20	
Chloroethane	9.716	1.0	20	0	48.6	60 - 138	10.31	5.93	20	S
Chloroform	16.43	1.0	20	0	82.1	79 - 124	16.9	2.82	20	
Chloromethane	4.642	1.0	20	0	23.2	50 - 139	4.721	1.67	20	S
cis-1,2-Dichloroethene	18.7	1.0	20	0.8057	89.5	78 - 123	19.32	3.25	20	
cis-1,3-Dichloropropene	18.44	1.0	20	0	92.2	75 - 124	18.77	1.77	20	
Dibromochloromethane	18.8	1.0	20	0	94.0	74 - 126	19.14	1.8	20	
Dibromomethane	17.47	1.0	20	0	87.3	79 - 123	17.65	1.03	20	
Dichlorodifluoromethane	2.182	1.0	20	0	10.9	32 - 152	2.281	4.47	20	S
Ethylbenzene	19.55	1.0	20	0	97.7	79 - 121	20.58	5.15	20	
Hexachlorobutadiene	19.9	1.0	20	0	99.5	66 - 134	20.21	1.58	20	
Isopropylbenzene	19.69	1.0	20	0	98.5	72 - 131	20.66	4.83	20	
m,p-Xylene	38.9	2.0	40	0	97.2	80 - 121	40.67	4.47	20	
Methylene chloride	16.3	2.0	20	0	81.5	74 - 124	16.6	1.8	20	
Naphthalene	21.56	1.0	20	0	108	61 - 128	20.02	7.4	20	
n-Butylbenzene	20.69	1.0	20	0	103	75 - 128	21.64	4.48	20	
n-Propylbenzene	21.27	1.0	20	0	106	76 - 126	22.55	5.86	20	
o-Xylene	19.29	1.0	20	0	96.5	78 - 122	20.22	4.69	20	
sec-Butylbenzene	21.17	1.0	20	0	106	77 - 126	22.65	6.78	20	
Styrene	18.57	1.0	20	0	92.9	78 - 123	19.99	7.36	20	
tert-Butylbenzene	21.41	1.0	20	0	107	78 - 124	22.63	5.56	20	
Tetrachloroethene	18.46	1.0	20	0	92.3	74 - 129	19.55	5.75	20	
Toluene	19.5	1.0	20	0	97.5	80 - 121	20.51	5.03	20	
trans-1,2-Dichloroethene	17.04	1.0	20	0	85.2	75 - 124	17.82	4.47	20	
trans-1,3-Dichloropropene	17.63	1.0	20	0	88.2	73 - 127	18.06	2.41	20	
Trichloroethene	31.02	1.0	20	12.97	90.3	79 - 123	32.47	4.55	20	
Trichlorofluoromethane	10.99	1.0	20	0	54.9	65 - 141	11.65	5.87	20	S
Vinyl chloride	6.735	1.0	20	0	33.7	58 - 137	7.24	7.23	20	S
Surr: 1,2-Dichloroethane-d4	45.16	1.0	50	0	90.3	81 - 118	45.06	0.232	20	
Surr: 4-Bromofluorobenzene	50	1.0	50	0	100.0	85 - 114	50.29	0.579	20	
Surr: Dibromofluoromethane	45.87	1.0	50	0	91.7	80 - 119	45.9	0.0709	20	
Surr: Toluene-d8	51.04	1.0	50	0	102	89 - 112	51.51	0.907	20	

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6			Method: VOLATILES ORGANICS BY METHOD 8260C					
MSD	Sample ID: HS19121036-01MSD	Units: UG/L			Analysis Date: 19-Dec-2019 16:56					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402195		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	18.56	1.0	20	0	92.8	78 - 124	18.81	1.32	20	
1,1,1-Trichloroethane	17.03	1.0	20	0	85.2	74 - 131	17.47	2.55	20	
1,1,2,2-Tetrachloroethane	20.22	1.0	20	0	101	71 - 121	19.54	3.42	20	
1,1,2-Trichloroethane	19.19	1.0	20	0	95.9	80 - 119	18.87	1.68	20	
1,1-Dichloroethane	17.21	1.0	20	0	86.0	77 - 125	18.12	5.17	20	
1,1-Dichloroethene	12.6	1.0	20	0	63.0	71 - 131	13.26	5.11	20	S
1,1-Dichloropropene	18.23	1.0	20	0	91.1	78 - 125	18.92	3.72	20	
1,2,3-Trichlorobenzene	23.7	1.0	20	0	119	69 - 129	22.05	7.24	20	
1,2,3-Trichloropropane	20.11	1.0	20	0	101	73 - 122	19.84	1.34	20	
1,2,4-Trichlorobenzene	20.64	1.0	20	0	103	69 - 130	20.8	0.749	20	
1,2,4-Trimethylbenzene	21.09	1.0	20	0	105	76 - 124	20.4	3.29	20	
1,2-Dibromo-3-chloropropane	20.58	1.0	20	0	103	62 - 128	18.75	9.32	20	
1,2-Dibromoethane	18.41	1.0	20	0	92.0	77 - 121	18.62	1.12	20	
1,2-Dichlorobenzene	19.56	1.0	20	0	97.8	80 - 119	18.95	3.16	20	
1,2-Dichloroethane	16.87	1.0	20	0	84.4	73 - 128	17.08	1.21	20	
1,2-Dichloropropane	17.96	1.0	20	0	89.8	78 - 122	18.72	4.14	20	
1,3,5-Trimethylbenzene	21.57	1.0	20	0	108	75 - 124	21.04	2.49	20	
1,3-Dichlorobenzene	20.38	1.0	20	0	102	80 - 119	19.41	4.88	20	
1,3-Dichloropropane	18.91	1.0	20	0	94.5	80 - 119	19.03	0.654	20	
1,4-Dichlorobenzene	20.07	1.0	20	0	100	79 - 118	19.16	4.66	20	
2,2-Dichloropropane	16.57	1.0	20	0	82.9	60 - 139	17.33	4.45	20	
2-Butanone	32.49	2.0	40	0	81.2	56 - 143	32.49	0.00115	20	
2-Chlorotoluene	22.06	1.0	20	0	110	79 - 122	21.44	2.88	20	
2-Hexanone	36.09	2.0	40	0	90.2	57 - 139	35.63	1.28	20	
4-Chlorotoluene	20.89	1.0	20	0	104	78 - 122	20.26	3.04	20	
4-Isopropyltoluene	21.38	1.0	20	0	107	77 - 127	20.61	3.69	20	
4-Methyl-2-pentanone	36.93	2.0	40	0	92.3	67 - 130	36.71	0.6	20	
Acetone	21.38	2.0	40	0	53.4	39 - 160	20.74	3.02	20	
Benzene	18.77	1.0	20	0	93.8	79 - 120	19.32	2.89	20	
Bromobenzene	20.24	1.0	20	0	101	80 - 120	19.97	1.33	20	
Bromochloromethane	17.02	1.0	20	0	85.1	78 - 123	17.11	0.56	20	
Bromodichloromethane	17.47	1.0	20	0	87.4	79 - 125	17.8	1.87	20	
Bromoform	17.64	1.0	20	0	88.2	66 - 130	17.79	0.833	20	
Bromomethane	7.464	1.0	20	0	37.3	53 - 141	8.471	12.6	20	S

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: R352981 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19121036-01MSD	Units: UG/L			Analysis Date: 19-Dec-2019 16:56					
Client ID:	Run ID: VOA6_352981	SeqNo: 5402195	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	29.65	2.0	40	0	74.1	64 - 133	30.91	4.17	20	
Carbon tetrachloride	17.14	1.0	20	0	85.7	72 - 136	17.89	4.28	20	
Chlorobenzene	18.53	1.0	20	0	92.7	82 - 118	18.74	1.09	20	
Chloroethane	10.13	1.0	20	0	50.7	60 - 138	10.26	1.24	20	S
Chloroform	16.14	1.0	20	0	80.7	79 - 124	16.81	4.04	20	
Chloromethane	4.69	1.0	20	0	23.4	50 - 139	4.904	4.48	20	S
cis-1,2-Dichloroethene	17.81	1.0	20	0	89.0	78 - 123	18.25	2.46	20	
cis-1,3-Dichloropropene	18.14	1.0	20	0	90.7	75 - 124	18.68	2.96	20	
Dibromochloromethane	18.43	1.0	20	0	92.1	74 - 126	18.5	0.389	20	
Dibromomethane	17.38	1.0	20	0	86.9	79 - 123	17.5	0.658	20	
Dichlorodifluoromethane	2.234	1.0	20	0	11.2	32 - 152	2.343	4.77	20	S
Ethylbenzene	19.26	1.0	20	0	96.3	79 - 121	19.82	2.88	20	
Hexachlorobutadiene	19.05	1.0	20	0	95.2	66 - 134	21.08	10.2	20	
Isopropylbenzene	19.53	1.0	20	0	97.6	72 - 131	19.75	1.12	20	
m,p-Xylene	38.47	2.0	40	0	96.2	80 - 121	39.43	2.47	20	
Methylene chloride	16.32	2.0	20	0	81.6	74 - 124	16.71	2.39	20	
Naphthalene	21.18	1.0	20	0	106	61 - 128	18.98	11	20	
n-Butylbenzene	20.87	1.0	20	0	104	75 - 128	20.21	3.2	20	
n-Propylbenzene	21.64	1.0	20	0	108	76 - 126	21.15	2.28	20	
o-Xylene	19.02	1.0	20	0	95.1	78 - 122	19.38	1.9	20	
sec-Butylbenzene	21.58	1.0	20	0	108	77 - 126	20.87	3.3	20	
Styrene	18.73	1.0	20	0	93.6	78 - 123	19.01	1.49	20	
tert-Butylbenzene	21.6	1.0	20	0	108	78 - 124	20.94	3.11	20	
Tetrachloroethene	18.45	1.0	20	0	92.3	74 - 129	18.84	2.1	20	
Toluene	19.36	1.0	20	0	96.8	80 - 121	19.81	2.28	20	
trans-1,2-Dichloroethene	16.99	1.0	20	0	84.9	75 - 124	17.88	5.12	20	
trans-1,3-Dichloropropene	17.71	1.0	20	0	88.6	73 - 127	17.93	1.23	20	
Trichloroethene	18.6	1.0	20	0	93.0	79 - 123	19.97	7.11	20	
Trichlorofluoromethane	11.15	1.0	20	0	55.7	65 - 141	11.81	5.71	20	S
Vinyl chloride	6.862	1.0	20	0	34.3	58 - 137	7.34	6.73	20	S
Surr: 1,2-Dichloroethane-d4	45.04	1.0	50	0	90.1	81 - 118	46.32	2.8	20	
Surr: 4-Bromofluorobenzene	49.45	1.0	50	0	98.9	85 - 114	49.95	1	20	
Surr: Dibromofluoromethane	45.81	1.0	50	0	91.6	80 - 119	46.16	0.749	20	
Surr: Toluene-d8	50.59	1.0	50	0	101	89 - 112	50.34	0.509	20	

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT**Batch ID:** R352981 (0)**Instrument:** VOA6**Method:** VOLATILES ORGANICS BY METHOD
8260C

The following samples were analyzed in this batch: HS19121029-01 HS19121029-03

Revision: 1

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ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID:	R352964 (0)	Instrument:	WetChem_HS	Method:	CHEMICAL OXYGEN DEMAND BY E410.4					
MBLK	Sample ID: MBLK-R352964	Units:	mg/L	Analysis Date:	19-Dec-2019 18:00					
Client ID:	Run ID: WetChem_HS_352964	SeqNo:	5401921	PrepDate:	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	15.0	15.0								U
LCS	Sample ID: LCS-R352964	Units:	mg/L	Analysis Date:	19-Dec-2019 18:00					
Client ID:	Run ID: WetChem_HS_352964	SeqNo:	5401920	PrepDate:	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	105	15.0	100	0	105	85 - 115				
LCSD	Sample ID: LCSD-R352964	Units:	mg/L	Analysis Date:	19-Dec-2019 18:00					
Client ID:	Run ID: WetChem_HS_352964	SeqNo:	5401919	PrepDate:	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	103	15.0	100	0	103	85 - 115	105	1.92	20	
MS	Sample ID: HS19120979-01MS	Units:	mg/L	Analysis Date:	19-Dec-2019 18:00					
Client ID:	Run ID: WetChem_HS_352964	SeqNo:	5401923	PrepDate:	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	63	15.0	50	14	98.0	80 - 120				
MSD	Sample ID: HS19120979-01MSD	Units:	mg/L	Analysis Date:	19-Dec-2019 18:00					
Client ID:	Run ID: WetChem_HS_352964	SeqNo:	5401922	PrepDate:	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	62	15.0	50	14	96.0	80 - 120	63	1.6	20	
The following samples were analyzed in this batch: <input type="text" value="HS19121029-01"/>										

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: R353307 (0)		Instrument: ICS-Integrion		Method: ANIONS BY SW9056A						
MBLK	Sample ID: WBLKW1-122619	Units: mg/L			Analysis Date: 26-Dec-2019 10:37					
Client ID:	Run ID: ICS-Integrion_353307	SeqNo: 5409816		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	0.500	0.500							U	
Sulfate	0.500	0.500							U	
LCS	Sample ID: WLCSW1-122619	Units: mg/L			Analysis Date: 26-Dec-2019 10:54					
Client ID:	Run ID: ICS-Integrion_353307	SeqNo: 5409817		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	19.7	0.500	20	0	98.5	80 - 120				
Sulfate	19.39	0.500	20	0	97.0	80 - 120				
LCSD	Sample ID: WLCSDW1-122619	Units: mg/L			Analysis Date: 26-Dec-2019 11:10					
Client ID:	Run ID: ICS-Integrion_353307	SeqNo: 5409818		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	19.69	0.500	20	0	98.5	80 - 120	19.7	0.0305	20	
Sulfate	19.32	0.500	20	0	96.6	80 - 120	19.39	0.351	20	
MS	Sample ID: HS19121313-04MS	Units: mg/L			Analysis Date: 26-Dec-2019 12:33					
Client ID:	Run ID: ICS-Integrion_353307	SeqNo: 5409823		PrepDate:			DF: 500			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	4892	250	5000	102	95.8	80 - 120				
Sulfate	4728	250	5000	34.95	93.9	80 - 120				
MS	Sample ID: HS19120760-11MS	Units: mg/L			Analysis Date: 26-Dec-2019 18:29					
Client ID:	Run ID: ICS-Integrion_353307	SeqNo: 5412209		PrepDate:			DF: 500			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	14800	250	5000	10110	93.8	80 - 120				
Sulfate	5883	250	5000	1099	95.7	80 - 120				

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID: R353307 (0)		Instrument: ICS-Integrion		Method: ANIONS BY SW9056A						
MSD	Sample ID: HS19121313-04MSD	Units: mg/L			Analysis Date: 26-Dec-2019 12:50					
Client ID:	Run ID: ICS-Integrion_353307	SeqNo: 5409824		PrepDate:			DF: 500			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	4849	250	5000	102	94.9	80 - 120	4892	0.883	20	
Sulfate	4687	250	5000	34.95	93.0	80 - 120	4728	0.86	20	
MSD	Sample ID: HS19120760-11MSD	Units: mg/L			Analysis Date: 26-Dec-2019 18:45					
Client ID:	Run ID: ICS-Integrion_353307	SeqNo: 5412210		PrepDate:			DF: 500			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	14830	250	5000	10110	94.3	80 - 120	14800	0.179	20	
Sulfate	5914	250	5000	1099	96.3	80 - 120	5883	0.529	20	

The following samples were analyzed in this batch: HS19121029-01

Revision: 1

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ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
WorkOrder: HS19121029

QC BATCH REPORT

Batch ID:	R353320 (0)	Instrument:	Balance1	Method:	OIL & GREASE (HEM) BY E1664A					
MBLK	Sample ID: WBLKW-122619	Units:	mg/L	Analysis Date:	26-Dec-2019 13:20					
Client ID:	Run ID: Balance1_353320	SeqNo:	5410231	PrepDate:	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	1.00	2.00								U
LCS	Sample ID: WLCSW-122619	Units:	mg/L	Analysis Date:	26-Dec-2019 13:20					
Client ID:	Run ID: Balance1_353320	SeqNo:	5410233	PrepDate:	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	37.2	2.00	40	0	93.0	78 - 114				
LCSD	Sample ID: WLCSDW-122619	Units:	mg/L	Analysis Date:	26-Dec-2019 13:20					
Client ID:	Run ID: Balance1_353320	SeqNo:	5410232	PrepDate:	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	38	2.00	40	0	95.0	78 - 114	37.2	2.13	18	
MS	Sample ID: HS19120962-01MS	Units:	mg/L	Analysis Date:	26-Dec-2019 13:20					
Client ID:	Run ID: Balance1_353320	SeqNo:	5410216	PrepDate:	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	40	2.00	40	0.8333	97.9	78 - 114				

The following samples were analyzed in this batch: HS19121029-01

Revision: 1

ALS Houston, US

Date: 07-Jan-20

Client:	Bhate Environmental Associates, Inc.	QUALIFIERS, ACRONYMS, UNITS
Project:	Groundwater Treatment Plant Quarterly Effluent Samples	
WorkOrder:	HS19121029	

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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS, ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North 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: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Effluent Samples
Work Order: HS19121029

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19121029-01	LH18/24-SP650_121719	Login	12/18/2019 10:46:57 PM	NDR	Sub
HS19121029-01	LH18/24-SP650_121719	Login	12/18/2019 10:46:57 PM	NDR	WET303
HS19121029-01	LH18/24-SP650_121719	Login	12/18/2019 10:46:57 PM	NDR	EXT116
HS19121029-01	LH18/24-SP650_121719	Login	12/18/2019 10:46:57 PM	NDR	WET303
HS19121029-01	LH18/24-SP650_121719	Login	12/18/2019 10:46:57 PM	NDR	WET303
HS19121029-01	LH18/24-SP650_121719	Login	12/18/2019 10:46:57 PM	NDR	MET079
HS19121029-01	LH18/24-SP650_121719	Login	12/18/2019 10:46:57 PM	NDR	VOA248
HS19121029-03	Trip Blank	Login	12/18/2019 10:46:57 PM	NDR	VOA248

Revision:1

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19121029

Date/Time Received: **18-Dec-2019 10:30**
 Received by: **JRM**

Checklist completed by: Nilesh D. Ranchod 18-Dec-2019 Reviewed by: Corey Grandits 19-Dec-2019
 eSignature Date eSignature Date

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

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes No Not Present
- Chain of custody present? Yes No 1 Page(s)
- Chain of custody signed when relinquished and received? Yes No COC IDs:N/A
- Samplers name present on COC? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s): 1.7c C/UC IR 11
 Cooler(s)/Kit(s): 45576
 Date/Time sample(s) sent to storage: 12/18/2019 10:50pm

- 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: Trip Blank received 2 vials, 2 COC. Logged in 1 vials per COC.
 Trip Blanks split between W/O HS19121028

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:


Comments:

Corrective Action:

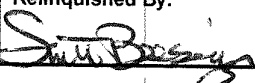
CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd., Suite 210 Houston, Tx. 77099 ATTN: RJ Modashia

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS			Project No. NWO1312.0150.0 16.0001		Analyses										Remarks (Preservatives, etc.)	
Job: GROUNDWATER TREATMENT PLANT QUARTERLY EFFLUENT SAMPLES			MS / MSD	No. OF CONTAINERS	ROD Volatiles	Total Metals	Oil & Grease	Chemical Oxygen Demand	Chloride & Sulfate	1, 4 - DIOXANE	PERCHLORATE	1	1			
Prepared By: Scott Beesinger		P. O. Number														
Field Sample I.D.			Sample Matrix		Date / Time										Remarks (Preservatives, etc.)	
LH18/24-SP650_121719			Water		12/17/19 / 14:00										HCL	
LH18/24-SP650_121719			Water		12/17/19 / 14:00										HNO3	
LH18/24-SP650_121719			Water		12/17/19 / 14:00										NONE	
LH18/24-SP650_121719			Water		12/17/19 / 14:00										H2SO4	
LH18/24-SP650_121719_BIX			Water		12/17/19 / 14:00										NONE	
Trip Blank			Water		12/17/19										HCL	

Bhate Environmental Associates, Inc.
 Groundwater Treatment Plant Quarterly Influent Sample

HS19121029

Additional Remarks: **24 hour TAT on VOC's. Standard TAT on all other parameters**

Relinquished By: 		Date 12/17/19	Time 14:30	Received By:		Date	Time	Relinquished By:		Date	Time	Received By:		Date	Time
--	--	-------------------------	----------------------	---------------------	--	-------------	-------------	-------------------------	--	-------------	-------------	---------------------	--	-------------	-------------

Received At Lab By: J. M...		Date 12/18/19	Time 10:50	Airbill No.	For Lab Use Only										
Remarks: Cooler 45576 1K11 Temp 1.7 CFO.0				Opened By:		Date	Time	Temp of Container	Seal No.	Condition					

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

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

CUSTODY SEAL		Seal Broken By:
Date: 12/17/19	Time: 1430	Jm
Name: Scott Messinger		Date:
Company: ALS		12/18/19

FedEx
 TRACKING 4380 9533 6736
 WED - 18 DEC 10:30A
 PRIORITY OVERNIGHT

AB SGRA 77099
 TX-US
 IAH



FID 162705 17DEC19 66GA 56AC2/18DD/05A2



Case Narrative

Method: 6850

Analysis: Perchlorate

Analysis SOP: LC-MS-CLO4

ALS WO ID(s): 1935912; 1935913; 1935914;
1935915; 1936106

Client: ALS Laboratories (Houston, TX)

Matrix: Water

ELMS Batch (HBN): 2336 (254688)

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

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

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50 μL 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 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 690689) was less than 1/2 the CRDL. The recovery for the LCS (690686) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on samples 1935915002/03 and 1935915007/08 (Client ID's: C09_121719 and MW18_121719). 3.0 μ L of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3. μ g/L. The MS/MSD (1935912002/03) failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected. The relative percent difference (RPD) failed acceptance criteria for MS/MSD 1935915007/08.

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

NC/CAR(s): NA

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

where: A = Analyte concentration from the standard curve (μ g/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 – 690687) is reported from the analysis of the Laboratory Control Sample (LCS – 690686) at a level of 3.0 μ g/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).

Thomas Bosch January 06, 2020
Analyst Date



ANALYTICAL REPORT

Report Date: January 06, 2020

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

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1935914**

Project ID: HS19121029

Purchase Order: HS19121029

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_121719_BIX	1935914001	12/17/19	12/20/19	

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

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ANALYTICAL REPORT

Workorder: 34-1935914

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: LH18/24-SP650_121719_BIX	Sampling Site: NA	Collected: 12/17/2019				
Lab ID: 1935914001	Media: 125 mL Nalgene	Received: 12/20/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2336 (HBN: 254688) Analyzed: 01/02/2020 14:35	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	1.9	1.0	2.0	4.0	1	J

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 254688)

Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. 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 01/03/2020 13:16	/S/ Stephen Brose 01/06/2020 10:58

Laboratory Contact Information

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

Phone: (801) 266-7700
Email: als@alst.com
Web: www.alst.com



ANALYTICAL REPORT

Workorder: 34-1935914

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: 1935914
Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2336 (HBN: 254688)
Analyzed By: Thomas Bosch

Blank

LMB: 690689 Analyzed: 01/02/2020 13:54 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 690686 Analyzed: 01/02/2020 13:26 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.19	3.00	106	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1935915001 Analyzed: 01/02/2020 14:49 Dilution: 1 Units: ug/L		MS: 1935915002 Analyzed: 01/02/2020 15:03 Dilution: 1 Units: ug/L				MSD: 1935915003 Analyzed: 01/02/2020 15:17 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	1.50	4.34	3	# 145	78.8 123.8	3.81	# 127	13	0.0 20.0
Sample: 1935915006 Analyzed: 01/02/2020 15:59 Dilution: 1 Units: ug/L		MS: 1935915007 Analyzed: 01/02/2020 16:27 Dilution: 1 Units: ug/L				MSD: 1935915008 Analyzed: 01/02/2020 16:41 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	2.46	3	81.9	78.8 123.8	3.35	112	# 30.7	0.0 20.0

Comments

Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

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

Analyt	Peer Review
/S/ Thomas Bosch 01/06/2020 08:23	/S/ Stephen Brose 01/06/2020 10:58

Symbols and Definitions

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

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



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Subcontract Chain of Custody

18698/#2

SAMPLING STATE: Colorado

COC ID: 12904

SUBCONTRACT TO:

1935914

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: HS19121029
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19121029-02	LH18/24-SP650_121719_BIX	Water	17 Dec 2019 14:00
	SUB_Perch-6850		03 Jan 2020

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: [Signature]
Received By: [Signature]
Cooler ID(s): _____

Date/Time: 12-19-19 18:00
Date/Time: 12-20-19 10:06
Temperature(s): _____

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ALS Environmental
CHAIN-OF-CUSTODY

Project / Job / Task: HS19121029		Split:		Workorder ID: 1935914		Level: ENV_LVL4		Requested Analysis																			
Client: ALS Environmental (Houston)				Account: 8101		Type: 125Poly																					
Comments:						Preservatives		EPA 8860, DoD QSM																			
						COOL																					
						Containers																					
em	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Count																				
1	12/17/1029 14:00	LH18/24-SP650_121719_BIX	1935914001		Water	A	1	A																			
2																											
3																											
4																											
5																											
6																											
7																											
8																											

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

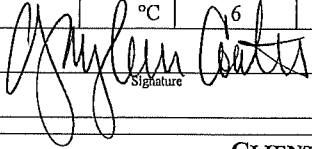
SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

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	Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Grath, Julie	12/20/2019 10:06	ALS Sample Receiving	Sample Login				
<i>[Signature]</i>	12/19/2019	ISC	storage				
R.33-1	01-22-20 11:20	T. Bush	not analysis				

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**ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)
COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)**

Client Name: <u>ALS HOUSTON</u>		Project/Task/Site: _____						
Date/Time of Receipt: <u>12-20-19 1006</u>		Number of Coolers Received: <u>1 1935914</u>						
Condition of Coolers: <u>Acceptable/Unacceptable</u>		Temperature Control: Present/ <u>Not Included</u>						
Cooler Custody Seals: <u>Present/Absent/NA</u>		Location Temp Taken: Control/ <u>Between Samples</u>						
Container Custody Seals: <u>Present/Absent/NA</u>		Are all temperatures within project specific guidelines? <u>Yes/No/NA</u>						
Ice Present: <u>Yes/No/NA</u>		VOA Headspace Present? Yes/No/ <u>NA</u>						
Frozen/Melted/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.
	<u>GOOD</u>	<u>3 °C</u>	<u>4</u>		<u>°C</u>	<u>7</u>		<u>°C</u>
		<u>°C</u>	<u>5</u>		<u>°C</u>	<u>8</u>		<u>°C</u>
		<u>°C</u>	<u>6</u>		<u>°C</u>	<u>9</u>		<u>°C</u>
Taken By: <u></u>		Printed Name: <u>GAYLEEN COATES</u>		Date: <u>12-20-19</u>				

CLIENT-RELATED INFORMATION

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

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES NO

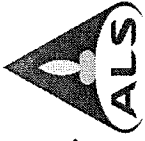
Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ Returned to Sample Receipt by: _____ Date: _____

Printed Name Signature



Batch Worklist

HBN: 254688



Instrument:

Status: WP

Created: 1/2/2020 13:05

Analyst: T. Bosch

Batch: ELMS/ 2336

Rule: EPA 6850, DoD QSM Water

- Workorder: 1935912 [ENV_LVL4]
- Workorder: 1935913 [ENV_LVL4]
- Workorder: 1935914 [ENV_LVL4]
- Workorder: 1935915 [ENV_LVL4]
- Workorder: 1936106 [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	690685	CCV for HBN 254688 [ELMS/2336]				CCV	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	
2	690686	LCS for HBN 254688 [ELMS/2336]				LCS	3	E6850Q413Q	E6850Q413Q	5311	1/6/2020	1/6/2020	
3	690687	RLVS for HBN 254688 [ELMS/2336]				RLVS	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	
4	690688	ICS for HBN 254688 [ELMS/2336]				ICS	3	E6850.D3Q	E6850.D3Q	5311	1/6/2020	1/6/2020	
5	690689	LMB for HBN 254688 [ELMS/2336]				LMB	3	E6850Q413Q	E6850Q413Q	5311	1/6/2020	1/6/2020	
6	1935912001	LH18/24-SP650_121719_BIX				SAMPLE	3	1935912001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
7	1935913001	LH18/24-SP140_121719				SAMPLE	3	1935913001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
8	1935914001	LH18/24-SP650_121719_BIX				SAMPLE	3	1935914001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
9	1935915001	C09_121719				SAMPLE	3	1935915001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
10	1935915002	C09_121719MS				MS	3	1935915002-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
11	1935915003	C09_121719MSD				MSD	3	1935915003-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
12	1935915004	126_121719				SAMPLE	3	1935915004-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
13	1935915005	126_121719_a				SAMPLE	3	1935915005-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
14	1935915006	MW18_121719				SAMPLE	3	1935915006-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
15	690690	CCV for HBN 254688 [ELMS/2336]				CCV	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	
16	1935915007	MW18_121719MS				MS	3	1935915007-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
17	1935915008	MW18_121719MSD				MSD	3	1935915008-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
18	1935915009	120_121719				SAMPLE	3	1935915009-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
19	1935915010	MW14_121719				SAMPLE	3	1935915010-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
20	1935915011	18CPTMW04SW_121719				SAMPLE	3	1935915011-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
21	1935915012	18CPTMW04_121719				SAMPLE	3	1935915012-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
22	1936106001	HS19121315-02				SAMPLE	3	1936106001-A	E6850Q41.3	5480	1/20/2020	1/8/2020	
23	690691	CCV for HBN 254688 [ELMS/2336]				CCV	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #()'s: 1935912 (001); 1935913 (001); 1935914 (001); 1935915 (001-12);
 1936106 (001) ELMS Batch/HBN ID: 2336 (254688)
 Prep Date: 01/02/2020 Analysis Date: 01/02/2020 Analyst: Tom Bosch
 Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
 Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2020\JAN\02JAN20D.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 690686; Target = 3.0µg/L. ASTM type II water was used for LMB 690689.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on samples 1935915002/03 and 1935915007/08 (Client ID's: C09_121719 and MW18_121719). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L. Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD (1935912002/03) failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected. The relative percent difference (RPD) failed acceptance criteria for MS/MSD 1935915007/08.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALS\TWS013\LCMS\LCMS04\2020\JAN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\als\TWS013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2020\DOD\254688-DoD-ALS-Hstn LCMS4 or through \\ALS\TWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 690687) is reported from the analysis of the Laboratory Control Sample (LCS – 690686) 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).

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	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2336 HBN: 254688</u> <u>1935915 / 1936106</u>		
Sample Set IDs if Applicable: <u>1935912 / 1935913 / 1935914</u>		
<u>Sample positions on autosampler verified against instrument sequence</u>	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



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

CERTIFICATE OF ANALYSIS



AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: Refer to SDS for complete safety information

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



Signal Word: None

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



Certificate of Analysis



ISO Guide 34 Reference Material

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



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

Product Name: Perchlorate IC Standard

Description:

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

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

Solvent: water (low TOC, < 50 ppb)

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

Traceability:

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

Estimation of Uncertainties:

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

Homogeneity:

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

Intended Use:

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

Instructions for Use:

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

Hazards:

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

Expiration of Certification:

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



ISO 9001 Registered Quality System – TUV USA

Page 1 of 2



Certificate of Analysis

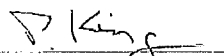


ISO Guide 34 Reference Material

Product Number: ICC-013 Lot Issue Date: 29-Feb 2016
 Lot Number: CP-0860 Expiration Date: 31-Mar 2020

Maintenance of Certification:

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


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


 Daniel J. Lamendola
 Director of QA/RA



ISO 9001 Registered Quality System – TUV USA

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Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

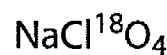
Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl*O4

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

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

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

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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	Perchlorate RT	Perchlorate Amount	
#*	690685	CCV@25	Vial 71	1	Control	1	1.55994e6	7.560	28.36838
#*	690686	QC@3.0	Vial 72	1	Control	2	1.77411e5	7.259	3.19399
#*	690688	ICS@3.0	Vial 73	1	Control	3	1.21919e5	7.244	2.98982
#*	690689	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1935912001		Vial 75	1	Sample	5	1.13186e5	7.256	1.69696
#*	1935913001	1K	Vial 76	1	Sample	6	7.50336e5	7.600	13.85381 × 1,000.
#*	1935914001		Vial 77	1	Sample	7	1.16448e5	7.271	1.93064
#*	1935915001		Vial 78	1	Sample	8	6.26357e4	7.202	1.53061
#*	1935915002	MS	Vial 79	1	Sample	9	1.67718e5	7.194	4.34105
#*	1935915003	MSD	Vial 80	1	Sample	10	1.70226e5	7.204	3.80971
#*	1935915004		Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1935915005		Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1935915006		Vial 83	1	Sample	13	0.00000	0.000	0.00000
#*	690690	CCV@25	Vial 71	1	Control	14	1.55697e6	7.430	25.18198
#*	1935915007	MS	Vial 84	1	Sample	15	1.31015e5	7.176	2.45647
#*	1935915008	MSD	Vial 85	1	Sample	16	1.32260e5	7.185	3.34662
#*	1935915009	1K	Vial 86	1	Sample	17	1.32009e6	7.615	2.26282e4
#*	1935915010	10K	Vial 87	1	Sample	18	7.68865e5	7.605	1.30447e5
#*	1935915011		Vial 88	1	Sample	19	7.20051e4	7.345	1.12833
#*	1936106001		Vial 90	1	Sample	21	3.75684e5	7.220	6.65265
#*	1935915012	10X	Vial 91	1	Sample	22	3.40719e6	7.485	516.14517
*	690691	CCV@25	Vial 71	1	Control	23	1.84092e6	7.431	26.50237

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
#*	690685	CCV@25	Vial 71	1	Control	1	1.85309e5	7.581	5.00000
#*	690686	QC@3.0	Vial 72	1	Control	2	2.04529e5	7.274	5.00000
#*	690688	ICS@3.0	Vial 73	1	Control	3	1.50034e5	7.270	5.00000
#*	690689	LMB	Vial 74	1	Control	4	1.97614e5	7.421	5.00000
#*	1935912001		Vial 75	1	Sample	5	2.41857e5	7.281	5.00000
#*	1935913001	1K	Vial 76	1	Sample	6	1.93760e5	7.618	5.00000
#*	1935914001		Vial 77	1	Sample	7	2.19726e5	7.292	5.00000
#*	1935915001		Vial 78	1	Sample	8	1.47744e5	7.212	5.00000
#*	1935915002	MS	Vial 79	1	Sample	9	1.42468e5	7.219	5.00000
#*	1935915003	MSD	Vial 80	1	Sample	10	1.64739e5	7.223	5.00000
#*	1935915004		Vial 81	1	Sample	11	8.26190e4	7.086	5.00000
#*	1935915005		Vial 82	1	Sample	12	8.16375e4	7.053	5.00000
#*	1935915006		Vial 83	1	Sample	13	1.75700e5	7.224	5.00000
#*	690690	CCV@25	Vial 71	1	Control	14	2.11105e5	7.446	5.00000
#*	1935915007	MS	Vial 84	1	Sample	15	1.95563e5	7.198	5.00000
#*	1935915008	MSD	Vial 85	1	Sample	16	1.45588e5	7.205	5.00000
#*	1935915009	1K	Vial 86	1	Sample	17	2.01300e5	7.637	5000.00000
#*	1935915010	10K	Vial 87	1	Sample	18	2.11546e5	7.628	5.00000e4
#*	1935915011		Vial 88	1	Sample	19	2.26624e5	7.350	5.00000
#*	1936106001		Vial 90	1	Sample	21	2.07387e5	7.238	5.00000
#*	1935915012	10X	Vial 91	1	Sample	22	2.02952e5	7.505	50.00000
*	690691	CCV@25	Vial 71	1	Control	23	2.35883e5	7.456	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
#*	690685	CCV@25	Vial 71	1	Control	1	4.57213e5	7.577	27.40050
#*	690686	QC@3.0	Vial 72	1	Control	2	5.95825e4	7.268	3.42868
#*	690688	ICS@3.0	Vial 73	1	Control	3	4.72946e4	7.260	3.71890
#*	690689	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1935912001		Vial 75	1	Sample	5	4.05294e4	7.272	1.91502
#*	1935913001	1K	Vial 76	1	Sample	6	2.24222e5	7.618	13.51424
#*	1935914001		Vial 77	1	Sample	7	4.06777e4	7.281	2.13096
#*	1935915001		Vial 78	1	Sample	8	2.50802e4	7.216	1.94184

Batch Report: C:\HPCHEM\1\DATA\02JAN20D\02JAN20S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
#*	1935915002	MS	Vial 79	1	Sample	9	6.04977e4	7.206	5.03782
#*	1935915003	MSD	Vial 80	1	Sample	10	6.53036e4	7.210	4.69891
#*	1935915004		Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1935915005		Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1935915006		Vial 83	1	Sample	13	0.00000	0.000	0.00000
#*	690690	CCV@25	Vial 71	1	Control	14	4.73141e5	7.448	25.10439
#*	1935915007	MS	Vial 84	1	Sample	15	4.35554e4	7.182	2.59201
#*	1935915008	MSD	Vial 85	1	Sample	16	4.64932e4	7.193	3.76884
#*	1935915009	1K	Vial 86	1	Sample	17	3.97734e5	7.628	2.23585e4
#*	1935915010	10K	Vial 87	1	Sample	18	2.35180e5	7.624	1.30045e5
#*	1935915011		Vial 88	1	Sample	19	2.59057e4	7.372	1.25727
#*	1936106001		Vial 90	1	Sample	21	1.25368e5	7.239	7.17456
#*	1935915012	10X	Vial 91	1	Sample	22	9.99390e5	7.502	502.85057
*	690691	CCV@25	Vial 71	1	Control	23	5.41119e5	7.448	25.64372

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	690685	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	690686	QC@3.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	690688	ICS@3.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	690689	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1935912001		CLO4-AQN	1	Sample	
6	Vial 76	1935913001	1K	CLO4-AQN	1	Sample	
7	Vial 77	1935914001		CLO4-AQN	1	Sample	
8	Vial 78	1935915001		CLO4-AQN	1	Sample	
9	Vial 79	1935915002	MS	CLO4-AQN	1	Sample	
10	Vial 80	1935915003	MSD	CLO4-AQN	1	Sample	
11	Vial 81	1935915004		CLO4-AQN	1	Sample	
12	Vial 82	1935915005		CLO4-AQN	1	Sample	
13	Vial 83	1935915006		CLO4-AQN	1	Sample	
14	Vial 71	690690	CCV@25	CLO4-AQN	1	Ctrl Samp	
15	Vial 84	1935915007	MS	CLO4-AQN	1	Sample	
16	Vial 85	1935915008	MSD	CLO4-AQN	1	Sample	
17	Vial 86	1935915009	1K	CLO4-AQN	1	Sample	
18	Vial 87	1935915010	10K	CLO4-AQN	1	Sample	
19	Vial 88	1935915011		CLO4-AQN	1	Sample	
20	Vial 89	1935915012	100	CLO4-AQN	1	Sample	
21	Vial 90	1936106001		CLO4-AQN	1	Sample	
22	Vial 91	1935915012	10X	CLO4-AQN	1	Sample	
23	Vial 71	690691	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND01.D

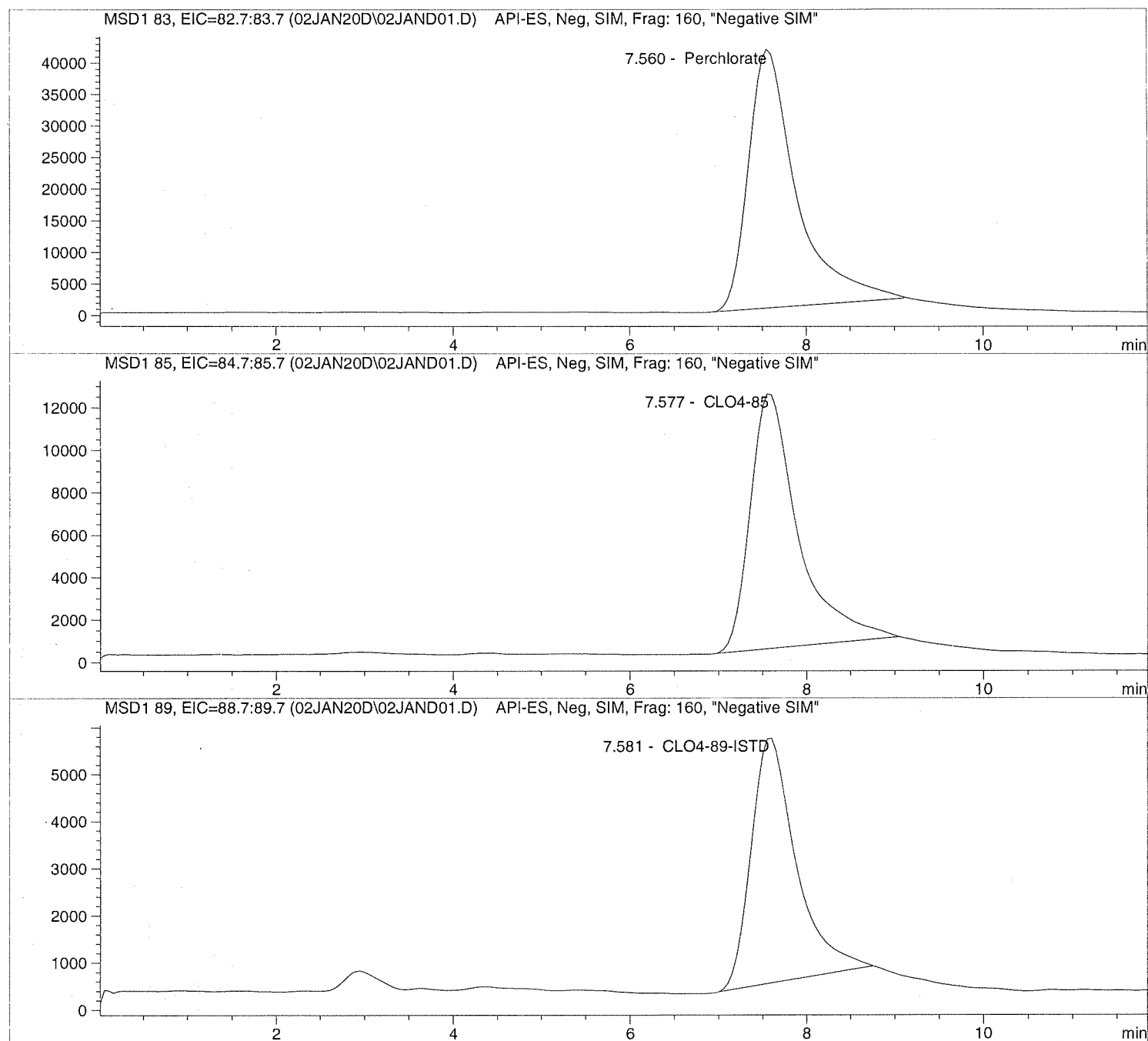
Sample Name: 690685 CCV@25

Injection Date: 1/02/2020 13:11:53
Sample Name: 690685 CCV@25
Acq Operator: TNB

Seq Line: 1
Location: Vial 71
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\02JAN20D\02JAND01.D Sample Name: 690685 CCV@25

```

=====
Injection Date: 1/02/2020 13:11:53 Seq Line: 1
Sample Name: 690685 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
7.560	PBA	1559941.9	28.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.577	PBA	457213.1	27.4005	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.581	PBA	185309.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

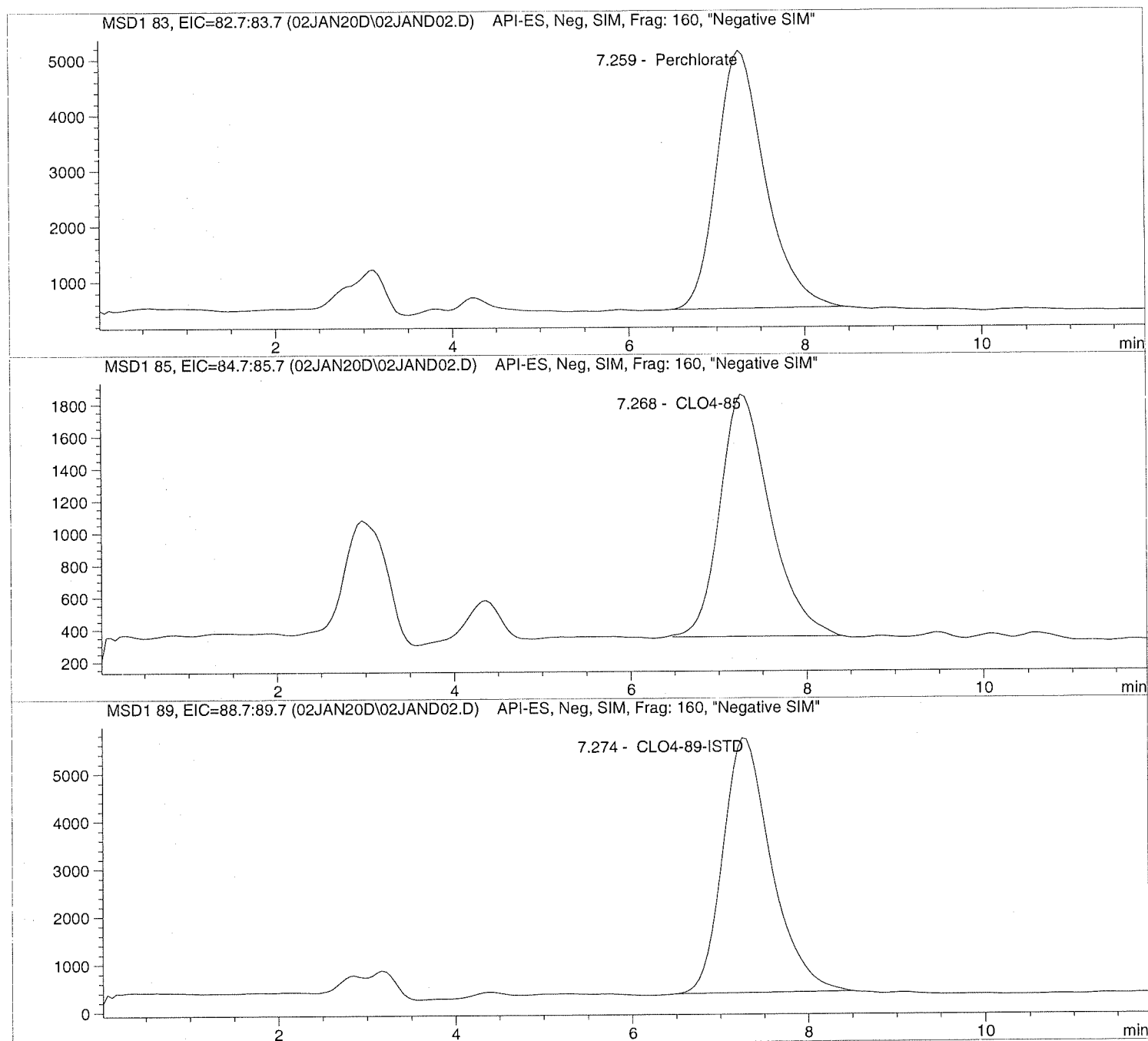
```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND02.D Sample Name: 690686 QC@3.0

=====
Injection Date: 1/02/2020 13:26:12 Seq Line: 2
Sample Name: 690686 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\02JAN20D\02JAND02.D Sample Name: 690686 QC@3.0

=====
 Injection Date: 1/02/2020 13:26:12 Seq Line: 2
 Sample Name: 690686 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
7.259	BBA	177410.8	3.1940	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.268	BBA	59582.5	3.4287	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.274	BBA	204529.1	5.0000	CLO4-89-ISTD

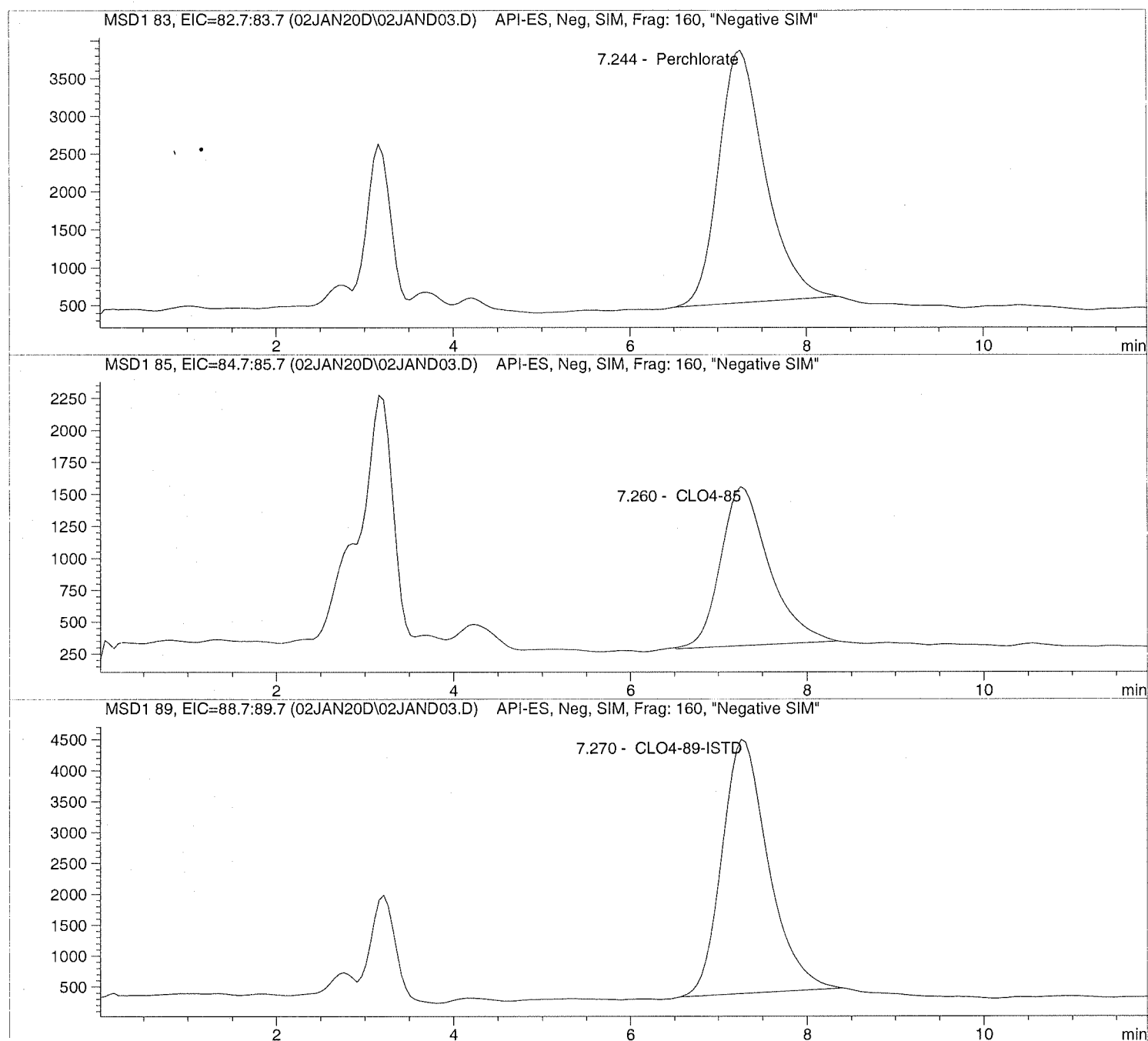
=====
 *** End of Report ***
 =====

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND03.D Sample Name: 690688 ICS@3.0

=====
Injection Date: 1/02/2020 13:40:06 Seq Line: 3
Sample Name: 690688 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\02JAN20D\02JAND03.D Sample Name: 690688 ICS@3.0

```

=====
Injection Date: 1/02/2020 13:40:06      Seq Line: 3
Sample Name: 690688 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
7.244	BBA	121919.3	2.9898	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.260	BBA	47294.6	3.7189	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.270	PBA	150034.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND04.D

Sample Name: 690689 LMB

Injection Date: 1/02/2020 13:54:01

Seq Line: 4

Sample Name: 690689 LMB

Location: Vial 74

Acq Operator: TNB

Inj. No.: 1

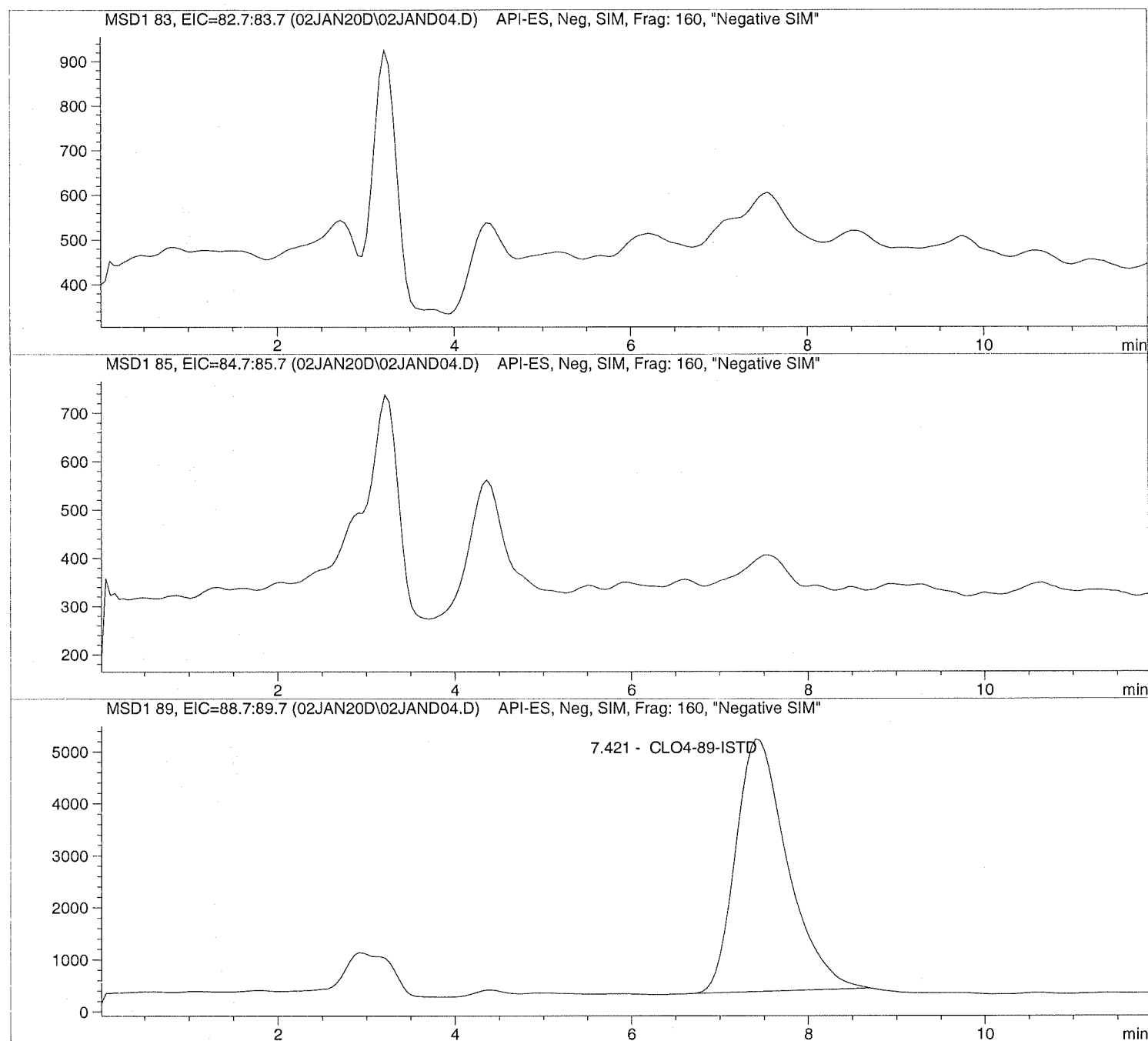
Inj. Vol.: 35 µl

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\02JAN20D\02JAND04.D Sample Name: 690689 LMB

```

=====
Injection Date: 1/02/2020 13:54:01      Seq Line:          4
Sample Name:   690689 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
7.421	PBA	197614.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

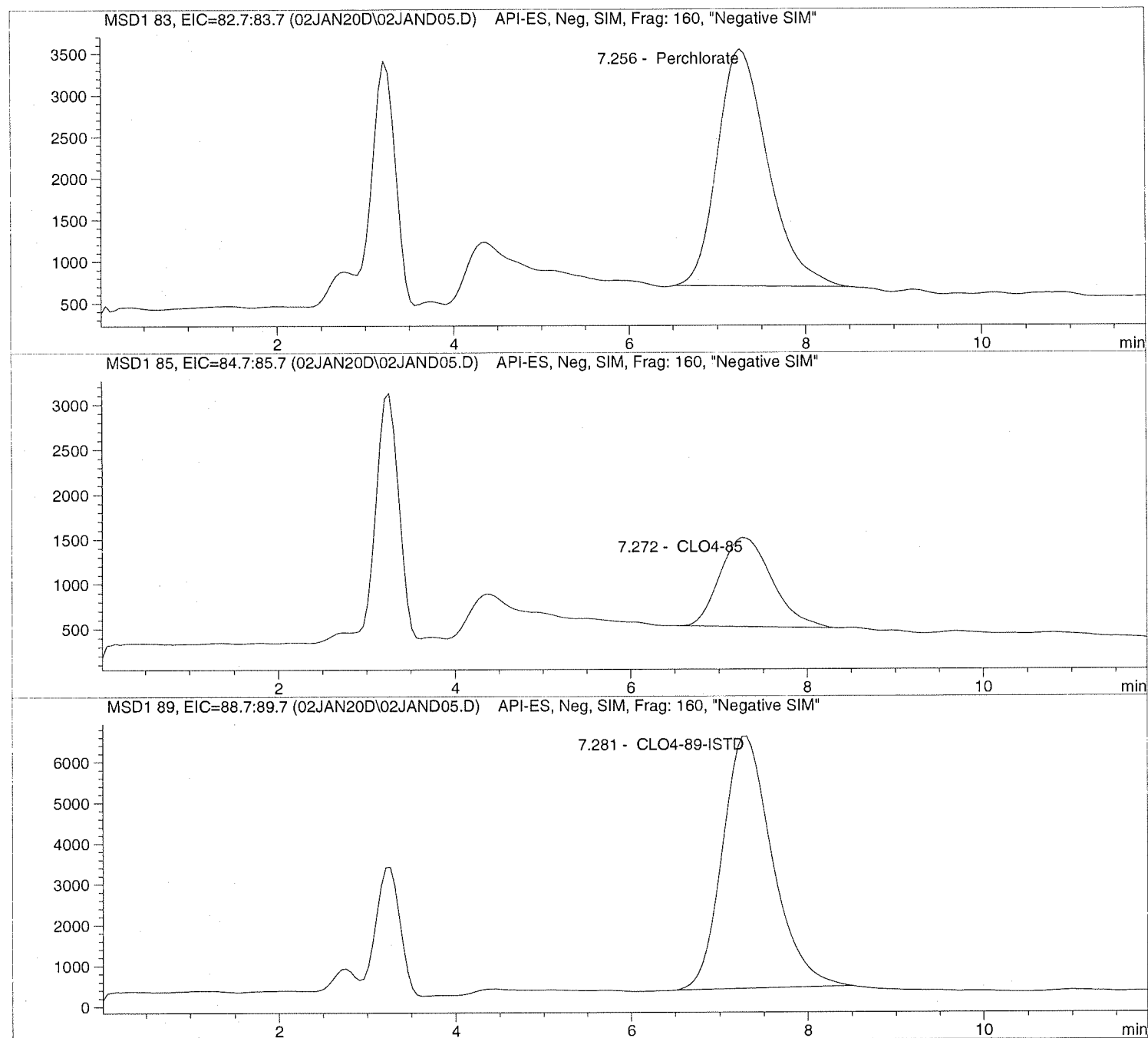
Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND05.D

Sample Name: 1935912001

```
=====
Injection Date: 1/02/2020 14:07:55      Seq Line:      5
Sample Name:    1935912001              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\02JAN20D\02JAND05.D Sample Name: 1935912001

```

=====
Injection Date: 1/02/2020 14:07:55      Seq Line:          5
Sample Name:   1935912001              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
7.256	PBA	113185.7	1.6970	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.272	PBA	40529.4	1.9150	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.281	PBA	241856.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

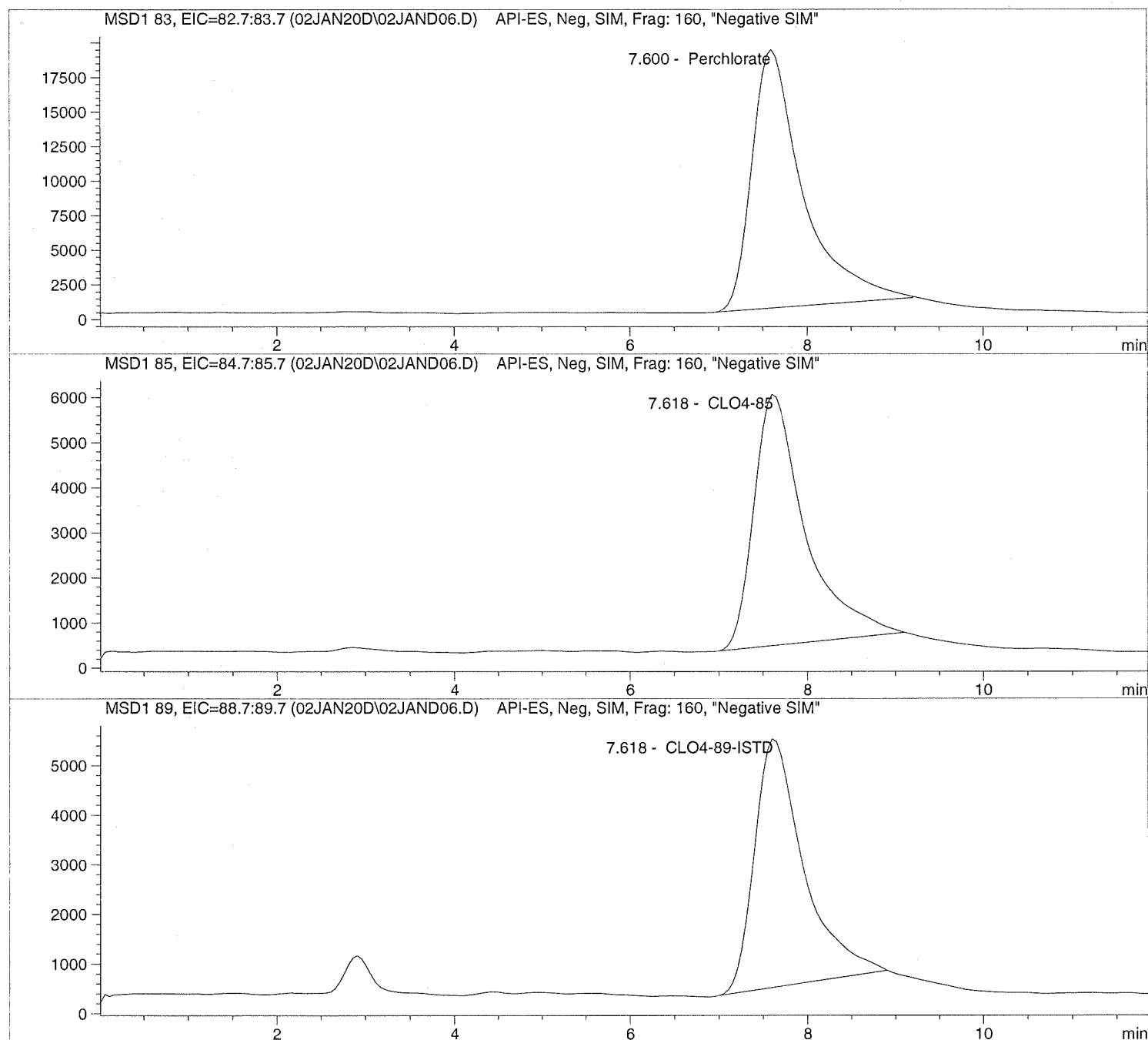
```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND06.D Sample Name: 1935913001 1K

=====
Injection Date: 1/02/2020 14:21:57 Seq Line: 6
Sample Name: 1935913001 1K 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\02JAN20D\02JAND06.D Sample Name: 1935913001 1K

```

=====
Injection Date: 1/02/2020 14:21:57      Seq Line:          6
Sample Name:    1935913001 1K           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
7.600	PBA	750336.3	13.8538	Perchlorate <i>Y</i> 1,000. DILUTION

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.618	PBA	224222.5	13.5142	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.618	PBA	193759.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND07.D

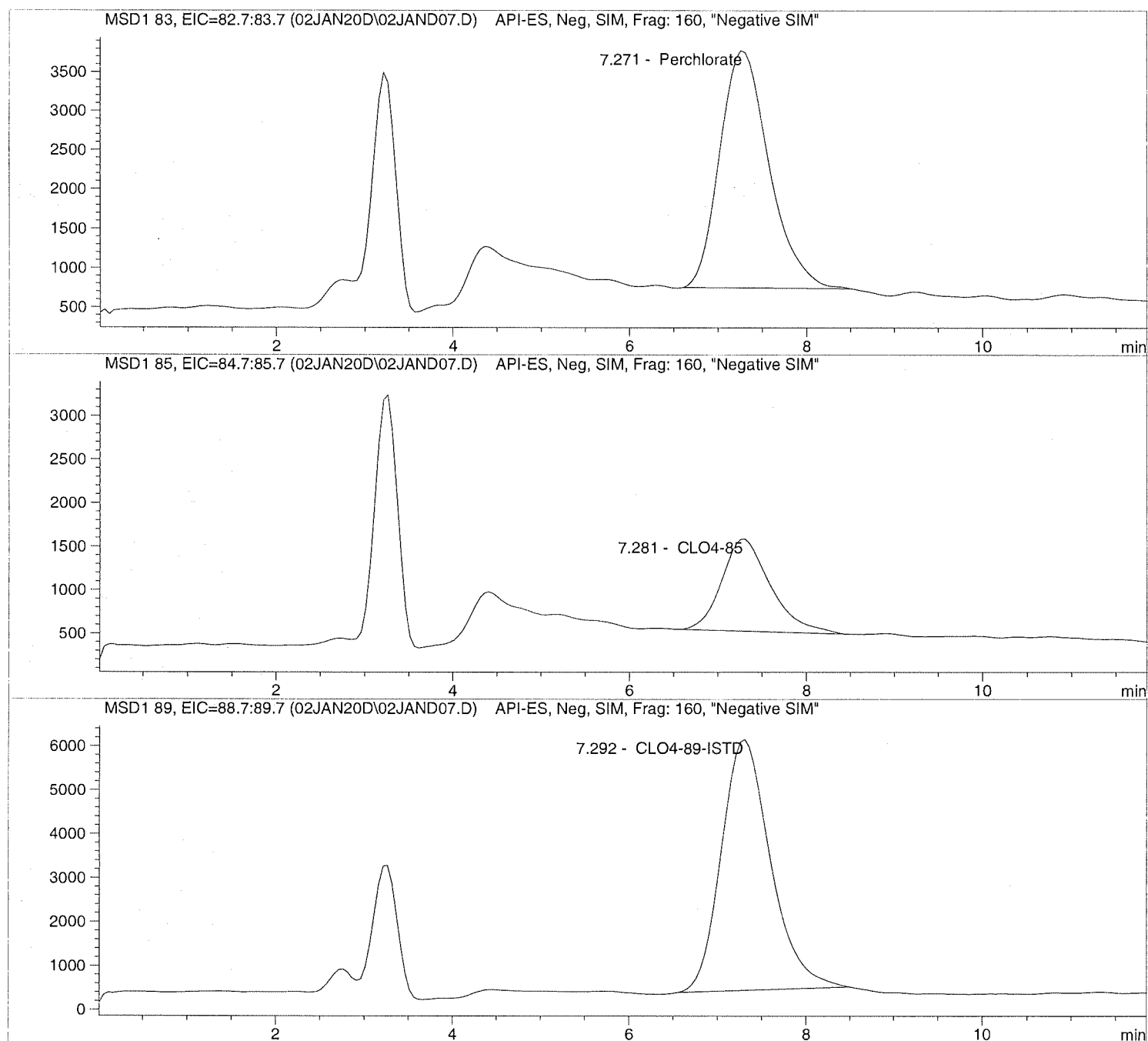
Sample Name: 1935914001

Injection Date: 1/02/2020 14:35:49
Sample Name: 1935914001
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
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\02JAN20D\02JAND07.D Sample Name: 1935914001

```

=====
Injection Date: 1/02/2020 14:35:49      Seq Line:          7
Sample Name:   1935914001              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
7.271	PBA	116448.2	1.9306	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.281	PBA	40677.7	2.1310	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.292	PBA	219725.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND08.D

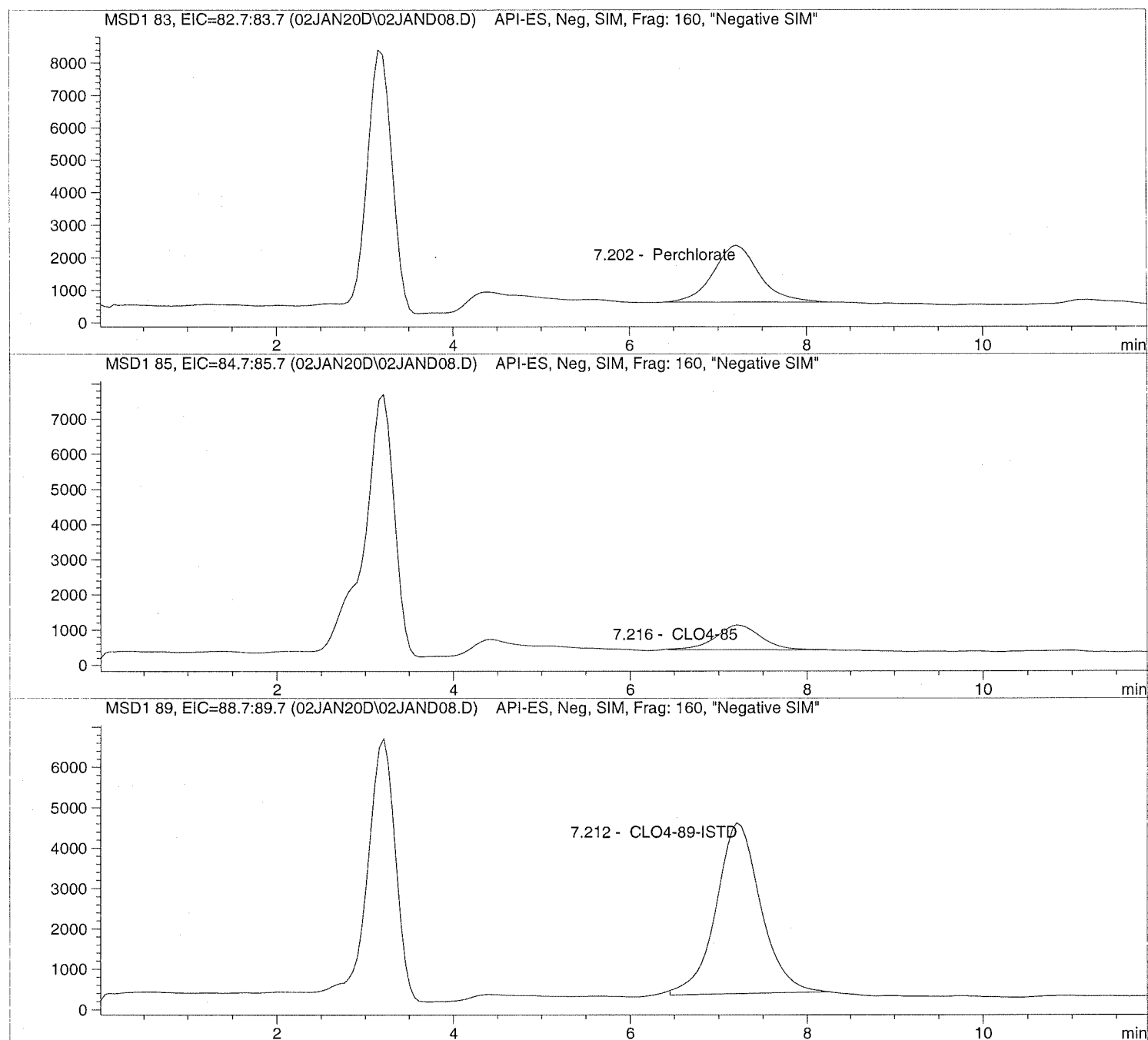
Sample Name: 1935915001

Injection Date: 1/02/2020 14:49:42
Sample Name: 1935915001
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND08.D

Sample Name: 1935915001

```

=====
Injection Date: 1/02/2020 14:49:42      Seq Line:      8
Sample Name:    1935915001              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
7.202	PBA	62635.7	1.5306	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.216	BBA	25080.2	1.9418	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.212	BBA	147744.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND09.D

Sample Name: 1935915002 MS

Injection Date: 1/02/2020 15:03:34

Seq Line: 9

Sample Name: 1935915002 MS

Location: Vial 79

Acq Operator: TNB

Inj. No.: 1

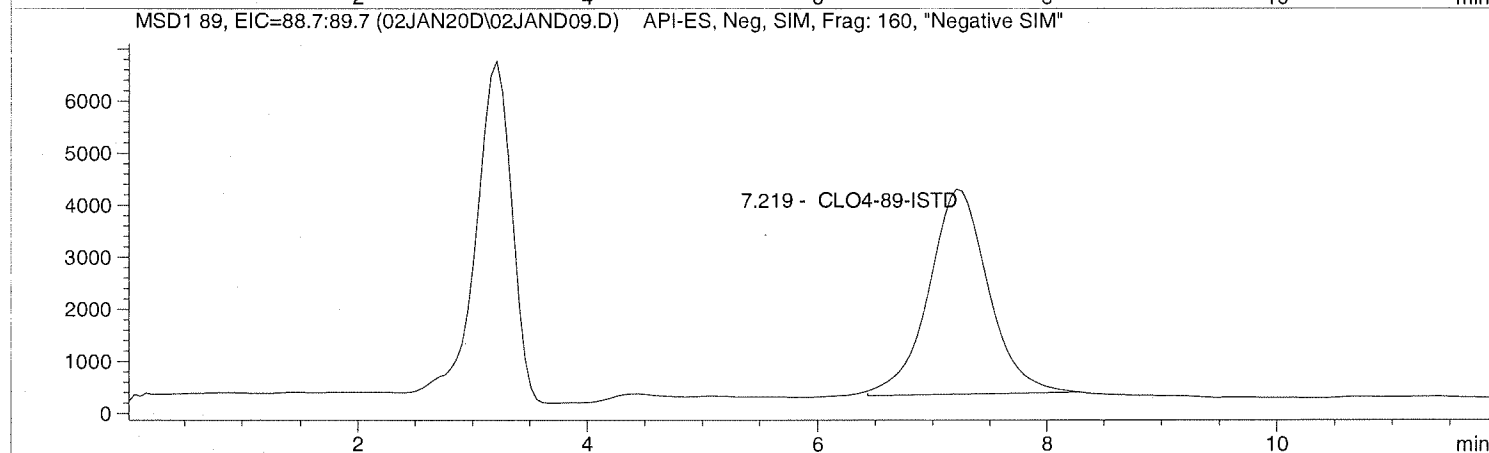
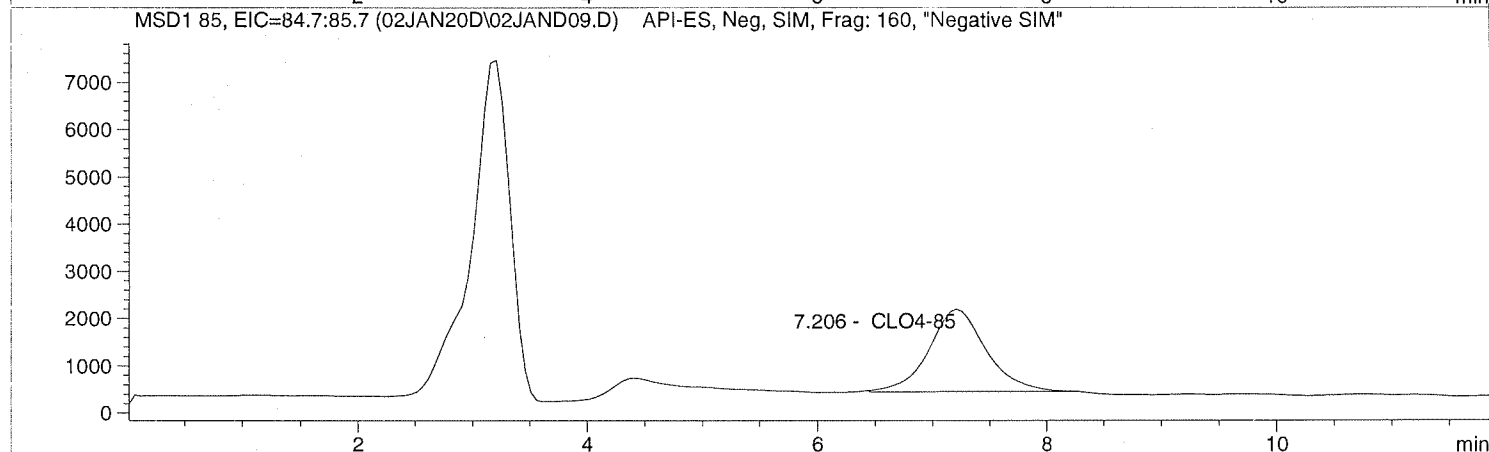
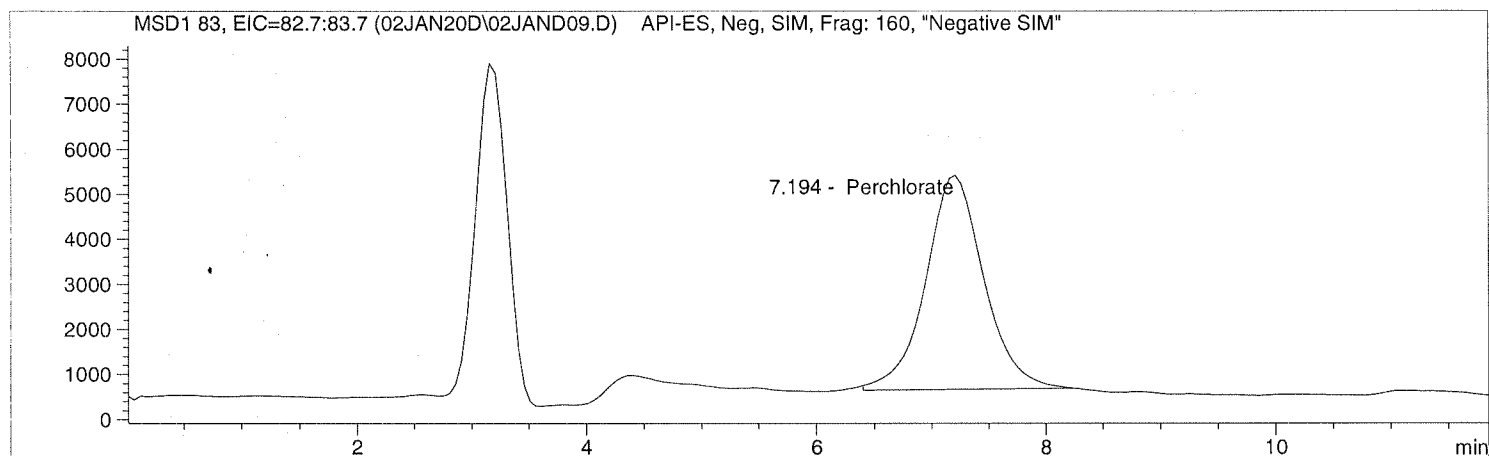
Inj. Vol.: 35 µl

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\02JAN20D\02JAND09.D Sample Name: 1935915002 MS

```

=====
Injection Date: 1/02/2020 15:03:34      Seq Line:          9
Sample Name:   1935915002 MS           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
7.194	BBA	167717.7	4.3410	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.206	BBA	60497.7	5.0378	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.219	BBA	142468.4	5.0000	CLO4-89-ISTD

```

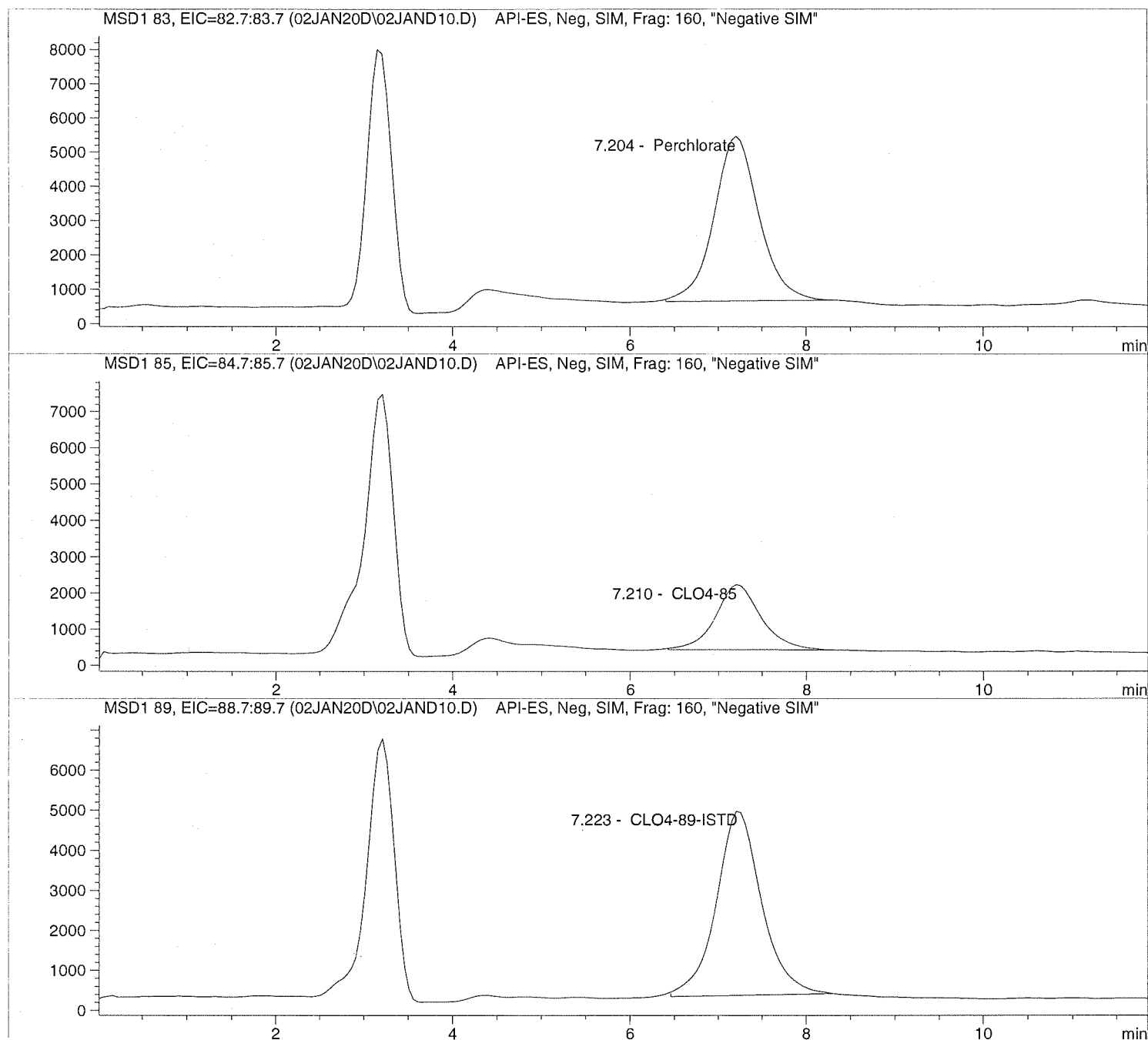
=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND10.D Sample Name: 1935915003 MSD

=====
Injection Date: 1/02/2020 15:17:28 Seq Line: 10
Sample Name: 1935915003 MSD 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\02JAN20D\02JAND10.D Sample Name: 1935915003 MSD

```
=====
Injection Date: 1/02/2020 15:17:28      Seq Line:      10
Sample Name:    1935915003  MSD          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
7.204	BBA	170226.0	3.8097	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.210	BBA	65303.6	4.6989	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.223	BBA	164738.8	5.0000	CLO4-89-ISTD

=====
*** End of Report ***
=====

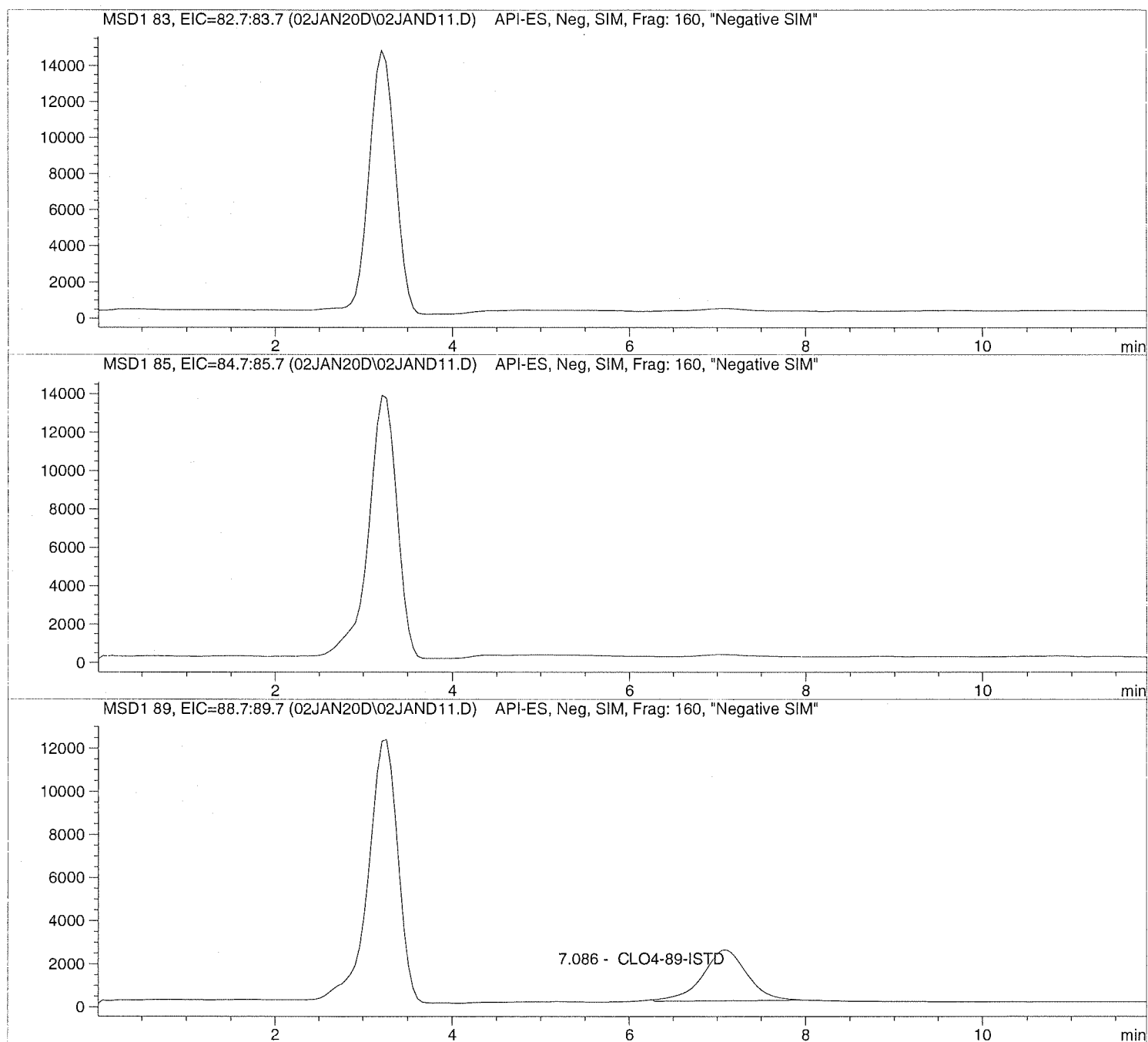
Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND11.D

Sample Name: 1935915004

```
=====
Injection Date: 1/02/2020 15:31:32      Seq Line:      11
Sample Name:    1935915004              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\02JAN20D\02JAND11.D

Sample Name: 1935915004

```

=====
Injection Date: 1/02/2020 15:31:32      Seq Line:      11
Sample Name:   1935915004              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:      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
7.086	BBA	82619.0	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND12.D

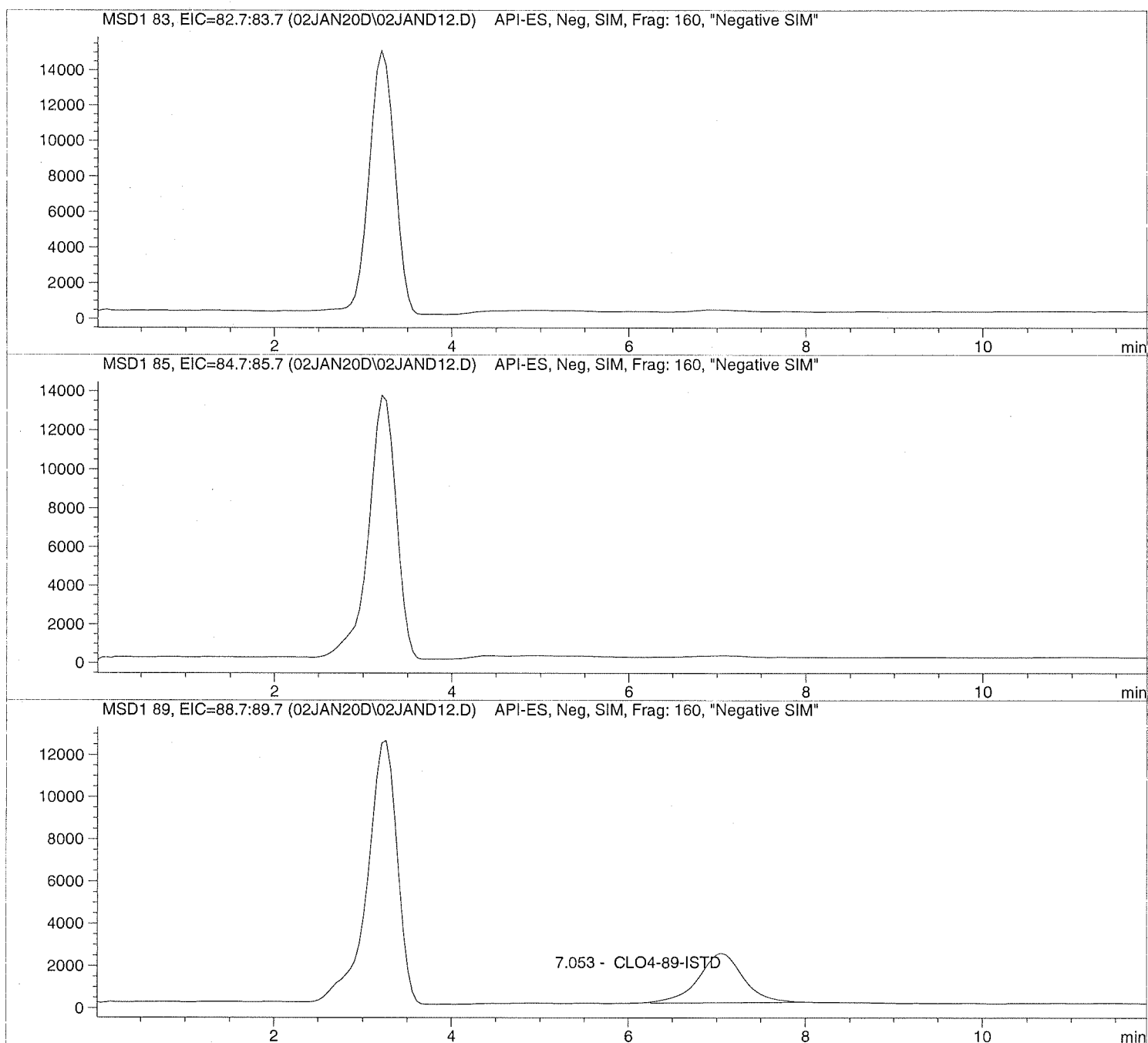
Sample Name: 1935915005

Injection Date: 1/02/2020 15:45:23
Sample Name: 1935915005
Acq Operator: TNB

Seq Line: 12
Location: Vial 82
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\02JAN20D\02JAND12.D

Sample Name: 1935915005

```

=====
Injection Date: 1/02/2020 15:45:23      Seq Line:          12
Sample Name:   1935915005              Location:          Vial 82
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
7.053	BBA	81637.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND13.D

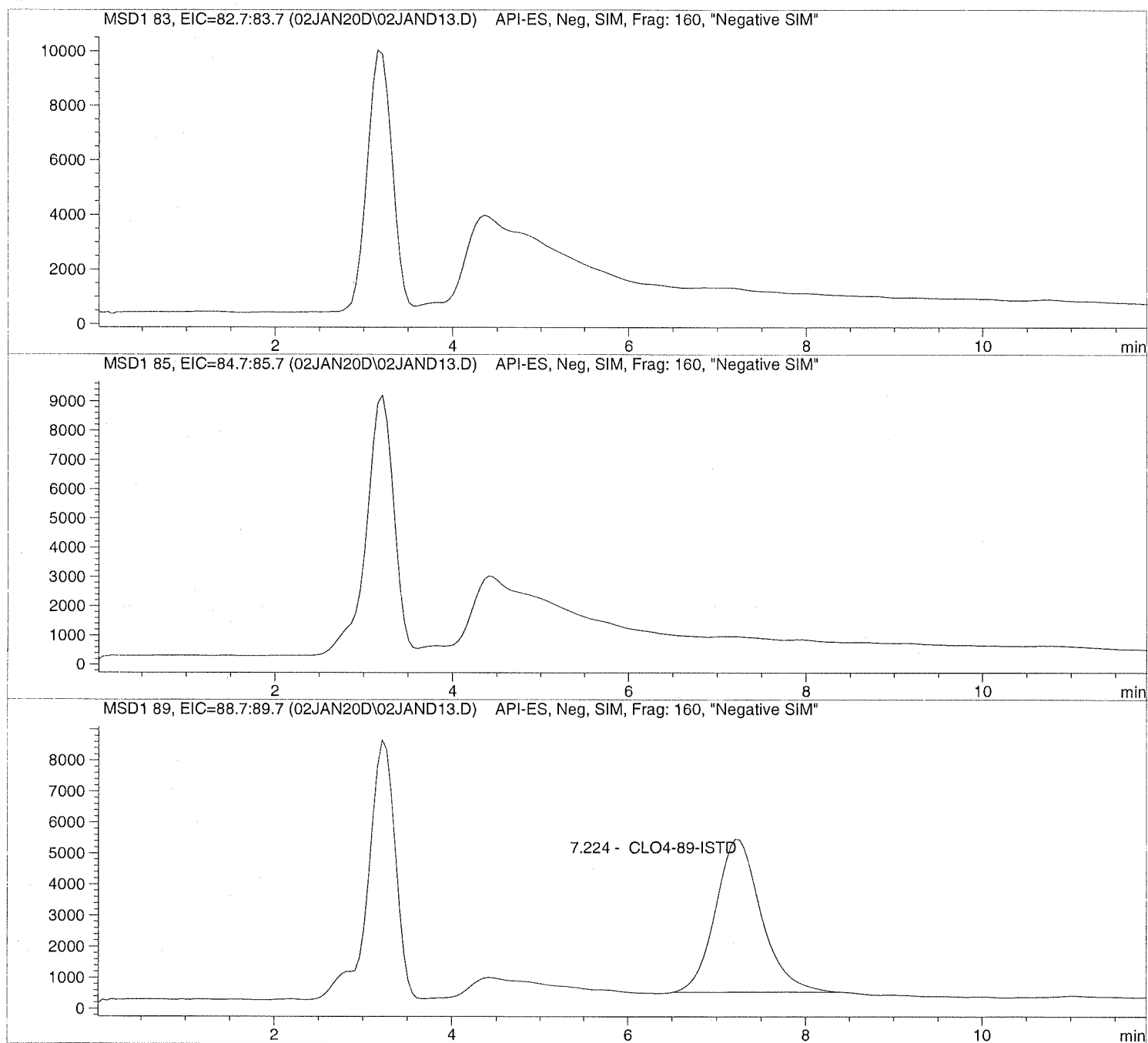
Sample Name: 1935915006

=====
Injection Date: 1/02/2020 15:59:22
Sample Name: 1935915006
Acq Operator: TNB

Seq Line: 13
Location: Vial 83
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND13.D

Sample Name: 1935915006

```

=====
Injection Date: 1/02/2020 15:59:22      Seq Line:          13
Sample Name:   1935915006              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:          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
7.224	PBA	175700.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND14.D

Sample Name: 690690 CCV@25

Injection Date: 1/02/2020 16:13:13

Seq Line: 14

Sample Name: 690690 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

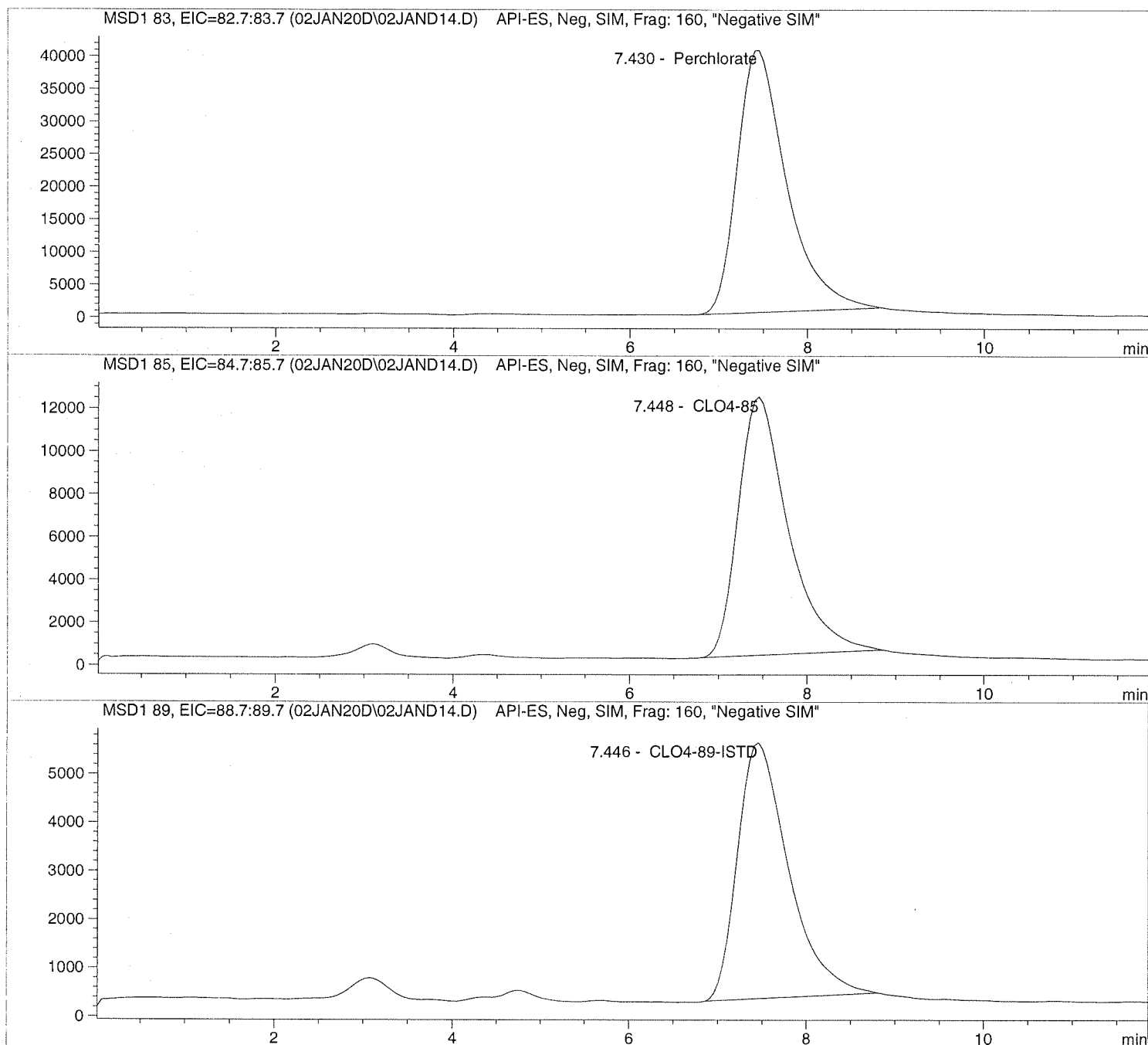
Inj. Vol.: 35 µl

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\02JAN20D\02JAND14.D Sample Name: 690690 CCV@25

```

=====
Injection Date: 1/02/2020 16:13:13      Seq Line:      14
Sample Name:   690690   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
7.430	PBA	1556973.9	25.1820	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.448	PBA	473140.5	25.1044	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.446	PBA	211105.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

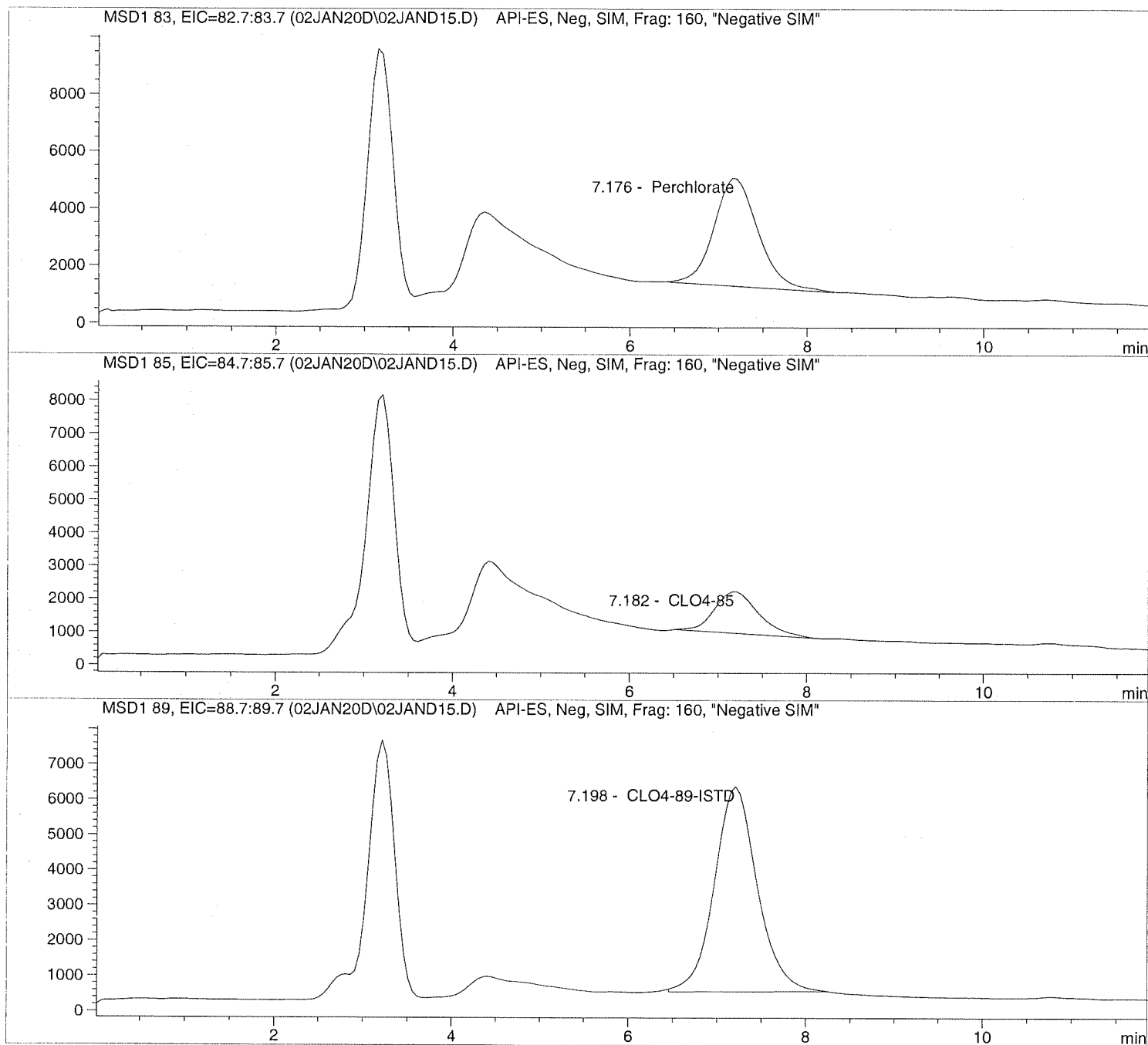
```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND15.D Sample Name: 1935915007 MS

=====
Injection Date: 1/02/2020 16:27:04 Seq Line: 15
Sample Name: 1935915007 MS 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\02JAN20D\02JAND15.D Sample Name: 1935915007 MS

=====
Injection Date: 1/02/2020 16:27:04 Seq Line: 15
Sample Name: 1935915007 MS 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: 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
7.176	BBA	131015.0	2.4565	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.182	PBA	43555.4	2.5920	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.198	BBA	195563.0	5.0000	CLO4-89-ISTD

=====
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND16.D

Sample Name: 1935915008 MSD

Injection Date: 1/02/2020 16:41:07

Seq Line: 16

Sample Name: 1935915008 MSD

Location: Vial 85

Acq Operator: TNB

Inj. No.: 1

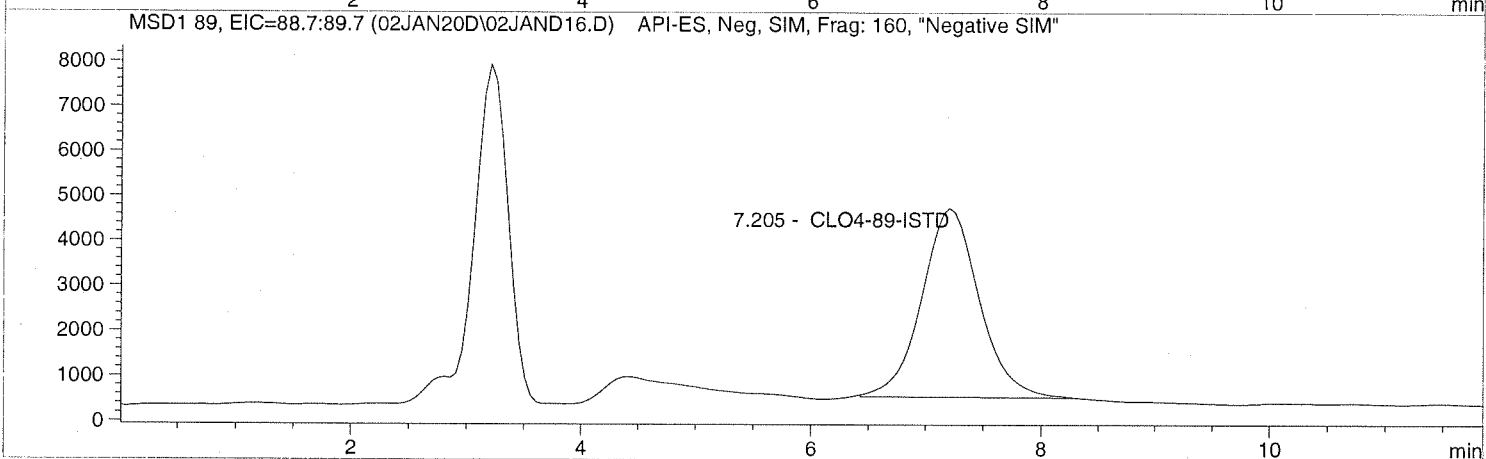
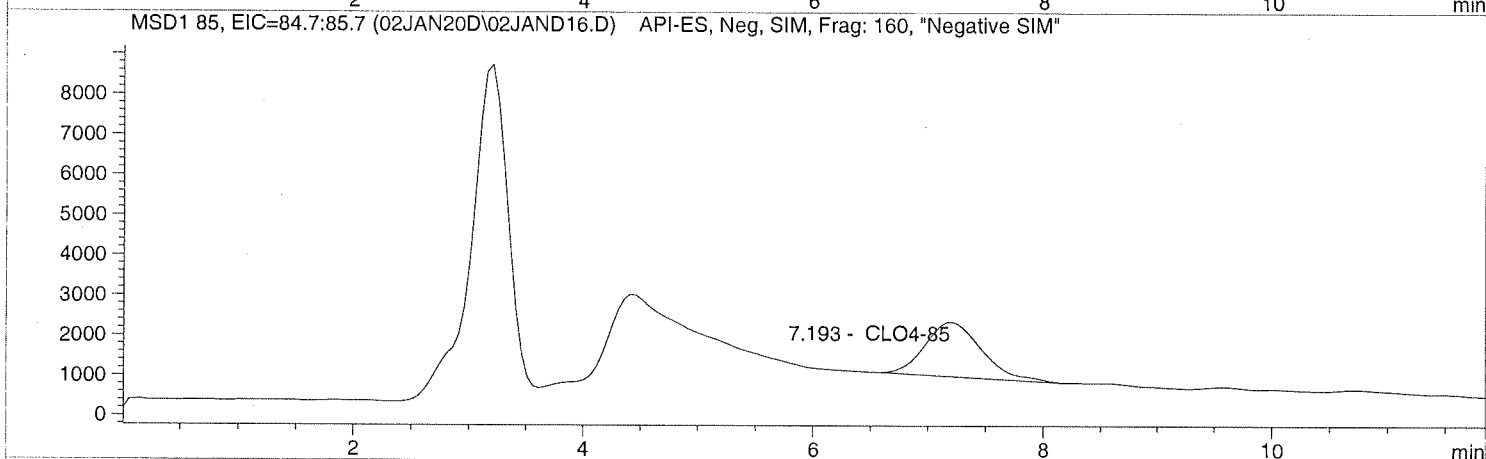
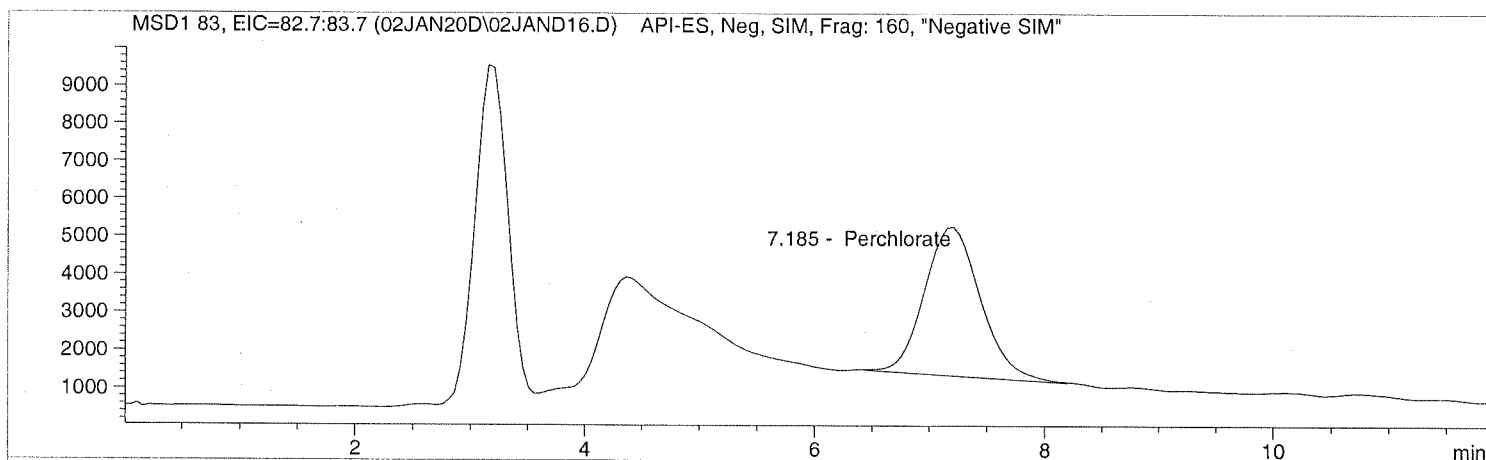
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND16.D Sample Name: 1935915008 MSD

```

=====
Injection Date: 1/02/2020 16:41:07      Seq Line:          16
Sample Name:   1935915008  MSD          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:      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
7.185	BBA	132259.5	3.3466	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.193	PBA	46493.2	3.7688	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.205	BBA	145588.4	5.0000	CLO4-89-ISTD

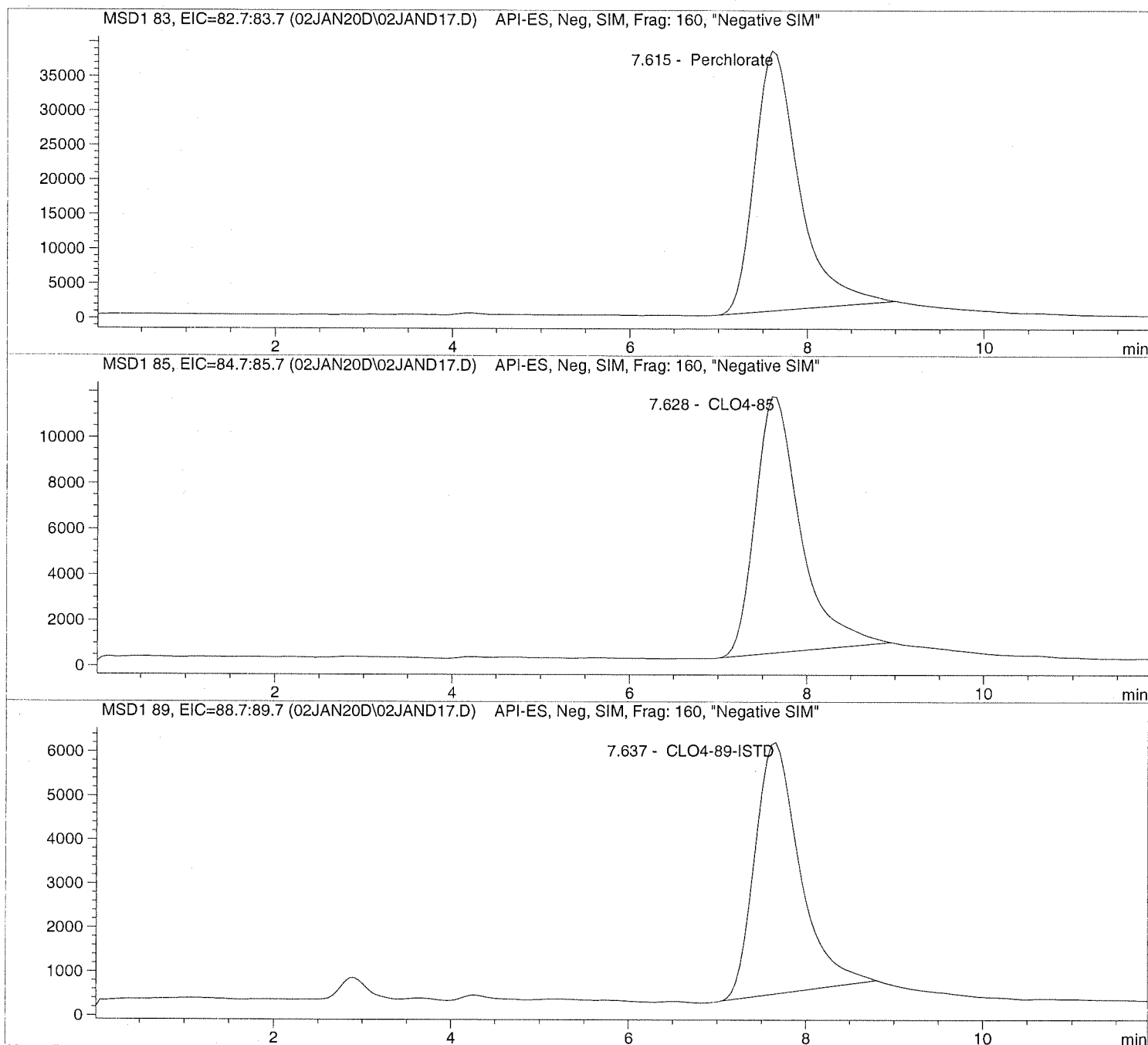
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND17.D Sample Name: 1935915009 1K

```
=====
Injection Date: 1/02/2020 16:54:59      Seq Line: 17
Sample Name: 1935915009 1K              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\02JAN20D\02JAND17.D Sample Name: 1935915009 1K

```

=====
Injection Date: 1/02/2020 16:54:59      Seq Line:          17
Sample Name:   1935915009 1K           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:          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
7.615	PBA	1320092.9	22628.1935	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.628	PBA	397733.8	22358.4905	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.637	PBA	201299.8	5000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND18.D

Sample Name: 1935915010 10K

Injection Date: 1/02/2020 17:08:52

Seq Line: 18

Sample Name: 1935915010 10K

Location: Vial 87

Acq Operator: TNB

Inj. No.: 1

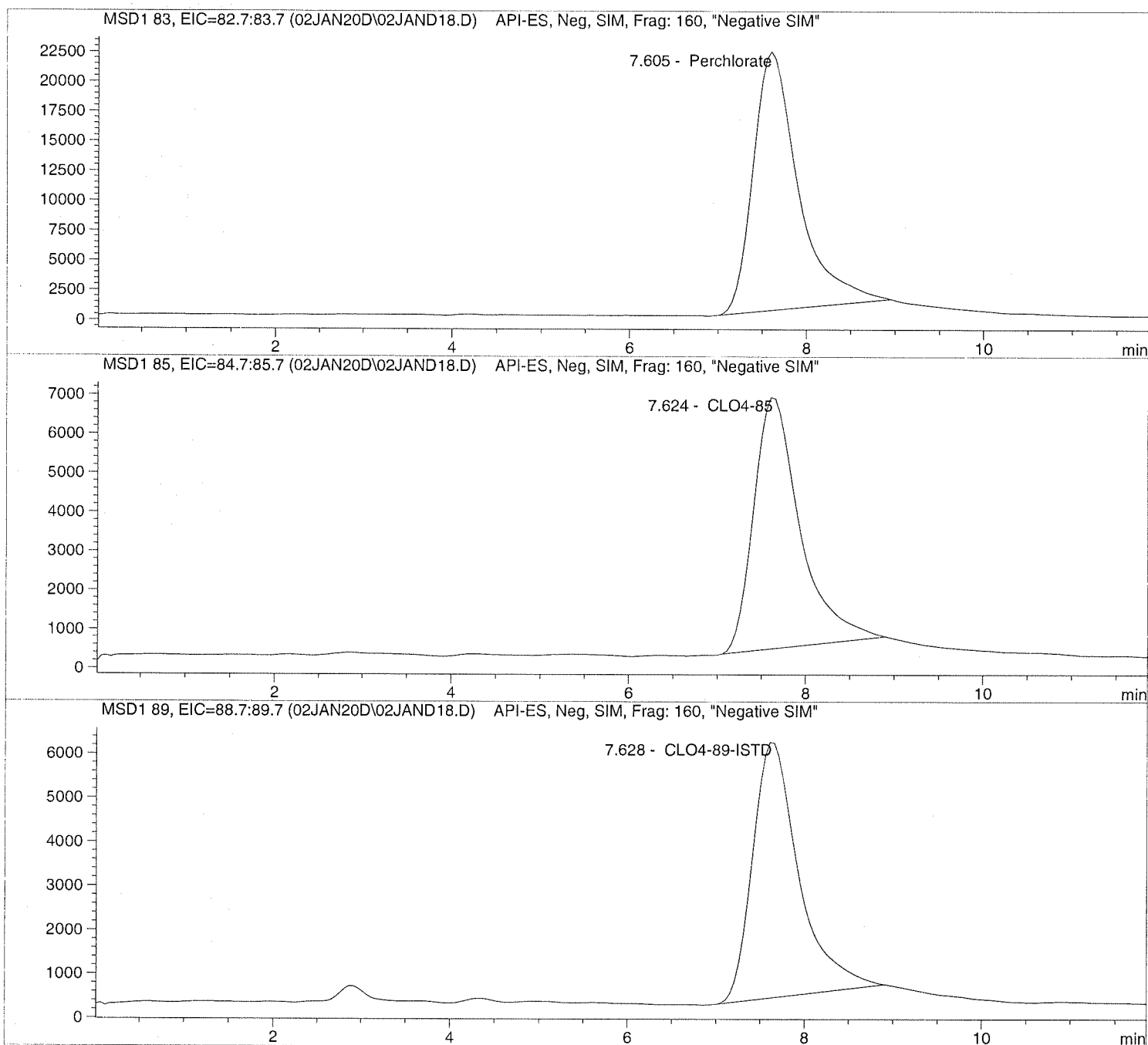
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND18.D Sample Name: 1935915010 10K

=====
 Injection Date: 1/02/2020 17:08:52 Seq Line: 18
 Sample Name: 1935915010 10K 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: 10000.000000
 Sample Amount: 0.000

=====
 LCMS Results
 =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.605	PBA	768865.3	130446.8924	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.624	PBA	235180.4	130044.7637	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.628	PBA	211545.7	50000.0000	CLO4-89-ISTD

=====
 *** End of Report ***
 =====

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND19.D

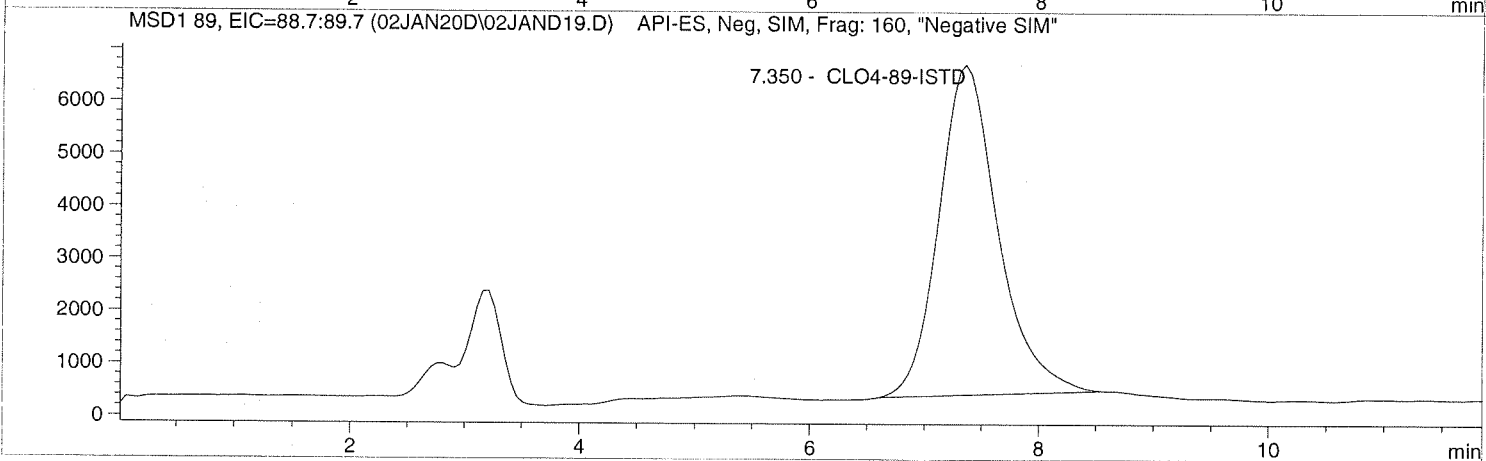
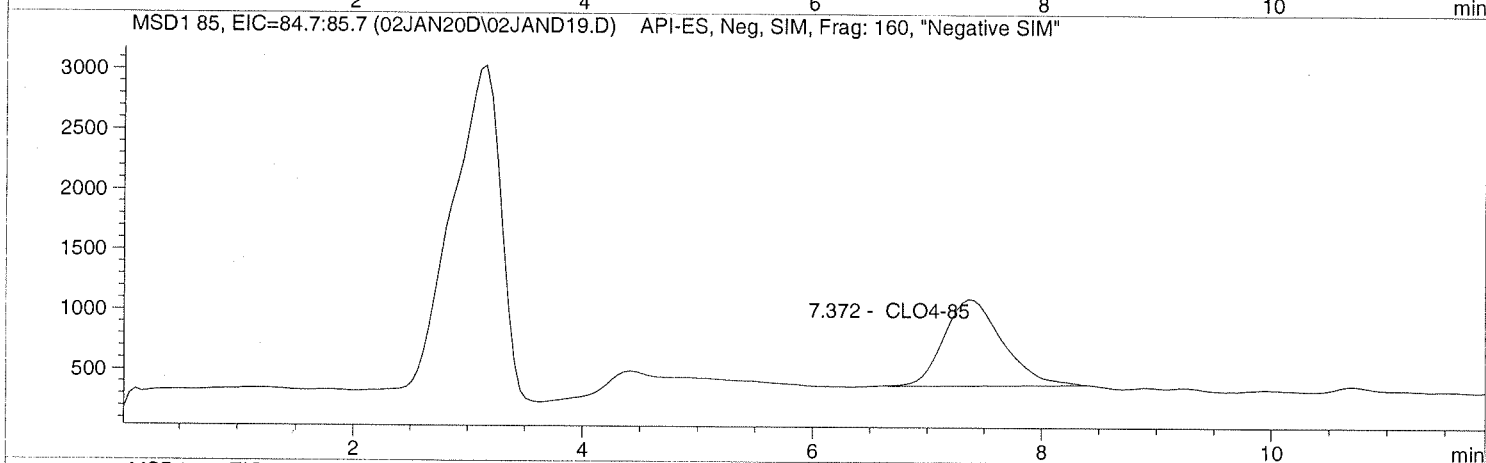
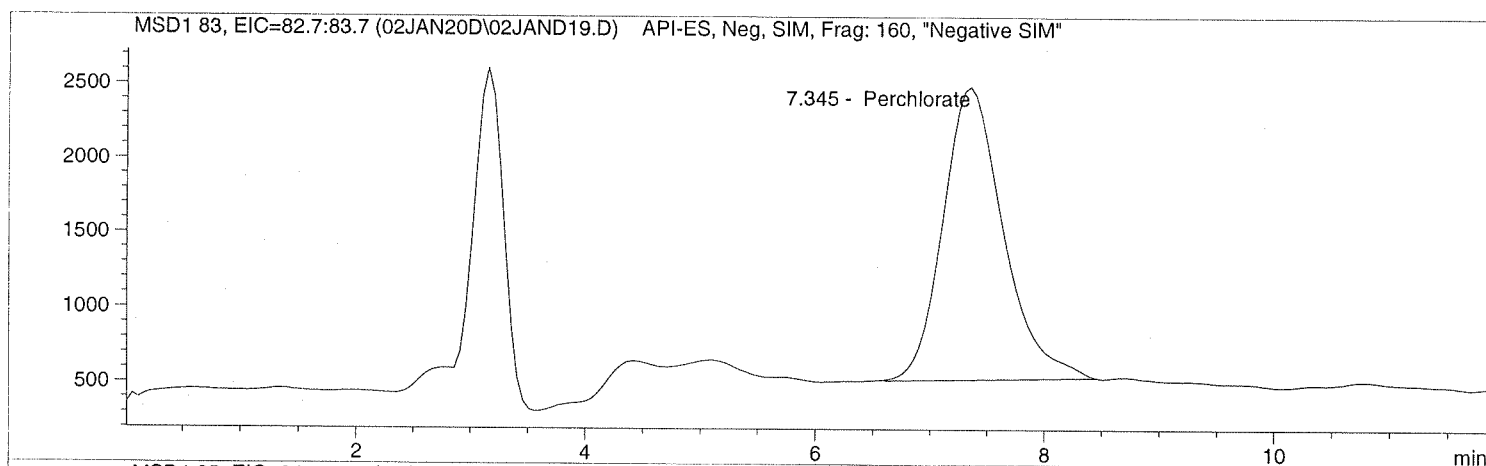
Sample Name: 1935915011

=====
Injection Date: 1/02/2020 17:22:48
Sample Name: 1935915011
Acq Operator: TNB

Seq Line: 19
Location: Vial 88
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\02JAN20D\02JAND19.D

Sample Name: 1935915011

```

=====
Injection Date: 1/02/2020 17:22:48      Seq Line: 19
Sample Name: 1935915011                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: 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
7.345	BBA	72005.1	1.1283	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.372	BBA	25905.7	1.2573	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.350	BBA	226623.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND21.D

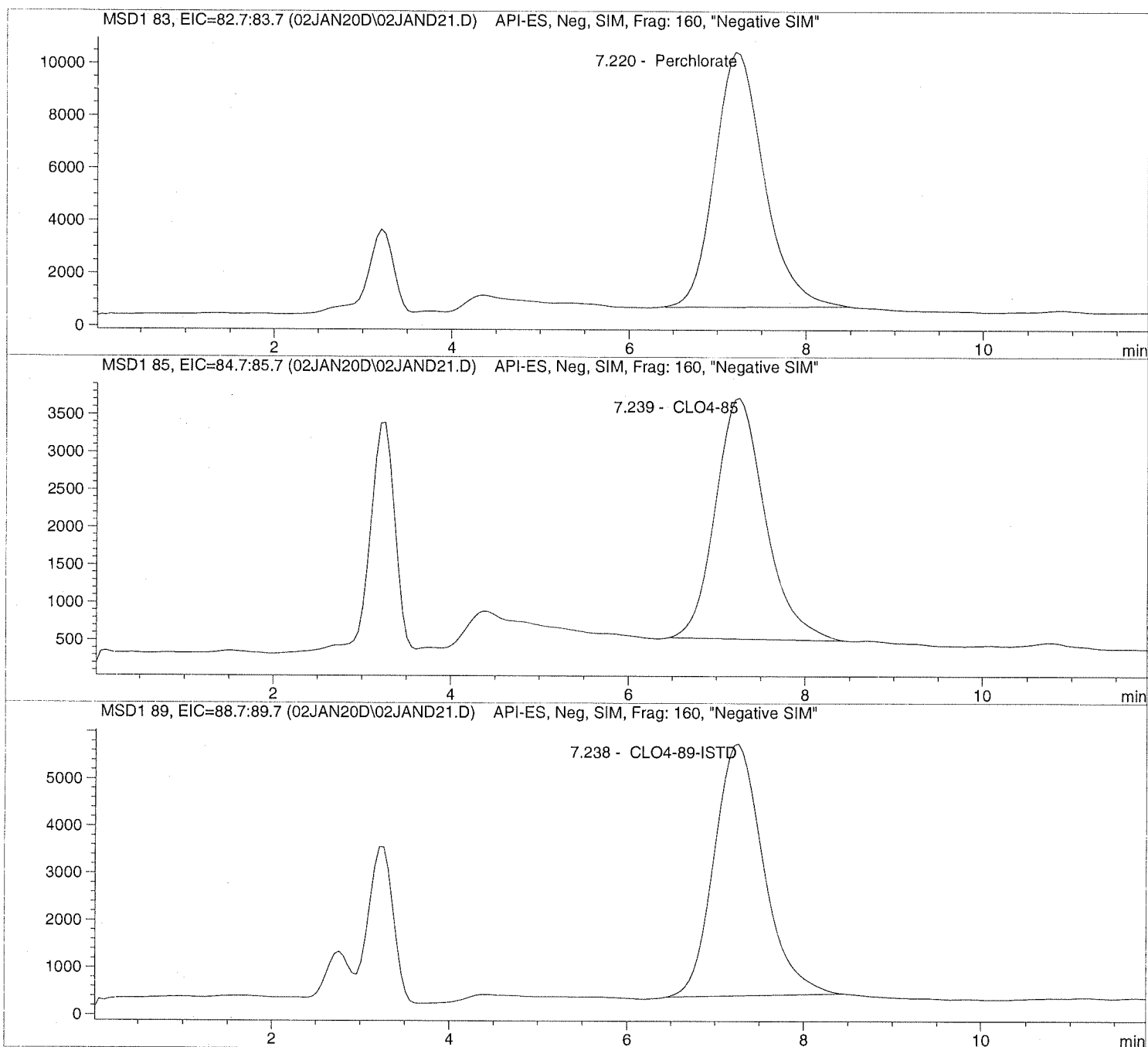
Sample Name: 1936106001

=====
Injection Date: 1/02/2020 17:50:37
Sample Name: 1936106001
Acq Operator: TNB

Seq Line: 21
Location: Vial 90
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\02JAN20D\02JAND21.D Sample Name: 1936106001

```

=====
Injection Date: 1/02/2020 17:50:37      Seq Line:      21
Sample Name:   1936106001                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
7.220	PBA	375683.7	6.6527	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.239	PBA	125368.0	7.1746	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.238	BBA	207387.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

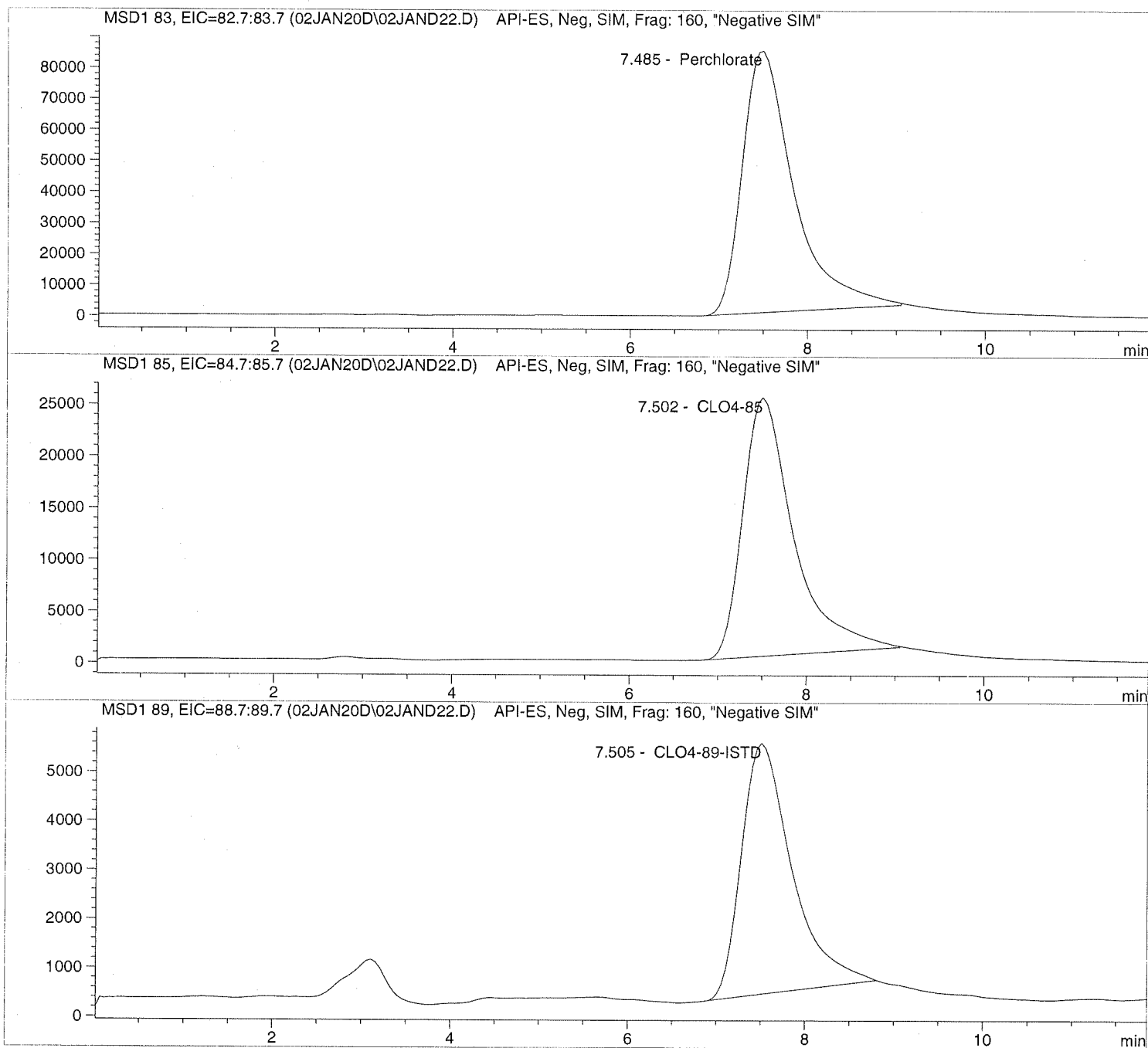
```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND22.D Sample Name: 1935915012 10X

=====
Injection Date: 1/02/2020 18:04:36 Seq Line: 22
Sample Name: 1935915012 10X 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\02JAN20D\02JAND22.D Sample Name: 1935915012 10X

```
=====
Injection Date: 1/02/2020 18:04:36      Seq Line:      22
Sample Name:    1935915012 10X          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:       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
7.485	PBA	3407190.3	516.1452	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.502	PBA	999389.8	502.8506	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.505	PBA	202951.9	50.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND23.D

Sample Name: 690691 CCV@25

Injection Date: 1/02/2020 18:18:27

Seq Line: 23

Sample Name: 690691 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

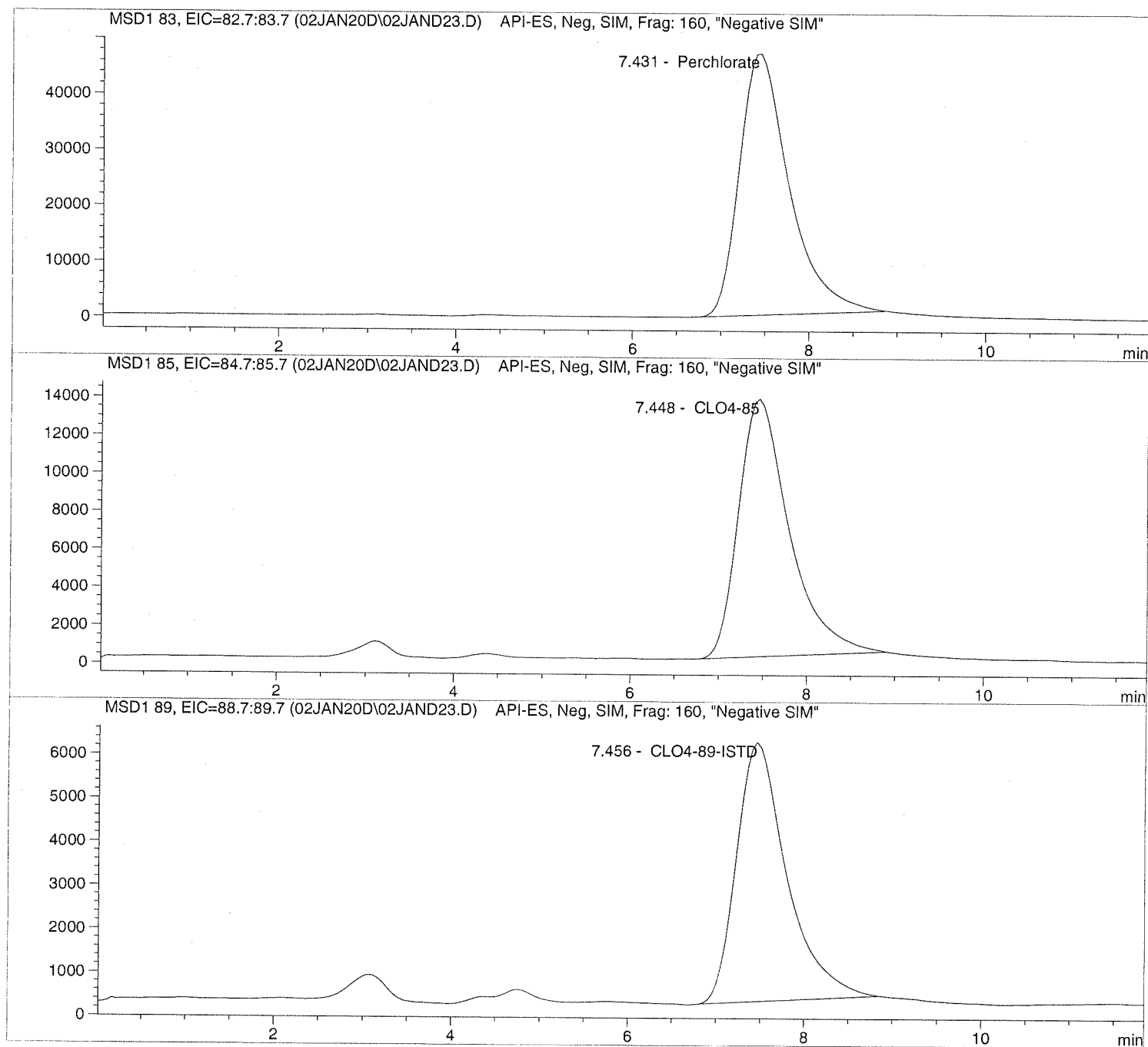
Inj. Vol.: 35 µl

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\02JAN20D\02JAND23.D Sample Name: 690691 CCV@25

```

=====
Injection Date:   1/02/2020  18:18:27        Seq Line:           23
Sample Name:     690691   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
7.431	PBA	1840917.4	26.5024	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.448	PBA	541119.1	25.6437	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.456	PBA	235883.1	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

=====
 Calibration Table
 =====

Perchlorate

Calib. Data Modified : 9/23/2019 12:20:59 PM

Calculate : Internal Standard
 Based on : Peak Area

Rel. Reference Window : 20.000 %
 Abs. Reference Window : 0.000 min
 Rel. Non-ref. Window : 20.000 %
 Abs. Non-ref. Window : 0.000 min

Use Multiplier & Dilution Factor with ISTDs
 Uncalibrated Peaks : not reported
 Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
 Origin : Ignored (some peaks differ, see below)
 Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
 Average Response : Average all calibrations
 Average Retention Time: Floating Average New 75%

Calibration Report Options :
 Printout of recalibrations within a sequence:
 Calibration Table after Recalibration
 Normal Report after Recalibration
 If the sequence is done with bracketing:
 Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
 Signal 2: MSD1 85, EIC=84.7:85.7
 Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref	Grp Name
7.750	1 3	1.00000	5.39218e4	1.85454e-5	1	Perchlorate
		2.00000	1.32825e5	1.50574e-5		
		5.00000	2.76271e5	1.80982e-5		
		10.00000	5.61298e5	1.78159e-5		
		25.00000	1.51820e6	1.64669e-5		
		50.00000	3.31156e6	1.50986e-5		
		75.00000	5.23914e6	1.43153e-5		
7.767	3 3	5.00000	2.14568e5	2.33026e-5	+I1	CLO4-89-ISTD
		5.00000	2.04758e5	2.44190e-5		
		5.00000	2.13407e5	2.34294e-5		
		5.00000	2.09246e5	2.38953e-5		
		5.00000	2.07403e5	2.41077e-5		
		5.00000	2.02929e5	2.46391e-5		
		5.00000	1.97933e5	2.52611e-5		
7.778	2 3	1.00000	1.70436e4	5.86732e-5	1	CLO4-85
		2.00000	4.20754e4	4.75337e-5		
		5.00000	9.24707e4	5.40712e-5		
		10.00000	1.68622e5	5.93041e-5		
		25.00000	4.63724e5	5.39114e-5		
		50.00000	9.95933e5	5.02042e-5		

RetTime [min]	Lvl Sig	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

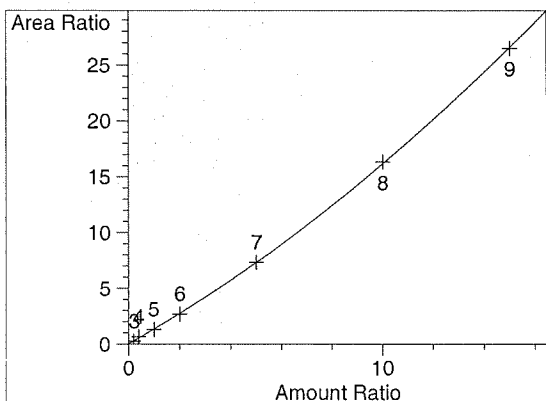
Compound: CLO4-85

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

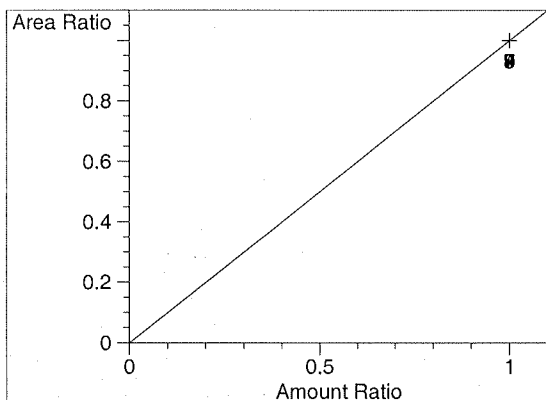
=====
 Peak Sum Table
 =====

No Entries in table
 =====

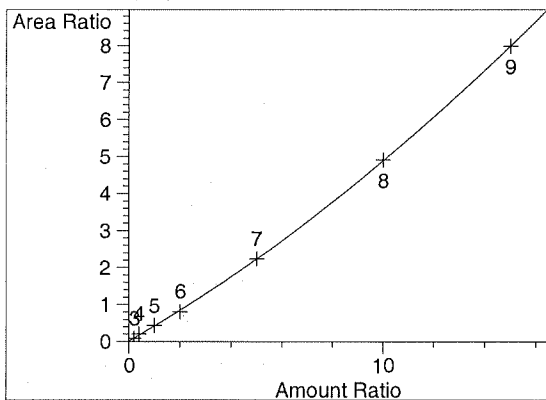
=====
 Calibration Curves
 =====



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\20SEP19\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

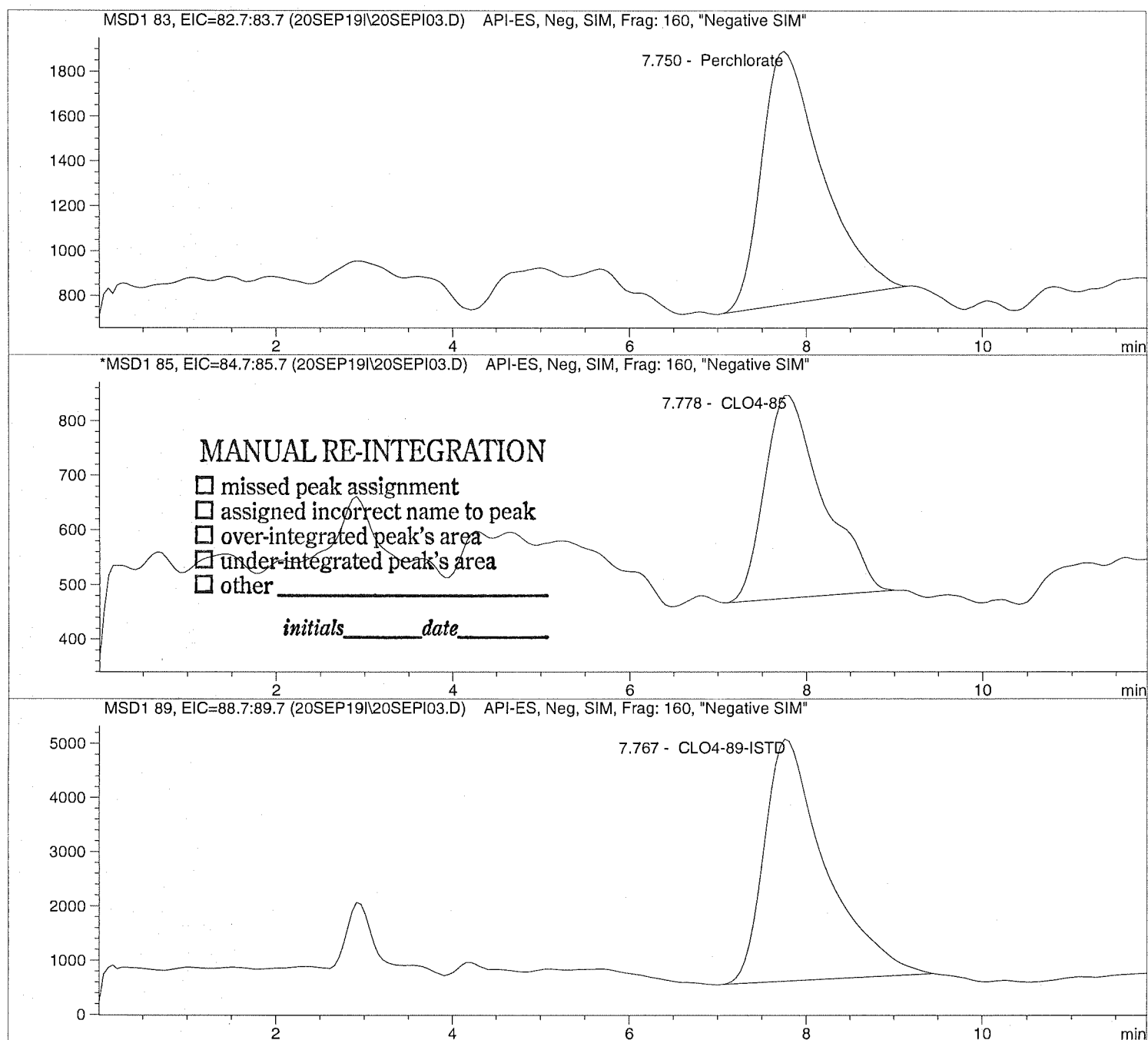
Inj. Vol.: 30 µl

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

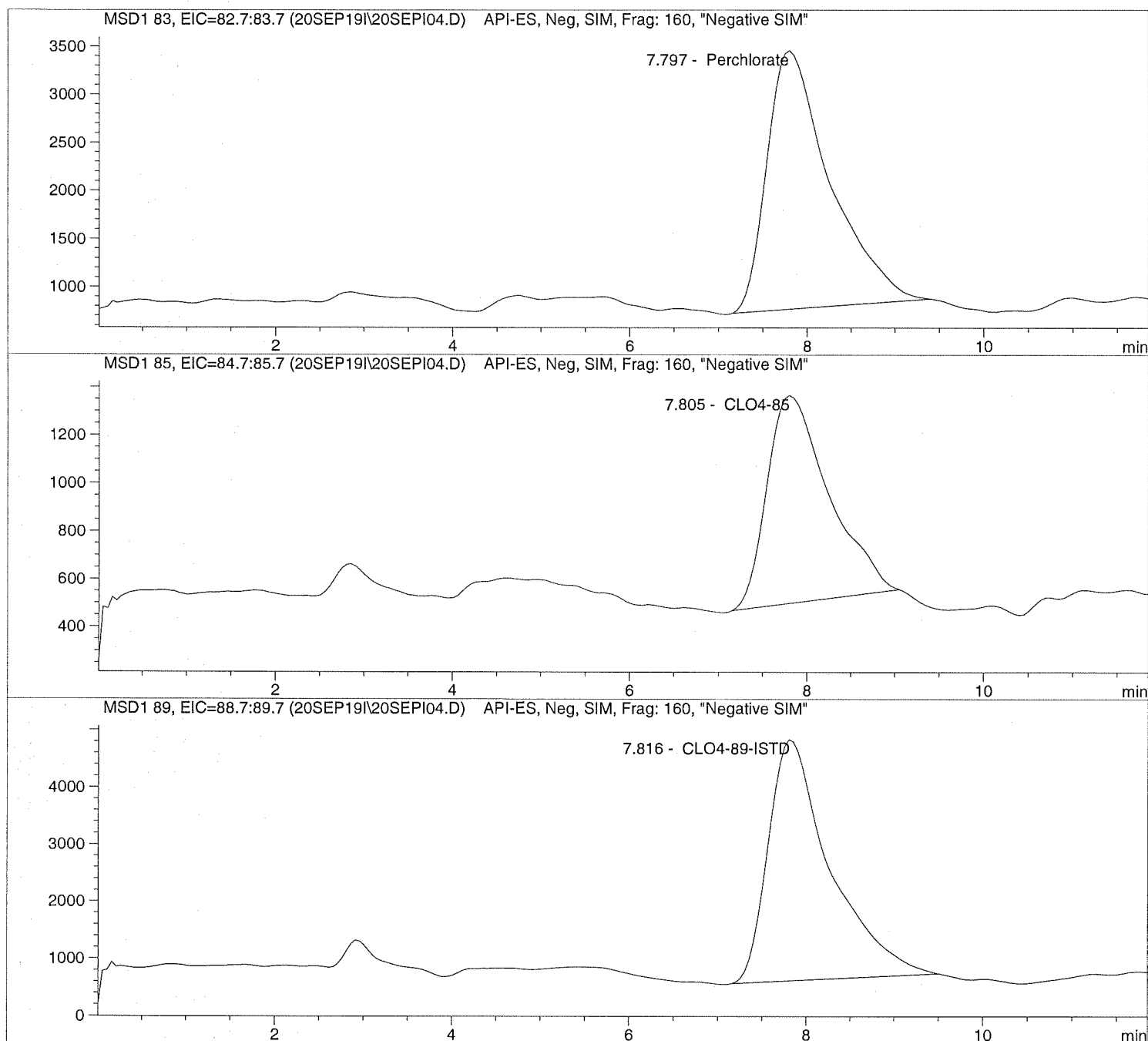
Inj. Vol.: 30 µl

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

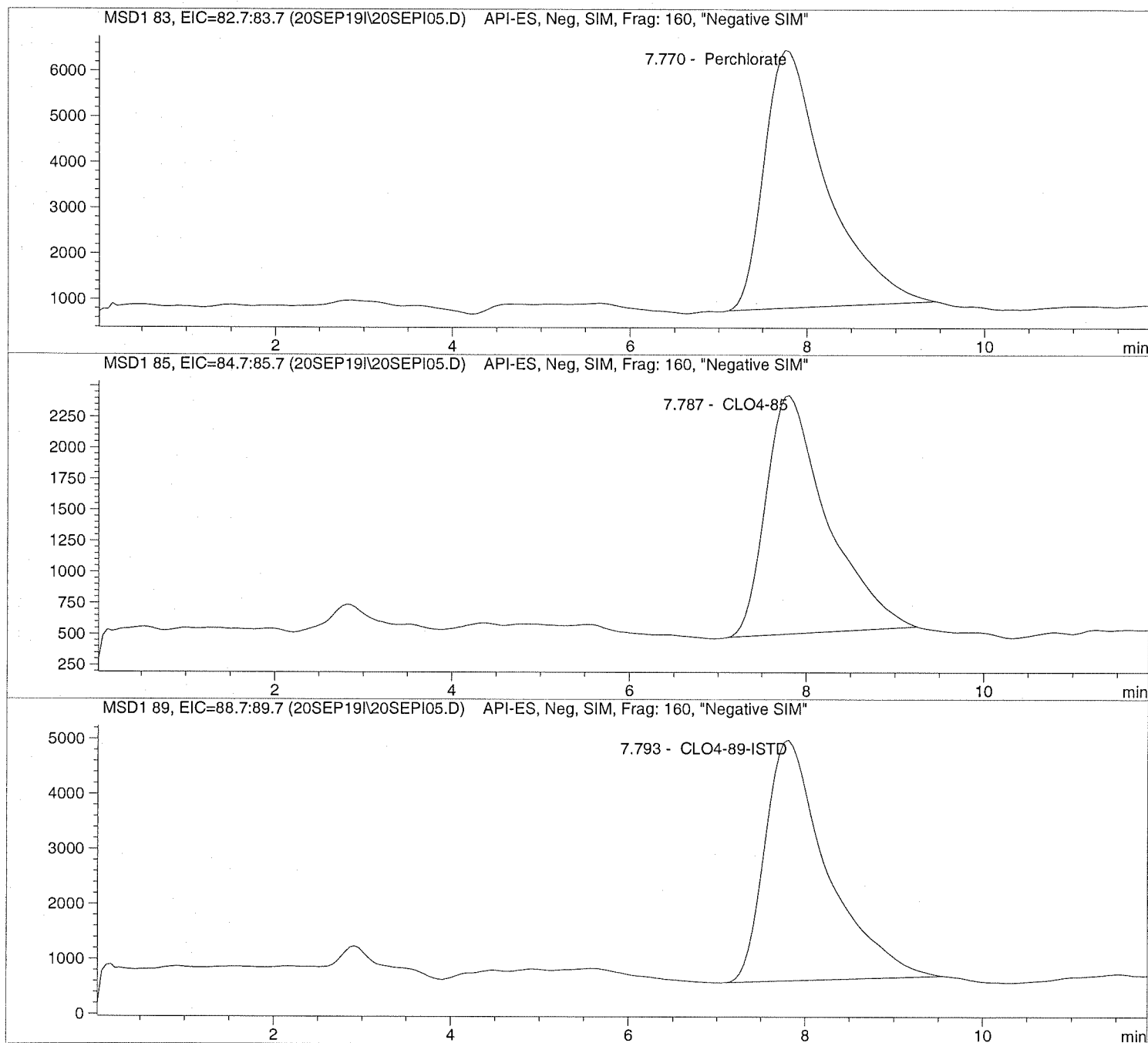
Sample Name: CLO4@ 5.0ug/L

Injection Date: 9/20/2019 09:51:49
Sample Name: CLO4@ 5.0ug/L
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
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\20SEP19\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

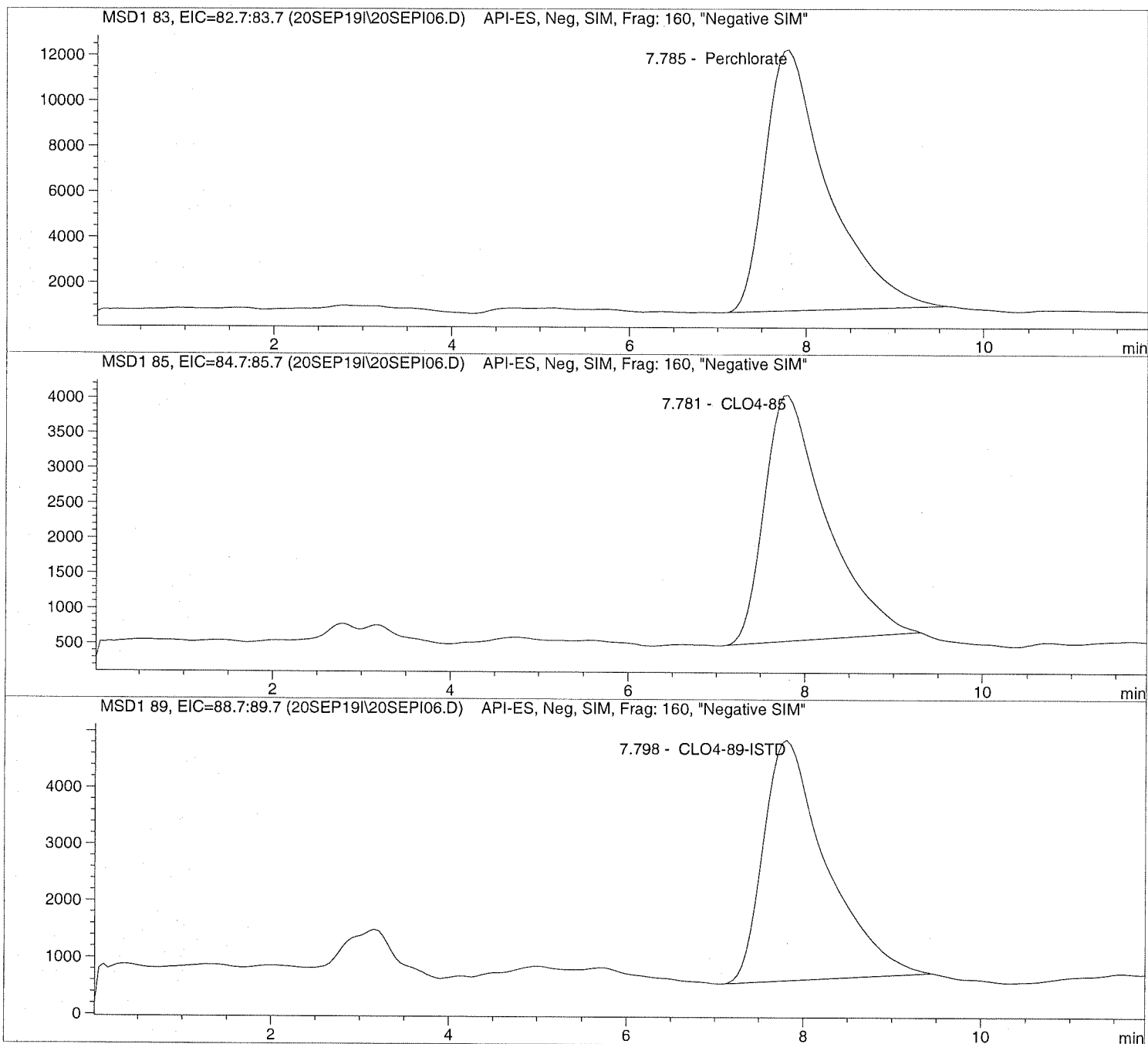
Inj. Vol.: 30 µl

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\20SEP19\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

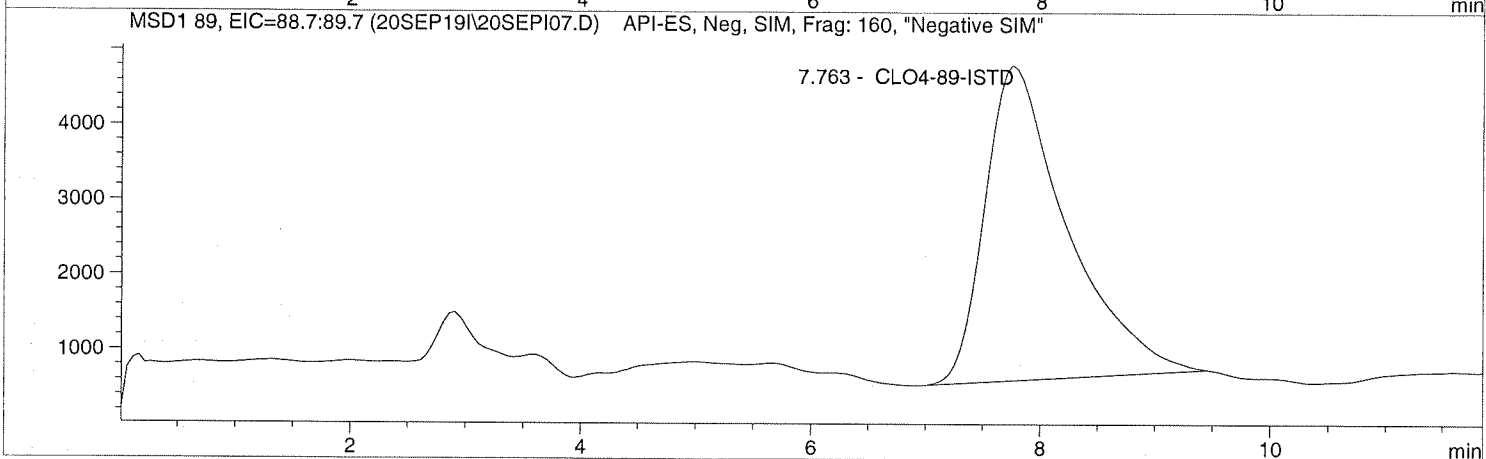
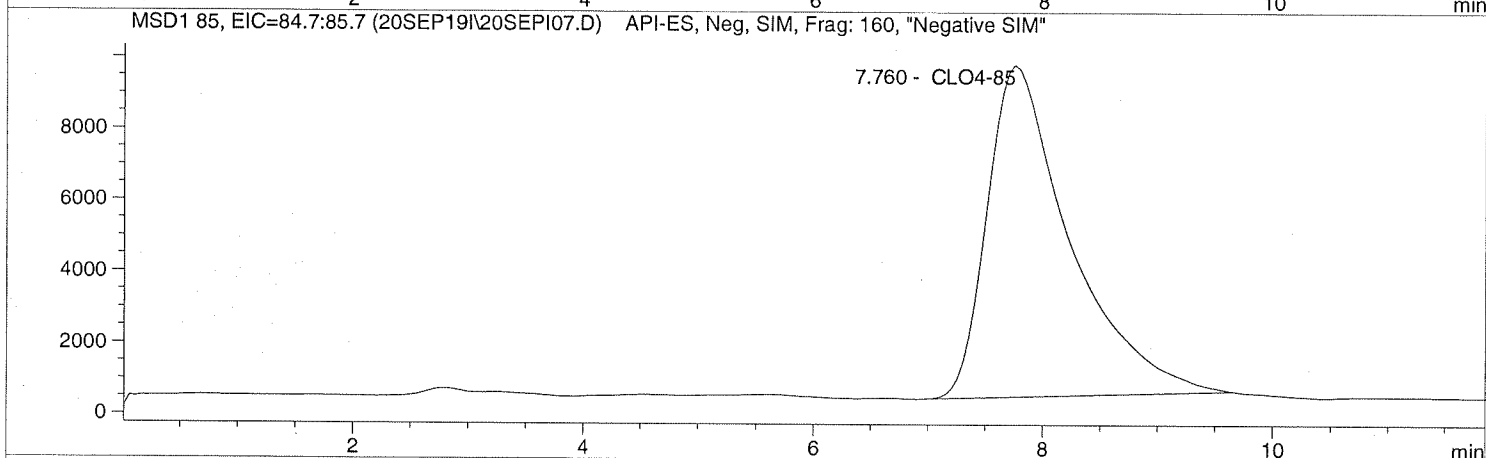
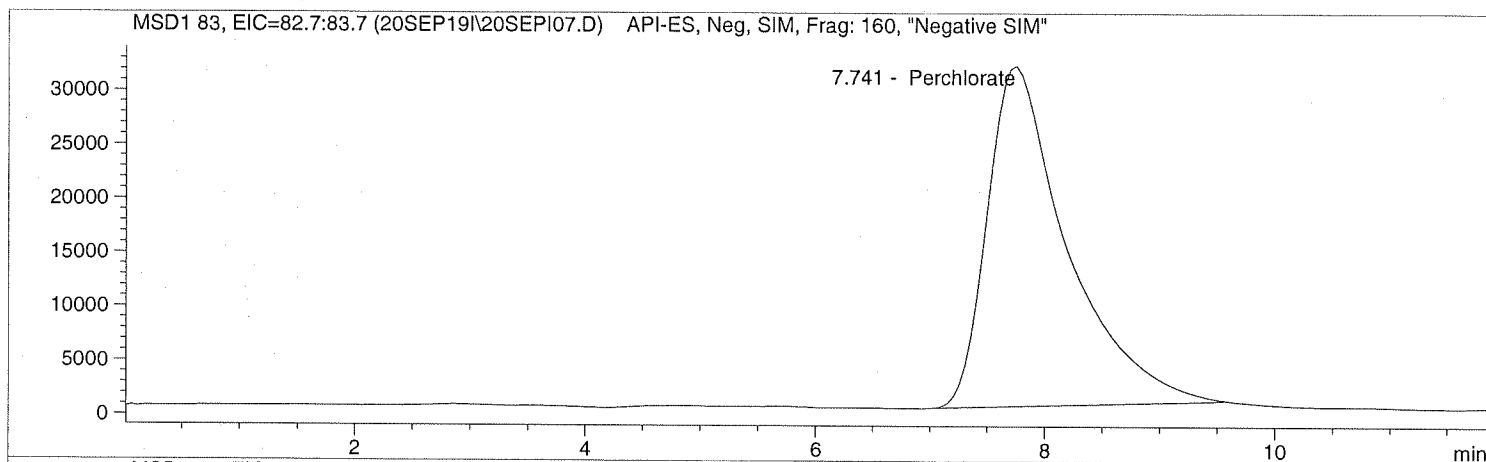
Inj. Vol.: 30 µl

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

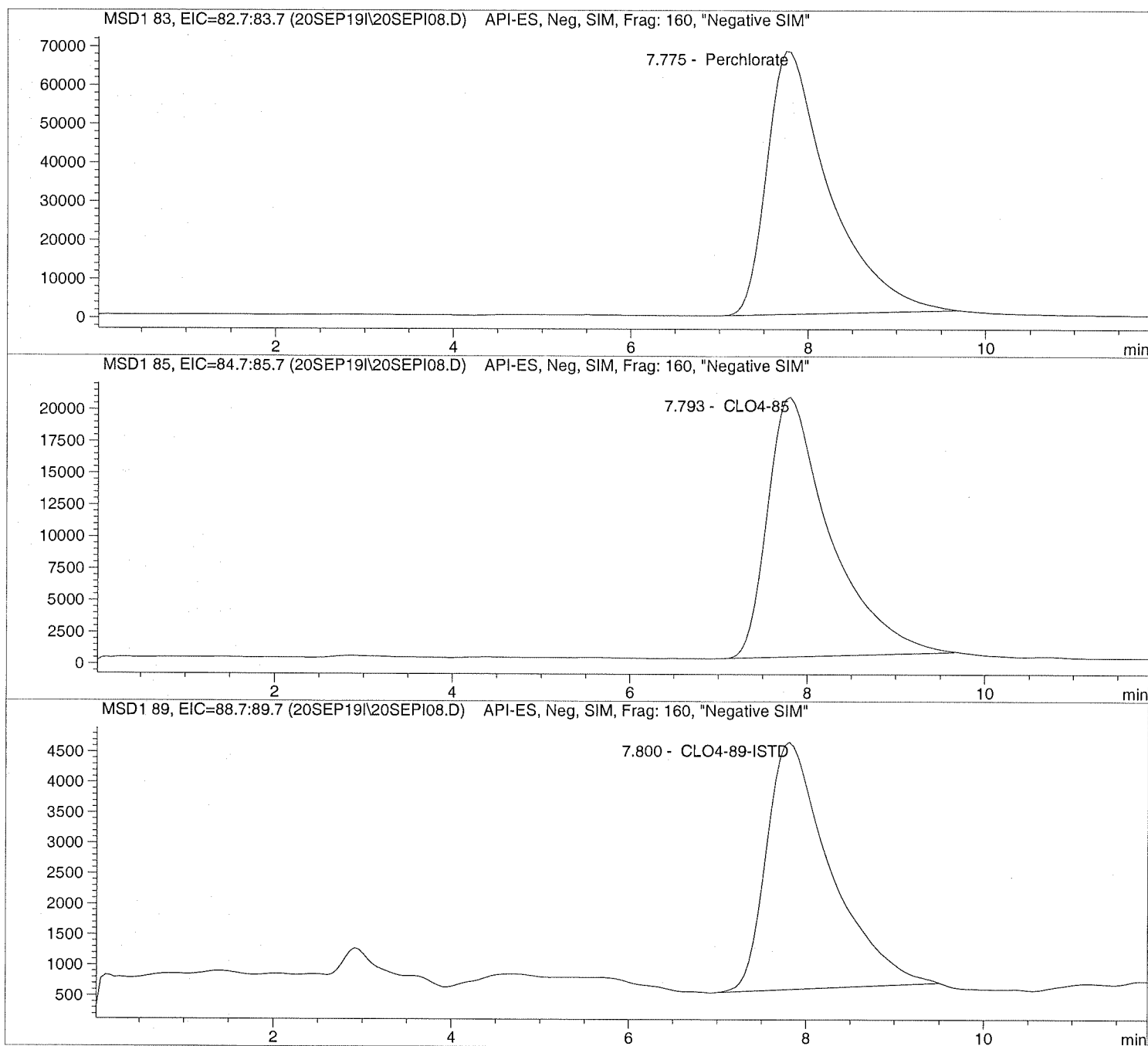
Sample Name: CLO4@ 50.ug/L

Injection Date: 9/20/2019 10:33:18
Sample Name: CLO4@ 50.ug/L
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
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

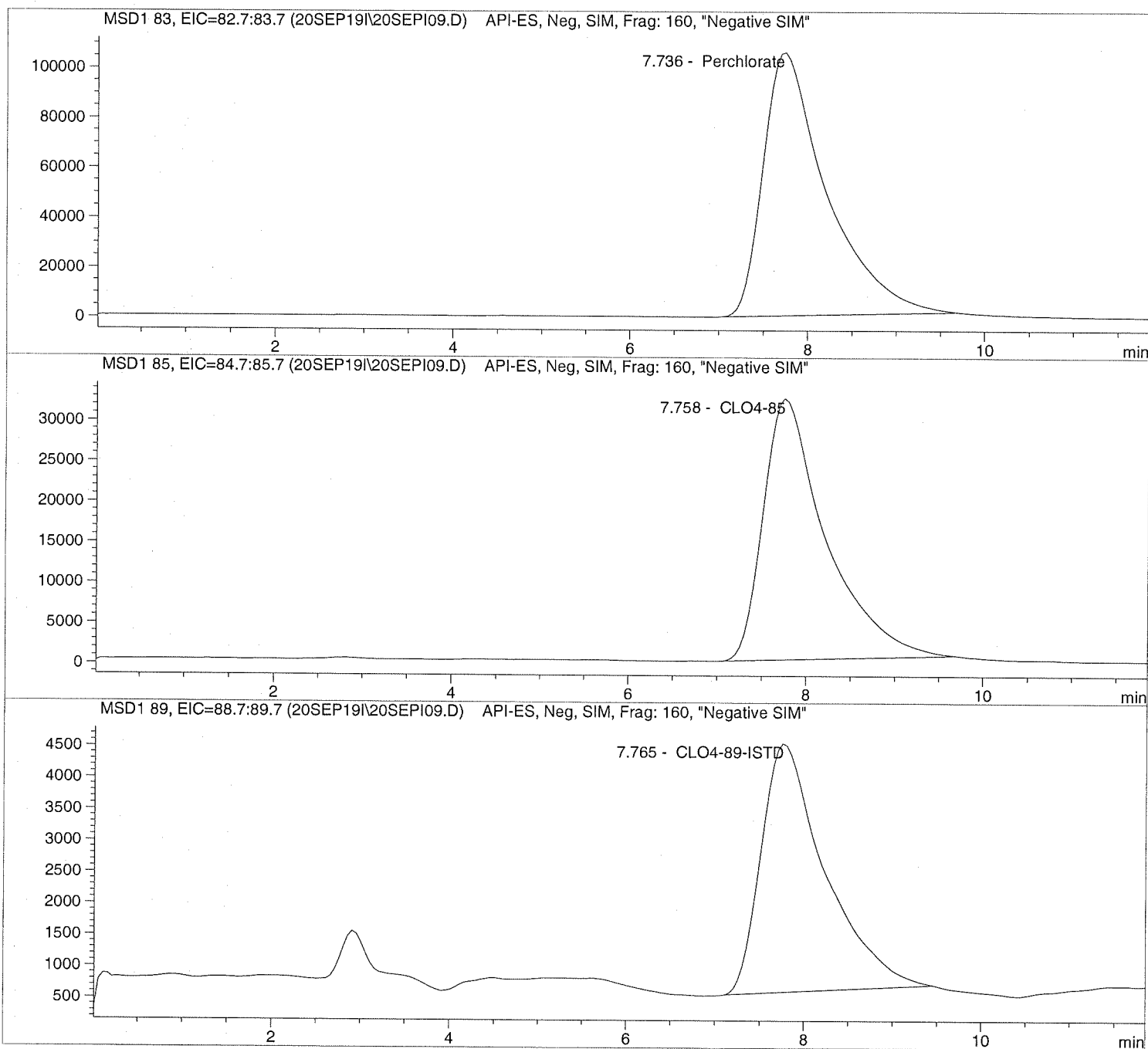
Inj. Vol.: 30 µl

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

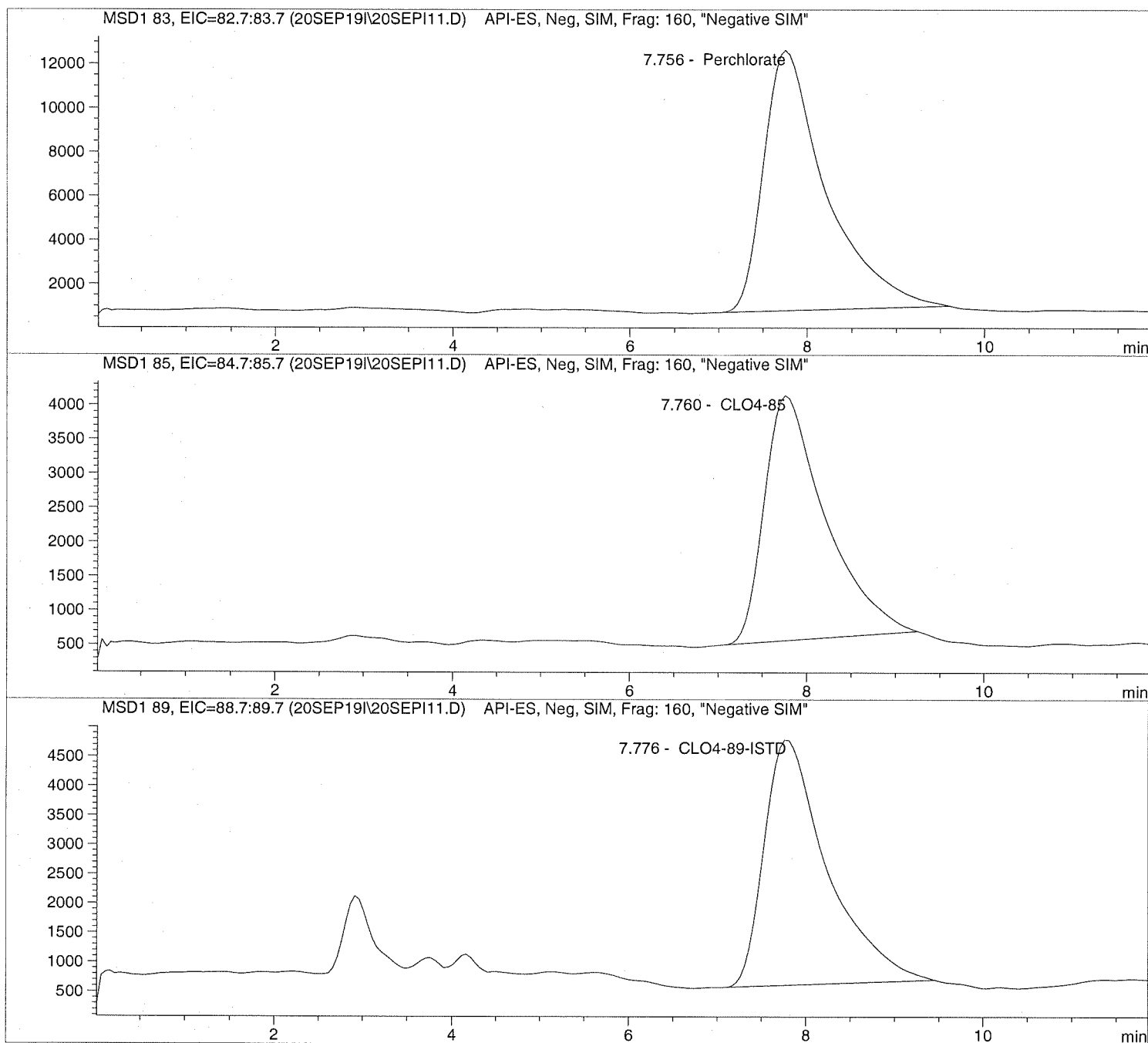
Sample Name: ICAL Verf@10ug/L

Injection Date: 9/20/2019 11:14:45
Sample Name: ICAL Verf@10ug/L
Acq Operator: TNB

Seq Line: 11
Location: Vial 80
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\20SEP19\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05

Seq Line: 3

Sample Name: CLO4@ 1.0ug/L

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

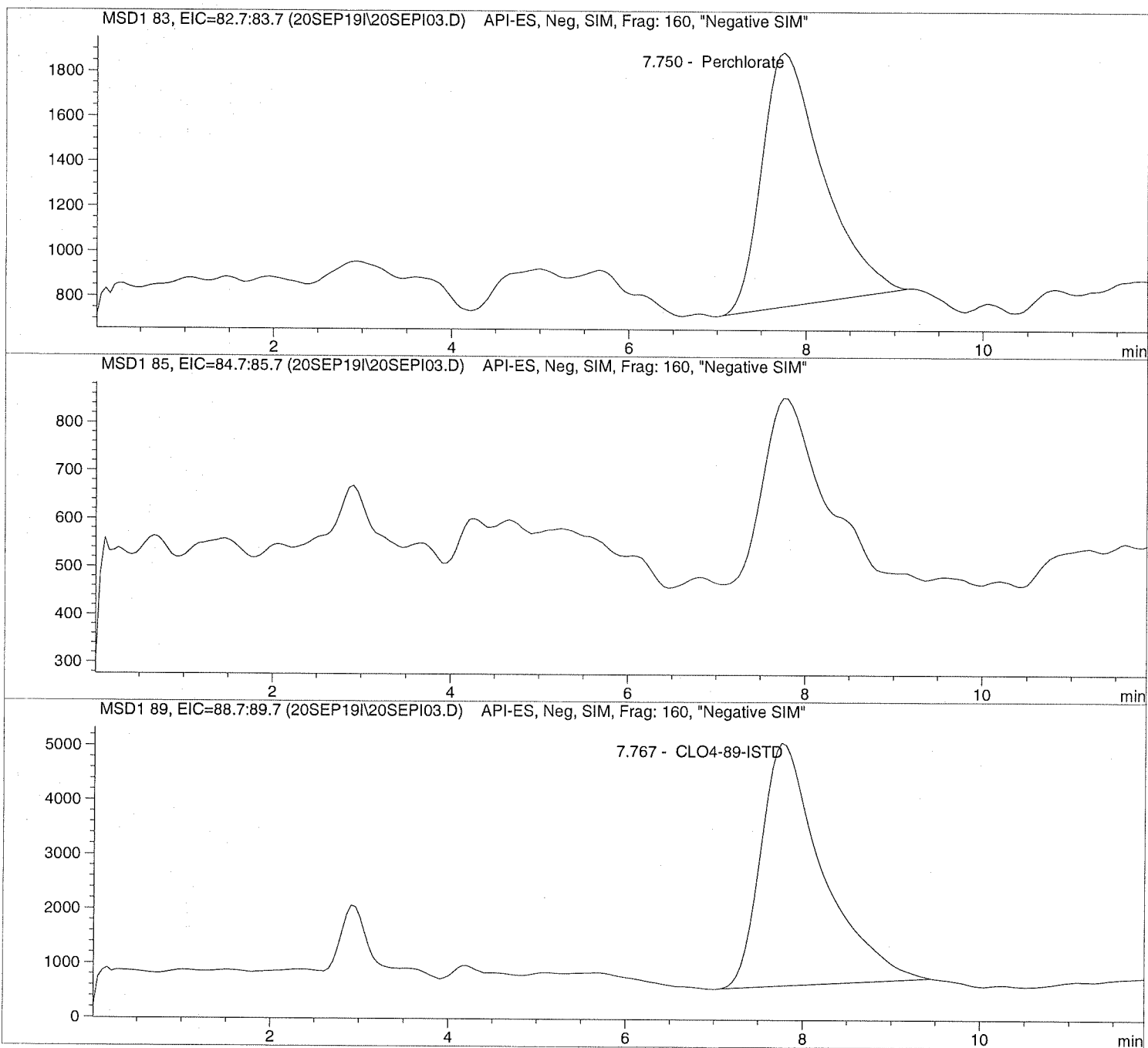
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

```
=====
Injection Date: 9/20/2019 09:24:05      Seq Line: 3
Sample Name:    CLO4@ 1.0ug/L           Location:  Vial 73
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:27:11
=====
```

Perchlorate analysis

Sample Information

```
=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

*** End of Report ***



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

January 07, 2020

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

Work Order: **HS19121315**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Dec 24, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

A handwritten signature in black ink, appearing to read "Raj. P. Modashia", enclosed in a circular scribble.

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19121315

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19121315-01	LH18/24-SP650_122319	Water		23-Dec-2019 14:00	24-Dec-2019 09:45	<input type="checkbox"/>
HS19121315-02	LH18/24-SP650_122319_BIX	Water		23-Dec-2019 14:00	24-Dec-2019 09:45	<input type="checkbox"/>

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19121315

CASE NARRATIVE

Work Order Comments

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

Work Order Comments

- The analyses for TOC was subcontracted to ALS Environmental in Kelso, WA. Final Report attached.
-

WetChemistry by Method E350.3**Batch ID: R353301**

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

WetChemistry by Method E365.3**Batch ID: R353280**

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

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Weekly Samples
 Sample ID: LH18/24-SP650_122319
 Collection Date: 23-Dec-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19121315
 Lab ID:HS19121315-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)								Analyst: MZD
	Method:E350.3							
Nitrogen, Ammonia (As N)	4.3	a	0.20	0.10	0.20	mg/L	1	26-Dec-2019 11:15
ORTHO PHOSPHATE (PO4) AS P BY E365.3								Analyst: MZD
	Method:E365.3							
Phosphorus, Total Orthophosphate (As P)	0.613	a	0.0100	0.0250	0.0250	mg/L	1	24-Dec-2019 16:30
SUBCONTRACT ANALYSIS - TOC ANALYSIS								Analyst: SUBK
	Method:NA							
Subcontract Analysis	See Attached		0	0		NA	1	03-Jan-2020 18:34

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Weekly Samples
 Sample ID: LH18/24-SP650_122319_BIX
 Collection Date: 23-Dec-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19121315
 Lab ID:HS19121315-02
 Matrix:Water

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	06-Jan-2020 14:07

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19121315

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R353280 (0)		Test Name : ORTHO PHOSPHATE (PO4) AS P BY E365.3			Matrix: Water	
HS19121315-01	LH18/24-SP650_122319	23 Dec 2019 14:00			24 Dec 2019 16:30	1
Batch ID: R353301 (0)		Test Name : AMMONIA AS N BY E350.3(ISE)			Matrix: Water	
HS19121315-01	LH18/24-SP650_122319	23 Dec 2019 14:00			26 Dec 2019 11:15	1
Batch ID: R353817 (0)		Test Name : SUBCONTRACT ANALYSIS - TOC ANALYSIS			Matrix: Water	
HS19121315-01	LH18/24-SP650_122319	23 Dec 2019 14:00			03 Jan 2020 18:34	1
Batch ID: R353891 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Water	
HS19121315-02	LH18/24-SP650_122319_BIX	23 Dec 2019 14:00			06 Jan 2020 14:07	1

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19121315

QC BATCH REPORT

Batch ID:	R353280 (0)	Instrument:	UV-2450	Method:	ORTHO PHOSPHATE (PO4) AS P BY E365.3					
MBLK	Sample ID: MBLK-353280	Units: mg/L		Analysis Date: 24-Dec-2019 16:30						
Client ID:	Run ID: UV-2450_353280	SeqNo: 5409919		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.0250	0.0250							U	
LCS	Sample ID: LCS-353280	Units: mg/L		Analysis Date: 24-Dec-2019 16:30						
Client ID:	Run ID: UV-2450_353280	SeqNo: 5409920		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.235	0.0250	0.25	0	94.0	85 - 115				
LCSD	Sample ID: LCSD-353280	Units: mg/L		Analysis Date: 24-Dec-2019 16:30						
Client ID:	Run ID: UV-2450_353280	SeqNo: 5409921		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.26	0.0250	0.25	0	104	85 - 115	0.235	10.1	20	
The following samples were analyzed in this batch: <input type="text" value="HS19121315-01"/>										

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19121315

QC BATCH REPORT

Batch ID: R353301 (0)		Instrument: WetChem_HS		Method: AMMONIA AS N BY E350.3(ISE)						
MBLK	Sample ID: MBLK-353301	Units: mg/L			Analysis Date: 26-Dec-2019 11:15					
Client ID:	Run ID: WetChem_HS_353301	SeqNo: 5409631			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Nitrogen, Ammonia (As N)	0.10	0.20							U	
LCS	Sample ID: LCS-353301	Units: mg/L			Analysis Date: 26-Dec-2019 11:15					
Client ID:	Run ID: WetChem_HS_353301	SeqNo: 5409632			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Nitrogen, Ammonia (As N)	9.943	0.20	10	0	99.4	80 - 120				
MS	Sample ID: HS19120987-01MS	Units: mg/L			Analysis Date: 26-Dec-2019 11:15					
Client ID:	Run ID: WetChem_HS_353301	SeqNo: 5409634			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Nitrogen, Ammonia (As N)	10.78	0.20	10	0.43	103	80 - 120				
MSD	Sample ID: HS19120987-01MSD	Units: mg/L			Analysis Date: 26-Dec-2019 11:15					
Client ID:	Run ID: WetChem_HS_353301	SeqNo: 5409635			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Nitrogen, Ammonia (As N)	10.72	0.20	10	0.43	103	80 - 120	10.78	0.586	20	

The following samples were analyzed in this batch: HS19121315-01

ALS Houston, US

Date: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19121315

**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 Quantitation 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 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: 07-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19121315

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19121315-01	LH18/24-SP650_122319	Login	12/24/2019 11:25:39 AM	PMG	WET264
HS19121315-01	LH18/24-SP650_122319	Login	12/24/2019 11:25:39 AM	PMG	WET264
HS19121315-01	LH18/24-SP650_122319	Login	12/24/2019 11:25:39 AM	PMG	Sub
HS19121315-02	LH18/24-SP650_122319_BIX	Login	12/24/2019 11:25:39 AM	PMG	Sub

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19121315

Date/Time Received: **24-Dec-2019 09:45**
 Received by: **PMG**

Checklist completed by: Paresh M. Giga 24-Dec-2019
 eSignature Date

Reviewed by: Andy C. Neir 24-Dec-2019
 eSignature Date

Matrices: **GW**

Carrier name: **FedEx**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes No Not Present
- Chain of custody present? Yes No 1 Page(s)
- Chain of custody signed when relinquished and received? Yes No COC IDs:None
- Samplers name present on COC? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s): 3.2c U/C IR25
 Cooler(s)/Kit(s): Blue
 Date/Time sample(s) sent to storage: 12/24/19 11:45

- 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:

CHAIN OF CUSTODY

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

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS			Project No. NWO1312.0150.0 16.0001			Analyses										HS19121315 Bhate Environmental Associates, Inc. Longhorn GW Treatment Plant Weekly Samples 								
Job: GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES						MS / MSD No. OF CONTAINERS	AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE											Remarks (Preservatives, etc.) Lab I.D.#			
Prepared By: Scott Beesinger			P.O. Number																					
Field Sample I.D.		Sample Matrix	Date / Time																					
LH18/24-SP650_122319		Water	12/23/19 / 14:00		3						X	X												H2SO4
LH18/24-SP650_122319		Water	12/23/19 / 14:00		1								X											NONE
LH18/24-SP650_122319_BIX		Water	12/23/19 / 14:00		1									X										NONE
Additional Remarks: Standard TAT on all parameters																								
Relinquished By: <i>Scott Beesinger</i>			Date 12/23/19		Time 14:30		Received By: <i>[Signature]</i>			Date 12/24/19		Time 09:47		Relinquished By:			Date		Time					
Received At Lab By:			Date		Time		Airbill No.			Opened By:			Date		Time		Temp of Container		Seal No.		Condition			
Remarks:																								

*Blac ulc
3-20
#25
CIF 0.0*

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CUSTODY SEAL		Seal Broken By: <i>SM</i>
	Date: <i>12/23/19</i>	Time: <i>1:50</i>	Date: <i>12/24/19</i>
	Name: <i>Scott Besinger</i>		Company: <i>SGRA</i>

Blue DEC 24 2019



Must Deliver Next Business Day
Time and Temperature Sensitive!

Blue

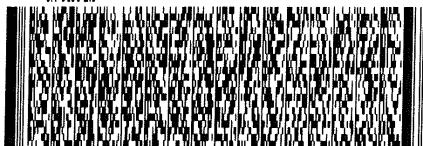
ORIGIN ID:SGRA (903) 930-6193
 SCOTT BESINGER
 BHATE ENVIRONMENTAL ASSOCIATES
 1203-B EAST GRAND AVE. PMB202
 MARSHALL, TX 75670
 UNITED STATES US

SHIP DATE: 02DEC19
 ACTWGT: 1.00 LB MAN
 CAD: 300130/CAFE3211
 DIMS: 25x14x14 IN

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099

(281) 630-6666
 REF: LHAAP-18/24-BO 68900-RJ

RMA: ||| ||| |||



FedEx Express

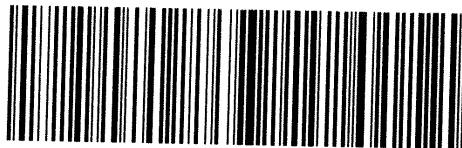


FedEx
 TRK# 1251 0292 4200

TUE - 24 DEC 10:30A
 PRIORITY OVERNIGHT

AB SGRA

77099
 TX-US IAH





ALS Environmental
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www.alsglobal.com

January 03, 2020

Analytical Report for Service Request No: K1912105

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

RE: HS19121315

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory December 27, 2019
For your reference, these analyses have been assigned our service request number **K1912105**.

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy
Project Manager



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Acronyms

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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/analyte is offered by that state.



Case Narrative

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



Client: ALS Environmental - US
Project: HS19121315
Sample Matrix: Water

Service Request: K1912105
Date Received: 12/27/2019

CASE NARRATIVE

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

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 12/27/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by

Kelley Avejoy

Date

01/03/2020



Chain of Custody

ALS Environmental—Kelso Laboratory
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Phone (360)577- 7222 Fax (360)636- 1068
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K1912105



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Houston, TX 77099
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F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: Dept of Defense

COC ID: 12959

SUBCONTRACT TO:

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

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19121315
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19121315-01	LH18/24-SP650_122319	Water	23 Dec 2019 14:00
TOC Analysis for DOD Level IV			03 Jan 2020

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. M. [Signature]
Received By: [Signature]
Cooler ID(s): _____

Date/Time: 12/26/19 18:00
Date/Time: 12/27/19 0900
Temperature(s): _____

RIGHT SOLUTIONS | RIGHT PARTNER



PC KL

Cooler Receipt and Preservation Form

Client ALS Houston Service Request K19 12105

Received: 12/27/19 Opened: 12/27/19 By: CG Unloaded: 12/27/19 By: CG

- 1. Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered
- 2. Samples were received in: (circle) Cooler Box Envelope Other NA
- 3. Were custody seals on coolers? NA Y N If yes, how many and where? 7 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	Tracking Number	NA	Filed
-0.8	-0.6	0.0	+0.2	+0.2	401	12959 ^{12/27} NA	1251 0293 1933		

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____

RUSH

Page of



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
Project: HS19121315
Sample Matrix: Water
Analysis Method: SM 5310 C
Prep Method: None

Service Request: K1912105
Date Collected: 12/23/19
Date Received: 12/27/19
Units: mg/L
Basis: NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_122319	K1912105-001	2.46	0.50	0.20	0.07	1	01/01/20 06:47	
Method Blank	K1912105-MB	ND U	0.50	0.20	0.07	1	01/01/20 06:18	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19121315
Sample Matrix: Water

Service Request: K1912105
Date Collected: 12/23/19
Date Received: 12/27/19
Date Analyzed: 01/01/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name: LH18/24-SP650_122319
Lab Code: K1912105-001

Units: mg/L
Basis: NA

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>LOQ</u>	<u>LOD</u>	<u>MDL</u>	<u>Sample Result</u>	<u>Duplicate Sample K1912105-001DUP Result</u>	<u>Average</u>	<u>RPD</u>	<u>RPD Limit</u>
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	2.46	2.33	2.39	5	10

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

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

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

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19121315
Sample Matrix: Water

Service Request: K1912105
Date Collected: 12/23/19
Date Received: 12/27/19
Date Analyzed: 01/1/20
Date Extracted: NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name: LH18/24-SP650_122319
Lab Code: K1912105-001
Analysis Method: SM 5310 C
Prep Method: None

Units: mg/L
Basis: NA

Matrix Spike
K1912105-001MS

<u>Analyte Name</u>	<u>Sample Result</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Carbon, Total Organic	2.46	28.1	25.0	103	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
Project: HS19121315
Sample Matrix: Water

Service Request: K1912105
Date Analyzed: 01/01/20
Date Extracted: NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method: SM 5310 C
Prep Method: None

Units: mg/L
Basis: NA
Analysis Lot: 665303

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1912105-LCS	25.1	25.0	100	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19121315

Service Request: K1912105

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C

Units: mg/L

	Analysis		Date	True	Measured	Percent	Acceptance
	Lot	Lab Code	Analyzed	Value	Value	Recovery	Limits
CCV1	665303	KQ1919247-01	01/01/20 05:48	25.0	24.0	96	90-110
CCV2	665303	KQ1919247-02	01/01/20 10:04	25.0	24.0	96	90-110
CCV3	665303	KQ1919247-03	01/01/20 15:01	25.0	23.7	95	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19121315

Service Request: K1912105

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	665303	KQ1919247-04	01/01/20 06:03	0.50	0.20	0.07	ND	U
CCB2	665303	KQ1919247-05	01/01/20 10:19	0.50	0.20	0.07	ND	U
CCB3	665303	KQ1919247-06	01/01/20 15:15	0.50	0.20	0.07	ND	U



Raw Data

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General Chemistry

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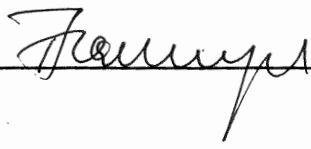
Work Request # ^{Original} () K1911934, 11980, 11981, 11995, 11998, 12042, 11912, 11968, 12074, 12105, 12140, 11963
 Tier: I I I I I I I I I I I I I I I
 Date Analyzed: 12/31/19 TOC: 665302,
665303
 Analyst: BCP Run # DOC: 665304
 Analysis: TOC/DOC

**DATA QUALITY REPORT
INORGANICS**

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

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

COMMENTS: K1911934-2/2d report a high %RSD. However, these samples are less than 5x the MRL.
K1912042-5/5d report a high %RSD due to suspected non-homogenous sample.
K1911998-3 sent for RA due to being over diluted.

Final Approved by:  Date: 01/03/20 DQREPORT

Analytical Results Summary


Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 665302 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
K1911934-002	Carbon, Total Organic	N/A		Drinking Water	0.80 mg/L	10 mL	0.80 mg/L	1	0.07	0.50			1/1/20 04:24:00	N	I
K1911980-001	Carbon, Total Organic	N/A		Water	3.94 mg/L	10 mL	3.94 mg/L	1	0.07	0.50			1/1/20 04:52:00	N	II
K1911981-001	Carbon, Total Organic	N/A		Water	3.51 mg/L	10 mL	3.51 mg/L	1	0.07	0.50			1/1/20 05:20:00	N	II
K1911995-001	Carbon, Total Organic	N/A		Water	2.19 mg/L	10 mL	2.19 mg/L	1	0.07	0.50			12/31/19 21:48:00	N	IV
K1911998-001	Carbon, Total Organic	N/A		Ground Water	2.96 mg/L	10 mL	2.96 mg/L	1	0.07	0.50			12/31/19 22:45:00	N	IV
K1911998-002	Carbon, Total Organic	N/A		Ground Water	0.92 mg/L	10 mL	92 mg/L	100	7	50			12/31/19 23:14:00	N	IV
K1911998-003	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	500 mg/L U	1000	70	500			12/31/19 23:42:00	N	IV
K1911998-004	Carbon, Total Organic	N/A		Ground Water	9.94 mg/L	10 mL	9.94 mg/L	1	0.07	0.50			1/1/20 00:10:00	N	IV
K1911998-005	Carbon, Total Organic	N/A		Ground Water	2.54 mg/L	10 mL	127 mg/L	50	4	25			1/1/20 01:07:00	N	IV
K1911998-006	Carbon, Total Organic	N/A		Ground Water	1.75 mg/L	10 mL	1.75 mg/L	1	0.07	0.50			1/1/20 01:35:00	N	IV
K1912042-001	Carbon, Total Organic	N/A		Ground Water	4.44 mg/L	10 mL	4.44 mg/L	1	0.07	0.50			1/1/20 02:03:00	N	IV
K1912042-002	Carbon, Total Organic	N/A		Ground Water	4.10 mg/L	10 mL	4.10 mg/L	1	0.07	0.50			1/1/20 02:32:00	N	IV
K1912042-003	Carbon, Total Organic	N/A		Ground Water	13.05 mg/L	10 mL	13.1 mg/L	1	0.07	0.50			1/1/20 03:00:00	N	IV
K1912042-004	Carbon, Total Organic	N/A		Ground Water	13.77 mg/L	10 mL	13.8 mg/L	1	0.07	0.50			1/1/20 03:28:00	N	IV
K1912042-005	Carbon, Total Organic	N/A		Ground Water	3.48 mg/L	10 mL	3.48 mg/L	1	0.07	0.50			1/1/20 03:56:00	N	IV
KQ1919248-01	Carbon, Total Organic	CCV		Water	23.98 mg/L	10 mL	24.0 mg/L	1					12/31/19 20:35:00	N	IV
KQ1919248-02	Carbon, Total Organic	CCV		Water	25.08 mg/L	10 mL	25.1 mg/L	1					1/1/20 00:38:00	N	IV
KQ1919248-03	Carbon, Total Organic	CCV		Water	24.03 mg/L	10 mL	24.0 mg/L	1					1/1/20 05:48:00	N	IV
KQ1919248-04	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			12/31/19 20:49:00	N	IV
KQ1919248-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/1/20 00:53:00	N	IV
KQ1919248-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/1/20 06:03:00	N	IV
KQ1919248-07	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			12/31/19 21:04:00	N	IV
KQ1919248-08	Carbon, Total Organic	LCS		Water	25.12 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		12/31/19 21:19:00	N	IV
KQ1919248-09	Carbon, Total Organic	MS	K1911995-001	Water	28.29 mg/L	10 mL	28.3 mg/L	1	0.07	0.50	104		12/31/19 22:16:00	N	IV
KQ1919248-10	Carbon, Total Organic	DUP	K1911934-002	Drinking Water	0.63 mg/L	10 mL	0.63 mg/L	1	0.07	0.50		23*	1/1/20 04:24:00	N	I
KQ1919248-11	Carbon, Total Organic	DUP	K1911980-001	Water	3.92 mg/L	10 mL	3.92 mg/L	1	0.07	0.50		<1	1/1/20 04:52:00	N	II
KQ1919248-12	Carbon, Total Organic	DUP	K1911981-001	Water	3.50 mg/L	10 mL	3.50 mg/L	1	0.07	0.50		<1	1/1/20 05:20:00	N	II
KQ1919248-13	Carbon, Total Organic	DUP	K1911995-001	Water	2.23 mg/L	10 mL	2.23 mg/L	1	0.07	0.50		2	12/31/19 21:48:00	N	IV
KQ1919248-14	Carbon, Total Organic	DUP	K1911998-002	Ground Water	0.88 mg/L	10 mL	88 mg/L	100	7	50		5	12/31/19 23:14:00	N	IV

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

01/03/20


Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 665302 Method/Testcode: SM 5310 C/TOC T

<u>Lab Code</u>	<u>Target Analytes</u>	<u>QC</u>	<u>Parent Sample</u>	<u>Matrix</u>	<u>Raw Result</u>	<u>Sample Amt.</u>	<u>Final Result</u>	<u>Dil</u>	<u>MDL</u>	<u>PQL</u>	<u>% Rec</u>	<u>% RSD</u>	<u>Date Analyzed</u>	<u>QC?</u>	<u>Tier</u>
KQ1919248-15	Carbon, Total Organic	DUP	K1911998-001	Ground Water	2.86 mg/L	10 mL	2.86 mg/L	1	0.07	0.50		3	12/31/19 22:45:00	N	IV
KQ1919248-16	Carbon, Total Organic	DUP	K1911998-003	Ground Water	0.00 mg/L	10 mL	500 mg/L U 1000		70	500		NC	12/31/19 23:42:00	N	IV
KQ1919248-17	Carbon, Total Organic	DUP	K1911998-004	Ground Water	9.77 mg/L	10 mL	9.77 mg/L	1	0.07	0.50		2	1/1/20 00:10:00	N	IV
KQ1919248-18	Carbon, Total Organic	DUP	K1911998-005	Ground Water	2.50 mg/L	10 mL	125 mg/L	50	4	25		2	1/1/20 01:07:00	N	IV
KQ1919248-19	Carbon, Total Organic	DUP	K1911998-006	Ground Water	1.77 mg/L	10 mL	1.77 mg/L	1	0.07	0.50		1	1/1/20 01:35:00	N	IV
KQ1919248-20	Carbon, Total Organic	DUP	K1912042-002	Ground Water	4.01 mg/L	10 mL	4.01 mg/L	1	0.07	0.50		2	1/1/20 02:32:00	N	IV
KQ1919248-21	Carbon, Total Organic	DUP	K1912042-001	Ground Water	4.41 mg/L	10 mL	4.41 mg/L	1	0.07	0.50		<1	1/1/20 02:03:00	N	IV
KQ1919248-22	Carbon, Total Organic	DUP	K1912042-003	Ground Water	13.43 mg/L	10 mL	13.4 mg/L	1	0.07	0.50		3	1/1/20 03:00:00	N	IV
KQ1919248-23	Carbon, Total Organic	DUP	K1912042-004	Ground Water	14.50 mg/L	10 mL	14.5 mg/L	1	0.07	0.50		5	1/1/20 03:28:00	N	IV
KQ1919248-24	Carbon, Total Organic	DUP	K1912042-005	Ground Water	3.01 mg/L	10 mL	3.01 mg/L	1	0.07	0.50		14*	1/1/20 03:56:00	N	IV

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

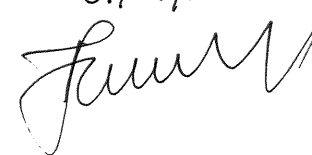
Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 665303 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
K1911912-001	Carbon, Total Organic	N/A		Water	1.32 mg/L	10 mL	1.32 mg/L	1	0.07	0.50			1/1/20 07:44:00	N	II
K1911912-002	Carbon, Total Organic	N/A		Water	0.42 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/1/20 08:12:00	N	II
K1911912-003	Carbon, Total Organic	N/A		Water	0.62 mg/L	10 mL	0.62 mg/L	1	0.07	0.50			1/1/20 08:40:00	N	II
K1911912-004	Carbon, Total Organic	N/A		Water	0.35 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/1/20 09:08:00	N	II
K1911968-004	Carbon, Total Organic	N/A		Water	1.15 mg/L	10 mL	1.15 mg/L	1	0.07	0.50			1/1/20 09:36:00	N	IV
K1911968-005	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/1/20 10:34:00	N	IV
K1912074-003	Carbon, Total Organic	N/A		Water	7.12 mg/L	10 mL	7.12 mg/L	1	0.07	0.50			1/1/20 11:02:00	N	II
K1912105-001	Carbon, Total Organic	N/A		Water	2.46 mg/L	10 mL	2.46 mg/L	1	0.07	0.50			1/1/20 06:47:00	N	IV
K1912140-001	Carbon, Total Organic	N/A		Water	7.36 mg/L	10 mL	7.36 mg/L	1	0.07	0.50			1/1/20 11:30:00	N	II
KQ1919247-01	Carbon, Total Organic	CCV		Water	24.03 mg/L	10 mL	24.0 mg/L	1					1/1/20 05:48:00	N	IV
KQ1919247-02	Carbon, Total Organic	CCV		Water	23.99 mg/L	10 mL	24.0 mg/L	1					1/1/20 10:04:00	N	IV
KQ1919247-03	Carbon, Total Organic	CCV		Water	23.70 mg/L	10 mL	23.7 mg/L	1					1/1/20 15:01:00	N	IV
KQ1919247-04	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/1/20 06:03:00	N	IV
KQ1919247-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/1/20 10:19:00	N	IV
KQ1919247-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/1/20 15:15:00	N	IV
KQ1919247-07	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			1/1/20 06:18:00	N	IV
KQ1919247-08	Carbon, Total Organic	LCS		Water	25.08 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		1/1/20 06:32:00	N	IV
KQ1919247-09	Carbon, Total Organic	MS	K1912105-001	Water	28.13 mg/L	10 mL	28.1 mg/L	1	0.07	0.50	103		1/1/20 07:15:00	N	IV
KQ1919247-10	Carbon, Total Organic	DUP	K1911912-001	Water	1.28 mg/L	10 mL	1.28 mg/L	1	0.07	0.50		3	1/1/20 07:44:00	N	II
KQ1919247-11	Carbon, Total Organic	DUP	K1911912-002	Water	0.40 mg/L	10 mL	0.40 mg/L J	1	0.07	0.50		NC	1/1/20 08:12:00	N	II
KQ1919247-12	Carbon, Total Organic	DUP	K1911912-003	Water	0.63 mg/L	10 mL	0.63 mg/L	1	0.07	0.50		2	1/1/20 08:40:00	N	II
KQ1919247-13	Carbon, Total Organic	DUP	K1911912-004	Water	0.35 mg/L	10 mL	0.35 mg/L J	1	0.07	0.50		NC	1/1/20 09:08:00	N	II
KQ1919247-14	Carbon, Total Organic	DUP	K1911968-004	Water	1.21 mg/L	10 mL	1.21 mg/L	1	0.07	0.50		5	1/1/20 09:36:00	N	IV
KQ1919247-15	Carbon, Total Organic	DUP	K1911968-005	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	1/1/20 10:34:00	N	IV
KQ1919247-16	Carbon, Total Organic	DUP	K1912074-003	Water	7.18 mg/L	10 mL	7.18 mg/L	1	0.07	0.50		<1	1/1/20 11:02:00	N	II
KQ1919247-17	Carbon, Total Organic	DUP	K1912105-001	Water	2.33 mg/L	10 mL	2.33 mg/L	1	0.07	0.50		5	1/1/20 06:47:00	N	IV
KQ1919247-18	Carbon, Total Organic	DUP	K1912140-001	Water	7.35 mg/L	10 mL	7.35 mg/L	1	0.07	0.50		<1	1/1/20 11:30:00	N	II

01/03/20


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: 665304 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
K1911963-001	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.40 mg/L	10 mL	2.40 mg/L	1	0.07	0.50			1/1/20 12:13:00	N	II
K1911963-002	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.38 mg/L	10 mL	2.38 mg/L	1	0.07	0.50			1/1/20 12:41:00	N	II
K1911963-003	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	0.51 mg/L	10 mL	0.51 mg/L	1	0.07	0.50			1/1/20 13:09:00	N	II
K1911963-004	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.57 mg/L	10 mL	1.57 mg/L	1	0.07	0.50			1/1/20 13:37:00	N	II
K1911963-005	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.50 mg/L	10 mL	1.50 mg/L	1	0.07	0.50			1/1/20 14:05:00	N	II
K1911963-006	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.96 mg/L	10 mL	1.96 mg/L	1	0.07	0.50			1/1/20 14:33:00	N	II
K1911963-007	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.14 mg/L	10 mL	2.14 mg/L	1	0.07	0.50			1/1/20 16:00:00	N	II
K1911963-008	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.92 mg/L	10 mL	1.92 mg/L	1	0.07	0.50			1/1/20 16:28:00	N	II
K1911963-009	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.95 mg/L	10 mL	1.95 mg/L	1	0.07	0.50			1/1/20 16:56:00	N	II
K1911963-010	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.04 mg/L	10 mL	2.04 mg/L	1	0.07	0.50			1/1/20 17:25:00	N	II
K1911963-011	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	1.93 mg/L	10 mL	1.93 mg/L	1	0.07	0.50			1/1/20 17:53:00	N	II
K1911963-012	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	0.46 mg/L	10 mL	0.46 mg/L	J 1	0.07	0.50			1/1/20 18:21:00	N	II
KQ1919246-01	Carbon, Dissolved Organic (DOC)	MS	K1911963-012	Surface Water	27.18 mg/L	10 mL	27.2 mg/L	1	0.07	0.50	107		1/1/20 18:49:00	N	II
KQ1919246-02	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	23.99 mg/L	10 mL	24.0 mg/L	1					1/1/20 10:04:00	N	II
KQ1919246-03	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	23.70 mg/L	10 mL	23.7 mg/L	1					1/1/20 15:01:00	N	II
KQ1919246-04	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	23.80 mg/L	10 mL	23.8 mg/L	1					1/1/20 19:32:00	N	II
KQ1919246-05	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			1/1/20 10:19:00	N	II
KQ1919246-06	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			1/1/20 15:15:00	N	II
KQ1919246-07	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			1/1/20 19:46:00	N	II
KQ1919246-08	Carbon, Dissolved Organic (DOC)	MB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			1/1/20 15:30:00	N	II
KQ1919246-09	Carbon, Dissolved Organic (DOC)	LCS		Surface Water	24.87 mg/L	10 mL	24.9 mg/L	1	0.07	0.50	99		1/1/20 15:45:00	N	II
KQ1919246-10	Carbon, Dissolved Organic (DOC)	DUP	K1911963-001	Surface Water	2.35 mg/L	10 mL	2.35 mg/L	1	0.07	0.50		2	1/1/20 12:13:00	N	II
KQ1919246-11	Carbon, Dissolved Organic (DOC)	DUP	K1911963-002	Surface Water	2.35 mg/L	10 mL	2.35 mg/L	1	0.07	0.50		1	1/1/20 12:41:00	N	II

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

01/03/20
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Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 665304 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
KQ1919246-12	Carbon, Dissolved Organic (DOC)	DUP	K1911963-003	Surface Water	0.51 mg/L	10 mL	0.51 mg/L	1	0.07	0.50		1	1/1/20 13:09:00	N	II
KQ1919246-13	Carbon, Dissolved Organic (DOC)	DUP	K1911963-004	Surface Water	1.53 mg/L	10 mL	1.53 mg/L	1	0.07	0.50		3	1/1/20 13:37:00	N	II
KQ1919246-14	Carbon, Dissolved Organic (DOC)	DUP	K1911963-005	Surface Water	1.40 mg/L	10 mL	1.40 mg/L	1	0.07	0.50		7	1/1/20 14:05:00	N	II
KQ1919246-15	Carbon, Dissolved Organic (DOC)	DUP	K1911963-006	Surface Water	1.93 mg/L	10 mL	1.93 mg/L	1	0.07	0.50		1	1/1/20 14:33:00	N	II
KQ1919246-16	Carbon, Dissolved Organic (DOC)	DUP	K1911963-007	Surface Water	2.00 mg/L	10 mL	2.00 mg/L	1	0.07	0.50		6	1/1/20 16:00:00	N	II
KQ1919246-17	Carbon, Dissolved Organic (DOC)	DUP	K1911963-008	Surface Water	1.89 mg/L	10 mL	1.89 mg/L	1	0.07	0.50		2	1/1/20 16:28:00	N	II
KQ1919246-18	Carbon, Dissolved Organic (DOC)	DUP	K1911963-009	Surface Water	1.82 mg/L	10 mL	1.82 mg/L	1	0.07	0.50		7	1/1/20 16:56:00	N	II
KQ1919246-19	Carbon, Dissolved Organic (DOC)	DUP	K1911963-010	Surface Water	1.90 mg/L	10 mL	1.90 mg/L	1	0.07	0.50		7	1/1/20 17:25:00	N	II
KQ1919246-20	Carbon, Dissolved Organic (DOC)	DUP	K1911963-011	Surface Water	1.88 mg/L	10 mL	1.88 mg/L	1	0.07	0.50		2	1/1/20 17:53:00	N	II
KQ1919246-21	Carbon, Dissolved Organic (DOC)	DUP	K1911963-012	Surface Water	0.46 mg/L	10 mL	0.46 mg/L	J 1	0.07	0.50		<1	1/1/20 18:21:00	N	II

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

TOC: 665302,
665303
DOC: 665304

Schedule: Daily Run Method 010711

Version: 80

Instrument: Fusion1

Last Saved by: Fusion1 (Fusion1)

Last Saved on: 2019/12/31 16:45 - Tuesday

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)	10	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	K1911995-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1911995-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
5	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K1911998-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1911998-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K1911998-003.01 1000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1911998-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1911998-005.01 50x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1911998-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1912042-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1912042-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1912042-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1912042-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1912042-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1911934-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1911980-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1911981-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
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	K1912105-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1912105-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
23	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
24	Sample	K1911912-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1911912-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1911912-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1911912-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1911968-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1911968-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1912074-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K1912140-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	FB 12/20/19 1501	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
33	Sample	K1911963-001.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K1911963-002.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K1911963-003.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1911963-004.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1911963-005.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K1911963-006.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

Printed on: January 3, 2020 09:21:40

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Schedule: Daily Run Method 010711

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	K1911963-007.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K1911963-008.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K1911963-009.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	K1911963-010.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	K1911963-011.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K1911963-012.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K1911963-012.01 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
47	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 - Daily Run Method 010711

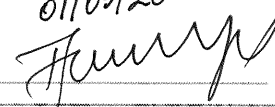
Tuesday, December 31, 2019 04:35 PM

(View - Repts, Unused Repts, Meta-Data, Signature, History)
Printed on 2020/01/03 09:21 -
Friday

Report Summary Information

Company Location: Gen Chem Lab
 Schedule Name: Daily Run Method 010711 Engine 1.1.5.1
 Version:
 Instrument Name: Fusion1 Firmware 1.2.0696
 Version:
 Report Version: 1 of 1 Connection: RS232 COM1
 Report Creation by Fusion1 (Fusion1) (v79)
 Operators (schedule Fusion1 (Fusion1) (v80)
 version):
 Comment:

Report Results

01/03/20


Sample Type: Clean From Schedule Version 79

Pos	Analysis Type	Sample ID	Start Time
◆ (clean)		Clean	2019/12/31 16:35

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.71	19.28	5.58	49.47	05:23
2	TC Clean	14.29	17.33	3.04	50.01	04:04
3	TC Clean	2.88	6.69	3.81	49.97	03:47
4	TC Clean	2.31	6.12	3.80	50.02	03:53

Sample Type: Clean From Schedule Version 80

Pos	Analysis Type	Sample ID	Start Time
◆ (clean)		Clean	2019/12/31 16:57

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.21	5.09	3.88	49.61	05:24
2	TC Clean	5.91	9.66	3.76	50.10	04:01
3	TC Clean	2.51	6.24	3.73	50.04	03:45
4	TC Clean	2.01	5.82	3.81	49.94	03:47

Sample Type: Clean							From Schedule Version 80	
Pos	Analysis Type	Sample ID			Start Time			
◆ (clean)		Clean			2019/12/31 17:19			
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time		
1	IC Clean	1.28	5.01	3.73	49.37	05:20		
2	TC Clean	6.29	10.12	3.84	50.05	04:01		
3	TC Clean	2.28	6.27	3.99	50.05	03:44		
4	TC Clean	2.20	5.97	3.77	50.08	03:46		

Sample Type: Blank (Creating v1333)							From Schedule Version 80	
Pos	Analysis Type	Sample ID			Start Time			
◆ (blank)		Reagent/Acid Blank			2019/12/31 17:40			
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time		
1	IC Clean	1.32	5.05	3.72	49.64	05:13		
2	TC Clean	5.58	9.42	3.84	49.99	04:01		
3	TC Clean	2.53	6.30	3.78	50.09	03:47		
4	TC Clean	2.36	6.26	3.90	49.92	03:51		
5	Reagent Blank	4.25	8.29	4.04	50.14	05:02		
6	Acid Blank	1.36	5.20	3.84	49.53	05:26		

Sample Type: Sample							From Schedule Version 80	
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
◆ D	TOC	RB	0.0441 ppm	0.1394 ppm	316.2300%	2019/12/31 18:14		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4407	4.4075	11.79	15.74	3.95	50.07	10:28
2	TOC	0.0000	0.0000	7.58	11.48	3.89	50.07	10:27
3	TOC	0.0000	0.0000	6.95	10.79	3.84	50.09	10:25
4	TOC	0.0000	0.0000	7.18	11.14	3.96	50.11	10:27
5	TOC	0.0000	0.0000	6.53	10.27	3.73	50.09	10:27
6	TOC	0.0000	0.0000	6.62	10.19	3.57	50.12	10:27
7	TOC	0.0000	0.0000	6.43	10.02	3.58	50.08	10:26

8	TOC	0.0000	0.0000	6.52	10.04	3.52	50.11	10:28
9	TOC	0.0000	0.0000	6.12	9.81	3.70	50.09	10:29
10	TOC	0.0000	0.0000	6.26	10.07	3.82	50.10	10:30
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.9773 ppm (PASS)	0.0000 ppm	0%	2019/12/31 20:35	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9773	239.7730	172.22	176.04	3.82	50.08	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 80

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%	2019/12/31 20:49	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.78	10.54	3.76	50.08	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 80

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
♦ 1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/12/31 21:04		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.94	9.79	3.85	50.09	10:33
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		

Sample Type: Check Standard --> LCS											From Schedule Version 80
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)	25.1165 ppm (PASS)	0.0000 ppm	0%	2019/12/31 21:19	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time	
C	TOC	25.0 ppm	1	25.1165	251.1653	179.95	183.84	3.89	50.07	10:33	
Completion State		Success Action		Method		Calibration		STD Conc - Pos C			
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		25 ppmC			

Sample Type: Sample											From Schedule Version 80
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time					
♦	2	TOC	ICS	0.0636 ppm	0.0000 ppm	0.0000%	2019/12/31 21:34				
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time			
1	TOC	0.0636	0.6361	9.23	13.06	3.83	50.09	10:34			
Dilution		Blank Contribution		Method		Calibration					
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)					
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time					
♦	3	TOC	K1911995-001.01	2.2088 ppm	0.0314 ppm	1.4200%	2019/12/31 21:48				
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time			
1	TOC	2.1866	21.8664	23.64	27.48	3.83	50.06	10:27			
2	TOC	2.2310	22.3098	23.94	27.71	3.76	50.06	10:26			
Dilution		Blank Contribution		Method		Calibration					
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)					
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time					
♦	4	TOC	K1911995-001.01 ms	28.2887 ppm	0.0000 ppm	0.0000%	2019/12/31 22:16				
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time			
1	TOC	28.2887	282.8866	200.82	204.62	3.80	50.05	10:33			
Dilution		Blank Contribution		Method		Calibration					
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)					
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time					

◆	5	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/12/31 22:31
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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.43	11.35	3.92	50.02	10:32

Dilution 1:10 **Blank Contribution** (TC) 8.7992 (IC) (v1333) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	6	TOC	K1911998-001.01	2.9073 ppm	0.0683 ppm	2.3500%	2019/12/31 22:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9556	29.5565	28.86	32.62	3.76	50.06	10:29
2	TOC	2.8590	28.5901	28.21	31.99	3.78	50.04	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7992 (IC) (v1333) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	7	TOC	K1911998-002.01 100x	0.8965 ppm	0.0303 ppm	3.3800%	2019/12/31 23:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9179	9.1792	15.03	18.91	3.88	50.07	10:27
2	TOC	0.8750	8.7505	14.74	18.37	3.63	50.05	10:29

Dilution 1:10 **Blank Contribution** (TC) 8.7992 (IC) (v1333) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	8	TOC	K1911998-003.01 1000x	0.0000 ppm	0.0000 ppm	0.0000%	2019/12/31 23:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.30	12.03	3.73	50.06	10:27
2	TOC	0.0000	0.0000	7.79	11.74	3.94	50.07	10:28

Dilution 1:10 **Blank Contribution** (TC) 8.7992 (IC) (v1333) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	9	TOC	K1911998-004.01	9.8591 ppm	0.1210 ppm	1.2300%	2020/01/01 00:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.9447	99.4466	76.30	80.14	3.84	50.03	10:31
2	TOC	9.7735	97.7347	75.14	79.02	3.87	50.08	10:29

Dilution **Blank Contribution** **Method** **Calibration**

1:10 (TC) 8.7992 (IC) CAS_salt_010711 CAS_salt_010711
(v1333) (v4) (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.0809 ppm (PASS)	0.0000 ppm	0%	2020/01/01 00:38

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.0809	250.8088	179.71	183.63	3.92	50.04	10:34

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

Sample Type: Check Standard --> CCB

From Schedule Version 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/01 00:53

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.54	11.40	3.87	50.02	10:29

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

Sample Type: Sample

From Schedule Version 80

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 10	TOC	K1911998-005.01 50x	2.5177 ppm	0.0309 ppm	1.2300%	2020/01/01 01:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5396	25.3962	26.04	29.64	3.60	50.04	10:30
2	TOC	2.4959	24.9586	25.74	29.62	3.88	50.03	10:27

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 11	TOC	K1911998-006.01	1.7592 ppm	0.0168 ppm	0.9500%	2020/01/01 01:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7473	17.4733	20.66	24.42	3.76	50.04	10:29
2	TOC	1.7710	17.7105	20.82	24.62	3.79	50.03	10:26

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
12	TOC	K1912042-001.01	4.4235 ppm	0.0222 ppm	0.5000%	2020/01/01 02:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.4392	44.3916	38.93	42.78	3.85	50.07	10:30
2	TOC	4.4078	44.0778	38.72	42.49	3.77	50.03	10:26

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
13	TOC	K1912042-002.01	4.0549 ppm	0.0614 ppm	1.5100%	2020/01/01 02:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.0983	40.9826	36.62	40.28	3.66	50.04	10:28
2	TOC	4.0115	40.1149	36.03	39.76	3.73	50.02	10:28

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
14	TOC	K1912042-003.01	13.2410 ppm	0.2666 ppm	2.0100%	2020/01/01 03:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.0525	130.5252	97.40	101.21	3.82	50.04	10:26
2	TOC	13.4295	134.2952	99.96	103.63	3.67	50.04	10:26

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
15	TOC	K1912042-004.01	14.1339 ppm	0.5156 ppm	3.6500%	2020/01/01 03:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.7692	137.6924	102.26	106.01	3.75	50.01	10:24
2	TOC	14.4985	144.9847	107.21	111.01	3.80	50.04	10:25

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC)
Method CAS_salt_010711
Calibration CAS_salt_010711

(v1333)

(v4)

(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
16	TOC	K1912042-005.01	3.2440 ppm	0.3311 ppm	10.2100%	2020/01/01 03:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.4780	34.7804	32.41	36.29	3.88	50.01	10:27
2	TOC	3.0099	30.0986	29.23	33.20	3.97	50.04	10:25

Dilution

1:10

Blank Contribution(TC) 8.7992 (IC)
(v1333)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
17	TOC	K1911934-002.01	0.7151 ppm	0.1165 ppm	16.2900%	2020/01/01 04:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7974	7.9741	14.21	17.98	3.77	50.03	10:28
2	TOC	0.6327	6.3270	13.09	16.84	3.74	50.02	10:29

Dilution

1:10

Blank Contribution(TC) 8.7992 (IC)
(v1333)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
18	TOC	K1911980-001.01	3.9289 ppm	0.0122 ppm	0.3100%	2020/01/01 04:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9375	39.3754	35.53	39.23	3.70	50.03	10:28
2	TOC	3.9203	39.2030	35.41	39.09	3.68	50.03	10:25

Dilution

1:10

Blank Contribution(TC) 8.7992 (IC)
(v1333)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
19	TOC	K1911981-001.01	3.5048 ppm	0.0034 ppm	0.1000%	2020/01/01 05:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5072	35.0721	32.61	36.21	3.61	50.02	10:30
2	TOC	3.5024	35.0235	32.57	36.34	3.77	50.01	10:27

Dilution

1:10

Blank Contribution(TC) 8.7992 (IC)
(v1333)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)**Sample Type:** Check Standard --> CCV 25 ppm

From Schedule Version 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
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♦	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.0346 ppm (PASS)	0.0000 ppm	0%	2020/01/01 05:48
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0346	240.3461	172.61	176.27	3.66	50.03	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 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
♦	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/01 06:03
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.34	9.85	3.50	50.01	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 80

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
♦	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/01 06:18	
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.53	9.23	3.70	50.02	10:30
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		

Sample Type: Check Standard --> LCS From Schedule Version 80

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)	25.0849 ppm (PASS)	0.0000 ppm	0%	2020/01/01 06:32
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.0849	250.8486	179.74	183.47	3.74	50.04	10:29

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

Sample Type: Sample

From Schedule Version 80

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
21	TOC	K1912105-001.01	2.3905 ppm	0.0923 ppm	3.8600%	2020/01/01 06:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4558	24.5579	25.47	29.13	3.66	50.00	10:28
2	TOC	2.3253	23.2526	24.58	28.29	3.70	50.01	10:27

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7992 (IC) (v1333)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
22	TOC	K1912105-001.01 ms	28.1332 ppm	0.0000 ppm	0.0000%	2020/01/01 07:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.1332	281.3324	199.77	203.34	3.58	50.01	10:31

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7992 (IC) (v1333)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
23	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/01 07:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.30	10.96	3.66	50.03	10:31

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7992 (IC) (v1333)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
24	TOC	K1911912-001.01	1.3018 ppm	0.0289 ppm	2.2200%	2020/01/01 07:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3222	13.2216	17.77	21.47	3.70	50.03	10:28
2	TOC	1.2814	12.8135	17.50	21.26	3.76	50.02	10:25

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7992 (IC) (v1333)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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

♦	25	TOC	K1911912-002.01	0.4133 ppm	0.0138 ppm	3.3300%	2020/01/01 08:12
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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4231	4.2307	11.67	15.28	3.60	50.04	10:26
2	TOC	0.4036	4.0362	11.54	15.27	3.73	50.03	10:27

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
♦	26	TOC	K1911912-003.01	0.6258 ppm	0.0079 ppm	1.2700%	2020/01/01 08:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6202	6.2018	13.01	16.67	3.66	50.04	10:28
2	TOC	0.6314	6.3138	13.08	16.79	3.70	50.02	10:27

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
♦	27	TOC	K1911912-004.01	0.3476 ppm	0.0006 ppm	0.1800%	2020/01/01 09:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3481	3.4808	11.16	14.86	3.70	50.03	10:26
2	TOC	0.3472	3.4720	11.16	14.61	3.45	50.01	10:28

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
♦	28	TOC	K1911968-004.01	1.1812 ppm	0.0446 ppm	3.7700%	2020/01/01 09:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1497	11.4965	16.60	20.31	3.71	50.03	10:30
2	TOC	1.2127	12.1270	17.03	20.61	3.57	50.02	10:25

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦	B	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.9870 ppm (PASS)	0.0000 ppm	0%	2020/01/01 10:04

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9870	239.8703	172.28	176.01	3.73	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 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
◊ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/01 10:19	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.23	10.09	3.86	50.04	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 80

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
◊ 29	TOC	K1911968-005.01	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/01 10:34		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.30	10.10	3.80	50.04	10:30
2	TOC	0.0000	0.0000	6.26	9.91	3.66	50.05	10:26
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
◊ 30	TOC	K1912074-003.01	7.1478 ppm	0.0402 ppm	0.5600%	2020/01/01 11:02		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.1194	71.1935	57.12	60.83	3.70	50.03	10:28
2	TOC	7.1762	71.7622	57.51	61.16	3.65	50.03	10:27
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
◊ 31	TOC	K1912140-001.01	7.3546 ppm	0.0080 ppm	0.1100%	2020/01/01 11:30		

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.3602	73.6022	58.76	62.25	3.49	50.02	10:30
2	TOC	7.3489	73.4888	58.68	62.37	3.69	50.03	10:25

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
32	TOC	FB 12/20/19 1501	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/01 11:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.83	10.55	3.72	50.02	10:31

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
33	TOC	K1911963-001.01 doc	2.3762 ppm	0.0331 ppm	1.3900%	2020/01/01 12:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3997	23.9966	25.09	28.67	3.58	50.02	10:25
2	TOC	2.3528	23.5281	24.77	28.44	3.67	50.03	10:29

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
34	TOC	K1911963-002.01 doc	2.3673 ppm	0.0236 ppm	1.0000%	2020/01/01 12:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3840	23.8405	24.98	28.84	3.86	50.04	10:27
2	TOC	2.3506	23.5060	24.76	28.37	3.61	50.03	10:25

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
35	TOC	K1911963-003.01 doc	0.5096 ppm	0.0047 ppm	0.9200%	2020/01/01 13:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5063	5.0630	12.24	16.00	3.76	50.02	10:29
2	TOC	0.5129	5.1293	12.28	15.83	3.55	50.02	10:24

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
36	TOC	K1911963-004.01 doc	1.5474 ppm	0.0310 ppm	2.0100%	2020/01/01 13:37		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5694	15.6937	19.45	23.25	3.80	50.02	10:26
2	TOC	1.5255	15.2546	19.15	22.81	3.66	50.03	10:29
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
37	TOC	K1911963-005.01 doc	1.4530 ppm	0.0733 ppm	5.0500%	2020/01/01 14:05		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5048	15.0484	19.01	22.69	3.68	50.05	10:30
2	TOC	1.4011	14.0113	18.31	22.18	3.87	50.03	10:24
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
38	TOC	K1911963-006.01 doc	1.9425 ppm	0.0184 ppm	0.9500%	2020/01/01 14:33		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9555	19.5549	22.07	25.96	3.89	50.07	10:27
2	TOC	1.9294	19.2942	21.90	25.73	3.84	50.03	10:25
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.6980 ppm (PASS)	0.0000 ppm	0%	2020/01/01 15:01	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6980	236.9798	170.32	174.08	3.75	50.05	10:32
<u>Completion State</u>		<u>Success Action</u>		<u>Method</u>	<u>Calibration</u>		<u>STD Conc - Pos B</u>			
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)		50 ppmC			

Sample Type: Check Standard --> CCB

From Schedule Version 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/01 15:15

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.31	10.01	3.71	50.03	10:29

Completion State

Success - Criteria met.

Success Action

Do Nothing

Method

CAS_salt_010711 (v4)

Calibration

CAS_salt_010711 (v30)

STD Conc - Pos D

0 ppmC

Sample Type: Sample

From Schedule Version 80

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/01 15:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.21	9.12	3.91	50.03	10:33

Dilution

1:10

Blank Contribution

(TC) 8.7992 (IC) (v1333)

Method

CAS_salt_010711 (v4)

Calibration

CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS

From Schedule Version 80

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)	24.8695 ppm (PASS)	0.0000 ppm	0%	2020/01/01 15:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.8695	248.6947	178.28	182.07	3.80	50.03	10:31

Completion State

Success - Criteria met.

Success Action

Do Nothing

Method

CAS_salt_010711 (v4)

Calibration

CAS_salt_010711 (v30)

STD Conc - Pos C

25 ppmC

Sample Type: Sample

From Schedule Version 80

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	40	TOC	K1911963-007.01 doc	2.0700 ppm	0.0933 ppm	4.5100%	2020/01/01 16:00

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

1	TOC	2.1360	21.3596	23.30	27.18	3.88	50.03	10:29
2	TOC	2.0040	20.0396	22.40	26.30	3.90	50.06	10:29

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
41	TOC	K1911963-008.01 doc	1.9025 ppm	0.0215 ppm	1.1300%	2020/01/01 16:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9176	19.1763	21.82	25.60	3.79	50.04	10:30
2	TOC	1.8873	18.8728	21.61	25.29	3.68	50.05	10:26

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
42	TOC	K1911963-009.01 doc	1.8852 ppm	0.0954 ppm	5.0600%	2020/01/01 16:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9527	19.5269	22.05	25.78	3.72	50.07	10:27
2	TOC	1.8177	18.1775	21.14	24.92	3.79	50.08	10:30

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
43	TOC	K1911963-010.01 doc	1.9715 ppm	0.0951 ppm	4.8200%	2020/01/01 17:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0387	20.3873	22.64	26.35	3.71	50.05	10:24
2	TOC	1.9042	19.0422	21.72	25.60	3.87	50.04	10:27

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
44	TOC	K1911963-011.01 doc	1.9039 ppm	0.0315 ppm	1.6500%	2020/01/01 17:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9262	19.2617	21.87	25.48	3.60	50.05	10:29
2	TOC	1.8817	18.8168	21.57	25.40	3.83	50.04	10:26

Dilution 1:10
Blank Contribution (TC) 8.7992 (IC) (v1333)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
45	TOC	K1911963-012.01 doc	0.4572 ppm	0.0020 ppm	0.4300%	2020/01/01 18:21		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4558	4.5577	11.89	15.63	3.73	50.04	10:26
2	TOC	0.4586	4.5857	11.91	15.54	3.63	50.04	10:28
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
46	TOC	K1911963-012.01 ms doc	27.1795 ppm	0.0000 ppm	0.0000%	2020/01/01 18:49		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.1795	271.7949	193.29	197.03	3.73	50.05	10:29
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
47	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/01 19:03		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.24	10.00	3.76	50.05	10:28
2	TOC	0.0000	0.0000	6.14	9.84	3.70	50.05	10:30
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7992 (IC) (v1333)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 80

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.7970 ppm (PASS)	0.0000 ppm	0%	2020/01/01 19:32	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.7970	237.9698	170.99	174.59	3.59	50.06	10:29
<u>Completion State</u>		<u>Success Action</u>		<u>Method</u>	<u>Calibration</u>		<u>STD Conc - Pos B</u>			
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)		50 ppmC			

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/01 19:46

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.81	9.46	3.65	50.06	10:35

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

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1332	6.2033	2.5850	0.0000	0.0000	0.0000	2019/12/27 19:09	Fusion1 (Fusion1)
v1333	1.4150	1.3570	0.0000	0.0000	0.0000	2019/12/31 18:14	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v30
 Calibration curve formula: TOC: $y = 6.788x + 9.463$
 Ver Creation: 2019/03/05 17:42
 r^2 value: TOC: $r^2 = 0.99963$
 Comment:
 Operator: Fusion1 (Fusion1)
 Basic Analysis Type: TOC

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)			
Version:	v4	Operator:	Fusion1 (Fusion1)
Ver Creation:	2019/02/21 17:57		
Comment:			
Parameter	Value	Advanced Parameter	Value
SampleVolume	10.0 mL	NeedleRinseVolume	5.0 ml
Dilution	1:10	VialPrimeVolume	2.0 ml
AcidVolume	0.5 ml	ICSamplePrimeVolume	2.0 ml
ReagentVolume	2.0 ml	ICSpurgeRinseVolume	12.0 ml
UVReactorPrerinse	Off	BaselineStabilizeTime	0.70 min
UVReactorPrerinseVolume	5.0	DetectorPressureFlow	150 ml/min
NumberOfUVReactorPrerinses	1	SyringeSpeedWaste	10
ICSpurgeTime	1.00 mins	SyringeSpeedAcid	7
DetectorSweepFlow	500 ml/min	SyringeSpeedReagent	7
PreSpurgeTime	2.00 mins	SyringeSpeedDIWater	7
SystemFlow	500 ml/min	NDIRPressurization	60 psig
		SyringeSpeedSampleDispense	5
		SyringeSpeedSampleAspirate	4
		SyringeSpeedUVDispense	5
		SyringeSpeedUVAspirate	5
		SyringeSpeedICDispense	5
		SyringeSpeedICAspirate	5
		NDIRPressureStabilize	1.75 min
		SampleMixing	Off
		SampleMixingCycles	1
		SampleMixingVolume	10.0
		LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date

1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2020/01/01 20:01
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ALS Environmental

StarLIMS Run: 665302, 665303, 665304
 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-05-83H

21 % H3PO4: 11-GEN-05-83I

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By: <i>Bob</i>	Date Analyzed: <i>12/31/19</i>
Reviewed By: <i>[Signature]</i>	Date Reviewed: <i>12/01/03/20</i>

JH



Case Narrative

Method: 6850

Analysis: Perchlorate

Analysis SOP: LC-MS-CLO4

ALS WO ID(s): 1935912; 1935913; 1935914;
1935915; 1936106

Client: ALS Laboratories (Houston, TX)

Matrix: Water

ELMS Batch (HBN): 2336 (254688)

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

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ¹⁸O 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 ¹⁸O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 690689) was less than 1/2 the CRDL. The recovery for the LCS (690686) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on samples 1935915002/03 and 1935915007/08 (Client ID's: C09_121719 and MW18_121719). 3.0 μ L of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3. μ g/L. The MS/MSD (1935912002/03) failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected. The relative percent difference (RPD) failed acceptance criteria for MS/MSD 1935915007/08.

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

NC/CAR(s): NA

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

where: A = Analyte concentration from the standard curve (μ g/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 – 690687) is reported from the analysis of the Laboratory Control Sample (LCS – 690686) at a level of 3.0 μ g/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).

Thomas Bosch January 06, 2020
Analyst Date



ANALYTICAL REPORT

Report Date: January 06, 2020

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

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1936106**

Project ID: HS19121315

Purchase Order: HS19121315

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
HS19121315-02	1936106001	12/23/19	12/27/19	HS19121315

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ANALYTICAL REPORT

Workorder: **34-1936106**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: HS19121315-02	Sampling Site: HS19121315	Collected: 12/23/2019				
Lab ID: 1936106001	Media: 125 mL Nalgene	Received: 12/27/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2336 (HBN: 254688) Analyzed: 01/02/2020 17:50	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	6.7	1.0	2.0	4.0	1	

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 254688)

Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. 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 01/03/2020 13:16	/S/ Stephen Brose 01/06/2020 10:58

Laboratory Contact Information

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

Phone: (801) 266-7700
Email: als@alst.com
Web: www.alst.com



ANALYTICAL REPORT

Workorder: 34-1936106

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.pjlab.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlab.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.pjlab.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlab.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: 1936106
Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2336 (HBN: 254688)
Analyzed By: Thomas Bosch

Blank

LMB: 690689 Analyzed: 01/02/2020 13:54 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 690686 Analyzed: 01/02/2020 13:26 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.19	3.00	106	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1935915001 Analyzed: 01/02/2020 14:49 Dilution: 1 Units: ug/L		MS: 1935915002 Analyzed: 01/02/2020 15:03 Dilution: 1 Units: ug/L				MSD: 1935915003 Analyzed: 01/02/2020 15:17 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	1.50	4.34	3	# 145	78.8 123.8	3.81	# 127	13	0.0 20.0
Sample: 1935915006 Analyzed: 01/02/2020 15:59 Dilution: 1 Units: ug/L		MS: 1935915007 Analyzed: 01/02/2020 16:27 Dilution: 1 Units: ug/L				MSD: 1935915008 Analyzed: 01/02/2020 16:41 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	2.46	3	81.9	78.8 123.8	3.35	112	# 30.7	0.0 20.0

Comments

Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

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

Analyt	Peer Review
/S/ Thomas Bosch 01/06/2020 08:23	/S/ Stephen Brose 01/06/2020 10:58

Symbols and Definitions

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

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



1936 106



18698/5

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1936102

Subcontract Chain of Custody

SAMPLING STATE: Dept of Defense

COC ID: 12960

SUBCONTRACT TO:

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

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19121315
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS19121315-02	LH18/24-SP650_122319_BIX	Water	23 Dec 2019 14:00
	SUB_Perch-6850			03 Jan 2020

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. M. MURPHY
Received By: [Signature]
Cooler ID(s): N/A

Date/Time: 12/26/19 18:00
Date/Time: 12/27/19 09:38
Temperature(s): 2

ALS GLOBAL | 10450 STANCLIFF RD, HOUSTON, TX 77099



ALS Environmental CHAIN-OF-CUSTODY

Project / Job / Task: HS19121315		Split:		Workorder ID: 1936106		Level: ENV_LVL4		Requested Analysis															
Client: ALS Environmental (Houston)				Account: 8101				Type: 125Poly		EPA 6850, DxD GSM													
Comments:												Preservatives		Containers									
		COOL																					
								</															

**ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)
COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)**

Client Name: <u>ALS Houston</u>		Project/Task/Site: <u>12960</u>							
Date/Time of Receipt: <u>12/27/19 0939</u>		Number of Coolers Received: <u>1</u>							
Condition of Coolers: <u>Acceptable</u> /Unacceptable		Temperature Control: <u>Present</u> /Not Included							
Cooler Custody Seals: <u>Present</u> /Absent/NA		Location Temp Taken: <u>Control</u> /Between Samples							
Container Custody Seals: <u>Intact</u> /Broken/NA		Are all temperatures within project specific guidelines? Yes/No/ <u>NA</u>							
Ice Present: <u>Present</u> / Absent /NA		VOA Headspace Present? Yes/No/ <u>NA</u>							
Intact/Broken/ <u>NA</u>									
<u>Yes</u> /No/NA									
<u>Frozen</u> /Melted/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.	
	<u>Good</u>	<u>2</u> °C	4		°C	7		°C	
		°C	5		°C	8		°C	
		°C	6		°C	9		°C	
Taken By: <u>[Signature]</u>		Signature		<u>Rebecca Wise</u>		Printed Name		<u>12/27/19</u>	
								Date	

CLIENT-RELATED INFORMATION

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

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES NO

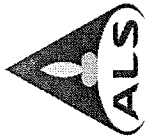
Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ Returned to Sample Receipt by: _____ Date: _____

Printed Name Signature



Batch Worklist

HBN: 254688

Instrument: WP

Created: 1/2/2020 13:05

Batch: ELMS/ 2336



Status: WP

Analyst: T. Bosch

Rule: EPA 6850, DoD QSM Water

- Workorder: 1935912 [ENV_LVL4]
- Workorder: 1935913 [ENV_LVL4]
- Workorder: 1935914 [ENV_LVL4]
- Workorder: 1935915 [ENV_LVL4]
- Workorder: 1936106 [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	690685	CCV for HBN 254688 [ELMS/2336]				CCV	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	
2	690686	LCS for HBN 254688 [ELMS/2336]				LCS	3	E6850Q413Q	E6850Q413Q	5311	1/6/2020	1/6/2020	
3	690687	RLVS for HBN 254688 [ELMS/2336]				RLVS	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	
4	690688	ICS for HBN 254688 [ELMS/2336]				ICS	3	E6850.D3Q	E6850.D3Q	5311	1/6/2020	1/6/2020	
5	690689	LMB for HBN 254688 [ELMS/2336]				LMB	3	E6850Q413Q	E6850Q413Q	5311	1/6/2020	1/6/2020	
6	1935912001	LH18/24-SP650_121719_BIX				SAMPLE	3	1935912001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
7	1935913001	LH18/24-SP140_121719				SAMPLE	3	1935913001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
8	1935914001	LH18/24-SP650_121719_BIX				SAMPLE	3	1935914001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
9	1935915001	C09_121719				SAMPLE	3	1935915001-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
10	1935915002	C09_121719MS				MS	3	1935915002-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
11	1935915003	C09_121719MSD				MSD	3	1935915003-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
12	1935915004	126_121719				SAMPLE	3	1935915004-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
13	1935915005	126_121719_a				SAMPLE	3	1935915005-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
14	1935915006	MW18_121719				SAMPLE	3	1935915006-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
15	690690	CCV for HBN 254688 [ELMS/2336]				CCV	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	
16	1935915007	MW18_121719MS				MS	3	1935915007-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
17	1935915008	MW18_121719MSD				MSD	3	1935915008-A	E6850Q413Q	5480	1/6/2020	1/6/2020	
18	1935915009	120_121719				SAMPLE	3	1935915009-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
19	1935915010	MW14_121719				SAMPLE	3	1935915010-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
20	1935915011	18CPTMW04SW_121719				SAMPLE	3	1935915011-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
21	1935915012	18CPTMW04_121719				SAMPLE	3	1935915012-A	E6850Q41.3	5480	1/14/2020	1/6/2020	
22	1936106001	HS19121315-02				SAMPLE	3	1936106001-A	E6850Q41.3	5480	1/20/2020	1/8/2020	
23	690691	CCV for HBN 254688 [ELMS/2336]				CCV	3	E685041C3Q	E685041C3Q	5311	1/6/2020	1/6/2020	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #()'s: 1935912 (001); 1935913 (001); 1935914 (001); 1935915 (001-12);
1936106 (001) ELMS Batch/HBN ID: 2336 (254688)

Prep Date: 01/02/2020 Analysis Date: 01/02/2020 Analyst: Tom Bosch

Analyte: **Perchlorate** Matrix: **Water** Method: **6850**

Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2020\JAN\02JAN20D.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 690686; Target = 3.0µg/L. ASTM type II water was used for LMB 690689.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on samples 1935915002/03 and 1935915007/08 (Client ID's: C09_121719 and MW18_121719). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L. Field samples 1935913001 and 1935915009 were analyzed and reported from 1:1,000 dilutions. Field sample 1935915010 was analyzed and reported from a 1:10,000 dilution. Field sample 1935915012 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD (1935912002/03) failed QC acceptance criteria for percent recoveries. The relative percent difference (RPD) passed acceptance criteria. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected. The relative percent difference (RPD) failed acceptance criteria for MS/MSD 1935915007/08.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2020\JAN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2020\DOD\254688-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 690687) is reported from the analysis of the Laboratory Control Sample (LCS – 690686) 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).

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	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2336 HBN: 254688</u> <u>1935915 / 1936106</u>		
Sample Set IDs if Applicable: <u>1935912 / 1935913 / 1935914</u>		
<u>Sample positions on autosampler verified against instrument sequence</u>	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



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

CERTIFICATE OF ANALYSIS



AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: Refer to SDS for complete safety information

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



Signal Word: None

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



Certificate of Analysis



ISO Guide 34 Reference Material

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



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

Product Name: Perchlorate IC Standard

Description:

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

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

Solvent: water (low TOC, < 50 ppb)

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

Traceability:

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

Estimation of Uncertainties:

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

Homogeneity:

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

Intended Use:

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

Instructions for Use:

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

Hazards:

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

Expiration of Certification:

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



ISO 9001 Registered Quality System – TUV USA

Page 1 of 2



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013

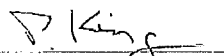
Lot Issue Date: 29-Feb 2016

Lot Number: CP-0860

Expiration Date: 31-Mar 2020

Maintenance of Certification:

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


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


Daniel J. Lamendola
Director of QA/RA



ISO 9001 Registered Quality System – TUV USA

Page 2 of 2



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

S



Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

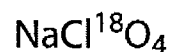
Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl^*O_4

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

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

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

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)

CIL subscribes to the following standards for different products: ISO Guide 34, ISO/IEC 17025, ISO 13485 and cGMP as appropriate.



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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	Perchlorate RT	Perchlorate Amount	
#*	690685	CCV@25	Vial 71	1	Control	1	1.55994e6	7.560	28.36838
#*	690686	QC@3.0	Vial 72	1	Control	2	1.77411e5	7.259	3.19399
#*	690688	ICS@3.0	Vial 73	1	Control	3	1.21919e5	7.244	2.98982
#*	690689	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1935912001		Vial 75	1	Sample	5	1.13186e5	7.256	1.69696
#*	1935913001	1K	Vial 76	1	Sample	6	7.50336e5	7.600	13.85381 × 1,000.
#*	1935914001		Vial 77	1	Sample	7	1.16448e5	7.271	1.93064
#*	1935915001		Vial 78	1	Sample	8	6.26357e4	7.202	1.53061
#*	1935915002	MS	Vial 79	1	Sample	9	1.67718e5	7.194	4.34105
#*	1935915003	MSD	Vial 80	1	Sample	10	1.70226e5	7.204	3.80971
#*	1935915004		Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1935915005		Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1935915006		Vial 83	1	Sample	13	0.00000	0.000	0.00000
#*	690690	CCV@25	Vial 71	1	Control	14	1.55697e6	7.430	25.18198
#*	1935915007	MS	Vial 84	1	Sample	15	1.31015e5	7.176	2.45647
#*	1935915008	MSD	Vial 85	1	Sample	16	1.32260e5	7.185	3.34662
#*	1935915009	1K	Vial 86	1	Sample	17	1.32009e6	7.615	2.26282e4
#*	1935915010	10K	Vial 87	1	Sample	18	7.68865e5	7.605	1.30447e5
#*	1935915011		Vial 88	1	Sample	19	7.20051e4	7.345	1.12833
#*	1936106001		Vial 90	1	Sample	21	3.75684e5	7.220	6.65265
#*	1935915012	10X	Vial 91	1	Sample	22	3.40719e6	7.485	516.14517
*	690691	CCV@25	Vial 71	1	Control	23	1.84092e6	7.431	26.50237

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
#*	690685	CCV@25	Vial 71	1	Control	1	1.85309e5	7.581	5.00000
#*	690686	QC@3.0	Vial 72	1	Control	2	2.04529e5	7.274	5.00000
#*	690688	ICS@3.0	Vial 73	1	Control	3	1.50034e5	7.270	5.00000
#*	690689	LMB	Vial 74	1	Control	4	1.97614e5	7.421	5.00000
#*	1935912001		Vial 75	1	Sample	5	2.41857e5	7.281	5.00000
#*	1935913001	1K	Vial 76	1	Sample	6	1.93760e5	7.618	5.00000
#*	1935914001		Vial 77	1	Sample	7	2.19726e5	7.292	5.00000
#*	1935915001		Vial 78	1	Sample	8	1.47744e5	7.212	5.00000
#*	1935915002	MS	Vial 79	1	Sample	9	1.42468e5	7.219	5.00000
#*	1935915003	MSD	Vial 80	1	Sample	10	1.64739e5	7.223	5.00000
#*	1935915004		Vial 81	1	Sample	11	8.26190e4	7.086	5.00000
#*	1935915005		Vial 82	1	Sample	12	8.16375e4	7.053	5.00000
#*	1935915006		Vial 83	1	Sample	13	1.75700e5	7.224	5.00000
#*	690690	CCV@25	Vial 71	1	Control	14	2.11105e5	7.446	5.00000
#*	1935915007	MS	Vial 84	1	Sample	15	1.95563e5	7.198	5.00000
#*	1935915008	MSD	Vial 85	1	Sample	16	1.45588e5	7.205	5.00000
#*	1935915009	1K	Vial 86	1	Sample	17	2.01300e5	7.637	5000.00000
#*	1935915010	10K	Vial 87	1	Sample	18	2.11546e5	7.628	5.00000e4
#*	1935915011		Vial 88	1	Sample	19	2.26624e5	7.350	5.00000
#*	1936106001		Vial 90	1	Sample	21	2.07387e5	7.238	5.00000
#*	1935915012	10X	Vial 91	1	Sample	22	2.02952e5	7.505	50.00000
*	690691	CCV@25	Vial 71	1	Control	23	2.35883e5	7.456	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
#*	690685	CCV@25	Vial 71	1	Control	1	4.57213e5	7.577	27.40050
#*	690686	QC@3.0	Vial 72	1	Control	2	5.95825e4	7.268	3.42868
#*	690688	ICS@3.0	Vial 73	1	Control	3	4.72946e4	7.260	3.71890
#*	690689	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1935912001		Vial 75	1	Sample	5	4.05294e4	7.272	1.91502
#*	1935913001	1K	Vial 76	1	Sample	6	2.24222e5	7.618	13.51424
#*	1935914001		Vial 77	1	Sample	7	4.06777e4	7.281	2.13096
#*	1935915001		Vial 78	1	Sample	8	2.50802e4	7.216	1.94184

Batch Report: C:\HPCHEM\1\DATA\02JAN20D\02JAN20S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
#*	1935915002	MS	Vial 79	1	Sample	9	6.04977e4	7.206	5.03782
#*	1935915003	MSD	Vial 80	1	Sample	10	6.53036e4	7.210	4.69891
#*	1935915004		Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1935915005		Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1935915006		Vial 83	1	Sample	13	0.00000	0.000	0.00000
#*	690690	CCV@25	Vial 71	1	Control	14	4.73141e5	7.448	25.10439
#*	1935915007	MS	Vial 84	1	Sample	15	4.35554e4	7.182	2.59201
#*	1935915008	MSD	Vial 85	1	Sample	16	4.64932e4	7.193	3.76884
#*	1935915009	1K	Vial 86	1	Sample	17	3.97734e5	7.628	2.23585e4
#*	1935915010	10K	Vial 87	1	Sample	18	2.35180e5	7.624	1.30045e5
#*	1935915011		Vial 88	1	Sample	19	2.59057e4	7.372	1.25727
#*	1936106001		Vial 90	1	Sample	21	1.25368e5	7.239	7.17456
#*	1935915012	10X	Vial 91	1	Sample	22	9.99390e5	7.502	502.85057
*	690691	CCV@25	Vial 71	1	Control	23	5.41119e5	7.448	25.64372

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	690685	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	690686	QC@3.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	690688	ICS@3.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	690689	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1935912001		CLO4-AQN	1	Sample	
6	Vial 76	1935913001	1K	CLO4-AQN	1	Sample	
7	Vial 77	1935914001		CLO4-AQN	1	Sample	
8	Vial 78	1935915001		CLO4-AQN	1	Sample	
9	Vial 79	1935915002	MS	CLO4-AQN	1	Sample	
10	Vial 80	1935915003	MSD	CLO4-AQN	1	Sample	
11	Vial 81	1935915004		CLO4-AQN	1	Sample	
12	Vial 82	1935915005		CLO4-AQN	1	Sample	
13	Vial 83	1935915006		CLO4-AQN	1	Sample	
14	Vial 71	690690	CCV@25	CLO4-AQN	1	Ctrl Samp	
15	Vial 84	1935915007	MS	CLO4-AQN	1	Sample	
16	Vial 85	1935915008	MSD	CLO4-AQN	1	Sample	
17	Vial 86	1935915009	1K	CLO4-AQN	1	Sample	
18	Vial 87	1935915010	10K	CLO4-AQN	1	Sample	
19	Vial 88	1935915011		CLO4-AQN	1	Sample	
20	Vial 89	1935915012	100	CLO4-AQN	1	Sample	
21	Vial 90	1936106001		CLO4-AQN	1	Sample	
22	Vial 91	1935915012	10X	CLO4-AQN	1	Sample	
23	Vial 71	690691	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND01.D

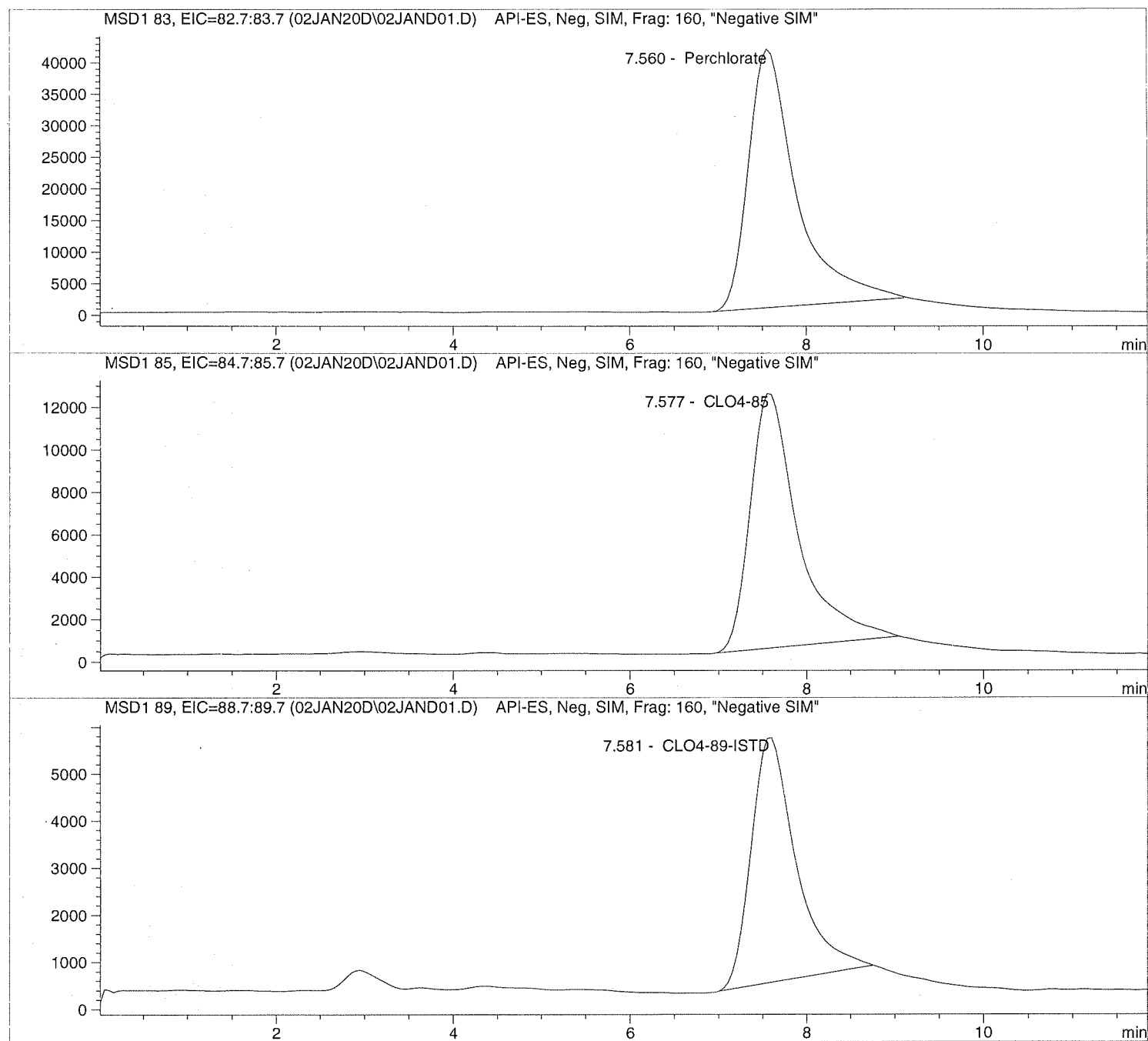
Sample Name: 690685 CCV@25

=====
Injection Date: 1/02/2020 13:11:53
Sample Name: 690685 CCV@25
Acq Operator: TNB

Seq Line: 1
Location: Vial 71
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\02JAN20D\02JAND01.D Sample Name: 690685 CCV@25

```

=====
Injection Date: 1/02/2020 13:11:53 Seq Line: 1
Sample Name: 690685 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
7.560	PBA	1559941.9	28.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.577	PBA	457213.1	27.4005	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.581	PBA	185309.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND02.D

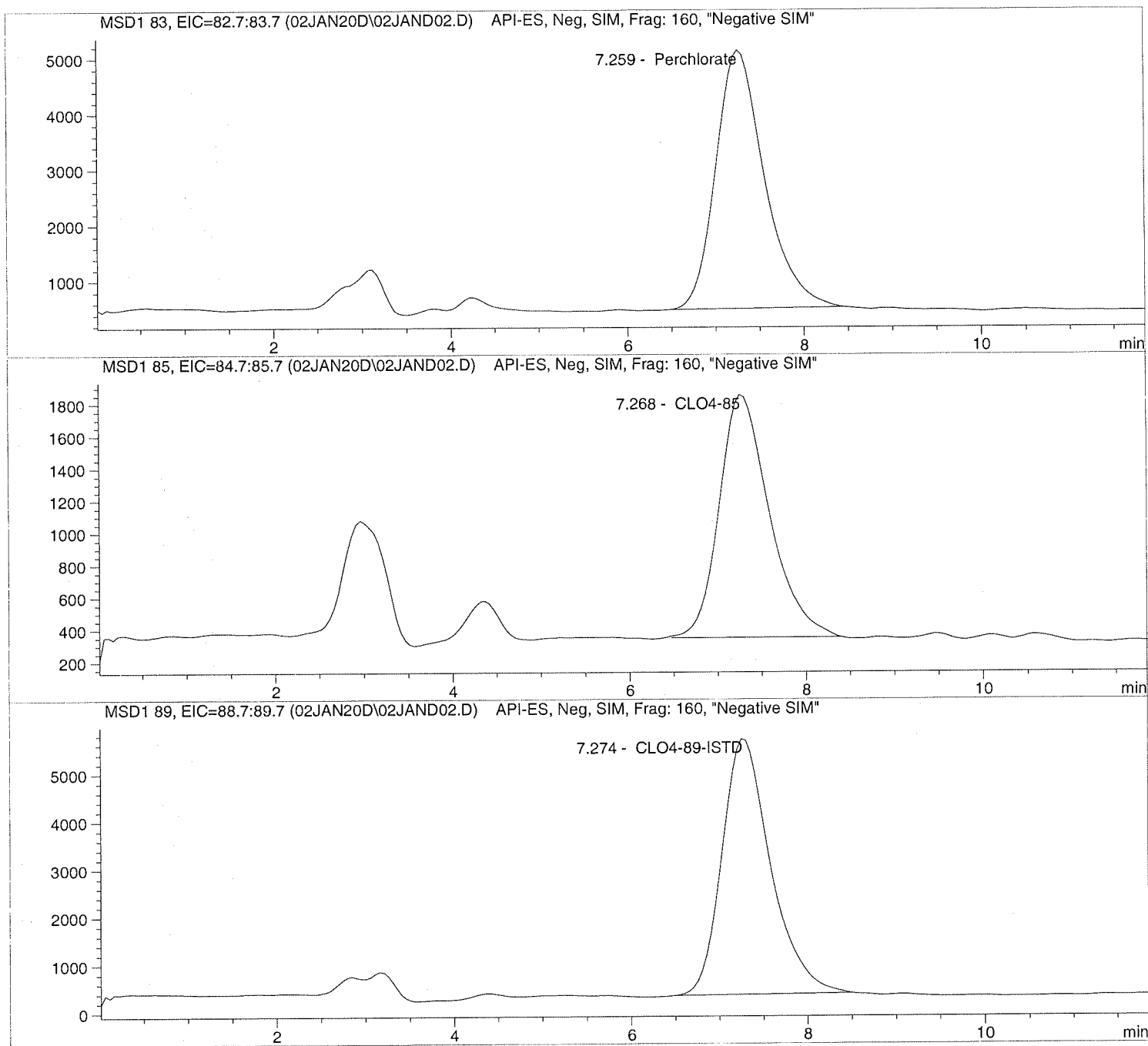
Sample Name: 690686 QC@3.0

Injection Date: 1/02/2020 13:26:12
Sample Name: 690686 QC@3.0
Acq Operator: TNB

Seq Line: 2
Location: Vial 72
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\02JAN20D\02JAND02.D Sample Name: 690686 QC@3.0

```
=====
Injection Date: 1/02/2020 13:26:12      Seq Line: 2
Sample Name: 690686 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
7.259	BBA	177410.8	3.1940	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.268	BBA	59582.5	3.4287	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.274	BBA	204529.1	5.0000	CLO4-89-ISTD

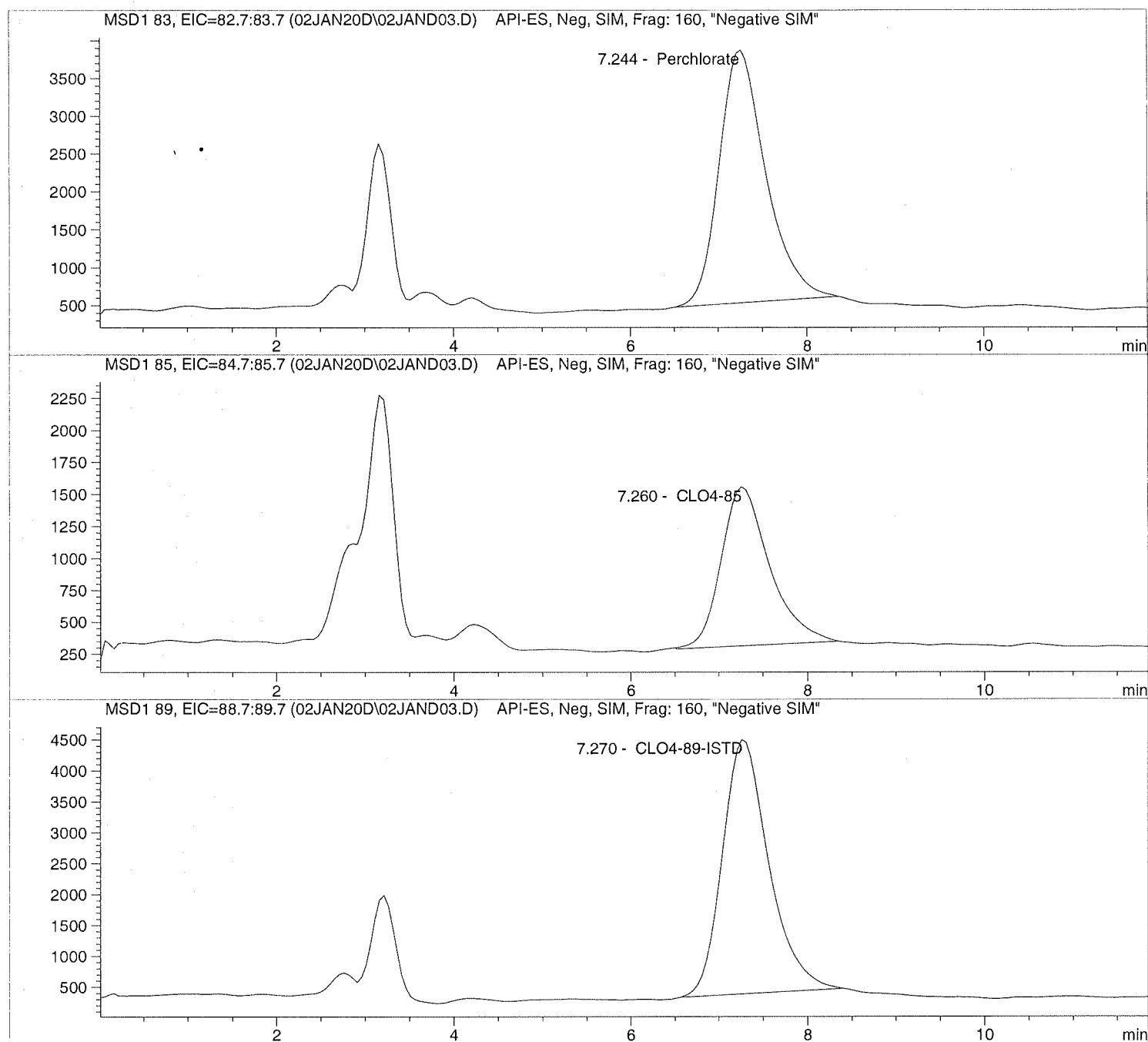
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND03.D Sample Name: 690688 ICS@3.0

```
=====
Injection Date: 1/02/2020 13:40:06      Seq Line:          3
Sample Name:    690688 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\02JAN20D\02JAND03.D Sample Name: 690688 ICS@3.0

```

=====
Injection Date: 1/02/2020 13:40:06      Seq Line: 3
Sample Name: 690688 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
7.244	BBA	121919.3	2.9898	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.260	BBA	47294.6	3.7189	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.270	PBA	150034.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND04.D

Sample Name: 690689 LMB

Injection Date: 1/02/2020 13:54:01

Seq Line: 4

Sample Name: 690689 LMB

Location: Vial 74

Acq Operator: TNB

Inj. No.: 1

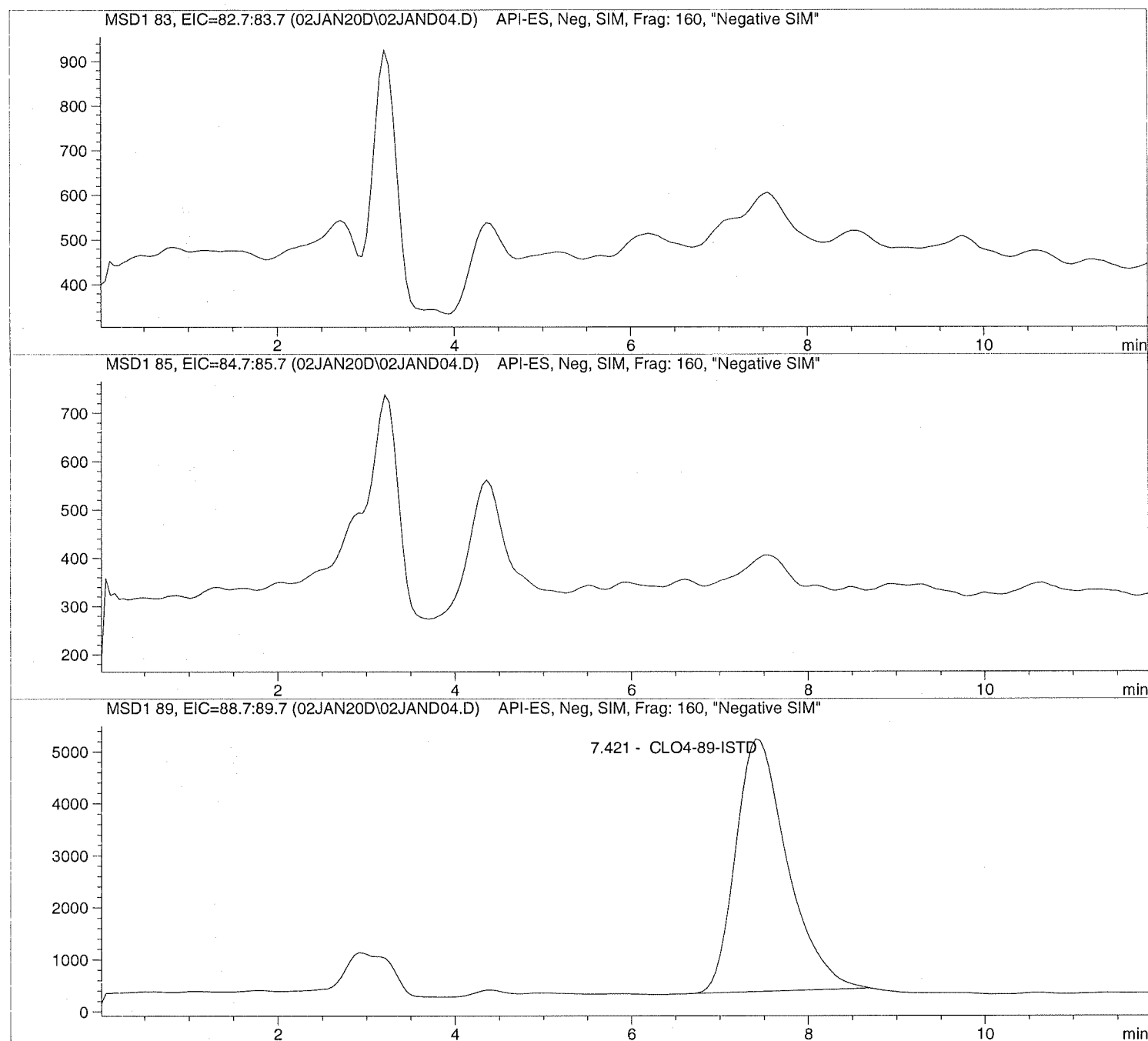
Inj. Vol.: 35 µl

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\02JAN20D\02JAND04.D Sample Name: 690689 LMB

```

=====
Injection Date: 1/02/2020 13:54:01      Seq Line: 4
Sample Name: 690689 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
7.421	PBA	197614.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND05.D

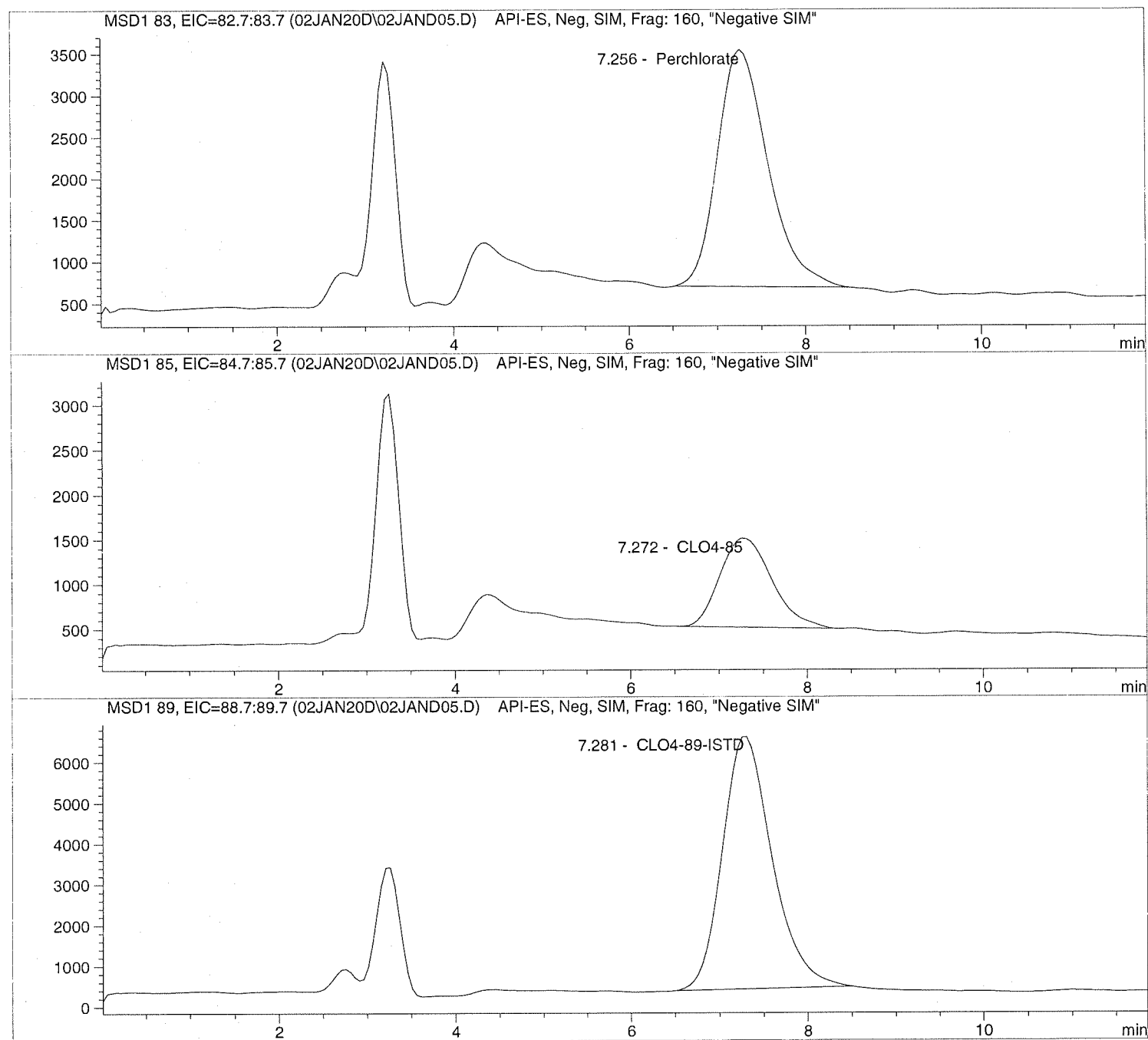
Sample Name: 1935912001

Injection Date: 1/02/2020 14:07:55
Sample Name: 1935912001
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND05.D

Sample Name: 1935912001

```

=====
Injection Date: 1/02/2020 14:07:55      Seq Line:      5
Sample Name:   1935912001              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
7.256	PBA	113185.7	1.6970	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.272	PBA	40529.4	1.9150	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.281	PBA	241856.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

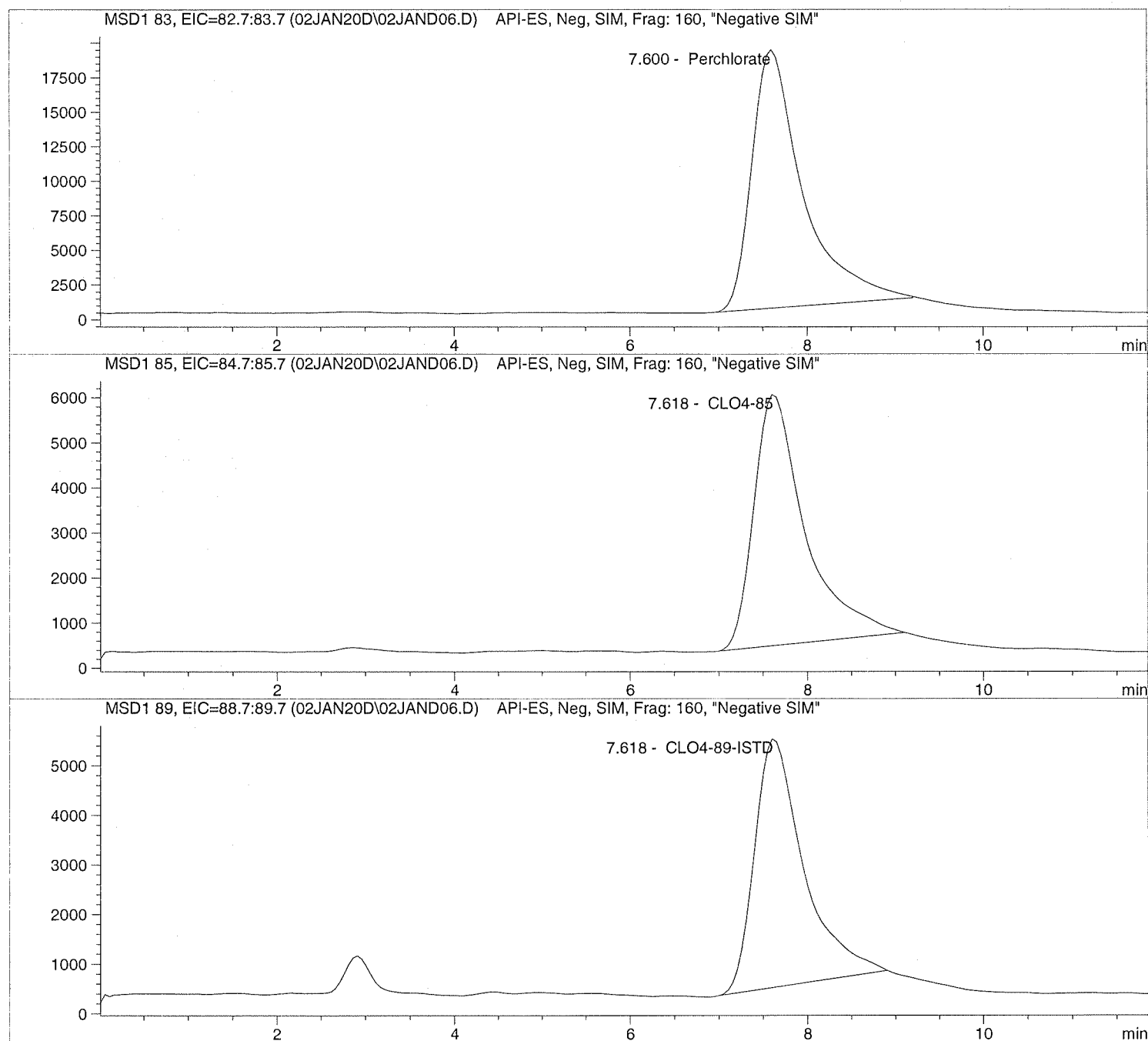
```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND06.D Sample Name: 1935913001 1K

```
=====
Injection Date: 1/02/2020 14:21:57      Seq Line: 6
Sample Name: 1935913001 1K              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\02JAN20D\02JAND06.D Sample Name: 1935913001 1K

```

=====
Injection Date: 1/02/2020 14:21:57      Seq Line:      6
Sample Name:    1935913001 1K           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
7.600	PBA	750336.3	13.8538	Perchlorate <i>Y</i> 1,000. DILUTION

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.618	PBA	224222.5	13.5142	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.618	PBA	193759.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND07.D

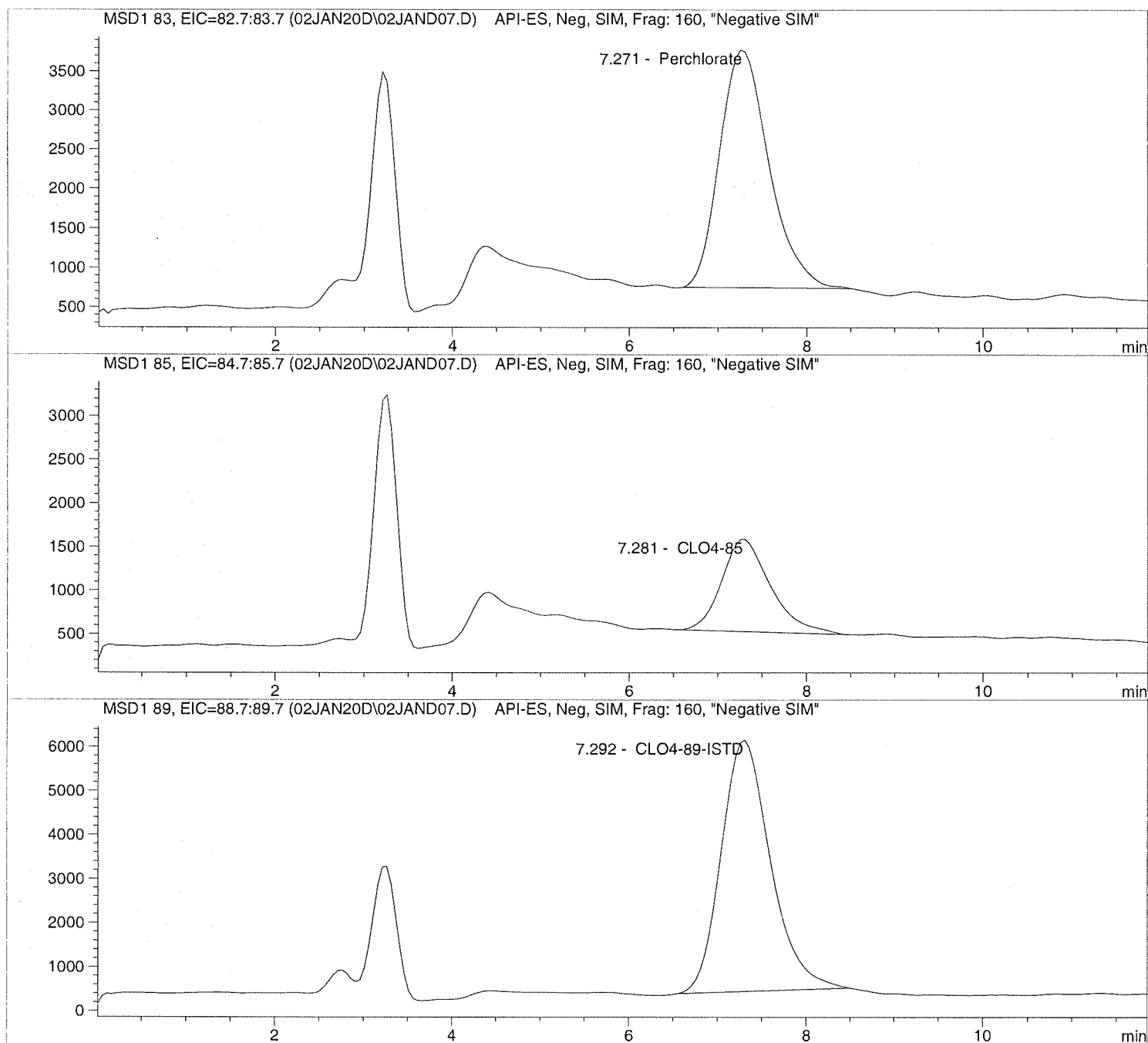
Sample Name: 1935914001

Injection Date: 1/02/2020 14:35:49
Sample Name: 1935914001
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
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\02JAN20D\02JAND07.D

Sample Name: 1935914001

```

=====
Injection Date: 1/02/2020 14:35:49      Seq Line:          7
Sample Name:   1935914001              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
7.271	PBA	116448.2	1.9306	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.281	PBA	40677.7	2.1310	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.292	PBA	219725.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND08.D

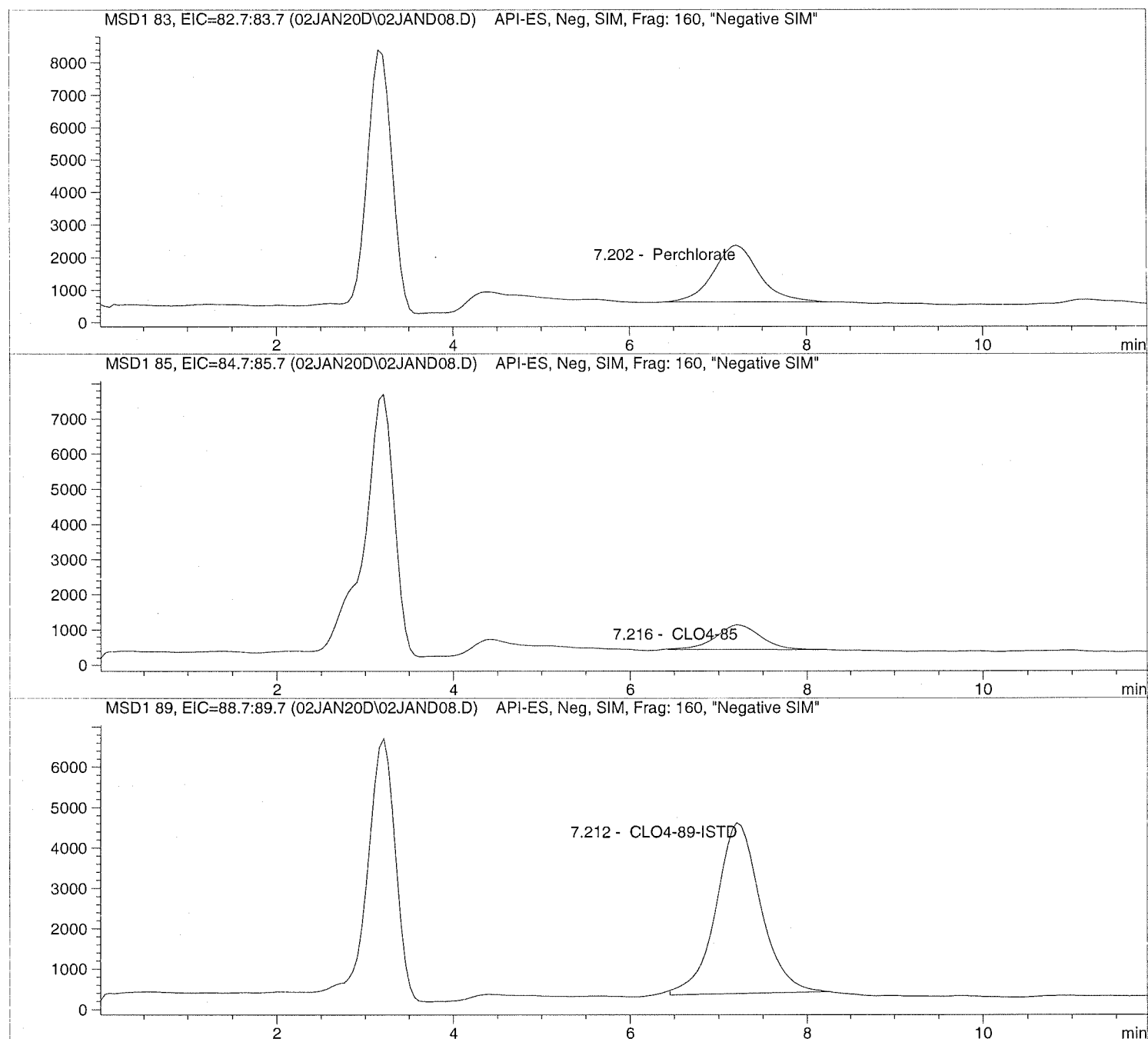
Sample Name: 1935915001

Injection Date: 1/02/2020 14:49:42
Sample Name: 1935915001
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND08.D Sample Name: 1935915001

```

=====
Injection Date: 1/02/2020 14:49:42      Seq Line:      8
Sample Name:   1935915001              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
7.202	PBA	62635.7	1.5306	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.216	BBA	25080.2	1.9418	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.212	BBA	147744.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND09.D

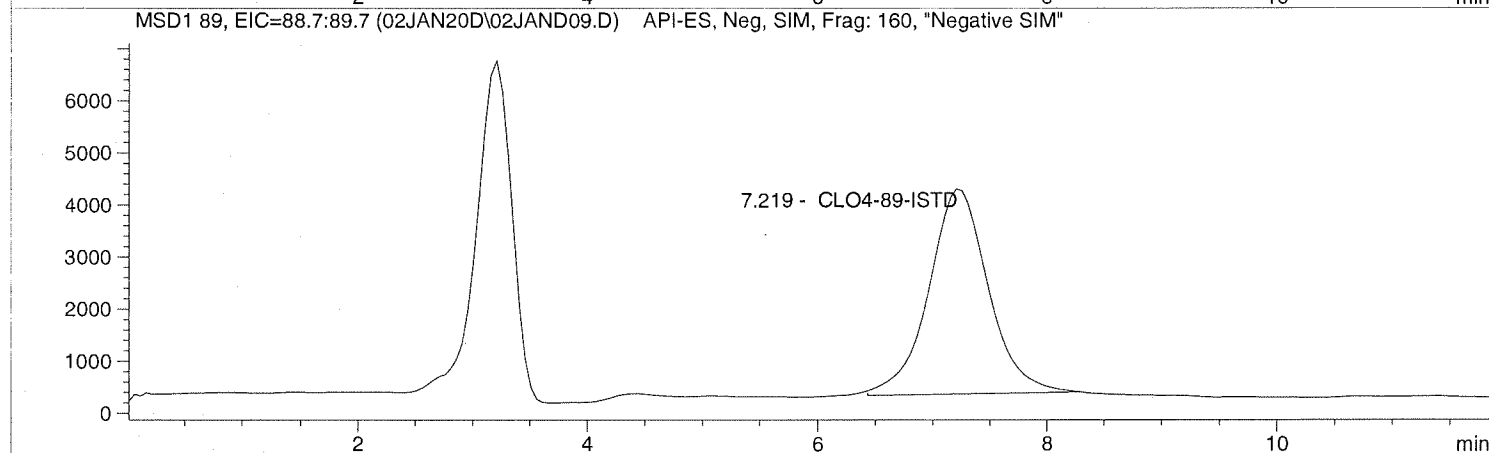
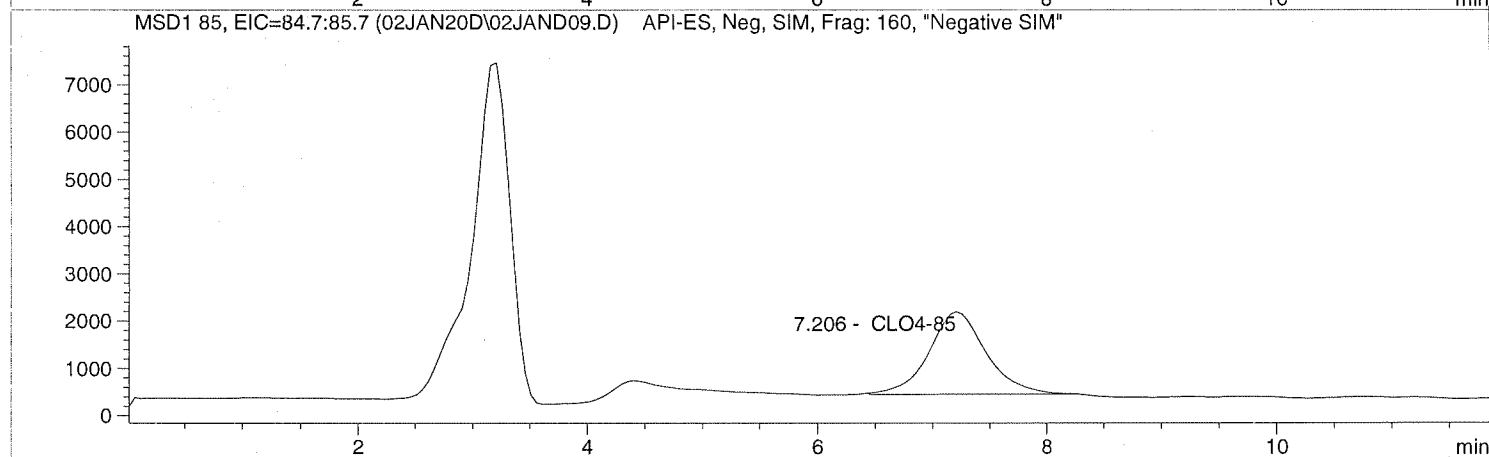
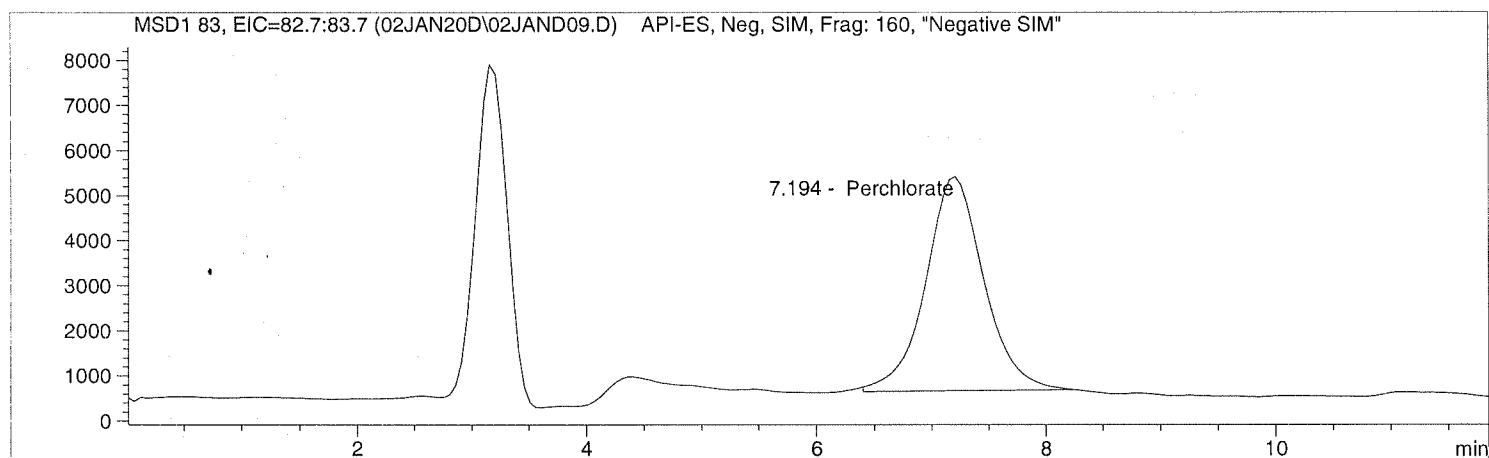
Sample Name: 1935915002 MS

Injection Date: 1/02/2020 15:03:34
Sample Name: 1935915002 MS
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
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\02JAN20D\02JAND09.D Sample Name: 1935915002 MS

```

=====
Injection Date: 1/02/2020 15:03:34      Seq Line:          9
Sample Name:   1935915002 MS           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
7.194	BBA	167717.7	4.3410	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.206	BBA	60497.7	5.0378	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.219	BBA	142468.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

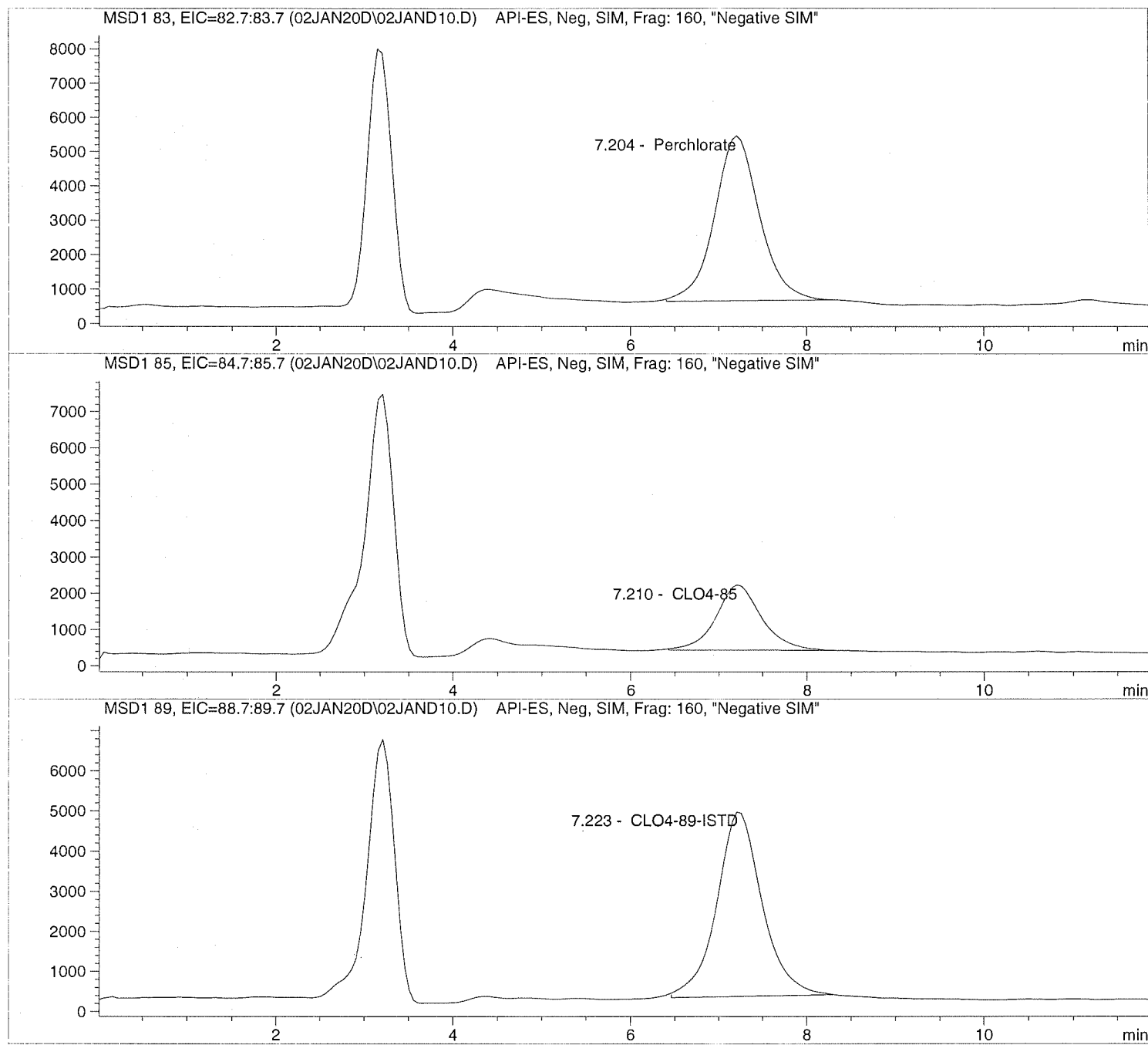
```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND10.D Sample Name: 1935915003 MSD

=====
Injection Date: 1/02/2020 15:17:28 Seq Line: 10
Sample Name: 1935915003 MSD 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\02JAN20D\02JAND10.D Sample Name: 1935915003 MSD

```
=====
Injection Date: 1/02/2020 15:17:28      Seq Line:          10
Sample Name:    1935915003  MSD          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
7.204	BBA	170226.0	3.8097	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.210	BBA	65303.6	4.6989	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.223	BBA	164738.8	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND11.D

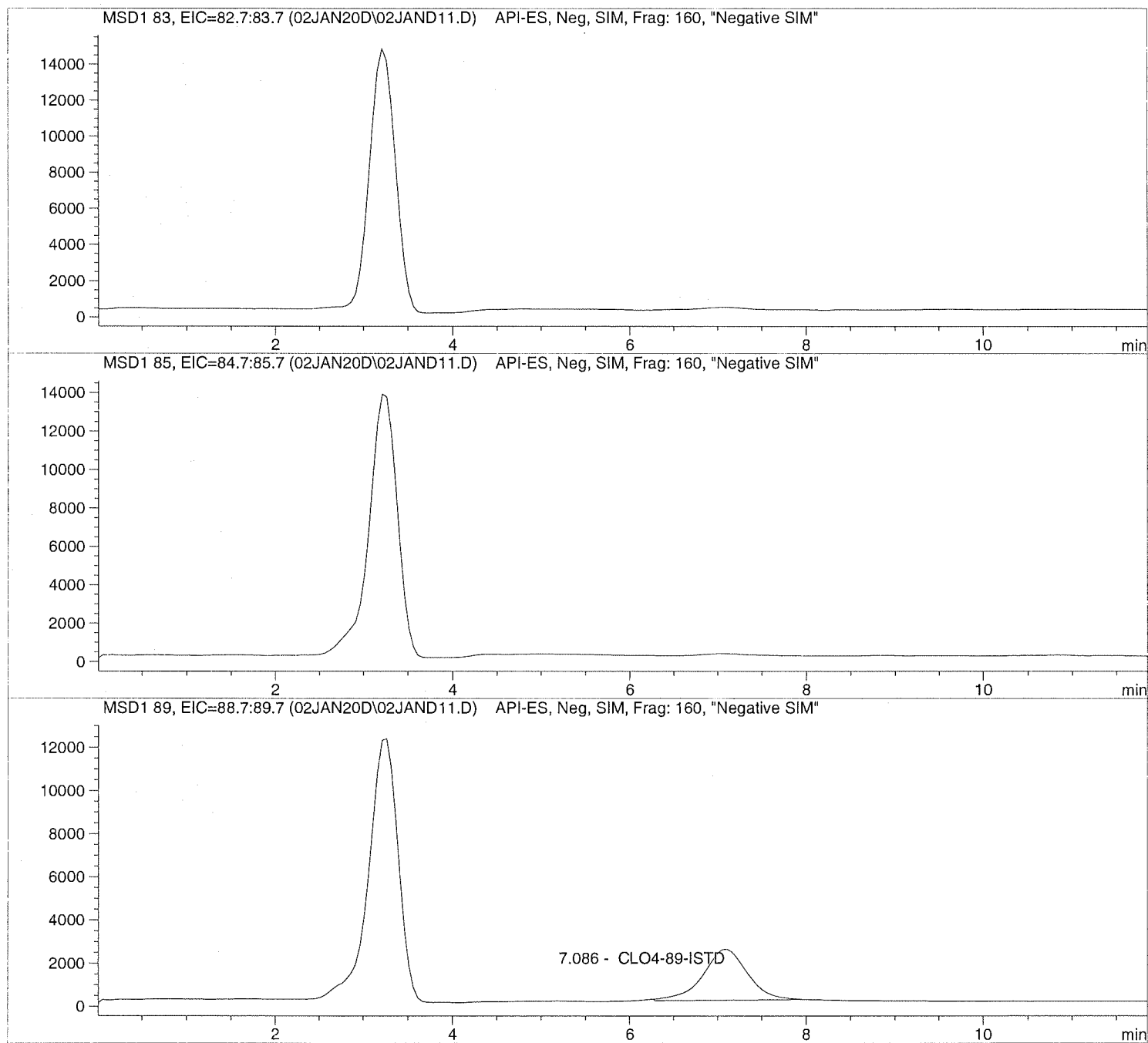
Sample Name: 1935915004

Injection Date: 1/02/2020 15:31:32
Sample Name: 1935915004
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND11.D Sample Name: 1935915004

```

=====
Injection Date: 1/02/2020 15:31:32      Seq Line:      11
Sample Name:   1935915004              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:      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
7.086	BBA	82619.0	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND12.D

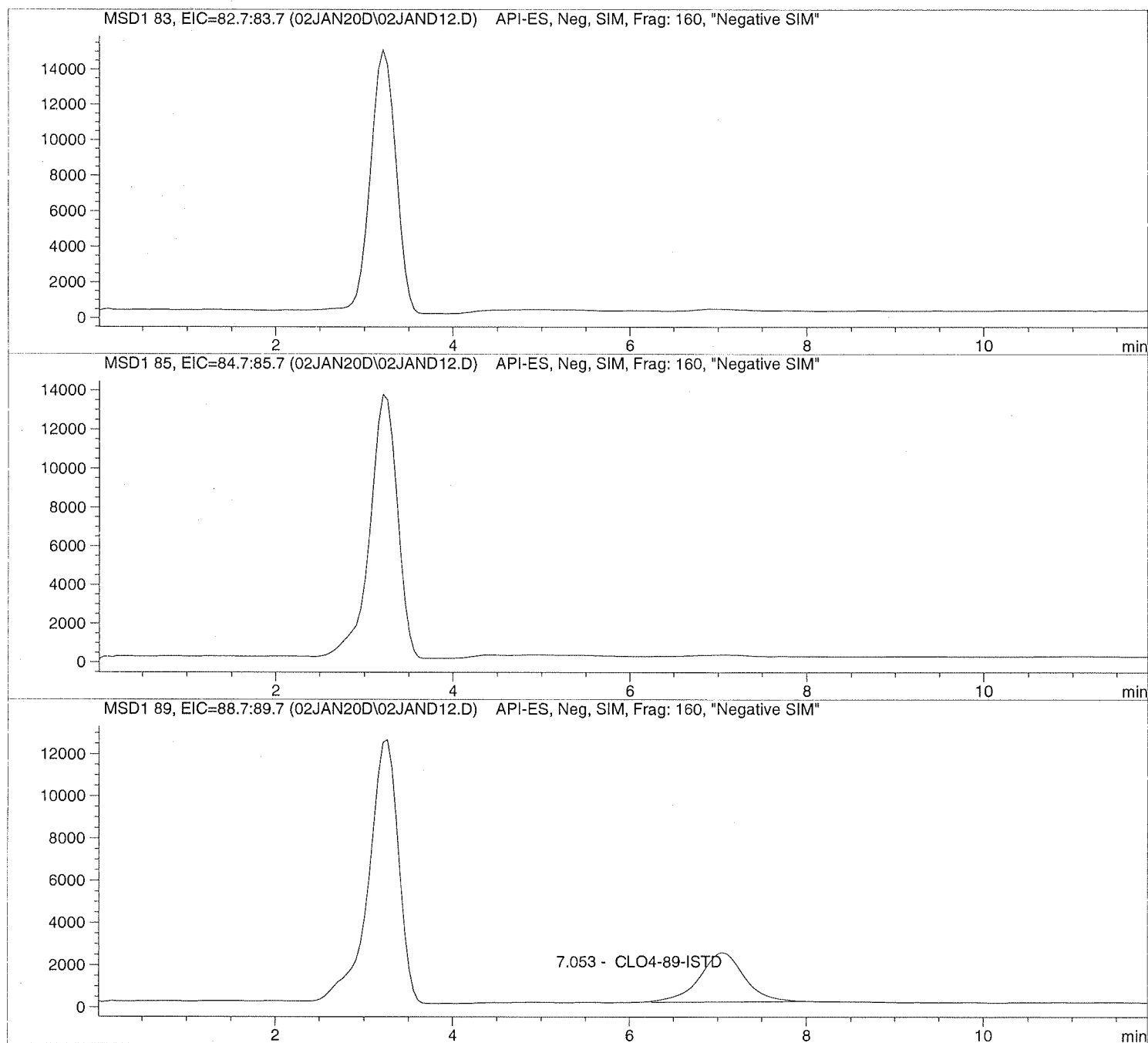
Sample Name: 1935915005

=====
Injection Date: 1/02/2020 15:45:23
Sample Name: 1935915005
Acq Operator: TNB

Seq Line: 12
Location: Vial 82
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\02JAN20D\02JAND12.D

Sample Name: 1935915005

```

=====
Injection Date: 1/02/2020 15:45:23      Seq Line:          12
Sample Name:   1935915005              Location:         Vial 82
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
7.053	BBA	81637.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND13.D

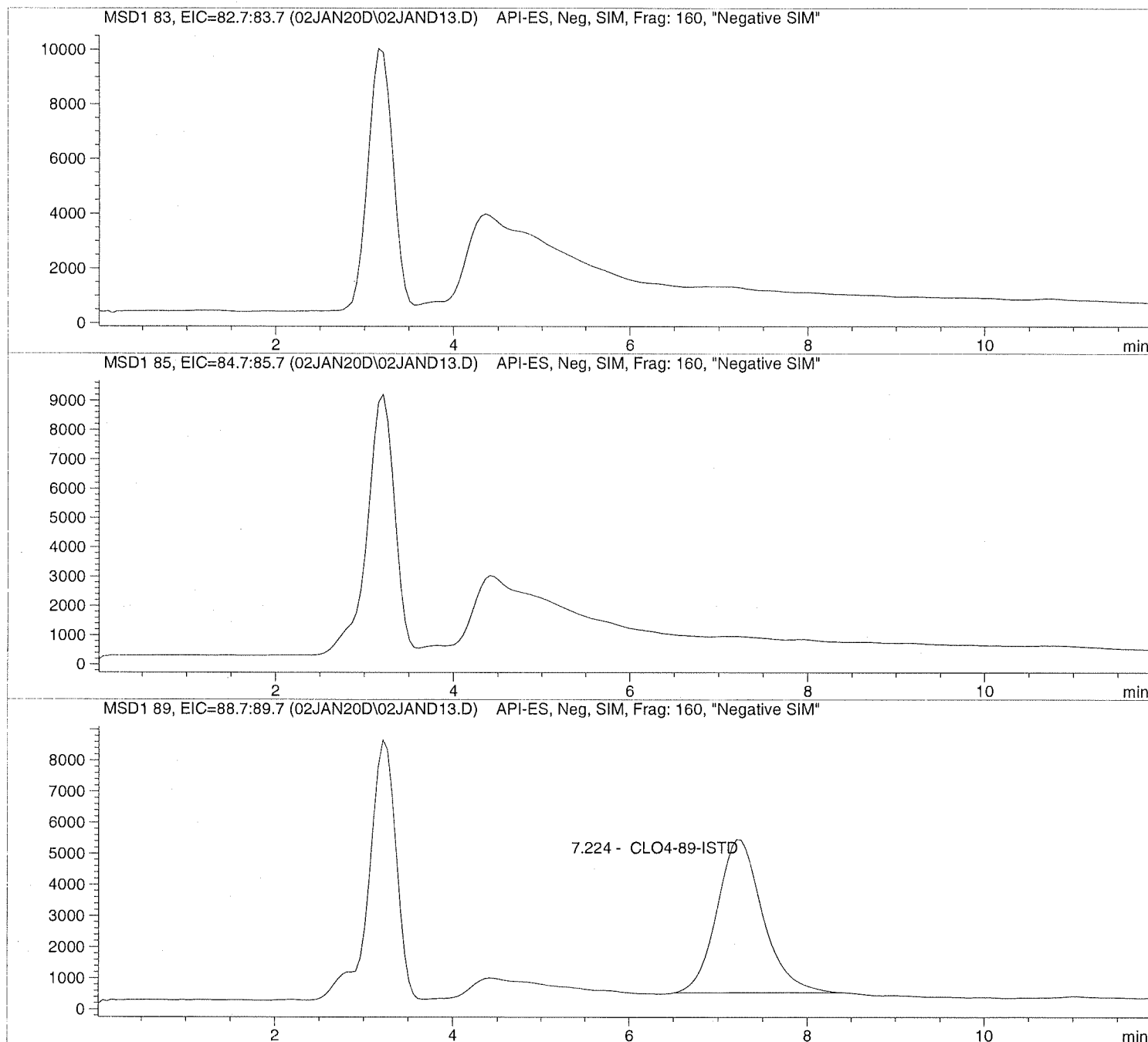
Sample Name: 1935915006

Injection Date: 1/02/2020 15:59:22
Sample Name: 1935915006
Acq Operator: TNB

Seq Line: 13
Location: Vial 83
Inj. No.: 1
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND13.D Sample Name: 1935915006

```

=====
Injection Date: 1/02/2020 15:59:22      Seq Line:      13
Sample Name:    1935915006              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:       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
7.224	PBA	175700.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND14.D

Sample Name: 690690 CCV@25

Injection Date: 1/02/2020 16:13:13

Seq Line: 14

Sample Name: 690690 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

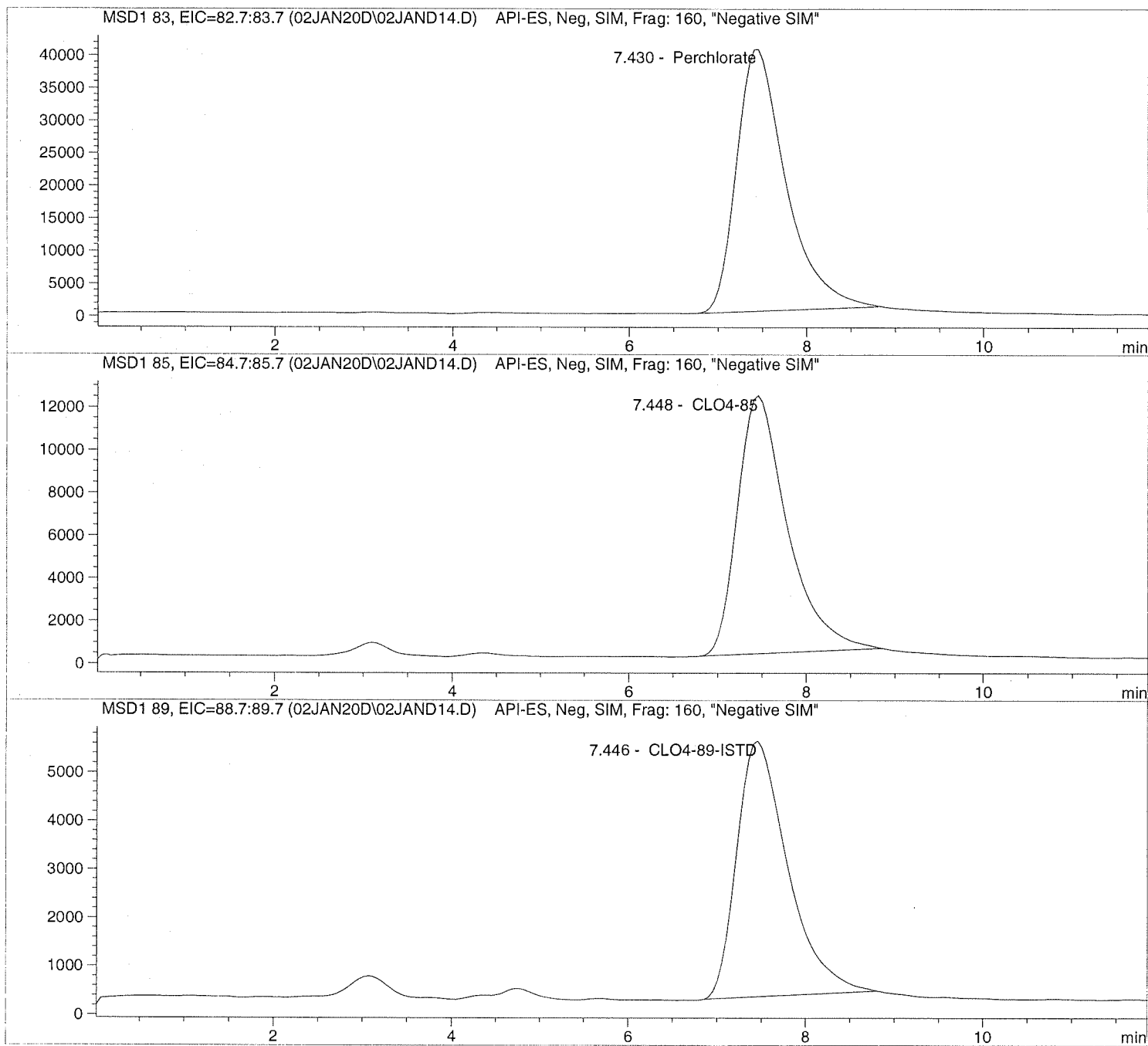
Inj. Vol.: 35 µl

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\02JAN20D\02JAND14.D Sample Name: 690690 CCV@25

```

=====
Injection Date: 1/02/2020 16:13:13      Seq Line:          14
Sample Name:   690690  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
7.430	PBA	1556973.9	25.1820	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.448	PBA	473140.5	25.1044	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.446	PBA	211105.3	5.0000	CLO4-89-ISTD

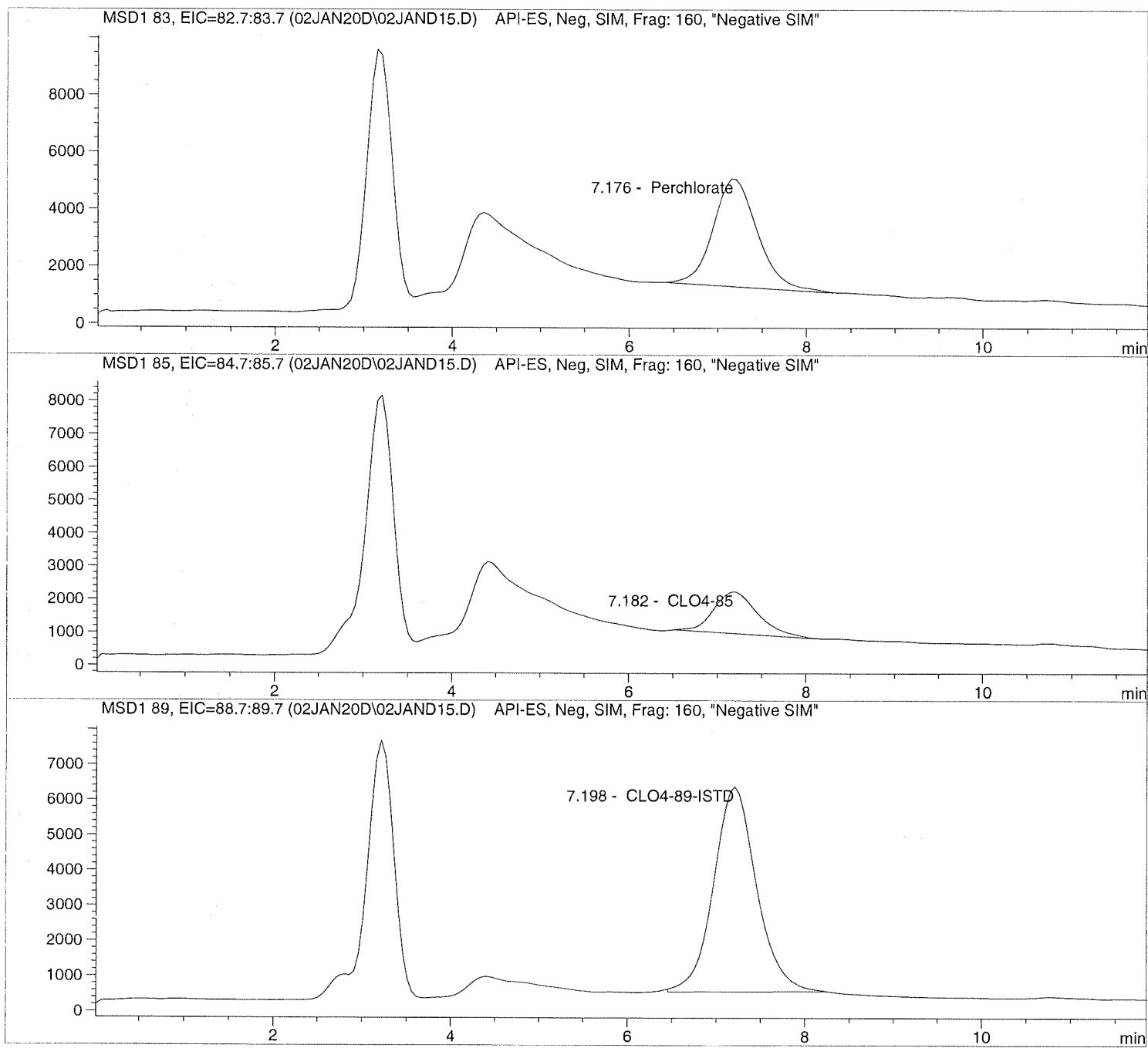
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND15.D Sample Name: 1935915007 MS

```
=====
Injection Date: 1/02/2020 16:27:04      Seq Line:      15
Sample Name:    1935915007 MS           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\02JAN20D\02JAND15.D Sample Name: 1935915007 MS

```

=====
Injection Date: 1/02/2020 16:27:04      Seq Line: 15
Sample Name: 1935915007 MS              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: 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
7.176	BBA	131015.0	2.4565	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.182	PBA	43555.4	2.5920	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.198	BBA	195563.0	5.0000	CLO4-89-ISTD

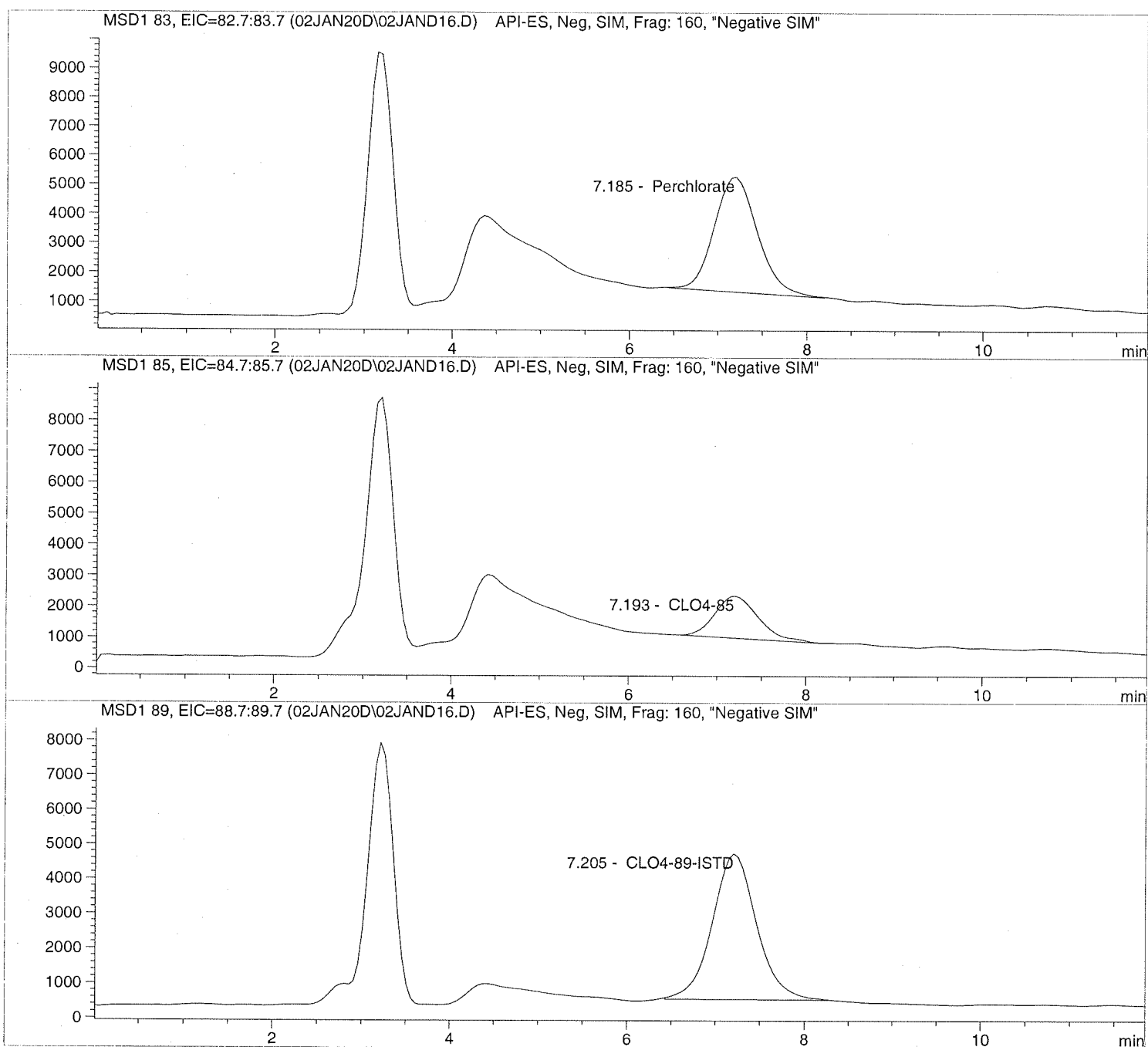
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND16.D Sample Name: 1935915008 MSD

=====
Injection Date: 1/02/2020 16:41:07 Seq Line: 16
Sample Name: 1935915008 MSD 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\02JAN20D\02JAND16.D Sample Name: 1935915008 MSD

```

=====
Injection Date: 1/02/2020 16:41:07          Seq Line:          16
Sample Name:   1935915008   MSD             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:          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
7.185	BBA	132259.5	3.3466	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.193	PBA	46493.2	3.7688	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.205	BBA	145588.4	5.0000	CLO4-89-ISTD

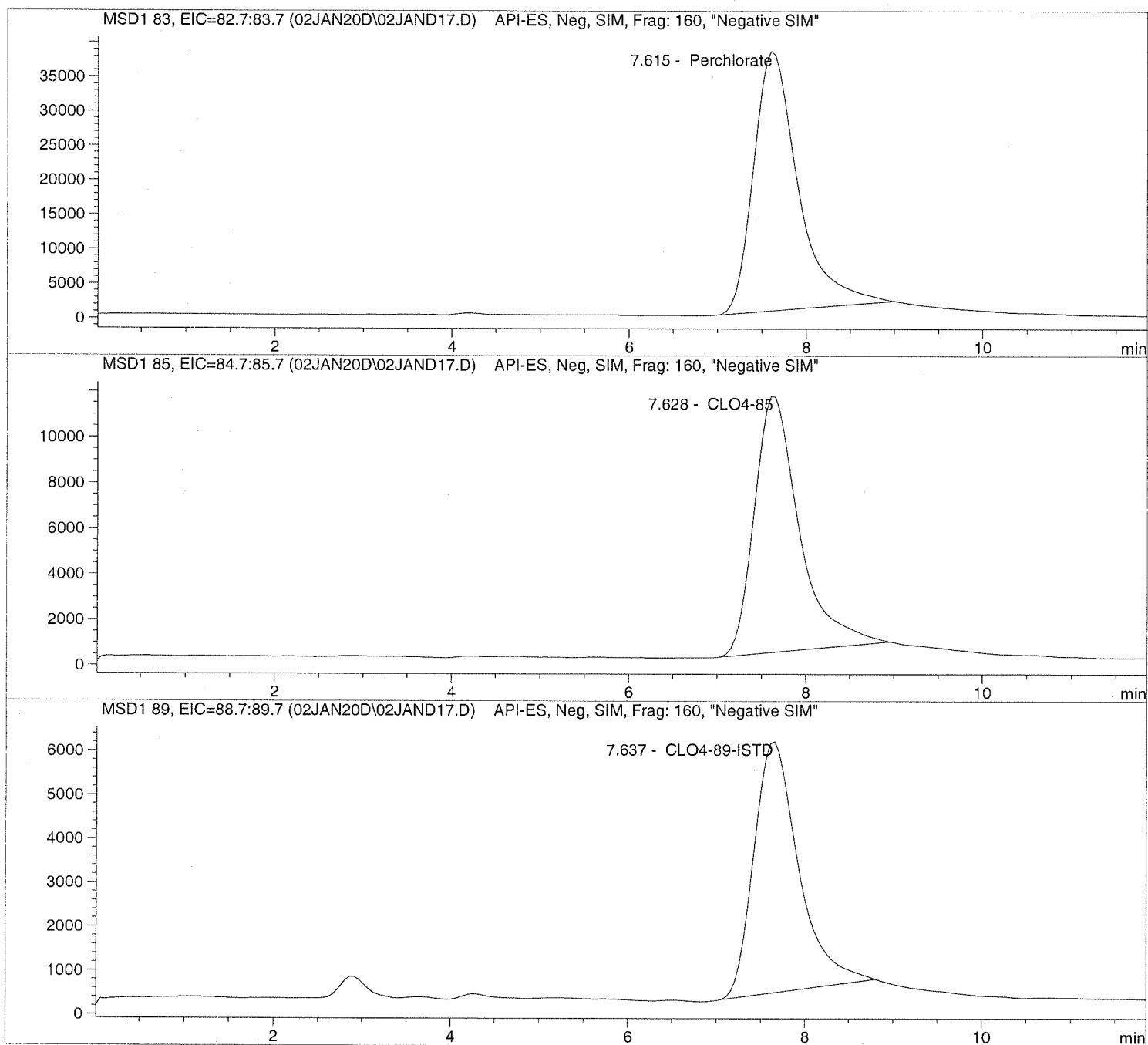
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND17.D Sample Name: 1935915009 1K

```
=====
Injection Date: 1/02/2020 16:54:59      Seq Line: 17
Sample Name:    1935915009 1K           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\02JAN20D\02JAND17.D Sample Name: 1935915009 1K

```

=====
Injection Date: 1/02/2020 16:54:59      Seq Line:          17
Sample Name:    1935915009 1K           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:       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
7.615	PBA	1320092.9	22628.1935	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.628	PBA	397733.8	22358.4905	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.637	PBA	201299.8	5000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

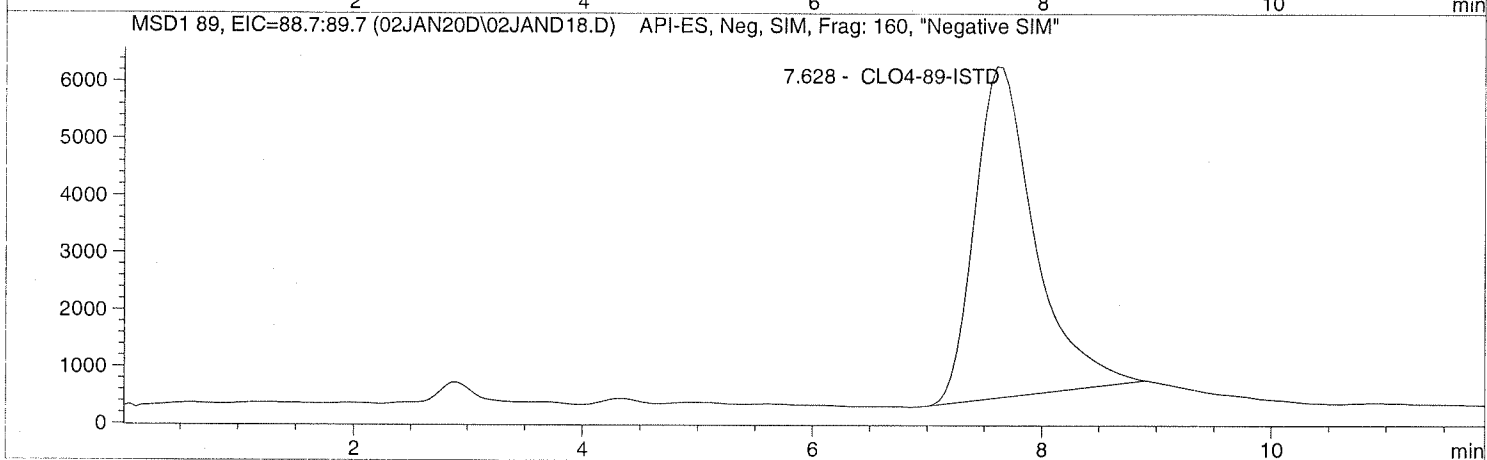
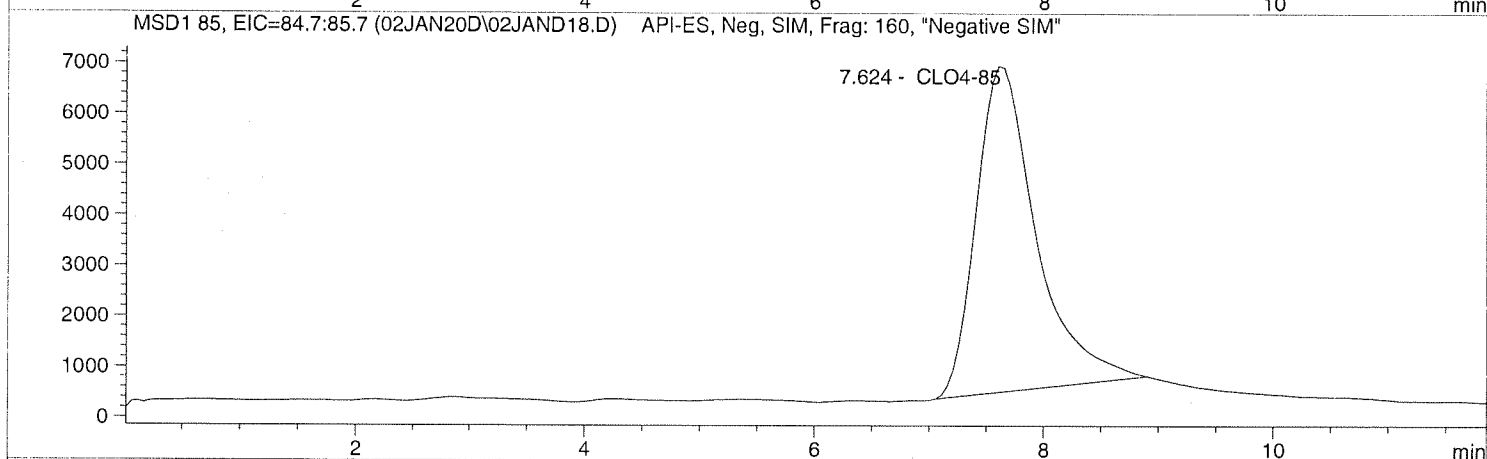
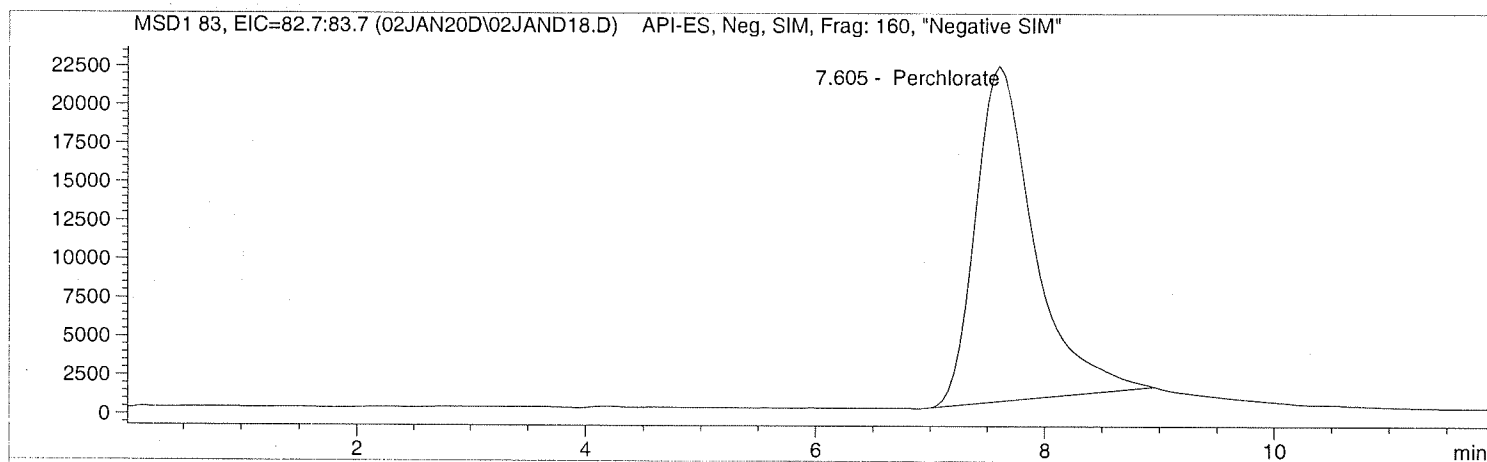
```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND18.D Sample Name: 1935915010 10K

```
=====
Injection Date: 1/02/2020 17:08:52      Seq Line:      18
Sample Name:    1935915010 10K          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\02JAN20D\02JAND18.D Sample Name: 1935915010 10K

```
=====
Injection Date: 1/02/2020 17:08:52      Seq Line:          18
Sample Name:    1935915010 10K          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:       10000.000000
Sample Amount:  0.000
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.605	PBA	768865.3	130446.8924	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.624	PBA	235180.4	130044.7637	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.628	PBA	211545.7	50000.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND19.D

Sample Name: 1935915011

Injection Date: 1/02/2020 17:22:48

Seq Line: 19

Sample Name: 1935915011

Location: Vial 88

Acq Operator: TNB

Inj. No.: 1

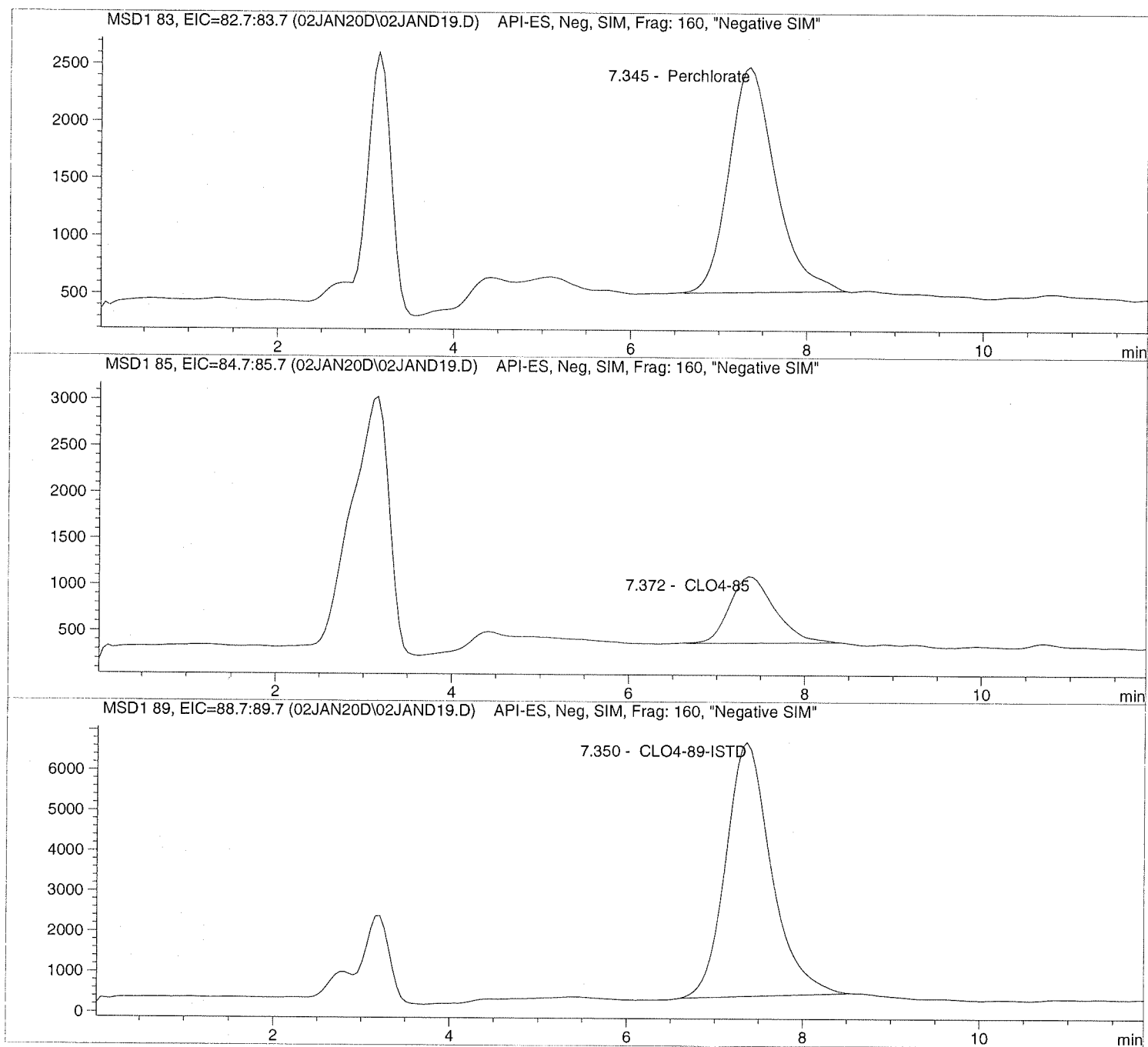
Inj. Vol.: 35 µl

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\02JAN20D\02JAND19.D

Sample Name: 1935915011

```

=====
Injection Date: 1/02/2020 17:22:48      Seq Line: 19
Sample Name: 1935915011                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: 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
7.345	BBA	72005.1	1.1283	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.372	BBA	25905.7	1.2573	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.350	BBA	226623.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND21.D

Sample Name: 1936106001

Injection Date: 1/02/2020 17:50:37

Seq Line: 21

Sample Name: 1936106001

Location: Vial 90

Acq Operator: TNB

Inj. No.: 1

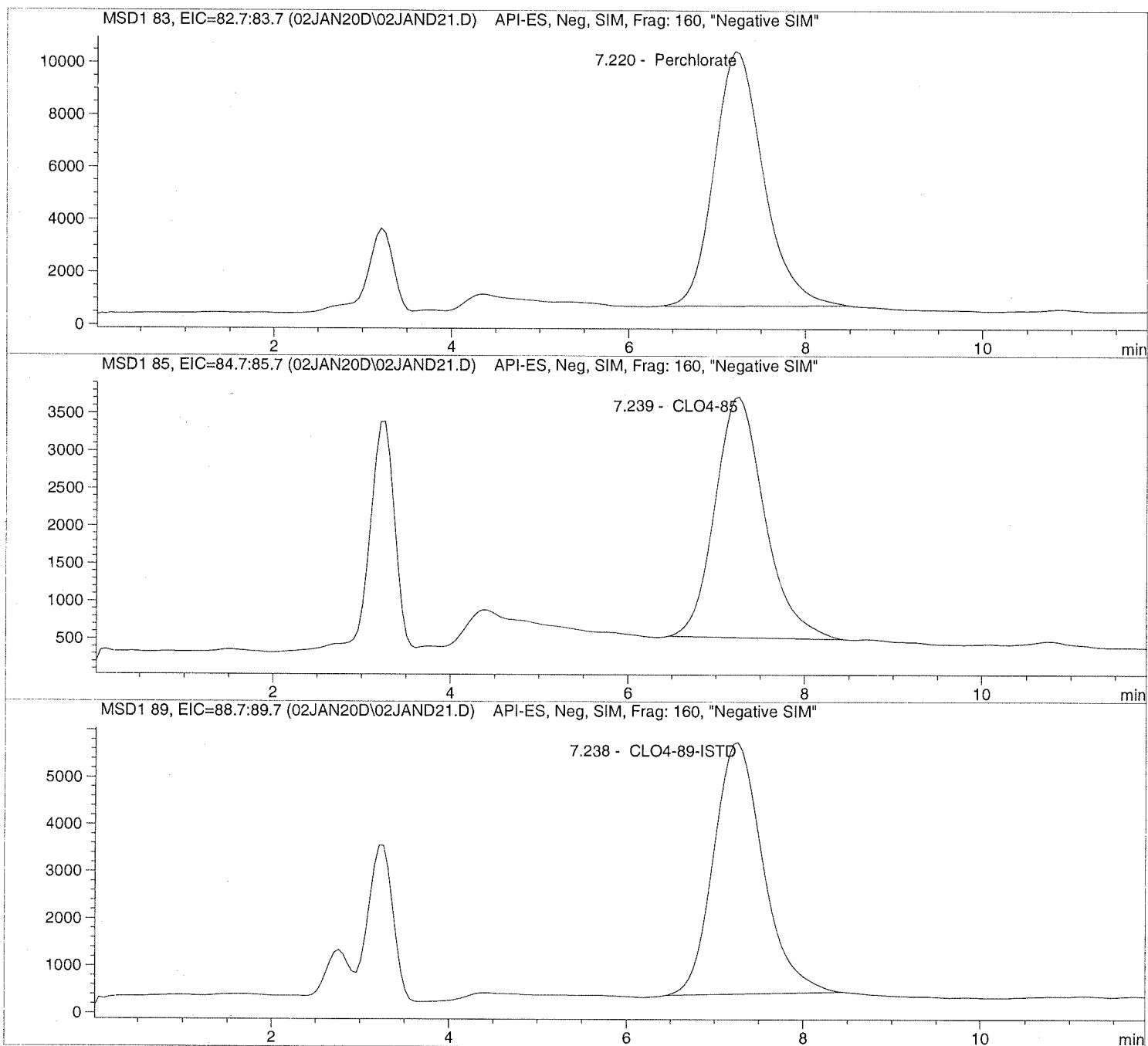
Inj. Vol.: 35 µl

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\02JAN20D\02JAND21.D

Sample Name: 1936106001

```

=====
Injection Date: 1/02/2020 17:50:37      Seq Line:          21
Sample Name:   1936106001                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
7.220	PBA	375683.7	6.6527	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.239	PBA	125368.0	7.1746	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.238	BBA	207387.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

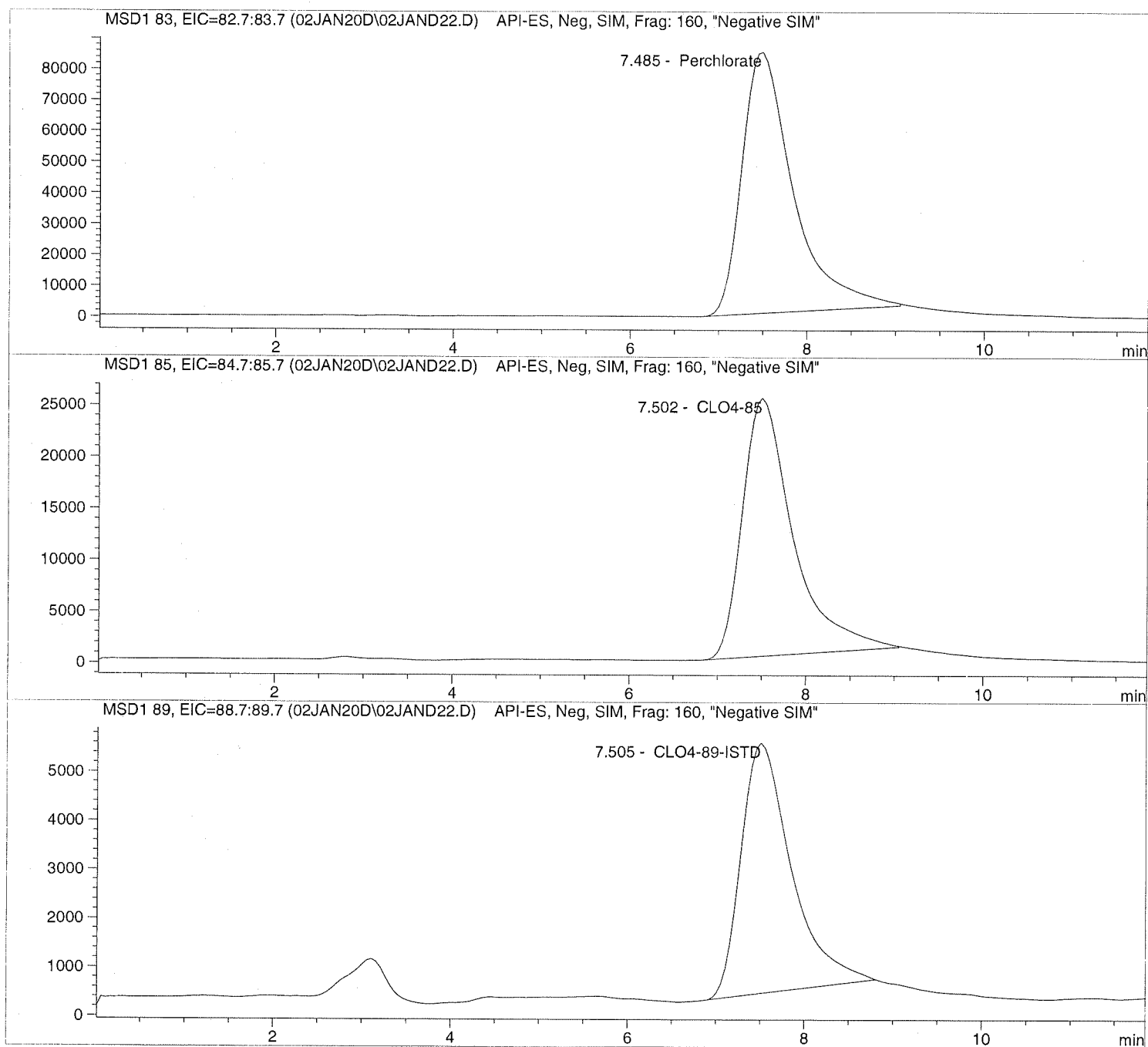
```

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND22.D Sample Name: 1935915012 10X

=====
Injection Date: 1/02/2020 18:04:36 Seq Line: 22
Sample Name: 1935915012 10X 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\02JAN20D\02JAND22.D Sample Name: 1935915012 10X

```

=====
Injection Date: 1/02/2020 18:04:36      Seq Line:          22
Sample Name:    1935915012 10X          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:     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
7.485	PBA	3407190.3	516.1452	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.502	PBA	999389.8	502.8506	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.505	PBA	202951.9	50.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\02JAN20D\02JAND23.D

Sample Name: 690691 CCV@25

Injection Date: 1/02/2020 18:18:27

Seq Line: 23

Sample Name: 690691 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

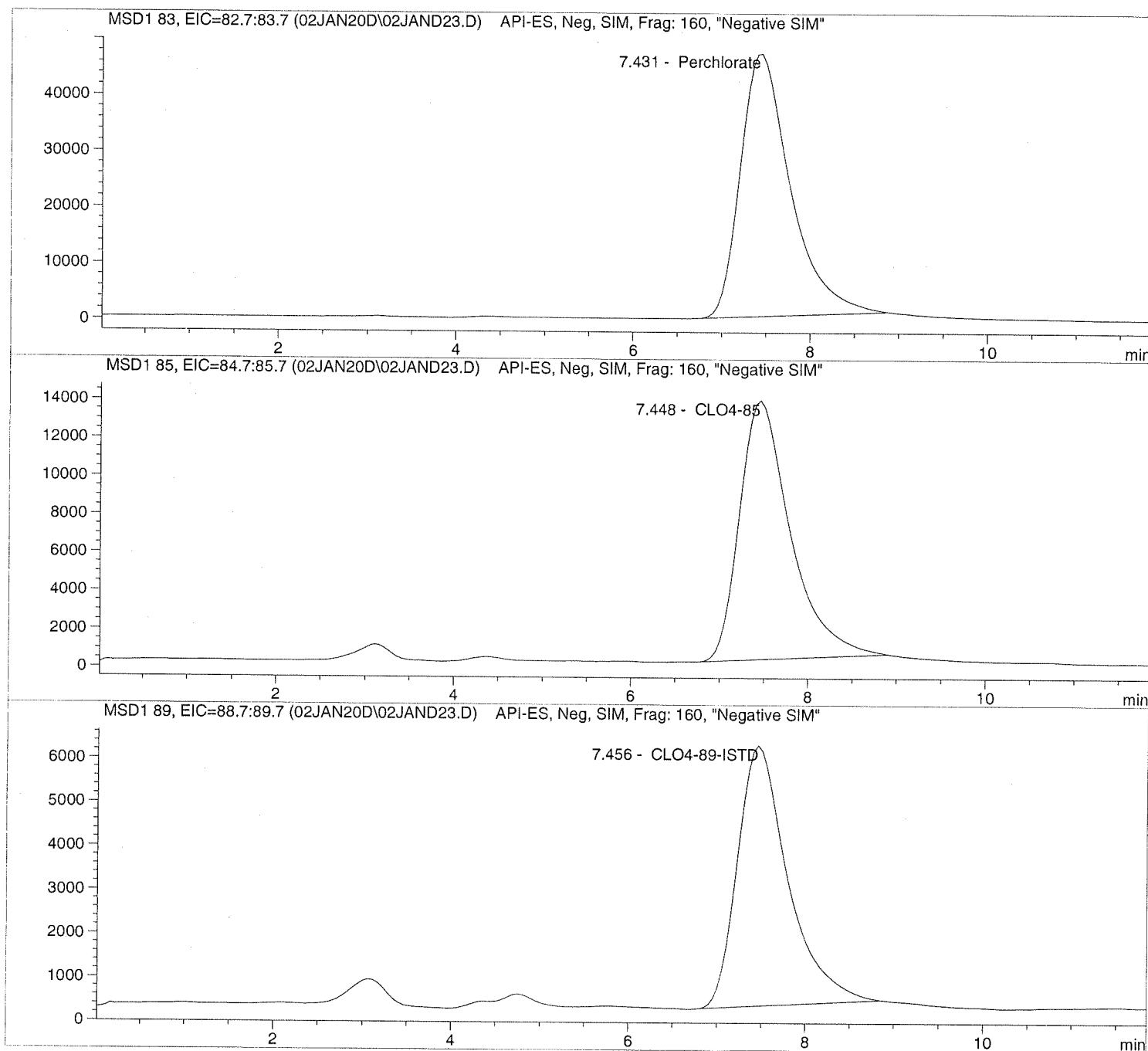
Inj. Vol.: 35 μ l

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\02JAN20D\02JAND23.D Sample Name: 690691 CCV@25

```

=====
Injection Date: 1/02/2020 18:18:27      Seq Line:          23
Sample Name:   690691  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
7.431	PBA	1840917.4	26.5024	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.448	PBA	541119.1	25.6437	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.456	PBA	235883.1	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

**Initial
Calibration**

```

=====
                          Calibration Table
=====

```

Perchlorate

```

Calib. Data Modified   :      9/23/2019 12:20:59 PM

Calculate              :      Internal Standard
Based on              :      Peak Area

Rel. Reference Window :      20.000 %
Abs. Reference Window :      0.000 min
Rel. Non-ref. Window  :      20.000 %
Abs. Non-ref. Window  :      0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks    :      not reported
Partial Calibration    :      No recalibration if peaks missing

Curve Type            :      Quadratic (some peaks differ, see below)
Origin                :      Ignored (some peaks differ, see below)
Weight                :      Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response      :      Average all calibrations
Average Retention Time:      Floating Average New 75%

```

Calibration Report Options :

```

Printout of recalibrations within a sequence:
  Calibration Table after Recalibration
  Normal Report after Recalibration
If the sequence is done with bracketing:
  Results of first cycle (ending previous bracket)

```

Default Sample ISTD Information (if not set in sample table):

```

ISTD  ISTD Amount  Name
#
-----|-----|-----

```

```

1      5.00000    CLO4-89-ISTD

```

```

Signal 1: MSD1 83, EIC=82.7:83.7

```

```

Signal 2: MSD1 85, EIC=84.7:85.7

```

```

Signal 3: MSD1 89, EIC=88.7:89.7

```

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp	Name
7.750	1 3	1.00000	5.39218e4	1.85454e-5	1	Perchlorate
	4	2.00000	1.32825e5	1.50574e-5		
	5	5.00000	2.76271e5	1.80982e-5		
	6	10.00000	5.61298e5	1.78159e-5		
	7	25.00000	1.51820e6	1.64669e-5		
	8	50.00000	3.31156e6	1.50986e-5		
	9	75.00000	5.23914e6	1.43153e-5		
7.767	3 3	5.00000	2.14568e5	2.33026e-5	+I1	CLO4-89-ISTD
	4	5.00000	2.04758e5	2.44190e-5		
	5	5.00000	2.13407e5	2.34294e-5		
	6	5.00000	2.09246e5	2.38953e-5		
	7	5.00000	2.07403e5	2.41077e-5		
	8	5.00000	2.02929e5	2.46391e-5		
	9	5.00000	1.97933e5	2.52611e-5		
7.778	2 3	1.00000	1.70436e4	5.86732e-5	1	CLO4-85
	4	2.00000	4.20754e4	4.75337e-5		
	5	5.00000	9.24707e4	5.40712e-5		
	6	10.00000	1.68622e5	5.93041e-5		
	7	25.00000	4.63724e5	5.39114e-5		
	8	50.00000	9.95933e5	5.02042e-5		

RetTime [min]	Lvl Sig	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

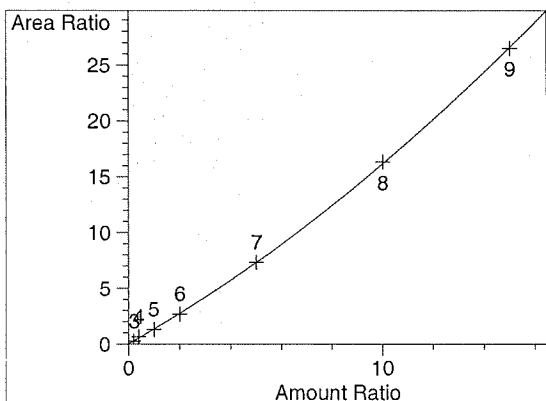
Compound: CLO4-85

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

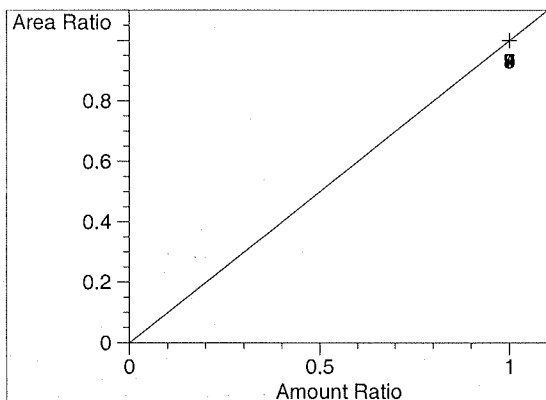
=====
 Peak Sum Table
 =====

No Entries in table
 =====

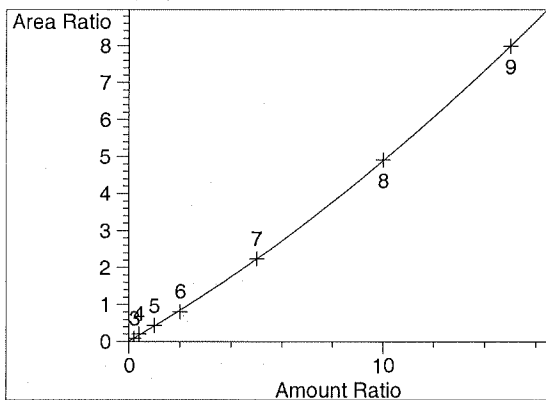
=====
 Calibration Curves
 =====



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\20SEP19\20SEPI03.D

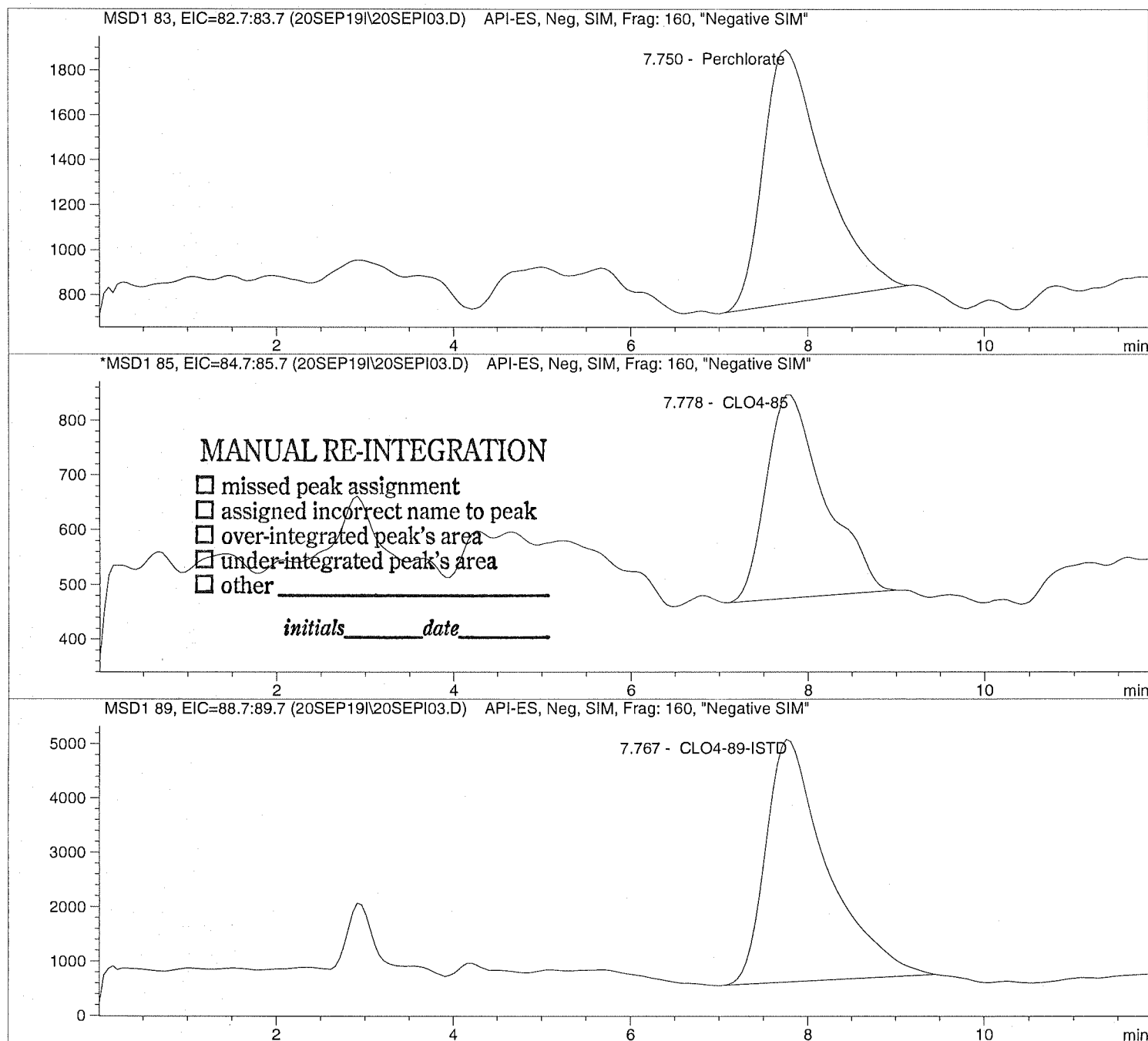
Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05
 Sample Name: CLO4@ 1.0ug/L
 Acq Operator: TNB

Seq Line: 3
 Location: Vial 73
 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

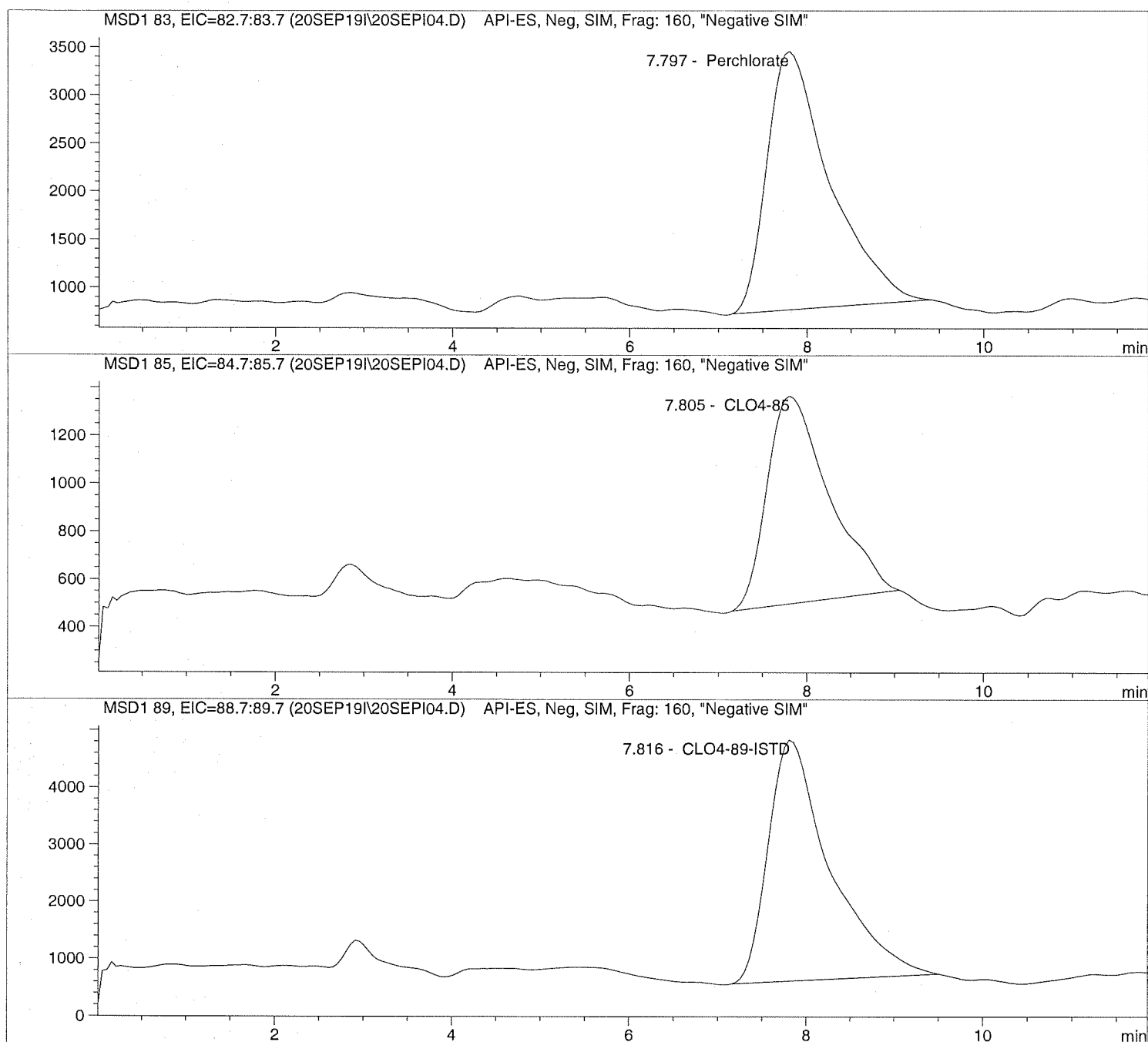
Sample Name: CLO4@ 2.0ug/L

Injection Date: 9/20/2019 09:37:58
Sample Name: CLO4@ 2.0ug/L
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
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

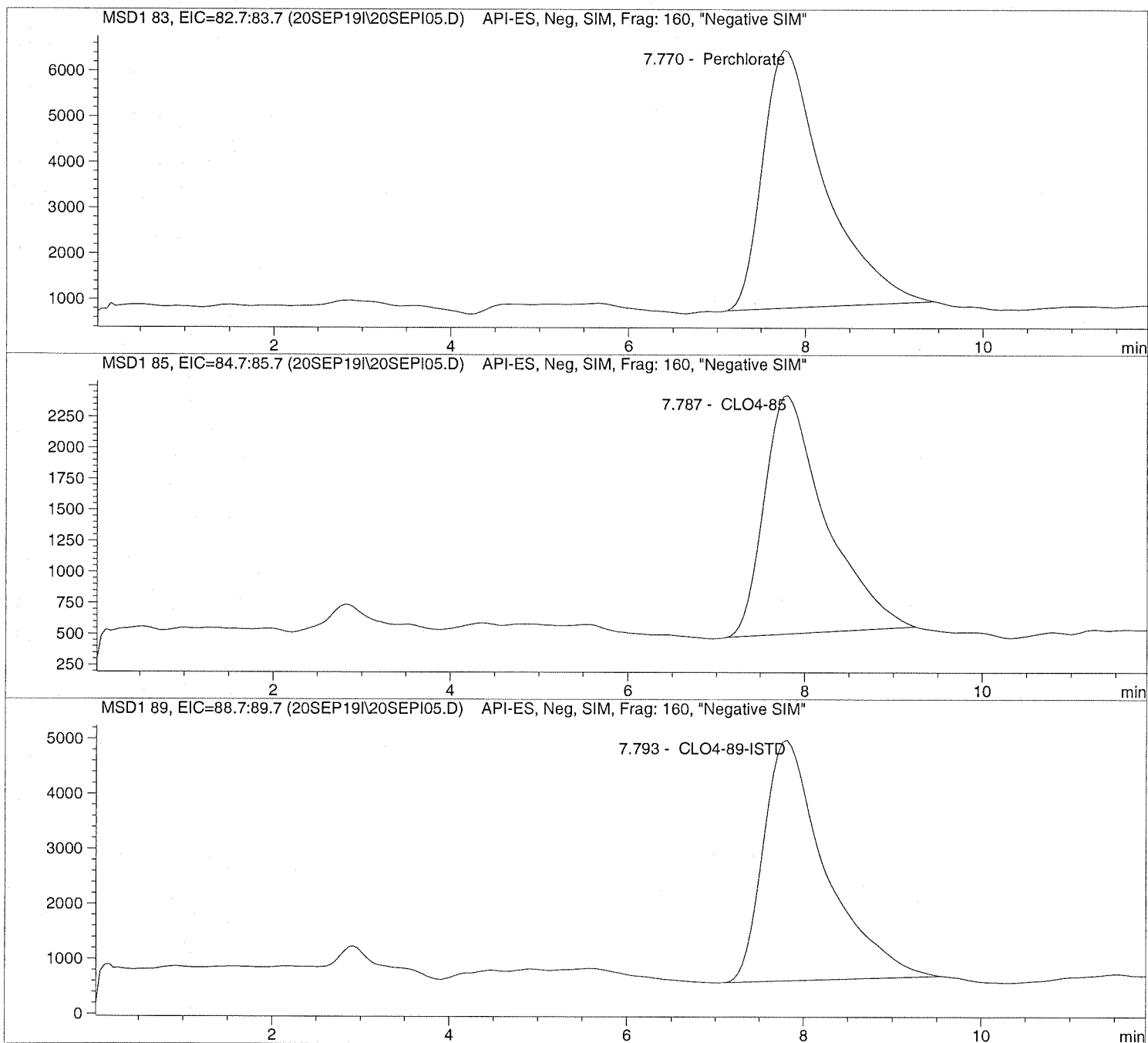
*** End of Report ***

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

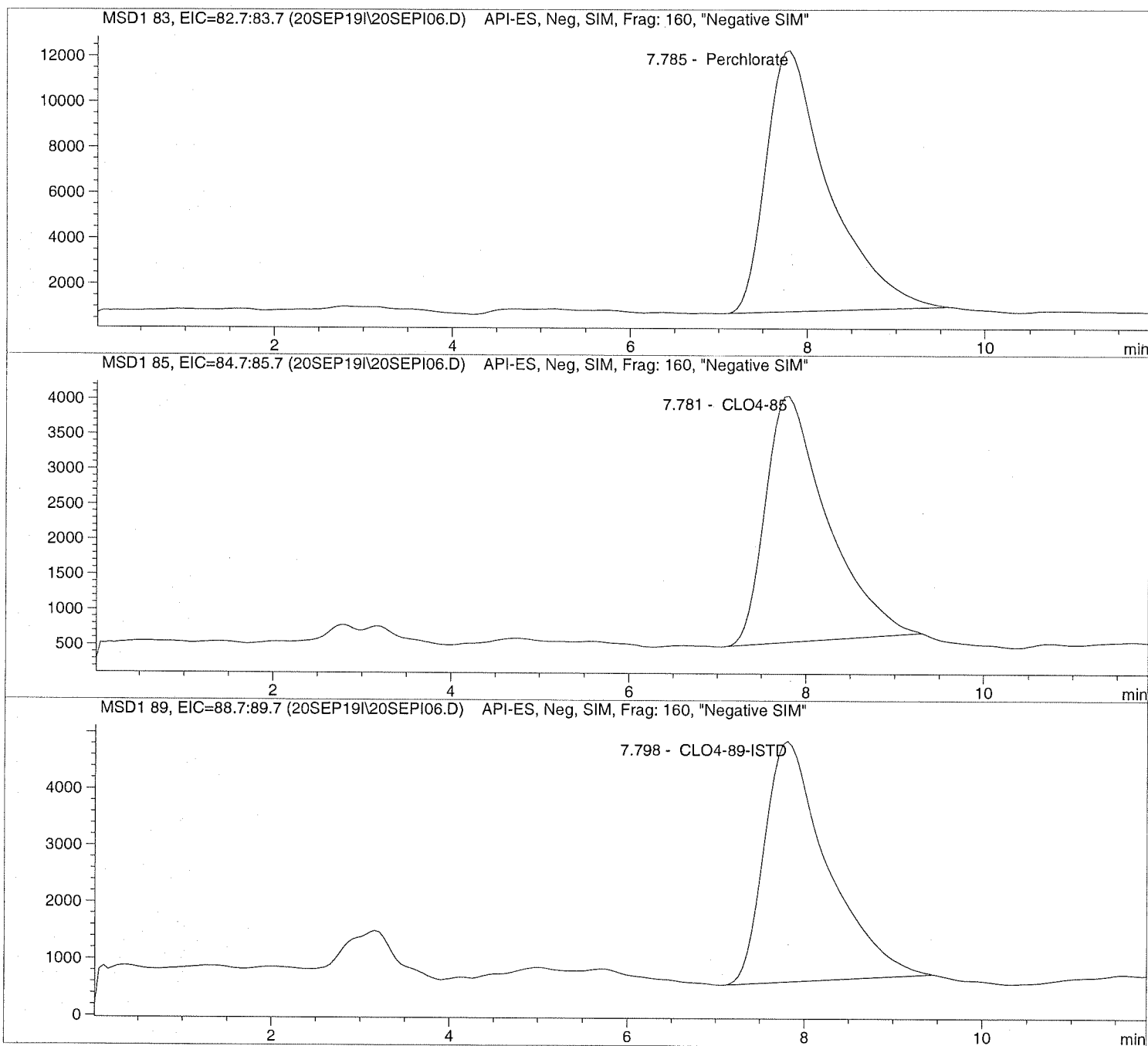
Sample Name: CLO4@ 10.ug/L

Injection Date: 9/20/2019 10:05:36
Sample Name: CLO4@ 10.ug/L
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
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\20SEP19\20SEPI07.D

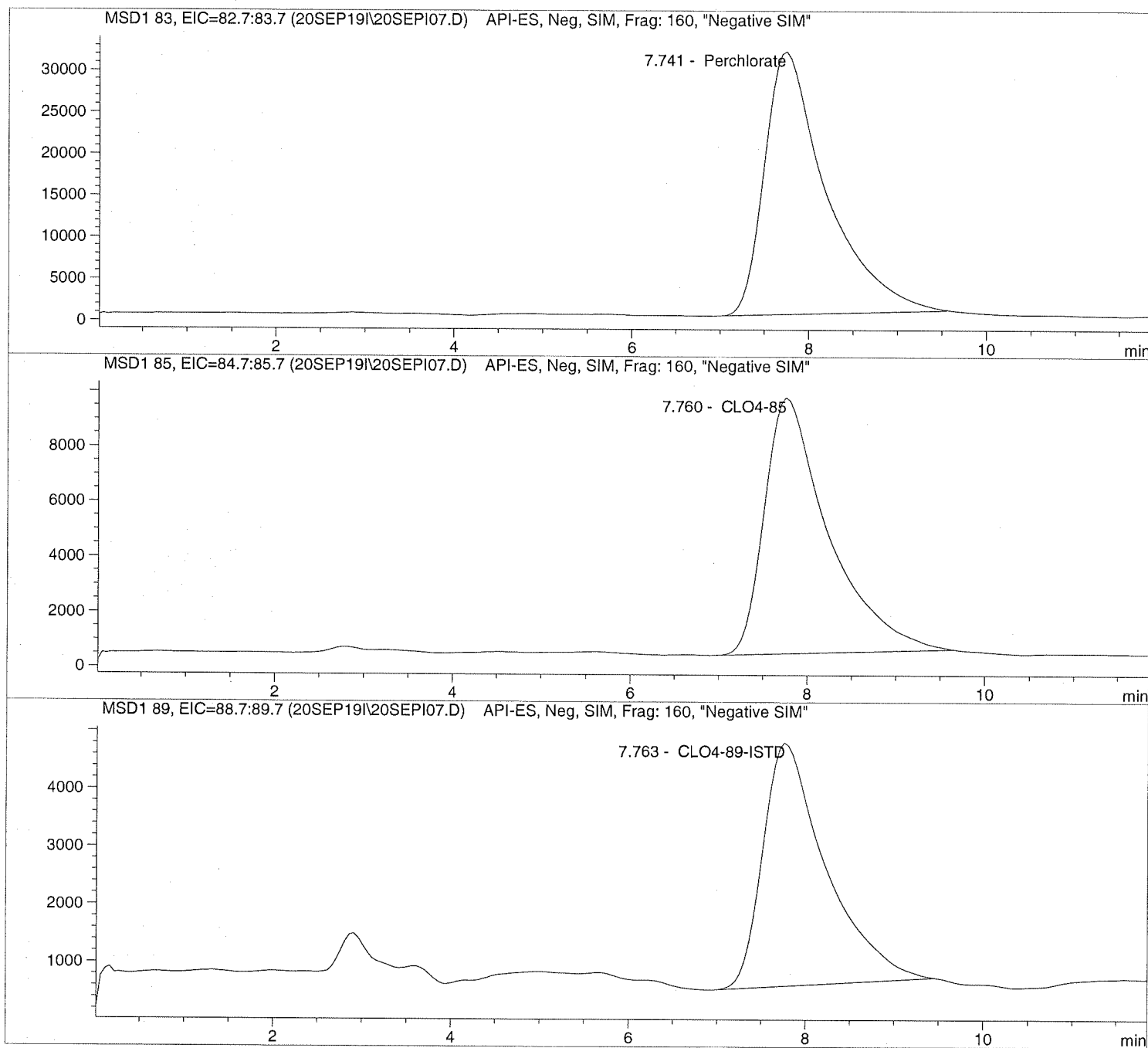
Sample Name: CLO4@ 25.ug/L

=====
Injection Date: 9/20/2019 10:19:23
Sample Name: CLO4@ 25.ug/L
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
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

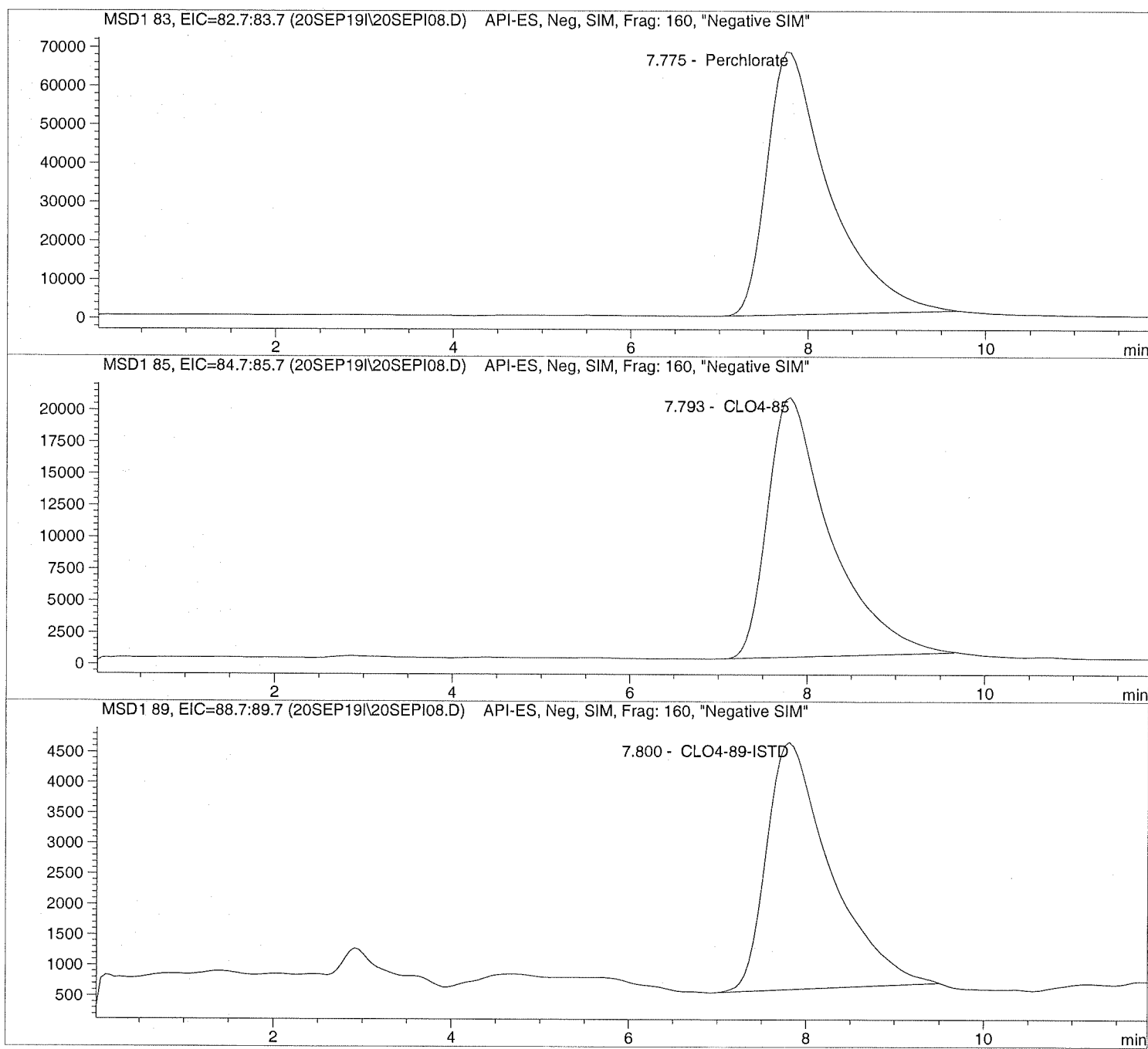
Sample Name: CLO4@ 50.ug/L

=====
Injection Date: 9/20/2019 10:33:18
Sample Name: CLO4@ 50.ug/L
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI08.D Sample Name: CLO4@ 50.ug/L

```

=====
Injection Date: 9/20/2019 10:33:18      Seq Line:      8
Sample Name:   CLO4@ 50.ug/L           Location:      Vial 78
Acq Operator:  TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 50.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.775	PBA	3311559.2	50.4030	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	995933.0	50.1422	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.800	PBA	202929.2	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D

Sample Name: CLO4@ 75.ug/L

Injection Date: 9/20/2019 10:47:05

Seq Line: 9

Sample Name: CLO4@ 75.ug/L

Location: Vial 79

Acq Operator: TNB

Inj. No.: 1

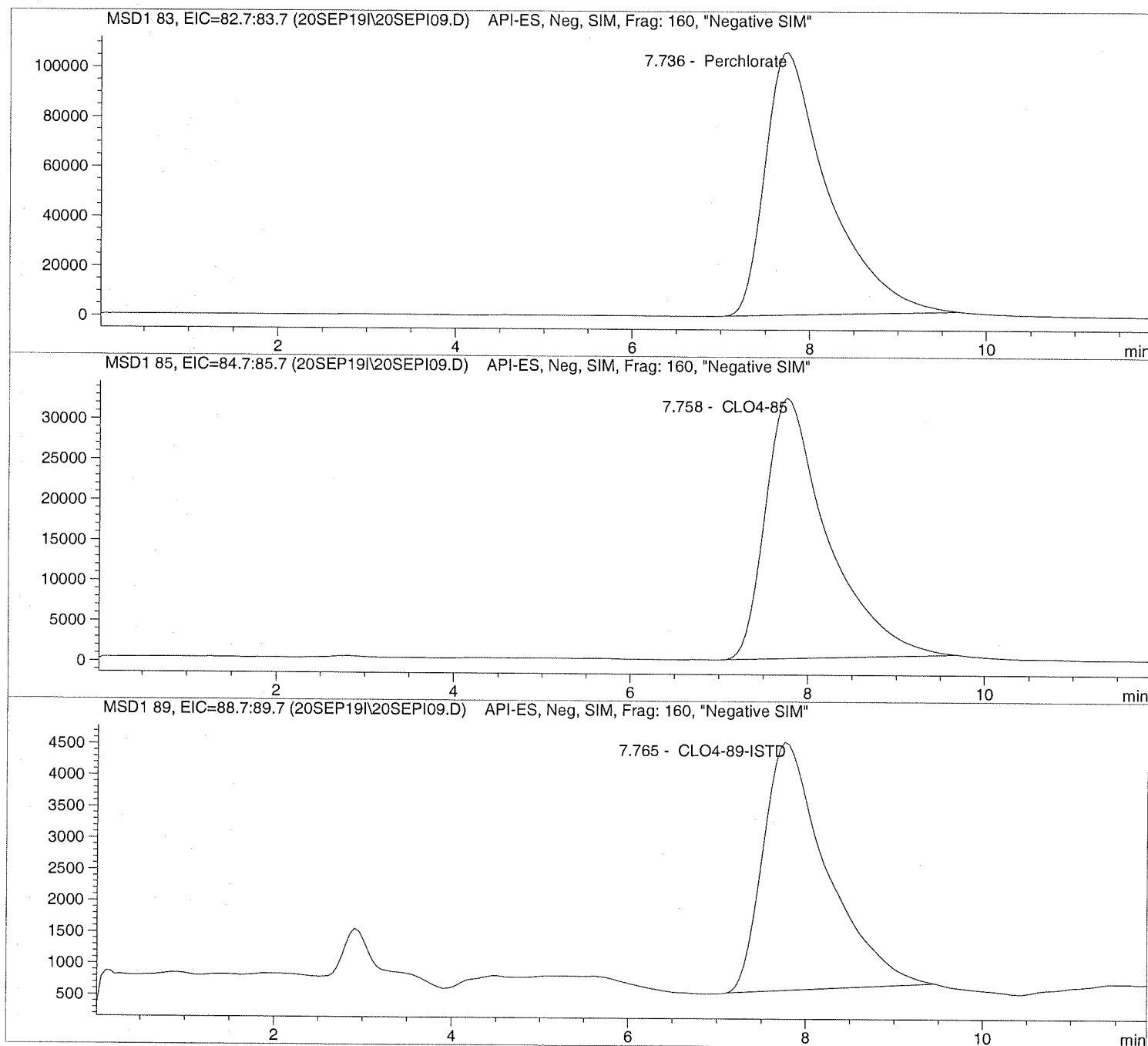
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI09.D Sample Name: CLO4@ 75.ug/L

```
=====
Injection Date: 9/20/2019 10:47:05      Seq Line: 9
Sample Name: CLO4@ 75.ug/L      Location: Vial 79
Acq Operator: TNB      Inj. No.: 1
                                 Inj. Vol.: 30 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47
```

Perchlorate analysis

=====

Sample Information

=====

```
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 75.000
```

=====

LCMS Results

=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.736	PBA	5239145.0	74.7911	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.758	PBA	1580664.2	74.9366	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.765	PBA	197932.5	5.0000	CLO4-89-ISTD

=====

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D

Sample Name: ICAL Verf@10ug/L

Injection Date: 9/20/2019 11:14:45

Seq Line: 11

Sample Name: ICAL Verf@10ug/L

Location: Vial 80

Acq Operator: TNB

Inj. No.: 1

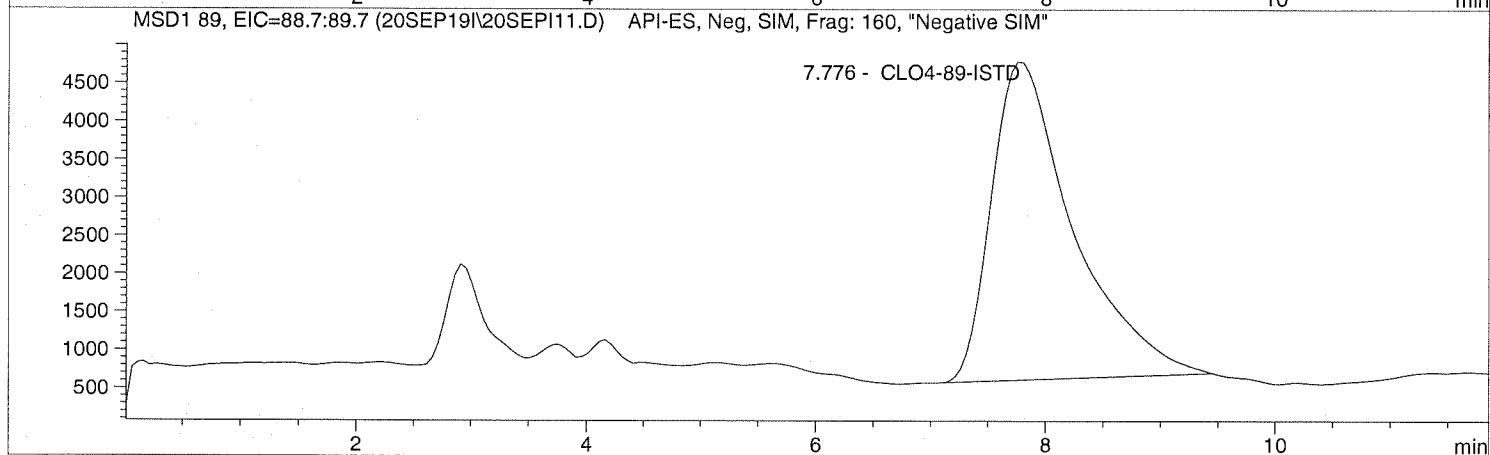
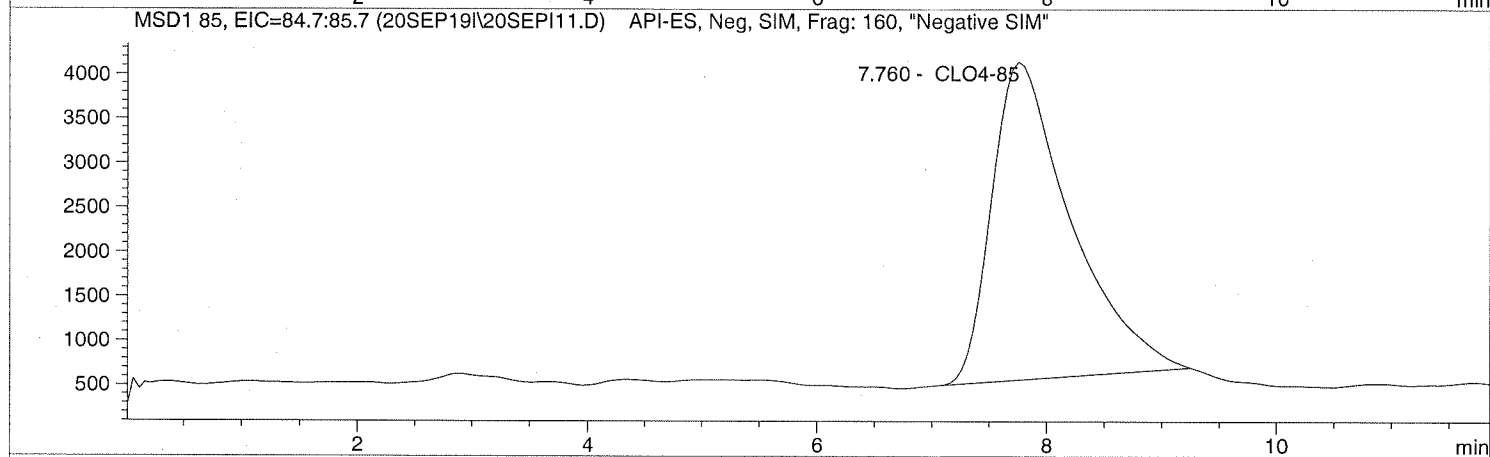
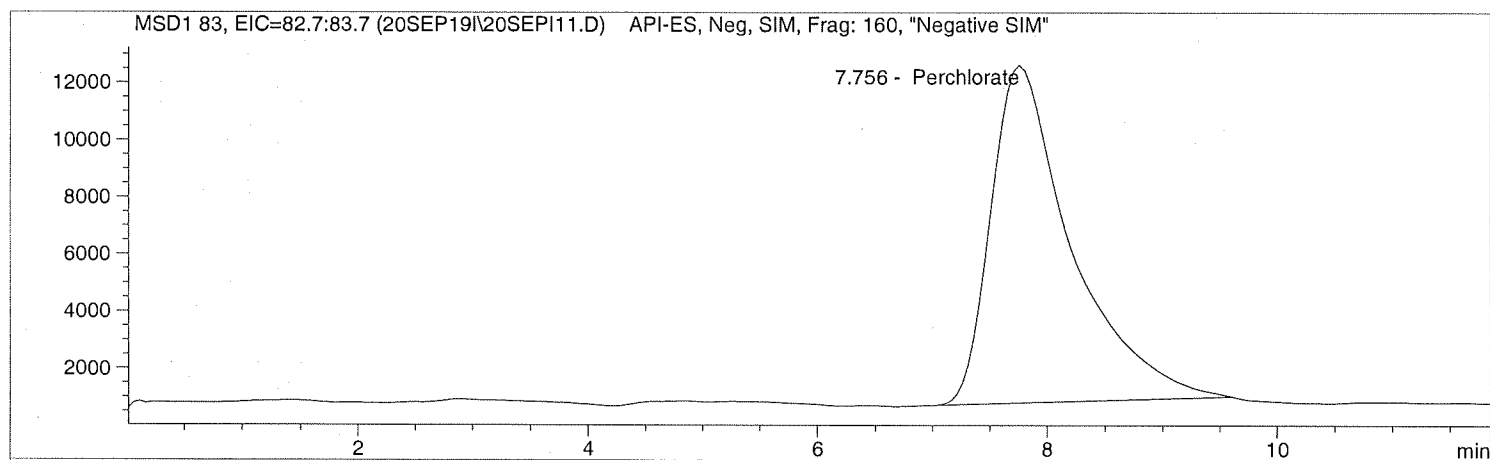
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



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

```

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

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  10.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.756	PBA	574879.4	10.1185	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	171000.4	9.7904	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.776	PBA	206243.3	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05

Seq Line: 3

Sample Name: CLO4@ 1.0ug/L

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

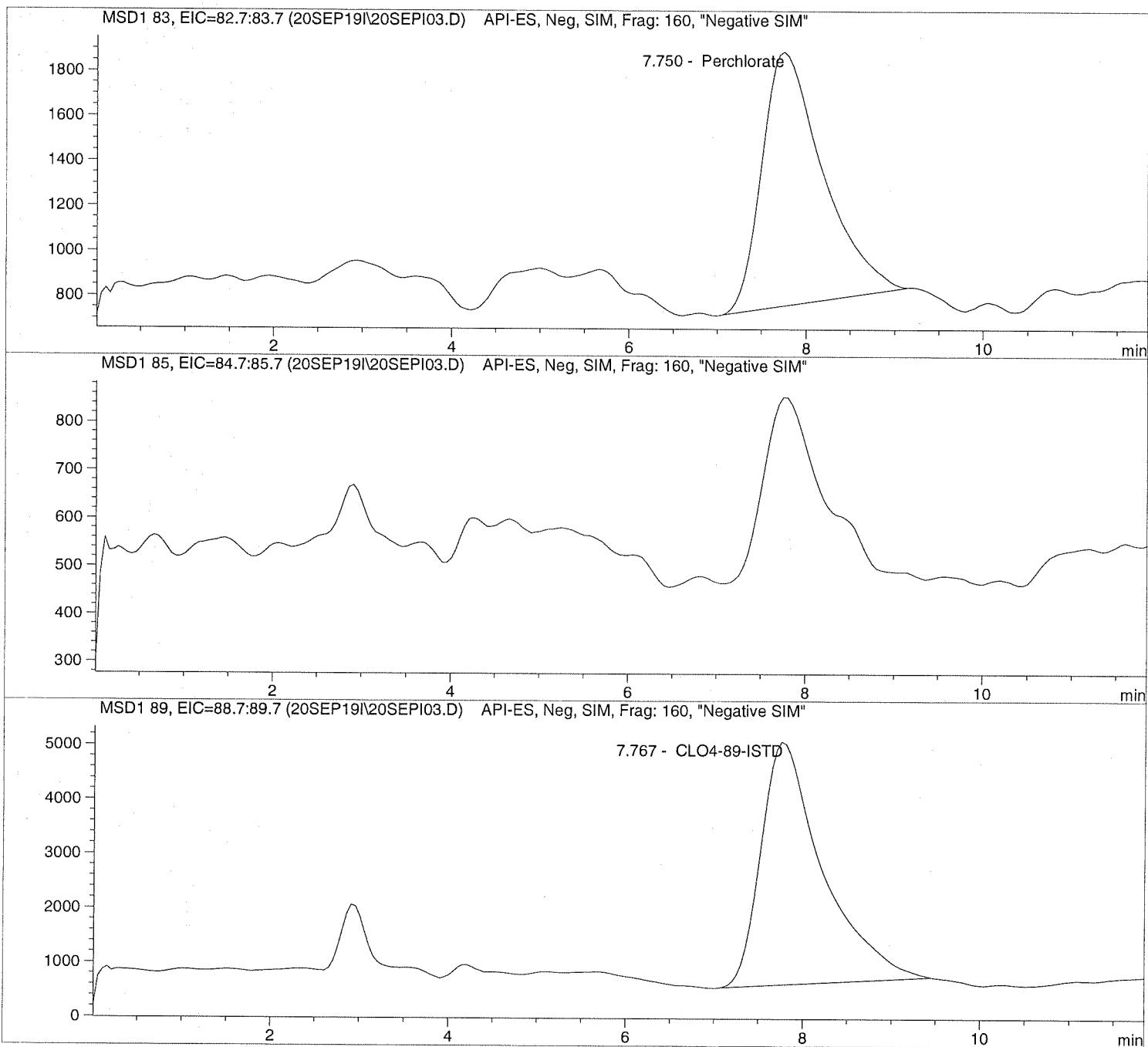
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

```
=====
Injection Date: 9/20/2019 09:24:05      Seq Line:          3
Sample Name:    CLO4@ 1.0ug/L           Location:          Vial 73
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:        30 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:27:11
=====
```

Perchlorate analysis

Sample Information

```
=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

*** End of Report ***



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

January 06, 2020

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

Work Order: **HS19121316**

Laboratory Results for: **Longhorn GW Treatment Plant Bi Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Dec 24, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

A handwritten signature in black ink, appearing to read 'Raj. A. Modashia', enclosed in a circular scribble.

Generated By: DAYNA.FISHER

RJ Modashia
Project Manager

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
Work Order: HS19121316

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19121316-01	LH18/24-SP650_122319	Water		23-Dec-2019 14:00	24-Dec-2019 09:45	<input type="checkbox"/>
HS19121316-02	Trip Blank	Water	CG-111519 -23	23-Dec-2019 00:00	24-Dec-2019 09:45	<input type="checkbox"/>

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
Work Order: HS19121316

CASE NARRATIVE

GCMS Volatiles by Method SW8260**Batch ID: R353818****Sample ID: CCV**

- 1,2,3_Trichlorobenzene and 2_Butanone exceeded %D limits for CCV. Samples are ND for these compounds.

Sample ID: VLCSW-200103

- 1,2,3_Trichlorobenzene is also high for LCS.

Sample ID: HS19121484-01MS

- MS and MSD are for an unrelated sample

WetChemistry by Method SW9056**Batch ID: R353307**

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Bi Weekly Samples
 Sample ID: LH18/24-SP650_122319
 Collection Date: 23-Dec-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19121316
 Lab ID:HS19121316-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
1,2-Dichloroethane	1.5		0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jan-2020 17:10	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jan-2020 17:10	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jan-2020 17:10	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jan-2020 17:10	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jan-2020 17:10	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:10	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Bi Weekly Samples
 Sample ID: LH18/24-SP650_122319
 Collection Date: 23-Dec-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19121316
 Lab ID:HS19121316-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
cis-1,2-Dichloroethene	35		0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jan-2020 17:10	
Methylene chloride	1.4	J	0.40	1.0	2.0	UG/L	1	03-Jan-2020 17:10	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Trichloroethene	5.4		0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
Vinyl chloride	0.45	J	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:10	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>100.0</i>			0	<i>81-118</i>	%REC	<i>1</i>	<i>03-Jan-2020 17:10</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>100</i>			0	<i>85-114</i>	%REC	<i>1</i>	<i>03-Jan-2020 17:10</i>	
<i>Surr: Dibromofluoromethane</i>	<i>98.3</i>			0	<i>80-119</i>	%REC	<i>1</i>	<i>03-Jan-2020 17:10</i>	
<i>Surr: Toluene-d8</i>	<i>104</i>			0	<i>89-112</i>	%REC	<i>1</i>	<i>03-Jan-2020 17:10</i>	
ANIONS BY SW9056A		Method:SW9056							Analyst: KMU
Chloride	457		2.00	5.00	5.00	mg/L	10	26-Dec-2019 14:03	
Sulfate	27.8		2.00	5.00	5.00	mg/L	10	26-Dec-2019 14:03	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Bi Weekly Samples
 Sample ID: Trip Blank
 Collection Date: 23-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19121316
 Lab ID:HS19121316-02
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD		Method:SW8260						
8260C								Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 16:46
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 16:46
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 16:46
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 16:46
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 16:46
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 16:46
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 16:46
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 16:46
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 16:46
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 16:46
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 16:46
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 16:46
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 16:46
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 16:46
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 16:46
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jan-2020 16:46
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jan-2020 16:46
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 16:46
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jan-2020 16:46
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jan-2020 16:46
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 16:46
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 16:46
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 16:46
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 16:46
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 16:46
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 16:46
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jan-2020 16:46
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 16:46
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 16:46

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Bi Weekly Samples
 Sample ID: Trip Blank
 Collection Date: 23-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19121316
 Lab ID:HS19121316-02
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD		Method:SW8260							Analyst: PC
8260C									
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jan-2020 16:46	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jan-2020 16:46	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 16:46	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>98.9</i>			<i>0</i>	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>03-Jan-2020 16:46</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>102</i>			<i>0</i>	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>03-Jan-2020 16:46</i>	
<i>Surr: Dibromofluoromethane</i>	<i>97.8</i>			<i>0</i>	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>03-Jan-2020 16:46</i>	
<i>Surr: Toluene-d8</i>	<i>102</i>			<i>0</i>	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>03-Jan-2020 16:46</i>	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19121316

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R353307 (0)		Test Name : ANIONS BY SW9056A			Matrix: Water	
HS19121316-01	LH18/24-SP650_122319	23 Dec 2019 14:00			26 Dec 2019 14:03	10
Batch ID: R353818 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19121316-01	LH18/24-SP650_122319	23 Dec 2019 14:00			03 Jan 2020 17:10	1
HS19121316-02	Trip Blank	23 Dec 2019 00:00			03 Jan 2020 16:46	1

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19121316

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-200103	Units: UG/L			Analysis Date: 03-Jan-2020 15:10					
Client ID:	Run ID: VOA6_353818	SeqNo: 5423601	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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	49.87	1.0	50	0	99.7	81 - 118				
Surr: 4-Bromofluorobenzene	50.04	1.0	50	0	100	85 - 114				
Surr: Dibromofluoromethane	48.57	1.0	50	0	97.1	80 - 119				
Surr: Toluene-d8	51.27	1.0	50	0	103	89 - 112				

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19121316

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6			Method: VOLATILES ORGANICS BY METHOD 8260C					
LCS	Sample ID: VLCSW-200103	Units: UG/L			Analysis Date: 03-Jan-2020 14:22					
Client ID:	Run ID: VOA6_353818	SeqNo: 5423600		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.56	1.0	20	0	103	78 - 124				
1,1,1-Trichloroethane	21.61	1.0	20	0	108	74 - 131				
1,1,2,2-Tetrachloroethane	22.09	1.0	20	0	110	71 - 121				
1,1,2-Trichloroethane	21.64	1.0	20	0	108	80 - 119				
1,1-Dichloroethane	24.25	1.0	20	0	121	77 - 125				
1,1-Dichloroethene	19.16	1.0	20	0	95.8	71 - 131				
1,1-Dichloropropene	20.95	1.0	20	0	105	78 - 125				
1,2,3-Trichlorobenzene	26.15	1.0	20	0	131	69 - 129				S
1,2,3-Trichloropropane	22.56	1.0	20	0	113	73 - 122				
1,2,4-Trichlorobenzene	23.24	1.0	20	0	116	69 - 130				
1,2,4-Trimethylbenzene	21.52	1.0	20	0	108	76 - 124				
1,2-Dibromo-3-chloropropane	19.13	1.0	20	0	95.7	62 - 128				
1,2-Dibromoethane	20.59	1.0	20	0	103	77 - 121				
1,2-Dichlorobenzene	20.45	1.0	20	0	102	80 - 119				
1,2-Dichloroethane	21.28	1.0	20	0	106	73 - 128				
1,2-Dichloropropane	22.64	1.0	20	0	113	78 - 122				
1,3,5-Trimethylbenzene	21.98	1.0	20	0	110	75 - 124				
1,3-Dichlorobenzene	20.76	1.0	20	0	104	80 - 119				
1,3-Dichloropropane	21.88	1.0	20	0	109	80 - 119				
1,4-Dichlorobenzene	20.27	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	22.09	1.0	20	0	110	60 - 139				
2-Butanone	46.15	2.0	40	0	115	56 - 143				
2-Chlorotoluene	23.3	1.0	20	0	116	79 - 122				
2-Hexanone	41.4	2.0	40	0	103	57 - 139				
4-Chlorotoluene	22.28	1.0	20	0	111	78 - 122				
4-Isopropyltoluene	20.74	1.0	20	0	104	77 - 127				
4-Methyl-2-pentanone	42.57	2.0	40	0	106	67 - 130				
Acetone	44.68	2.0	40	0	112	39 - 160				
Benzene	22.89	1.0	20	0	114	79 - 120				
Bromobenzene	21.42	1.0	20	0	107	80 - 120				
Bromochloromethane	21.42	1.0	20	0	107	78 - 123				
Bromodichloromethane	21.53	1.0	20	0	108	79 - 125				
Bromoform	19.43	1.0	20	0	97.2	66 - 130				
Bromomethane	15.71	1.0	20	0	78.6	53 - 141				

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19121316

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-200103	Units: UG/L			Analysis Date: 03-Jan-2020 14:22					
Client ID:	Run ID: VOA6_353818	SeqNo: 5423600	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	48.51	2.0	40	0	121	64 - 133				
Carbon tetrachloride	18.91	1.0	20	0	94.5	72 - 136				
Chlorobenzene	20.85	1.0	20	0	104	82 - 118				
Chloroethane	20.05	1.0	20	0	100	60 - 138				
Chloroform	21.85	1.0	20	0	109	79 - 124				
Chloromethane	20.12	1.0	20	0	101	50 - 139				
cis-1,2-Dichloroethene	23.63	1.0	20	0	118	78 - 123				
cis-1,3-Dichloropropene	22.76	1.0	20	0	114	75 - 124				
Dibromochloromethane	20.69	1.0	20	0	103	74 - 126				
Dibromomethane	20.72	1.0	20	0	104	79 - 123				
Dichlorodifluoromethane	20.97	1.0	20	0	105	32 - 152				
Ethylbenzene	20.85	1.0	20	0	104	79 - 121				
Hexachlorobutadiene	20.58	1.0	20	0	103	66 - 134				
Isopropylbenzene	19.64	1.0	20	0	98.2	72 - 131				
m,p-Xylene	41.2	2.0	40	0	103	80 - 121				
Methylene chloride	22.76	2.0	20	0	114	74 - 124				
Naphthalene	21.59	1.0	20	0	108	61 - 128				
n-Butylbenzene	20.84	1.0	20	0	104	75 - 128				
n-Propylbenzene	21.97	1.0	20	0	110	76 - 126				
o-Xylene	20.48	1.0	20	0	102	78 - 122				
sec-Butylbenzene	20.92	1.0	20	0	105	77 - 126				
Styrene	20.4	1.0	20	0	102	78 - 123				
tert-Butylbenzene	21.24	1.0	20	0	106	78 - 124				
Tetrachloroethene	18.52	1.0	20	0	92.6	74 - 129				
Toluene	21.67	1.0	20	0	108	80 - 121				
trans-1,2-Dichloroethene	23.26	1.0	20	0	116	75 - 124				
trans-1,3-Dichloropropene	22.17	1.0	20	0	111	73 - 127				
Trichloroethene	21.01	1.0	20	0	105	79 - 123				
Trichlorofluoromethane	17.89	1.0	20	0	89.5	65 - 141				
Vinyl chloride	22.3	1.0	20	0	111	58 - 137				
Surr: 1,2-Dichloroethane-d4	57.35	1.0	50	0	115	81 - 118				
Surr: 4-Bromofluorobenzene	53.88	1.0	50	0	108	85 - 114				
Surr: Dibromofluoromethane	54.72	1.0	50	0	109	80 - 119				
Surr: Toluene-d8	51.4	1.0	50	0	103	89 - 112				

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19121316

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19121484-01MS	Units: UG/L			Analysis Date: 03-Jan-2020 19:11					
Client ID:	Run ID: VOA6_353818	SeqNo: 5424214	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	19.3	1.0	20	0	96.5	78 - 124				
1,1,1-Trichloroethane	19.73	1.0	20	0	98.7	74 - 131				
1,1,2,2-Tetrachloroethane	21.21	1.0	20	0	106	71 - 121				
1,1,2-Trichloroethane	20.4	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	21.08	1.0	20	0	105	77 - 125				
1,1-Dichloroethene	17.81	1.0	20	0	89.0	71 - 131				
1,1-Dichloropropene	20.63	1.0	20	0	103	78 - 125				
1,2,3-Trichlorobenzene	26.03	1.0	20	0	130	69 - 129				S
1,2,3-Trichloropropane	21.65	1.0	20	0	108	73 - 122				
1,2,4-Trichlorobenzene	22.98	1.0	20	0	115	69 - 130				
1,2,4-Trimethylbenzene	21.95	1.0	20	0	110	76 - 124				
1,2-Dibromo-3-chloropropane	20.69	1.0	20	0	103	62 - 128				
1,2-Dibromoethane	19.7	1.0	20	0	98.5	77 - 121				
1,2-Dichlorobenzene	20.38	1.0	20	0	102	80 - 119				
1,2-Dichloroethane	20.18	1.0	20	1.477	93.5	73 - 128				
1,2-Dichloropropane	20.35	1.0	20	0	102	78 - 122				
1,3,5-Trimethylbenzene	22.62	1.0	20	0	113	75 - 124				
1,3-Dichlorobenzene	20.94	1.0	20	0	105	80 - 119				
1,3-Dichloropropane	20.51	1.0	20	0	103	80 - 119				
1,4-Dichlorobenzene	20.18	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	19.45	1.0	20	0	97.3	60 - 139				
2-Butanone	38.44	2.0	40	0	96.1	56 - 143				
2-Chlorotoluene	23.7	1.0	20	0	118	79 - 122				
2-Hexanone	39.88	2.0	40	0	99.7	57 - 139				
4-Chlorotoluene	22.36	1.0	20	0	112	78 - 122				
4-Isopropyltoluene	22.42	1.0	20	0	112	77 - 127				
4-Methyl-2-pentanone	41.67	2.0	40	0	104	67 - 130				
Acetone	28.87	2.0	40	0	72.2	39 - 160				
Benzene	20.83	1.0	20	0	104	79 - 120				
Bromobenzene	21.07	1.0	20	0	105	80 - 120				
Bromochloromethane	18.68	1.0	20	0	93.4	78 - 123				
Bromodichloromethane	19.05	1.0	20	0	95.2	79 - 125				
Bromoform	18.33	1.0	20	0	91.6	66 - 130				
Bromomethane	12.1	1.0	20	0	60.5	53 - 141				

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19121316

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19121484-01MS	Units: UG/L			Analysis Date: 03-Jan-2020 19:11					
Client ID:	Run ID: VOA6_353818	SeqNo: 5424214	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	43.97	2.0	40	0	110	64 - 133				
Carbon tetrachloride	19.1	1.0	20	0	95.5	72 - 136				
Chlorobenzene	19.49	1.0	20	0	97.5	82 - 118				
Chloroethane	18.2	1.0	20	0	91.0	60 - 138				
Chloroform	18.52	1.0	20	0	92.6	79 - 124				
Chloromethane	17.94	1.0	20	0	89.7	50 - 139				
cis-1,2-Dichloroethene	52.56	1.0	20	32.16	102	78 - 123				
cis-1,3-Dichloropropene	19.99	1.0	20	0	99.9	75 - 124				
Dibromochloromethane	19.34	1.0	20	0	96.7	74 - 126				
Dibromomethane	18.69	1.0	20	0	93.4	79 - 123				
Dichlorodifluoromethane	21.4	1.0	20	0	107	32 - 152				
Ethylbenzene	20.8	1.0	20	0	104	79 - 121				
Hexachlorobutadiene	20.47	1.0	20	0	102	66 - 134				
Isopropylbenzene	20.73	1.0	20	0	104	72 - 131				
m,p-Xylene	40.76	2.0	40	0	102	80 - 121				
Methylene chloride	20.27	2.0	20	0	101	74 - 124				
Naphthalene	21.29	1.0	20	0	106	61 - 128				
n-Butylbenzene	22.42	1.0	20	0	112	75 - 128				
n-Propylbenzene	23.29	1.0	20	0	116	76 - 126				
o-Xylene	20.21	1.0	20	0	101	78 - 122				
sec-Butylbenzene	22.66	1.0	20	0	113	77 - 126				
Styrene	19.43	1.0	20	0	97.2	78 - 123				
tert-Butylbenzene	22.97	1.0	20	0	115	78 - 124				
Tetrachloroethene	19.33	1.0	20	0	96.6	74 - 129				
Toluene	20.94	1.0	20	0	105	80 - 121				
trans-1,2-Dichloroethene	20.28	1.0	20	0	101	75 - 124				
trans-1,3-Dichloropropene	19.34	1.0	20	0	96.7	73 - 127				
Trichloroethene	24.42	1.0	20	4.834	97.9	79 - 123				
Trichlorofluoromethane	17.97	1.0	20	0	89.9	65 - 141				
Vinyl chloride	21.43	1.0	20	0	107	58 - 137				
Surr: 1,2-Dichloroethane-d4	49.39	1.0	50	0	98.8	81 - 118				
Surr: 4-Bromofluorobenzene	50.59	1.0	50	0	101	85 - 114				
Surr: Dibromofluoromethane	48.45	1.0	50	0	96.9	80 - 119				
Surr: Toluene-d8	51.05	1.0	50	0	102	89 - 112				

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19121316

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19121484-01MSD	Units: UG/L			Analysis Date: 03-Jan-2020 19:35					
Client ID:	Run ID: VOA6_353818	SeqNo: 5424215	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	18.89	1.0	20	0	94.5	78 - 124	19.3	2.14	20	
1,1,1-Trichloroethane	18.74	1.0	20	0	93.7	74 - 131	19.73	5.18	20	
1,1,2,2-Tetrachloroethane	20.36	1.0	20	0	102	71 - 121	21.21	4.1	20	
1,1,2-Trichloroethane	19.75	1.0	20	0	98.8	80 - 119	20.4	3.23	20	
1,1-Dichloroethane	20.23	1.0	20	0	101	77 - 125	21.08	4.12	20	
1,1-Dichloroethene	16.57	1.0	20	0	82.9	71 - 131	17.81	7.19	20	
1,1-Dichloropropene	19.5	1.0	20	0	97.5	78 - 125	20.63	5.66	20	
1,2,3-Trichlorobenzene	23.55	1.0	20	0	118	69 - 129	26.03	10	20	
1,2,3-Trichloropropane	20.98	1.0	20	0	105	73 - 122	21.65	3.16	20	
1,2,4-Trichlorobenzene	20.14	1.0	20	0	101	69 - 130	22.98	13.2	20	
1,2,4-Trimethylbenzene	21.2	1.0	20	0	106	76 - 124	21.95	3.46	20	
1,2-Dibromo-3-chloropropane	19.89	1.0	20	0	99.4	62 - 128	20.69	3.97	20	
1,2-Dibromoethane	18.91	1.0	20	0	94.6	77 - 121	19.7	4.08	20	
1,2-Dichlorobenzene	19.53	1.0	20	0	97.6	80 - 119	20.38	4.29	20	
1,2-Dichloroethane	19.96	1.0	20	1.477	92.4	73 - 128	20.18	1.09	20	
1,2-Dichloropropane	20.04	1.0	20	0	100	78 - 122	20.35	1.55	20	
1,3,5-Trimethylbenzene	21.79	1.0	20	0	109	75 - 124	22.62	3.73	20	
1,3-Dichlorobenzene	20.02	1.0	20	0	100	80 - 119	20.94	4.49	20	
1,3-Dichloropropane	19.89	1.0	20	0	99.4	80 - 119	20.51	3.06	20	
1,4-Dichlorobenzene	19.77	1.0	20	0	98.9	79 - 118	20.18	2.04	20	
2,2-Dichloropropane	18.54	1.0	20	0	92.7	60 - 139	19.45	4.82	20	
2-Butanone	37.18	2.0	40	0	92.9	56 - 143	38.44	3.34	20	
2-Chlorotoluene	22.44	1.0	20	0	112	79 - 122	23.7	5.45	20	
2-Hexanone	38.07	2.0	40	0	95.2	57 - 139	39.88	4.66	20	
4-Chlorotoluene	21.47	1.0	20	0	107	78 - 122	22.36	4.08	20	
4-Isopropyltoluene	21.11	1.0	20	0	106	77 - 127	22.42	6.03	20	
4-Methyl-2-pentanone	39.31	2.0	40	0	98.3	67 - 130	41.67	5.83	20	
Acetone	27.28	2.0	40	0	68.2	39 - 160	28.87	5.68	20	
Benzene	20.01	1.0	20	0	100	79 - 120	20.83	4.04	20	
Bromobenzene	20.03	1.0	20	0	100	80 - 120	21.07	5.06	20	
Bromochloromethane	17.97	1.0	20	0	89.9	78 - 123	18.68	3.87	20	
Bromodichloromethane	18.8	1.0	20	0	94.0	79 - 125	19.05	1.3	20	
Bromoform	17.89	1.0	20	0	89.4	66 - 130	18.33	2.45	20	
Bromomethane	11.6	1.0	20	0	58.0	53 - 141	12.1	4.24	20	

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19121316

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19121484-01MSD	Units: UG/L			Analysis Date: 03-Jan-2020 19:35					
Client ID:	Run ID: VOA6_353818	SeqNo: 5424215	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	40.98	2.0	40	0	102	64 - 133	43.97	7.04	20	
Carbon tetrachloride	18.29	1.0	20	0	91.5	72 - 136	19.1	4.34	20	
Chlorobenzene	18.95	1.0	20	0	94.8	82 - 118	19.49	2.83	20	
Chloroethane	16.93	1.0	20	0	84.6	60 - 138	18.2	7.22	20	
Chloroform	18.12	1.0	20	0	90.6	79 - 124	18.52	2.17	20	
Chloromethane	16.9	1.0	20	0	84.5	50 - 139	17.94	5.96	20	
cis-1,2-Dichloroethene	50.96	1.0	20	32.16	94.0	78 - 123	52.56	3.1	20	
cis-1,3-Dichloropropene	19.83	1.0	20	0	99.1	75 - 124	19.99	0.8	20	
Dibromochloromethane	18.84	1.0	20	0	94.2	74 - 126	19.34	2.62	20	
Dibromomethane	18.09	1.0	20	0	90.5	79 - 123	18.69	3.23	20	
Dichlorodifluoromethane	19.14	1.0	20	0	95.7	32 - 152	21.4	11.1	20	
Ethylbenzene	19.58	1.0	20	0	97.9	79 - 121	20.8	6.07	20	
Hexachlorobutadiene	17.71	1.0	20	0	88.5	66 - 134	20.47	14.5	20	
Isopropylbenzene	19.63	1.0	20	0	98.2	72 - 131	20.73	5.46	20	
m,p-Xylene	39.27	2.0	40	0	98.2	80 - 121	40.76	3.7	20	
Methylene chloride	19.5	2.0	20	0	97.5	74 - 124	20.27	3.84	20	
Naphthalene	20.81	1.0	20	0	104	61 - 128	21.29	2.27	20	
n-Butylbenzene	21.27	1.0	20	0	106	75 - 128	22.42	5.27	20	
n-Propylbenzene	22.13	1.0	20	0	111	76 - 126	23.29	5.1	20	
o-Xylene	19.41	1.0	20	0	97.1	78 - 122	20.21	4.02	20	
sec-Butylbenzene	21.87	1.0	20	0	109	77 - 126	22.66	3.54	20	
Styrene	19.15	1.0	20	0	95.8	78 - 123	19.43	1.45	20	
tert-Butylbenzene	21.53	1.0	20	0	108	78 - 124	22.97	6.45	20	
Tetrachloroethene	18.22	1.0	20	0	91.1	74 - 129	19.33	5.89	20	
Toluene	19.9	1.0	20	0	99.5	80 - 121	20.94	5.09	20	
trans-1,2-Dichloroethene	19.33	1.0	20	0	96.7	75 - 124	20.28	4.78	20	
trans-1,3-Dichloropropene	18.96	1.0	20	0	94.8	73 - 127	19.34	2	20	
Trichloroethene	23.31	1.0	20	4.834	92.4	79 - 123	24.42	4.66	20	
Trichlorofluoromethane	16.48	1.0	20	0	82.4	65 - 141	17.97	8.64	20	
Vinyl chloride	19.74	1.0	20	0	98.7	58 - 137	21.43	8.18	20	
Surr: 1,2-Dichloroethane-d4	49.32	1.0	50	0	98.6	81 - 118	49.39	0.133	20	
Surr: 4-Bromofluorobenzene	50.47	1.0	50	0	101	85 - 114	50.59	0.253	20	
Surr: Dibromofluoromethane	48.39	1.0	50	0	96.8	80 - 119	48.45	0.127	20	
Surr: Toluene-d8	50.83	1.0	50	0	102	89 - 112	51.05	0.441	20	

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19121316

QC BATCH REPORT**Batch ID:** R353818 (0)**Instrument:** VOA6**Method:** VOLATILES ORGANICS BY METHOD
8260C

The following samples were analyzed in this batch:

HS19121316-01	HS19121316-02
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ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19121316

QC BATCH REPORT

Batch ID: R353307 (0)		Instrument: ICS-Integrion		Method: ANIONS BY SW9056A						
MBLK	Sample ID: WBLKW1-122619	Units: mg/L			Analysis Date: 26-Dec-2019 10:37					
Client ID:	Run ID: ICS-Integrion_353307	SeqNo: 5409816		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	0.500	0.500							U	
Sulfate	0.500	0.500							U	
LCS	Sample ID: WLCSW1-122619	Units: mg/L			Analysis Date: 26-Dec-2019 10:54					
Client ID:	Run ID: ICS-Integrion_353307	SeqNo: 5409817		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	19.7	0.500	20	0	98.5	80 - 120				
Sulfate	19.39	0.500	20	0	97.0	80 - 120				
LCSD	Sample ID: WLCSDW1-122619	Units: mg/L			Analysis Date: 26-Dec-2019 11:10					
Client ID:	Run ID: ICS-Integrion_353307	SeqNo: 5409818		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	19.69	0.500	20	0	98.5	80 - 120	19.7	0.0305	20	
Sulfate	19.32	0.500	20	0	96.6	80 - 120	19.39	0.351	20	
MS	Sample ID: HS19121313-04MS	Units: mg/L			Analysis Date: 26-Dec-2019 12:33					
Client ID:	Run ID: ICS-Integrion_353307	SeqNo: 5409823		PrepDate:			DF: 500			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	4892	250	5000	102	95.8	80 - 120				
Sulfate	4728	250	5000	34.95	93.9	80 - 120				
MS	Sample ID: HS19120760-11MS	Units: mg/L			Analysis Date: 26-Dec-2019 18:29					
Client ID:	Run ID: ICS-Integrion_353307	SeqNo: 5412209		PrepDate:			DF: 500			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	14800	250	5000	10110	93.8	80 - 120				
Sulfate	5883	250	5000	1099	95.7	80 - 120				

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19121316

QC BATCH REPORT

Batch ID: R353307 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MSD		Sample ID: HS19121313-04MSD		Units: mg/L		Analysis Date: 26-Dec-2019 12:50				
Client ID:		Run ID: ICS-Integrion_353307		SeqNo: 5409824		PrepDate:		DF: 500		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	4849	250	5000	102	94.9	80 - 120	4892	0.883	20	
Sulfate	4687	250	5000	34.95	93.0	80 - 120	4728	0.86	20	

MSD		Sample ID: HS19120760-11MSD		Units: mg/L		Analysis Date: 26-Dec-2019 18:45				
Client ID:		Run ID: ICS-Integrion_353307		SeqNo: 5412210		PrepDate:		DF: 500		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	14830	250	5000	10110	94.3	80 - 120	14800	0.179	20	
Sulfate	5914	250	5000	1099	96.3	80 - 120	5883	0.529	20	

The following samples were analyzed in this batch: HS19121316-01

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
WorkOrder: HS19121316

**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 Quantitation Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Florida	E87611-28	30-Jun-2020
Illinois	2000322019-2	09-May-2020
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North 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: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi Weekly Samples
Work Order: HS19121316

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19121316-01	LH18/24-SP650_122319	Login	12/24/2019 11:50:35 AM	PMG	WET393
HS19121316-01	LH18/24-SP650_122319	Login	12/24/2019 11:50:35 AM	PMG	VOA061
HS19121316-02	Trip Blank	Login	12/24/2019 11:50:35 AM	PMG	VOA061

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19121316

Date/Time Received: **24-Dec-2019 09:45**
 Received by: **PMG**

Checklist completed by: Paresh M. Giga 24-Dec-2019
 eSignature Date

Reviewed by: Andy C. Neir 24-Dec-2019
 eSignature Date

Matrices: **Water**

Carrier name: **FedEx**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes No Not Present
- Chain of custody present? Yes No 1 Page(s)
- Chain of custody signed when relinquished and received? Yes No COC IDs:None
- Samplers name present on COC? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s): 3.2c U/C IR25
 Cooler(s)/Kit(s): Blue
 Date/Time sample(s) sent to storage: 12/24/19 11:55

- 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:


CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210, Houston, Tx. 77099 ATTN: R.J. Modashia

Page 1 of 1

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS			Project No. NWO1312.0150.0 16.0001			Analyses												HS19121316 Bhate Environmental Associates. Inc. Longhorn GW Treatment Plant Bi Weekly Samples 											
Job: GROUNDWATER TREATMENT PLANT BI-WEEKLY SAMPLES						MS / MSD	No. OF CONTAINERS	VOC	CHLORIDE, SULFATE																				
Prepared By: Scott Beesinger			P.O Number																										
Field Sample I.D.			Sample Matrix			Date / Time															Remarks (Preservatives, etc.)		Lab I.D.#						
LH18/24-SP650_122319			Water			12/23/19 / 14:00			3			3															HCL		
LH18/24-SP650_122319			Water			12/23/19 / 14:00			1			1															NONE		
Trip Blank			Water			12/23/19			2			2															HCL		
Additional Remarks: Standard TAT on Chloride & Sulfate. 24 Hour TAT on VOC																													
Relinquished By:		Date		Time		Received By:		Date		Time		Relinquished By:		Date		Time		Received By:		Date		Time							
<i>Scott Beesinger</i>		12/23/19		14:30		<i>[Signature]</i>		12/23/19		09:45																			
9 For Lab Use Only																													
Received At Lab By:						Date		Time		Airbill No.				Opened By:				Date		Time		Temp of Container		Seal No.		Condition			
Remarks																													

Blue
3.20
12/23
16.0001

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CUSTODY SEAL		Seal Broken By:
	Date: 12/23/19	Time: 1:50	<i>SM</i>
	Name: Scott Beesinger	Company: F&K	Date: 12/24/19

Bme DEC 24 2019

Must Deliver Next Business Day
Time and Temperature Sensitive!



Bme

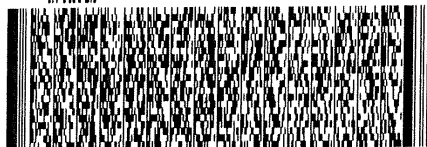
ORIGIN ID:SGRA (903) 930-6193
 SCOTT BEESINGER
 BHATE ENVIRONMENTAL ASSOCIATES
 1203-B EAST GRAND AVE., PHB202
 MARSHALL, TX 75670
 UNITED STATES US

SHIP DATE: 02DEC19
 ACTWGT: 1.00 LB MAN
 CAD: 300130/CAF3211
 DIMS: 26x14x14 IN

TO CLIENT SERVICES
 ALS LABORATORY GROUP
 10450 STANCLIFF ROAD
 SUITE 210
 HOUSTON TX 77099

(281) 530-6656
 REF: LHAAP-18/24-BO 66900-RJ

RMA: ||| ||| |||



FedEx Express



FedEx
 TRK# 1251 0292 4200

TUE - 24 DEC 10:30A
 PRIORITY OVERNIGHT

AB SGRA

77099
 TX-US IAH





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

January 06, 2020

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

Work Order: **HS19121433**

Laboratory Results for: **GW Treatment Plant Special Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Dec 28, 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,

A handwritten signature in black ink, appearing to read "Raj. P. Modashia", enclosed in a circular scribble.

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: GW Treatment Plant Special Samples
Work Order: HS19121433

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19121433-01	LH18/24-SP650_122719	Water		27-Dec-2019 09:00	28-Dec-2019 08:42	<input type="checkbox"/>
HS19121433-02	Trip Blank	Water		27-Dec-2019 00:00	28-Dec-2019 08:42	<input type="checkbox"/>

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: GW Treatment Plant Special Samples
Work Order: HS19121433

CASE NARRATIVE

GCMS Volatiles by Method SW8260**Batch ID: R353818****Sample ID: CCV**

- 1,2,3_Trichlorobenzene and 2_Butanone exceeded %D limits for CCV. Samples are ND for these compounds.

Sample ID: VLCSW-200103

- 1,2,3_Trichlorobenzene is also high for LCS.

Sample ID: HS19121484-01MS

- MS and MSD are for an unrelated sample
-

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: GW Treatment Plant Special Samples
 Sample ID: LH18/24-SP650_122719
 Collection Date: 27-Dec-2019 09:00

ANALYTICAL REPORT
 WorkOrder:HS19121433
 Lab ID:HS19121433-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
1,2-Dichloroethane	1.6		0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jan-2020 18:23	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jan-2020 18:23	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jan-2020 18:23	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jan-2020 18:23	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jan-2020 18:23	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:23	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:23	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: GW Treatment Plant Special Samples
 Sample ID: LH18/24-SP650_122719
 Collection Date: 27-Dec-2019 09:00

ANALYTICAL REPORT
 WorkOrder:HS19121433
 Lab ID:HS19121433-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED		
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
cis-1,2-Dichloroethene	40		0.20	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jan-2020	18:23	
Methylene chloride	1.1	J	0.40	1.0	2.0	UG/L	1	03-Jan-2020	18:23	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
Trichloroethene	6.5		0.20	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
Vinyl chloride	0.52	J	0.20	0.50	1.0	UG/L	1	03-Jan-2020	18:23	
Surr: 1,2-Dichloroethane-d4	99.1			0	81-118	%REC	1	03-Jan-2020	18:23	
Surr: 4-Bromofluorobenzene	100			0	85-114	%REC	1	03-Jan-2020	18:23	
Surr: Dibromofluoromethane	97.7			0	80-119	%REC	1	03-Jan-2020	18:23	
Surr: Toluene-d8	103			0	89-112	%REC	1	03-Jan-2020	18:23	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: GW Treatment Plant Special Samples
 Sample ID: Trip Blank
 Collection Date: 27-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19121433
 Lab ID:HS19121433-02
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jan-2020 17:35	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jan-2020 17:35	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jan-2020 17:35	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jan-2020 17:35	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jan-2020 17:35	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:35	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: GW Treatment Plant Special Samples
 Sample ID: Trip Blank
 Collection Date: 27-Dec-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19121433
 Lab ID:HS19121433-02
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jan-2020 17:35	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jan-2020 17:35	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:35	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>97.8</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>03-Jan-2020 17:35</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>100</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>03-Jan-2020 17:35</i>	
<i>Surr: Dibromofluoromethane</i>	<i>97.4</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>03-Jan-2020 17:35</i>	
<i>Surr: Toluene-d8</i>	<i>103</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>03-Jan-2020 17:35</i>	

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

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: GW Treatment Plant Special Samples
WorkOrder: HS19121433

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R353818 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19121433-01	LH18/24-SP650_122719	27 Dec 2019 09:00			03 Jan 2020 18:23	1
HS19121433-02	Trip Blank	27 Dec 2019 00:00			03 Jan 2020 17:35	1

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: GW Treatment Plant Special Samples
WorkOrder: HS19121433

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-200103	Units: UG/L			Analysis Date: 03-Jan-2020 15:10					
Client ID:	Run ID: VOA6_353818	SeqNo: 5423601	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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	49.87	1.0	50	0	99.7	81 - 118				
Surr: 4-Bromofluorobenzene	50.04	1.0	50	0	100	85 - 114				
Surr: Dibromofluoromethane	48.57	1.0	50	0	97.1	80 - 119				
Surr: Toluene-d8	51.27	1.0	50	0	103	89 - 112				

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: GW Treatment Plant Special Samples
WorkOrder: HS19121433

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6			Method: VOLATILES ORGANICS BY METHOD 8260C					
LCS	Sample ID: VLCSW-200103	Units: UG/L			Analysis Date: 03-Jan-2020 14:22					
Client ID:	Run ID: VOA6_353818	SeqNo: 5423600		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.56	1.0	20	0	103	78 - 124				
1,1,1-Trichloroethane	21.61	1.0	20	0	108	74 - 131				
1,1,2,2-Tetrachloroethane	22.09	1.0	20	0	110	71 - 121				
1,1,2-Trichloroethane	21.64	1.0	20	0	108	80 - 119				
1,1-Dichloroethane	24.25	1.0	20	0	121	77 - 125				
1,1-Dichloroethene	19.16	1.0	20	0	95.8	71 - 131				
1,1-Dichloropropene	20.95	1.0	20	0	105	78 - 125				
1,2,3-Trichlorobenzene	26.15	1.0	20	0	131	69 - 129				S
1,2,3-Trichloropropane	22.56	1.0	20	0	113	73 - 122				
1,2,4-Trichlorobenzene	23.24	1.0	20	0	116	69 - 130				
1,2,4-Trimethylbenzene	21.52	1.0	20	0	108	76 - 124				
1,2-Dibromo-3-chloropropane	19.13	1.0	20	0	95.7	62 - 128				
1,2-Dibromoethane	20.59	1.0	20	0	103	77 - 121				
1,2-Dichlorobenzene	20.45	1.0	20	0	102	80 - 119				
1,2-Dichloroethane	21.28	1.0	20	0	106	73 - 128				
1,2-Dichloropropane	22.64	1.0	20	0	113	78 - 122				
1,3,5-Trimethylbenzene	21.98	1.0	20	0	110	75 - 124				
1,3-Dichlorobenzene	20.76	1.0	20	0	104	80 - 119				
1,3-Dichloropropane	21.88	1.0	20	0	109	80 - 119				
1,4-Dichlorobenzene	20.27	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	22.09	1.0	20	0	110	60 - 139				
2-Butanone	46.15	2.0	40	0	115	56 - 143				
2-Chlorotoluene	23.3	1.0	20	0	116	79 - 122				
2-Hexanone	41.4	2.0	40	0	103	57 - 139				
4-Chlorotoluene	22.28	1.0	20	0	111	78 - 122				
4-Isopropyltoluene	20.74	1.0	20	0	104	77 - 127				
4-Methyl-2-pentanone	42.57	2.0	40	0	106	67 - 130				
Acetone	44.68	2.0	40	0	112	39 - 160				
Benzene	22.89	1.0	20	0	114	79 - 120				
Bromobenzene	21.42	1.0	20	0	107	80 - 120				
Bromochloromethane	21.42	1.0	20	0	107	78 - 123				
Bromodichloromethane	21.53	1.0	20	0	108	79 - 125				
Bromoform	19.43	1.0	20	0	97.2	66 - 130				
Bromomethane	15.71	1.0	20	0	78.6	53 - 141				

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Client: Bhate Environmental Associates, Inc.
Project: GW Treatment Plant Special Samples
WorkOrder: HS19121433

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-200103	Units: UG/L			Analysis Date: 03-Jan-2020 14:22					
Client ID:	Run ID: VOA6_353818	SeqNo: 5423600	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	48.51	2.0	40	0	121	64 - 133				
Carbon tetrachloride	18.91	1.0	20	0	94.5	72 - 136				
Chlorobenzene	20.85	1.0	20	0	104	82 - 118				
Chloroethane	20.05	1.0	20	0	100	60 - 138				
Chloroform	21.85	1.0	20	0	109	79 - 124				
Chloromethane	20.12	1.0	20	0	101	50 - 139				
cis-1,2-Dichloroethene	23.63	1.0	20	0	118	78 - 123				
cis-1,3-Dichloropropene	22.76	1.0	20	0	114	75 - 124				
Dibromochloromethane	20.69	1.0	20	0	103	74 - 126				
Dibromomethane	20.72	1.0	20	0	104	79 - 123				
Dichlorodifluoromethane	20.97	1.0	20	0	105	32 - 152				
Ethylbenzene	20.85	1.0	20	0	104	79 - 121				
Hexachlorobutadiene	20.58	1.0	20	0	103	66 - 134				
Isopropylbenzene	19.64	1.0	20	0	98.2	72 - 131				
m,p-Xylene	41.2	2.0	40	0	103	80 - 121				
Methylene chloride	22.76	2.0	20	0	114	74 - 124				
Naphthalene	21.59	1.0	20	0	108	61 - 128				
n-Butylbenzene	20.84	1.0	20	0	104	75 - 128				
n-Propylbenzene	21.97	1.0	20	0	110	76 - 126				
o-Xylene	20.48	1.0	20	0	102	78 - 122				
sec-Butylbenzene	20.92	1.0	20	0	105	77 - 126				
Styrene	20.4	1.0	20	0	102	78 - 123				
tert-Butylbenzene	21.24	1.0	20	0	106	78 - 124				
Tetrachloroethene	18.52	1.0	20	0	92.6	74 - 129				
Toluene	21.67	1.0	20	0	108	80 - 121				
trans-1,2-Dichloroethene	23.26	1.0	20	0	116	75 - 124				
trans-1,3-Dichloropropene	22.17	1.0	20	0	111	73 - 127				
Trichloroethene	21.01	1.0	20	0	105	79 - 123				
Trichlorofluoromethane	17.89	1.0	20	0	89.5	65 - 141				
Vinyl chloride	22.3	1.0	20	0	111	58 - 137				
Surr: 1,2-Dichloroethane-d4	57.35	1.0	50	0	115	81 - 118				
Surr: 4-Bromofluorobenzene	53.88	1.0	50	0	108	85 - 114				
Surr: Dibromofluoromethane	54.72	1.0	50	0	109	80 - 119				
Surr: Toluene-d8	51.4	1.0	50	0	103	89 - 112				

ALS Houston, US

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Client: Bhate Environmental Associates, Inc.
Project: GW Treatment Plant Special Samples
WorkOrder: HS19121433

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19121484-01MS	Units: UG/L			Analysis Date: 03-Jan-2020 19:11					
Client ID:	Run ID: VOA6_353818	SeqNo: 5424214	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	19.3	1.0	20	0	96.5	78 - 124				
1,1,1-Trichloroethane	19.73	1.0	20	0	98.7	74 - 131				
1,1,2,2-Tetrachloroethane	21.21	1.0	20	0	106	71 - 121				
1,1,2-Trichloroethane	20.4	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	21.08	1.0	20	0	105	77 - 125				
1,1-Dichloroethene	17.81	1.0	20	0	89.0	71 - 131				
1,1-Dichloropropene	20.63	1.0	20	0	103	78 - 125				
1,2,3-Trichlorobenzene	26.03	1.0	20	0	130	69 - 129				S
1,2,3-Trichloropropane	21.65	1.0	20	0	108	73 - 122				
1,2,4-Trichlorobenzene	22.98	1.0	20	0	115	69 - 130				
1,2,4-Trimethylbenzene	21.95	1.0	20	0	110	76 - 124				
1,2-Dibromo-3-chloropropane	20.69	1.0	20	0	103	62 - 128				
1,2-Dibromoethane	19.7	1.0	20	0	98.5	77 - 121				
1,2-Dichlorobenzene	20.38	1.0	20	0	102	80 - 119				
1,2-Dichloroethane	20.18	1.0	20	1.477	93.5	73 - 128				
1,2-Dichloropropane	20.35	1.0	20	0	102	78 - 122				
1,3,5-Trimethylbenzene	22.62	1.0	20	0	113	75 - 124				
1,3-Dichlorobenzene	20.94	1.0	20	0	105	80 - 119				
1,3-Dichloropropane	20.51	1.0	20	0	103	80 - 119				
1,4-Dichlorobenzene	20.18	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	19.45	1.0	20	0	97.3	60 - 139				
2-Butanone	38.44	2.0	40	0	96.1	56 - 143				
2-Chlorotoluene	23.7	1.0	20	0	118	79 - 122				
2-Hexanone	39.88	2.0	40	0	99.7	57 - 139				
4-Chlorotoluene	22.36	1.0	20	0	112	78 - 122				
4-Isopropyltoluene	22.42	1.0	20	0	112	77 - 127				
4-Methyl-2-pentanone	41.67	2.0	40	0	104	67 - 130				
Acetone	28.87	2.0	40	0	72.2	39 - 160				
Benzene	20.83	1.0	20	0	104	79 - 120				
Bromobenzene	21.07	1.0	20	0	105	80 - 120				
Bromochloromethane	18.68	1.0	20	0	93.4	78 - 123				
Bromodichloromethane	19.05	1.0	20	0	95.2	79 - 125				
Bromoform	18.33	1.0	20	0	91.6	66 - 130				
Bromomethane	12.1	1.0	20	0	60.5	53 - 141				

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Client: Bhate Environmental Associates, Inc.
Project: GW Treatment Plant Special Samples
WorkOrder: HS19121433

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19121484-01MS	Units: UG/L			Analysis Date: 03-Jan-2020 19:11					
Client ID:	Run ID: VOA6_353818	SeqNo: 5424214	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	43.97	2.0	40	0	110	64 - 133				
Carbon tetrachloride	19.1	1.0	20	0	95.5	72 - 136				
Chlorobenzene	19.49	1.0	20	0	97.5	82 - 118				
Chloroethane	18.2	1.0	20	0	91.0	60 - 138				
Chloroform	18.52	1.0	20	0	92.6	79 - 124				
Chloromethane	17.94	1.0	20	0	89.7	50 - 139				
cis-1,2-Dichloroethene	52.56	1.0	20	32.16	102	78 - 123				
cis-1,3-Dichloropropene	19.99	1.0	20	0	99.9	75 - 124				
Dibromochloromethane	19.34	1.0	20	0	96.7	74 - 126				
Dibromomethane	18.69	1.0	20	0	93.4	79 - 123				
Dichlorodifluoromethane	21.4	1.0	20	0	107	32 - 152				
Ethylbenzene	20.8	1.0	20	0	104	79 - 121				
Hexachlorobutadiene	20.47	1.0	20	0	102	66 - 134				
Isopropylbenzene	20.73	1.0	20	0	104	72 - 131				
m,p-Xylene	40.76	2.0	40	0	102	80 - 121				
Methylene chloride	20.27	2.0	20	0	101	74 - 124				
Naphthalene	21.29	1.0	20	0	106	61 - 128				
n-Butylbenzene	22.42	1.0	20	0	112	75 - 128				
n-Propylbenzene	23.29	1.0	20	0	116	76 - 126				
o-Xylene	20.21	1.0	20	0	101	78 - 122				
sec-Butylbenzene	22.66	1.0	20	0	113	77 - 126				
Styrene	19.43	1.0	20	0	97.2	78 - 123				
tert-Butylbenzene	22.97	1.0	20	0	115	78 - 124				
Tetrachloroethene	19.33	1.0	20	0	96.6	74 - 129				
Toluene	20.94	1.0	20	0	105	80 - 121				
trans-1,2-Dichloroethene	20.28	1.0	20	0	101	75 - 124				
trans-1,3-Dichloropropene	19.34	1.0	20	0	96.7	73 - 127				
Trichloroethene	24.42	1.0	20	4.834	97.9	79 - 123				
Trichlorofluoromethane	17.97	1.0	20	0	89.9	65 - 141				
Vinyl chloride	21.43	1.0	20	0	107	58 - 137				
Surr: 1,2-Dichloroethane-d4	49.39	1.0	50	0	98.8	81 - 118				
Surr: 4-Bromofluorobenzene	50.59	1.0	50	0	101	85 - 114				
Surr: Dibromofluoromethane	48.45	1.0	50	0	96.9	80 - 119				
Surr: Toluene-d8	51.05	1.0	50	0	102	89 - 112				

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: GW Treatment Plant Special Samples
WorkOrder: HS19121433

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19121484-01MSD	Units: UG/L			Analysis Date: 03-Jan-2020 19:35					
Client ID:	Run ID: VOA6_353818	SeqNo: 5424215	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	18.89	1.0	20	0	94.5	78 - 124	19.3	2.14	20	
1,1,1-Trichloroethane	18.74	1.0	20	0	93.7	74 - 131	19.73	5.18	20	
1,1,2,2-Tetrachloroethane	20.36	1.0	20	0	102	71 - 121	21.21	4.1	20	
1,1,2-Trichloroethane	19.75	1.0	20	0	98.8	80 - 119	20.4	3.23	20	
1,1-Dichloroethane	20.23	1.0	20	0	101	77 - 125	21.08	4.12	20	
1,1-Dichloroethene	16.57	1.0	20	0	82.9	71 - 131	17.81	7.19	20	
1,1-Dichloropropene	19.5	1.0	20	0	97.5	78 - 125	20.63	5.66	20	
1,2,3-Trichlorobenzene	23.55	1.0	20	0	118	69 - 129	26.03	10	20	
1,2,3-Trichloropropane	20.98	1.0	20	0	105	73 - 122	21.65	3.16	20	
1,2,4-Trichlorobenzene	20.14	1.0	20	0	101	69 - 130	22.98	13.2	20	
1,2,4-Trimethylbenzene	21.2	1.0	20	0	106	76 - 124	21.95	3.46	20	
1,2-Dibromo-3-chloropropane	19.89	1.0	20	0	99.4	62 - 128	20.69	3.97	20	
1,2-Dibromoethane	18.91	1.0	20	0	94.6	77 - 121	19.7	4.08	20	
1,2-Dichlorobenzene	19.53	1.0	20	0	97.6	80 - 119	20.38	4.29	20	
1,2-Dichloroethane	19.96	1.0	20	1.477	92.4	73 - 128	20.18	1.09	20	
1,2-Dichloropropane	20.04	1.0	20	0	100	78 - 122	20.35	1.55	20	
1,3,5-Trimethylbenzene	21.79	1.0	20	0	109	75 - 124	22.62	3.73	20	
1,3-Dichlorobenzene	20.02	1.0	20	0	100	80 - 119	20.94	4.49	20	
1,3-Dichloropropane	19.89	1.0	20	0	99.4	80 - 119	20.51	3.06	20	
1,4-Dichlorobenzene	19.77	1.0	20	0	98.9	79 - 118	20.18	2.04	20	
2,2-Dichloropropane	18.54	1.0	20	0	92.7	60 - 139	19.45	4.82	20	
2-Butanone	37.18	2.0	40	0	92.9	56 - 143	38.44	3.34	20	
2-Chlorotoluene	22.44	1.0	20	0	112	79 - 122	23.7	5.45	20	
2-Hexanone	38.07	2.0	40	0	95.2	57 - 139	39.88	4.66	20	
4-Chlorotoluene	21.47	1.0	20	0	107	78 - 122	22.36	4.08	20	
4-Isopropyltoluene	21.11	1.0	20	0	106	77 - 127	22.42	6.03	20	
4-Methyl-2-pentanone	39.31	2.0	40	0	98.3	67 - 130	41.67	5.83	20	
Acetone	27.28	2.0	40	0	68.2	39 - 160	28.87	5.68	20	
Benzene	20.01	1.0	20	0	100	79 - 120	20.83	4.04	20	
Bromobenzene	20.03	1.0	20	0	100	80 - 120	21.07	5.06	20	
Bromochloromethane	17.97	1.0	20	0	89.9	78 - 123	18.68	3.87	20	
Bromodichloromethane	18.8	1.0	20	0	94.0	79 - 125	19.05	1.3	20	
Bromoform	17.89	1.0	20	0	89.4	66 - 130	18.33	2.45	20	
Bromomethane	11.6	1.0	20	0	58.0	53 - 141	12.1	4.24	20	

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: GW Treatment Plant Special Samples
WorkOrder: HS19121433

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19121484-01MSD	Units: UG/L			Analysis Date: 03-Jan-2020 19:35					
Client ID:	Run ID: VOA6_353818	SeqNo: 5424215	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	40.98	2.0	40	0	102	64 - 133	43.97	7.04	20	
Carbon tetrachloride	18.29	1.0	20	0	91.5	72 - 136	19.1	4.34	20	
Chlorobenzene	18.95	1.0	20	0	94.8	82 - 118	19.49	2.83	20	
Chloroethane	16.93	1.0	20	0	84.6	60 - 138	18.2	7.22	20	
Chloroform	18.12	1.0	20	0	90.6	79 - 124	18.52	2.17	20	
Chloromethane	16.9	1.0	20	0	84.5	50 - 139	17.94	5.96	20	
cis-1,2-Dichloroethene	50.96	1.0	20	32.16	94.0	78 - 123	52.56	3.1	20	
cis-1,3-Dichloropropene	19.83	1.0	20	0	99.1	75 - 124	19.99	0.8	20	
Dibromochloromethane	18.84	1.0	20	0	94.2	74 - 126	19.34	2.62	20	
Dibromomethane	18.09	1.0	20	0	90.5	79 - 123	18.69	3.23	20	
Dichlorodifluoromethane	19.14	1.0	20	0	95.7	32 - 152	21.4	11.1	20	
Ethylbenzene	19.58	1.0	20	0	97.9	79 - 121	20.8	6.07	20	
Hexachlorobutadiene	17.71	1.0	20	0	88.5	66 - 134	20.47	14.5	20	
Isopropylbenzene	19.63	1.0	20	0	98.2	72 - 131	20.73	5.46	20	
m,p-Xylene	39.27	2.0	40	0	98.2	80 - 121	40.76	3.7	20	
Methylene chloride	19.5	2.0	20	0	97.5	74 - 124	20.27	3.84	20	
Naphthalene	20.81	1.0	20	0	104	61 - 128	21.29	2.27	20	
n-Butylbenzene	21.27	1.0	20	0	106	75 - 128	22.42	5.27	20	
n-Propylbenzene	22.13	1.0	20	0	111	76 - 126	23.29	5.1	20	
o-Xylene	19.41	1.0	20	0	97.1	78 - 122	20.21	4.02	20	
sec-Butylbenzene	21.87	1.0	20	0	109	77 - 126	22.66	3.54	20	
Styrene	19.15	1.0	20	0	95.8	78 - 123	19.43	1.45	20	
tert-Butylbenzene	21.53	1.0	20	0	108	78 - 124	22.97	6.45	20	
Tetrachloroethene	18.22	1.0	20	0	91.1	74 - 129	19.33	5.89	20	
Toluene	19.9	1.0	20	0	99.5	80 - 121	20.94	5.09	20	
trans-1,2-Dichloroethene	19.33	1.0	20	0	96.7	75 - 124	20.28	4.78	20	
trans-1,3-Dichloropropene	18.96	1.0	20	0	94.8	73 - 127	19.34	2	20	
Trichloroethene	23.31	1.0	20	4.834	92.4	79 - 123	24.42	4.66	20	
Trichlorofluoromethane	16.48	1.0	20	0	82.4	65 - 141	17.97	8.64	20	
Vinyl chloride	19.74	1.0	20	0	98.7	58 - 137	21.43	8.18	20	
Surr: 1,2-Dichloroethane-d4	49.32	1.0	50	0	98.6	81 - 118	49.39	0.133	20	
Surr: 4-Bromofluorobenzene	50.47	1.0	50	0	101	85 - 114	50.59	0.253	20	
Surr: Dibromofluoromethane	48.39	1.0	50	0	96.8	80 - 119	48.45	0.127	20	
Surr: Toluene-d8	50.83	1.0	50	0	102	89 - 112	51.05	0.441	20	

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: GW Treatment Plant Special Samples
WorkOrder: HS19121433

QC BATCH REPORT**Batch ID:** R353818 (0)**Instrument:** VOA6**Method:** VOLATILES ORGANICS BY METHOD
8260C

The following samples were analyzed in this batch: HS19121433-01 HS19121433-02

ALS Houston, US

Date: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: GW Treatment Plant Special Samples
WorkOrder: HS19121433

**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 Quantitation 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 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: 06-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: GW Treatment Plant Special Samples
Work Order: HS19121433

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19121433-01	LH18/24-SP650_122719	Login	12/28/2019 10:27:05 AM	NDR	WET036
HS19121433-01	LH18/24-SP650_122719	Login	12/28/2019 10:27:05 AM	NDR	VOA122
HS19121433-02	Trip Blank	Login	12/28/2019 10:27:05 AM	NDR	VOA122

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19121433

Date/Time Received: **28-Dec-2019 08:42**
 Received by: **NDR**

Checklist completed by: Nilesh D. Ranchod 28-Dec-2019
 eSignature Date

Reviewed by: RJ Modashia 30-Dec-2019
 eSignature Date

Matrices: **Water**

Carrier name: **FedEx**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes No Not Present
- Chain of custody present? Yes No 1 Page(s)
- Chain of custody signed when relinquished and received? Yes No COC IDs:None
- Samplers name present on COC? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s): 1.0c U/C IR25
 Cooler(s)/Kit(s): 45606
 Date/Time sample(s) sent to storage: 12/28/19 11:00

- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH acceptable upon receipt? Yes No N/A
- pH adjusted? Yes No N/A

pH adjusted by:

Login Notes:


Client Contacted: Date Contacted: Person Contacted:
 Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

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

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS			Project No. NWO1312.0150.0 16.0001			Analyses					Remarks (Preservatives, etc.)	Lab I.D.#	
Job: GROUNDWATER TREATMENT PLANT SPECIAL SAMPLES						 Bhate Environmental Associates, Inc. GW Treatment Plant Special Samples HS19121433							
Prepared By: Scott Beesinger			P.O. Number										
Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	NO. OF CONTAINERS	VOC								
LH18/24-SP650_122719	Water	12/27/19 / 09:00		3	X								
Trip Blank	Water	12/27/19		2	X								

Additional Remarks: 24 hour TAT

Relinquished By: <i>Scott Beesinger</i>	Date: 12/27/19	Time: 10:00	Received By:	Date:	Time:	Relinquished By:	Date:	Time:	Received By: <i>NU</i>	Date: 12/28/19	Time: 08:42
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For Lab Use Only									
Received At Lab By:	Date:	Time:	Airbill No.:	Opened By:	Date:	Time:	Temp of Container:	Seal No.:	Condition:
Remarks:									

45606 Temp 41C 1.0
12/28/19

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


CUSTODY SEAL		Seal Broken By:
Date: 12/27/09	Time: 1800	<i>[Signature]</i>
Name: Scott Bissinger		Date: 12.29
Company: BETA		

FedEx
 TRK# 1251 0292 4129
 0221

SATURDAY 12:00P
PRIORITY OVERNIGHT

X0 SGRA

77099
 TX-US
 IAH





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

January 08, 2020

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

Work Order: **HS19121484**

Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 2 sample(s) on Dec 31, 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,

A handwritten signature in black ink, appearing to read "Raj. P. Modashia", enclosed in a circular scribble.

Generated By: DAYNA.FISHER

RJ Modashia
Project Manager

ALS Houston, US

Date: 08-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19121484

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19121484-01	LH18/24-SP650_123019	Water		30-Dec-2019 09:00	31-Dec-2019 09:10	<input type="checkbox"/>
HS19121484-02	Trip Blank	Water	CG-111519 -102	30-Dec-2019 00:00	31-Dec-2019 09:10	<input type="checkbox"/>

ALS Houston, US

Date: 08-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19121484

CASE NARRATIVE

GCMS Volatiles by Method SW8260**Batch ID: R353818****Sample ID: CCV**

- 1,2,3-Trichlorobenzene and 2-Butanone exceeded %D limits for CCV. Samples are ND for these compounds.

Sample ID: VLCSW-200103

- 1,2,3-Trichlorobenzene is also high for LCS.

Sample ID: LH18/24-SP650_123019 (HS19121484-01MS)

- MS recovered above upper control limits for 1,2,3-Trichlorobenzene
-

ALS Houston, US

Date: 08-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: LH18/24-SP650_123019
 Collection Date: 30-Dec-2019 09:00

ANALYTICAL REPORT
 WorkOrder:HS19121484
 Lab ID:HS19121484-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD		Method:SW8260							Analyst: PC
8260C									
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
1,2-Dichloroethane	1.5		0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jan-2020 18:47	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jan-2020 18:47	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jan-2020 18:47	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jan-2020 18:47	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jan-2020 18:47	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 18:47	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 18:47	

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

ALS Houston, US

Date: 08-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: LH18/24-SP650_123019
 Collection Date: 30-Dec-2019 09:00

ANALYTICAL REPORT
 WorkOrder:HS19121484
 Lab ID:HS19121484-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED		
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260							Analyst: PC	
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
cis-1,2-Dichloroethene	32		0.20	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jan-2020	18:47	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jan-2020	18:47	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
Trichloroethene	4.8		0.20	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020	18:47	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>99.3</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>03-Jan-2020</i>	<i>18:47</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>102</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>03-Jan-2020</i>	<i>18:47</i>	
<i>Surr: Dibromofluoromethane</i>	<i>96.4</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>03-Jan-2020</i>	<i>18:47</i>	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>03-Jan-2020</i>	<i>18:47</i>	

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

ALS Houston, US

Date: 08-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: Trip Blank
 Collection Date: 30-Dec-2019 00:00

ANALYTICAL REPORT

WorkOrder:HS19121484
 Lab ID:HS19121484-02
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD		Method:SW8260							Analyst: PC
8260C									
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jan-2020 17:59	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jan-2020 17:59	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jan-2020 17:59	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jan-2020 17:59	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jan-2020 17:59	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:59	

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

ALS Houston, US

Date: 08-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP 18 24
 Sample ID: Trip Blank
 Collection Date: 30-Dec-2019 00:00

ANALYTICAL REPORT

WorkOrder:HS19121484
 Lab ID:HS19121484-02
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD		Method:SW8260							Analyst: PC
8260C									
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Hexachlorobutadiene	0.50	U	1.0	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jan-2020 17:59	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jan-2020 17:59	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jan-2020 17:59	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>98.5</i>			<i>0</i>	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>03-Jan-2020 17:59</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.4</i>			<i>0</i>	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>03-Jan-2020 17:59</i>	
<i>Surr: Dibromofluoromethane</i>	<i>97.5</i>			<i>0</i>	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>03-Jan-2020 17:59</i>	
<i>Surr: Toluene-d8</i>	<i>103</i>			<i>0</i>	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>03-Jan-2020 17:59</i>	

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

ALS Houston, US

Date: 08-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19121484

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R353818 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19121484-01	LH18/24-SP650_123019	30 Dec 2019 09:00			03 Jan 2020 18:47	1
HS19121484-02	Trip Blank	30 Dec 2019 00:00			03 Jan 2020 17:59	1

ALS Houston, US

Date: 08-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19121484

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-200103	Units: UG/L			Analysis Date: 03-Jan-2020 15:10					
Client ID:	Run ID: VOA6_353818	SeqNo: 5423601	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
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	49.87	1.0	50	0	99.7	81 - 118				
Surr: 4-Bromofluorobenzene	50.04	1.0	50	0	100	85 - 114				
Surr: Dibromofluoromethane	48.57	1.0	50	0	97.1	80 - 119				
Surr: Toluene-d8	51.27	1.0	50	0	103	89 - 112				

ALS Houston, US

Date: 08-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19121484

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6			Method: VOLATILES ORGANICS BY METHOD 8260C					
LCS	Sample ID: VLCSW-200103	Units: UG/L			Analysis Date: 03-Jan-2020 14:22					
Client ID:	Run ID: VOA6_353818	SeqNo: 5423600		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.56	1.0	20	0	103	78 - 124				
1,1,1-Trichloroethane	21.61	1.0	20	0	108	74 - 131				
1,1,2,2-Tetrachloroethane	22.09	1.0	20	0	110	71 - 121				
1,1,2-Trichloroethane	21.64	1.0	20	0	108	80 - 119				
1,1-Dichloroethane	24.25	1.0	20	0	121	77 - 125				
1,1-Dichloroethene	19.16	1.0	20	0	95.8	71 - 131				
1,1-Dichloropropene	20.95	1.0	20	0	105	78 - 125				
1,2,3-Trichlorobenzene	26.15	1.0	20	0	131	69 - 129				S
1,2,3-Trichloropropane	22.56	1.0	20	0	113	73 - 122				
1,2,4-Trichlorobenzene	23.24	1.0	20	0	116	69 - 130				
1,2,4-Trimethylbenzene	21.52	1.0	20	0	108	76 - 124				
1,2-Dibromo-3-chloropropane	19.13	1.0	20	0	95.7	62 - 128				
1,2-Dibromoethane	20.59	1.0	20	0	103	77 - 121				
1,2-Dichlorobenzene	20.45	1.0	20	0	102	80 - 119				
1,2-Dichloroethane	21.28	1.0	20	0	106	73 - 128				
1,2-Dichloropropane	22.64	1.0	20	0	113	78 - 122				
1,3,5-Trimethylbenzene	21.98	1.0	20	0	110	75 - 124				
1,3-Dichlorobenzene	20.76	1.0	20	0	104	80 - 119				
1,3-Dichloropropane	21.88	1.0	20	0	109	80 - 119				
1,4-Dichlorobenzene	20.27	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	22.09	1.0	20	0	110	60 - 139				
2-Butanone	46.15	2.0	40	0	115	56 - 143				
2-Chlorotoluene	23.3	1.0	20	0	116	79 - 122				
2-Hexanone	41.4	2.0	40	0	103	57 - 139				
4-Chlorotoluene	22.28	1.0	20	0	111	78 - 122				
4-Isopropyltoluene	20.74	1.0	20	0	104	77 - 127				
4-Methyl-2-pentanone	42.57	2.0	40	0	106	67 - 130				
Acetone	44.68	2.0	40	0	112	39 - 160				
Benzene	22.89	1.0	20	0	114	79 - 120				
Bromobenzene	21.42	1.0	20	0	107	80 - 120				
Bromochloromethane	21.42	1.0	20	0	107	78 - 123				
Bromodichloromethane	21.53	1.0	20	0	108	79 - 125				
Bromoform	19.43	1.0	20	0	97.2	66 - 130				
Bromomethane	15.71	1.0	20	0	78.6	53 - 141				

ALS Houston, US

Date: 08-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19121484

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6			Method: VOLATILES ORGANICS BY METHOD 8260C					
LCS	Sample ID: VLCSW-200103	Units: UG/L			Analysis Date: 03-Jan-2020 14:22					
Client ID:	Run ID: VOA6_353818	SeqNo: 5423600		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	48.51	2.0	40	0	121	64 - 133				
Carbon tetrachloride	18.91	1.0	20	0	94.5	72 - 136				
Chlorobenzene	20.85	1.0	20	0	104	82 - 118				
Chloroethane	20.05	1.0	20	0	100	60 - 138				
Chloroform	21.85	1.0	20	0	109	79 - 124				
Chloromethane	20.12	1.0	20	0	101	50 - 139				
cis-1,2-Dichloroethene	23.63	1.0	20	0	118	78 - 123				
cis-1,3-Dichloropropene	22.76	1.0	20	0	114	75 - 124				
Dibromochloromethane	20.69	1.0	20	0	103	74 - 126				
Dibromomethane	20.72	1.0	20	0	104	79 - 123				
Dichlorodifluoromethane	20.97	1.0	20	0	105	32 - 152				
Ethylbenzene	20.85	1.0	20	0	104	79 - 121				
Hexachlorobutadiene	20.58	1.0	20	0	103	66 - 134				
Isopropylbenzene	19.64	1.0	20	0	98.2	72 - 131				
m,p-Xylene	41.2	2.0	40	0	103	80 - 121				
Methylene chloride	22.76	2.0	20	0	114	74 - 124				
Naphthalene	21.59	1.0	20	0	108	61 - 128				
n-Butylbenzene	20.84	1.0	20	0	104	75 - 128				
n-Propylbenzene	21.97	1.0	20	0	110	76 - 126				
o-Xylene	20.48	1.0	20	0	102	78 - 122				
sec-Butylbenzene	20.92	1.0	20	0	105	77 - 126				
Styrene	20.4	1.0	20	0	102	78 - 123				
tert-Butylbenzene	21.24	1.0	20	0	106	78 - 124				
Tetrachloroethene	18.52	1.0	20	0	92.6	74 - 129				
Toluene	21.67	1.0	20	0	108	80 - 121				
trans-1,2-Dichloroethene	23.26	1.0	20	0	116	75 - 124				
trans-1,3-Dichloropropene	22.17	1.0	20	0	111	73 - 127				
Trichloroethene	21.01	1.0	20	0	105	79 - 123				
Trichlorofluoromethane	17.89	1.0	20	0	89.5	65 - 141				
Vinyl chloride	22.3	1.0	20	0	111	58 - 137				
Surr: 1,2-Dichloroethane-d4	57.35	1.0	50	0	115	81 - 118				
Surr: 4-Bromofluorobenzene	53.88	1.0	50	0	108	85 - 114				
Surr: Dibromofluoromethane	54.72	1.0	50	0	109	80 - 119				
Surr: Toluene-d8	51.4	1.0	50	0	103	89 - 112				

ALS Houston, US

Date: 08-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19121484

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS		Sample ID: HS19121484-01MS		Units: UG/L		Analysis Date: 03-Jan-2020 19:11				
Client ID: LH18/24-SP650_123019		Run ID: VOA6_353818		SeqNo: 5424214		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	19.3	1.0	20	0	96.5	78 - 124				
1,1,1-Trichloroethane	19.73	1.0	20	0	98.7	74 - 131				
1,1,2,2-Tetrachloroethane	21.21	1.0	20	0	106	71 - 121				
1,1,2-Trichloroethane	20.4	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	21.08	1.0	20	0	105	77 - 125				
1,1-Dichloroethene	17.81	1.0	20	0	89.0	71 - 131				
1,1-Dichloropropene	20.63	1.0	20	0	103	78 - 125				
1,2,3-Trichlorobenzene	26.03	1.0	20	0	130	69 - 129			S	
1,2,3-Trichloropropane	21.65	1.0	20	0	108	73 - 122				
1,2,4-Trichlorobenzene	22.98	1.0	20	0	115	69 - 130				
1,2,4-Trimethylbenzene	21.95	1.0	20	0	110	76 - 124				
1,2-Dibromo-3-chloropropane	20.69	1.0	20	0	103	62 - 128				
1,2-Dibromoethane	19.7	1.0	20	0	98.5	77 - 121				
1,2-Dichlorobenzene	20.38	1.0	20	0	102	80 - 119				
1,2-Dichloroethane	20.18	1.0	20	1.477	93.5	73 - 128				
1,2-Dichloropropane	20.35	1.0	20	0	102	78 - 122				
1,3,5-Trimethylbenzene	22.62	1.0	20	0	113	75 - 124				
1,3-Dichlorobenzene	20.94	1.0	20	0	105	80 - 119				
1,3-Dichloropropane	20.51	1.0	20	0	103	80 - 119				
1,4-Dichlorobenzene	20.18	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	19.45	1.0	20	0	97.3	60 - 139				
2-Butanone	38.44	2.0	40	0	96.1	56 - 143				
2-Chlorotoluene	23.7	1.0	20	0	118	79 - 122				
2-Hexanone	39.88	2.0	40	0	99.7	57 - 139				
4-Chlorotoluene	22.36	1.0	20	0	112	78 - 122				
4-Isopropyltoluene	22.42	1.0	20	0	112	77 - 127				
4-Methyl-2-pentanone	41.67	2.0	40	0	104	67 - 130				
Acetone	28.87	2.0	40	0	72.2	39 - 160				
Benzene	20.83	1.0	20	0	104	79 - 120				
Bromobenzene	21.07	1.0	20	0	105	80 - 120				
Bromochloromethane	18.68	1.0	20	0	93.4	78 - 123				
Bromodichloromethane	19.05	1.0	20	0	95.2	79 - 125				
Bromoform	18.33	1.0	20	0	91.6	66 - 130				
Bromomethane	12.1	1.0	20	0	60.5	53 - 141				

ALS Houston, US

Date: 08-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19121484

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS		Sample ID: HS19121484-01MS		Units: UG/L		Analysis Date: 03-Jan-2020 19:11				
Client ID: LH18/24-SP650_123019		Run ID: VOA6_353818		SeqNo: 5424214		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Carbon disulfide	43.97	2.0	40	0	110	64 - 133				
Carbon tetrachloride	19.1	1.0	20	0	95.5	72 - 136				
Chlorobenzene	19.49	1.0	20	0	97.5	82 - 118				
Chloroethane	18.2	1.0	20	0	91.0	60 - 138				
Chloroform	18.52	1.0	20	0	92.6	79 - 124				
Chloromethane	17.94	1.0	20	0	89.7	50 - 139				
cis-1,2-Dichloroethene	52.56	1.0	20	32.16	102	78 - 123				
cis-1,3-Dichloropropene	19.99	1.0	20	0	99.9	75 - 124				
Dibromochloromethane	19.34	1.0	20	0	96.7	74 - 126				
Dibromomethane	18.69	1.0	20	0	93.4	79 - 123				
Dichlorodifluoromethane	21.4	1.0	20	0	107	32 - 152				
Ethylbenzene	20.8	1.0	20	0	104	79 - 121				
Hexachlorobutadiene	20.47	1.0	20	0	102	66 - 134				
Isopropylbenzene	20.73	1.0	20	0	104	72 - 131				
m,p-Xylene	40.76	2.0	40	0	102	80 - 121				
Methylene chloride	20.27	2.0	20	0	101	74 - 124				
Naphthalene	21.29	1.0	20	0	106	61 - 128				
n-Butylbenzene	22.42	1.0	20	0	112	75 - 128				
n-Propylbenzene	23.29	1.0	20	0	116	76 - 126				
o-Xylene	20.21	1.0	20	0	101	78 - 122				
sec-Butylbenzene	22.66	1.0	20	0	113	77 - 126				
Styrene	19.43	1.0	20	0	97.2	78 - 123				
tert-Butylbenzene	22.97	1.0	20	0	115	78 - 124				
Tetrachloroethene	19.33	1.0	20	0	96.6	74 - 129				
Toluene	20.94	1.0	20	0	105	80 - 121				
trans-1,2-Dichloroethene	20.28	1.0	20	0	101	75 - 124				
trans-1,3-Dichloropropene	19.34	1.0	20	0	96.7	73 - 127				
Trichloroethene	24.42	1.0	20	4.834	97.9	79 - 123				
Trichlorofluoromethane	17.97	1.0	20	0	89.9	65 - 141				
Vinyl chloride	21.43	1.0	20	0	107	58 - 137				
Surr: 1,2-Dichloroethane-d4	49.39	1.0	50	0	98.8	81 - 118				
Surr: 4-Bromofluorobenzene	50.59	1.0	50	0	101	85 - 114				
Surr: Dibromofluoromethane	48.45	1.0	50	0	96.9	80 - 119				
Surr: Toluene-d8	51.05	1.0	50	0	102	89 - 112				

ALS Houston, US

Date: 08-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19121484

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19121484-01MSD	Units: UG/L			Analysis Date: 03-Jan-2020 19:35					
Client ID: LH18/24-SP650_123019	Run ID: VOA6_353818	SeqNo: 5424215	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	18.89	1.0	20	0	94.5	78 - 124	19.3	2.14	20	
1,1,1-Trichloroethane	18.74	1.0	20	0	93.7	74 - 131	19.73	5.18	20	
1,1,2,2-Tetrachloroethane	20.36	1.0	20	0	102	71 - 121	21.21	4.1	20	
1,1,2-Trichloroethane	19.75	1.0	20	0	98.8	80 - 119	20.4	3.23	20	
1,1-Dichloroethane	20.23	1.0	20	0	101	77 - 125	21.08	4.12	20	
1,1-Dichloroethene	16.57	1.0	20	0	82.9	71 - 131	17.81	7.19	20	
1,1-Dichloropropene	19.5	1.0	20	0	97.5	78 - 125	20.63	5.66	20	
1,2,3-Trichlorobenzene	23.55	1.0	20	0	118	69 - 129	26.03	10	20	
1,2,3-Trichloropropane	20.98	1.0	20	0	105	73 - 122	21.65	3.16	20	
1,2,4-Trichlorobenzene	20.14	1.0	20	0	101	69 - 130	22.98	13.2	20	
1,2,4-Trimethylbenzene	21.2	1.0	20	0	106	76 - 124	21.95	3.46	20	
1,2-Dibromo-3-chloropropane	19.89	1.0	20	0	99.4	62 - 128	20.69	3.97	20	
1,2-Dibromoethane	18.91	1.0	20	0	94.6	77 - 121	19.7	4.08	20	
1,2-Dichlorobenzene	19.53	1.0	20	0	97.6	80 - 119	20.38	4.29	20	
1,2-Dichloroethane	19.96	1.0	20	1.477	92.4	73 - 128	20.18	1.09	20	
1,2-Dichloropropane	20.04	1.0	20	0	100	78 - 122	20.35	1.55	20	
1,3,5-Trimethylbenzene	21.79	1.0	20	0	109	75 - 124	22.62	3.73	20	
1,3-Dichlorobenzene	20.02	1.0	20	0	100	80 - 119	20.94	4.49	20	
1,3-Dichloropropane	19.89	1.0	20	0	99.4	80 - 119	20.51	3.06	20	
1,4-Dichlorobenzene	19.77	1.0	20	0	98.9	79 - 118	20.18	2.04	20	
2,2-Dichloropropane	18.54	1.0	20	0	92.7	60 - 139	19.45	4.82	20	
2-Butanone	37.18	2.0	40	0	92.9	56 - 143	38.44	3.34	20	
2-Chlorotoluene	22.44	1.0	20	0	112	79 - 122	23.7	5.45	20	
2-Hexanone	38.07	2.0	40	0	95.2	57 - 139	39.88	4.66	20	
4-Chlorotoluene	21.47	1.0	20	0	107	78 - 122	22.36	4.08	20	
4-Isopropyltoluene	21.11	1.0	20	0	106	77 - 127	22.42	6.03	20	
4-Methyl-2-pentanone	39.31	2.0	40	0	98.3	67 - 130	41.67	5.83	20	
Acetone	27.28	2.0	40	0	68.2	39 - 160	28.87	5.68	20	
Benzene	20.01	1.0	20	0	100	79 - 120	20.83	4.04	20	
Bromobenzene	20.03	1.0	20	0	100	80 - 120	21.07	5.06	20	
Bromochloromethane	17.97	1.0	20	0	89.9	78 - 123	18.68	3.87	20	
Bromodichloromethane	18.8	1.0	20	0	94.0	79 - 125	19.05	1.3	20	
Bromoform	17.89	1.0	20	0	89.4	66 - 130	18.33	2.45	20	
Bromomethane	11.6	1.0	20	0	58.0	53 - 141	12.1	4.24	20	

ALS Houston, US

Date: 08-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19121484

QC BATCH REPORT

Batch ID: R353818 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19121484-01MSD	Units: UG/L			Analysis Date: 03-Jan-2020 19:35					
Client ID: LH18/24-SP650_123019	Run ID: VOA6_353818	SeqNo: 5424215	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	40.98	2.0	40	0	102	64 - 133	43.97	7.04	20	
Carbon tetrachloride	18.29	1.0	20	0	91.5	72 - 136	19.1	4.34	20	
Chlorobenzene	18.95	1.0	20	0	94.8	82 - 118	19.49	2.83	20	
Chloroethane	16.93	1.0	20	0	84.6	60 - 138	18.2	7.22	20	
Chloroform	18.12	1.0	20	0	90.6	79 - 124	18.52	2.17	20	
Chloromethane	16.9	1.0	20	0	84.5	50 - 139	17.94	5.96	20	
cis-1,2-Dichloroethene	50.96	1.0	20	32.16	94.0	78 - 123	52.56	3.1	20	
cis-1,3-Dichloropropene	19.83	1.0	20	0	99.1	75 - 124	19.99	0.8	20	
Dibromochloromethane	18.84	1.0	20	0	94.2	74 - 126	19.34	2.62	20	
Dibromomethane	18.09	1.0	20	0	90.5	79 - 123	18.69	3.23	20	
Dichlorodifluoromethane	19.14	1.0	20	0	95.7	32 - 152	21.4	11.1	20	
Ethylbenzene	19.58	1.0	20	0	97.9	79 - 121	20.8	6.07	20	
Hexachlorobutadiene	17.71	1.0	20	0	88.5	66 - 134	20.47	14.5	20	
Isopropylbenzene	19.63	1.0	20	0	98.2	72 - 131	20.73	5.46	20	
m,p-Xylene	39.27	2.0	40	0	98.2	80 - 121	40.76	3.7	20	
Methylene chloride	19.5	2.0	20	0	97.5	74 - 124	20.27	3.84	20	
Naphthalene	20.81	1.0	20	0	104	61 - 128	21.29	2.27	20	
n-Butylbenzene	21.27	1.0	20	0	106	75 - 128	22.42	5.27	20	
n-Propylbenzene	22.13	1.0	20	0	111	76 - 126	23.29	5.1	20	
o-Xylene	19.41	1.0	20	0	97.1	78 - 122	20.21	4.02	20	
sec-Butylbenzene	21.87	1.0	20	0	109	77 - 126	22.66	3.54	20	
Styrene	19.15	1.0	20	0	95.8	78 - 123	19.43	1.45	20	
tert-Butylbenzene	21.53	1.0	20	0	108	78 - 124	22.97	6.45	20	
Tetrachloroethene	18.22	1.0	20	0	91.1	74 - 129	19.33	5.89	20	
Toluene	19.9	1.0	20	0	99.5	80 - 121	20.94	5.09	20	
trans-1,2-Dichloroethene	19.33	1.0	20	0	96.7	75 - 124	20.28	4.78	20	
trans-1,3-Dichloropropene	18.96	1.0	20	0	94.8	73 - 127	19.34	2	20	
Trichloroethene	23.31	1.0	20	4.834	92.4	79 - 123	24.42	4.66	20	
Trichlorofluoromethane	16.48	1.0	20	0	82.4	65 - 141	17.97	8.64	20	
Vinyl chloride	19.74	1.0	20	0	98.7	58 - 137	21.43	8.18	20	
Surr: 1,2-Dichloroethane-d4	49.32	1.0	50	0	98.6	81 - 118	49.39	0.133	20	
Surr: 4-Bromofluorobenzene	50.47	1.0	50	0	101	85 - 114	50.59	0.253	20	
Surr: Dibromofluoromethane	48.39	1.0	50	0	96.8	80 - 119	48.45	0.127	20	
Surr: Toluene-d8	50.83	1.0	50	0	102	89 - 112	51.05	0.441	20	

ALS Houston, US

Date: 08-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19121484

QC BATCH REPORT**Batch ID:** R353818 (0)**Instrument:** VOA6**Method:** VOLATILES ORGANICS BY METHOD
8260C

The following samples were analyzed in this batch: HS19121484-01 HS19121484-02

ALS Houston, US

Date: 08-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19121484

**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 Quantitation 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 Dakota	R-193 2019-2020	30-Apr-2020
Oklahoma	2019-067	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19121484

Date/Time Received: **31-Dec-2019 09:10**
 Received by: **PMG**

Checklist completed by: Paresh M. Giga 31-Dec-2019
 eSignature Date
 Reviewed by: RJ Modashia 31-Dec-2019
 eSignature Date

Matrices: **Water** Carrier name: **FedEx**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes No Not Present
- Chain of custody present? Yes No 1 Page(s)
- Chain of custody signed when relinquished and received? Yes No COC IDs:None
- Samplers name present on COC? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s): 1.2c U/C IR25
 Cooler(s)/Kit(s): 43772
 Date/Time sample(s) sent to storage: 12/31/19 11:30

- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH acceptable upon receipt? Yes No N/A
- pH adjusted? Yes No N/A

pH adjusted by:

Login Notes: LH18/24-SP650_123019 Times differ :
 COC - 09:00 Labels - 14:00

Client Contacted: _____ Date Contacted: _____ Person Contacted: _____

Contacted By: _____ Regarding: _____


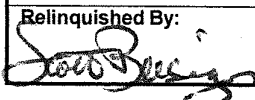
Comments:


Corrective Action:

CHAIN OF CUSTODY

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

Page 1 of 1

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS			Project No. NWO1312.0150.0 16.0001		Analyses																				
Job: GROUNDWATER TREATMENT PLANT SPECIAL SAMPLES					MS / MSD No. OF CONTAINERS VOC	3	X															Remarks (Preservatives, etc.) Lab I.D.#			
Prepared By: Scott Beesinger			P.O. Number																						
Field Sample I.D. LH18/24-SP650_123019			Sample Matrix Water																					Date / Time 12/30/19 / 09:00	
Trip Blank			Water																					12/30/19	
HS19121484 Bhate Environmental Associates, Inc. LHAAP 18 24 																									
Additional Remarks: 24 hour TAT																									
Relinquished By: 		Date 12/30/19	Time 10:00	Received By:				Relinquished By:		12/31/19	9:10	Received By:		PG	12/31/19	9:10									
For Lab Use Only																									
Received At Lab By:			Date	Time	Airbill No.		Opened By:			Date	Time	Temp of Container	Seal No.	Condition											
Remarks: <div style="text-align: right; font-family: cursive; font-size: 1.2em;"> 43772 #R25 ulc 1.2 </div>																									

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	43772	CUSTODY SEAL		Seal Broken By:	
		Date: 12/30/19	Time: 1430	Date:	
		Name: Scott Bosenberg			
		Company: SHATEX			12/30/19

FedEx
 TRK# 1251 0292 4221
 0221

TUE - 31 DEC 10:30A
 PRIORITY OVERNIGHT

AB SGRA

43772 77099
 TX-US IAH





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

January 16, 2020

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

Work Order: **HS19121486**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Dec 31, 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,

A handwritten signature in black ink, appearing to read "Raj. P. Modashia", enclosed in a circular scribble.

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US

Date: 16-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19121486

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19121486-01	LH18/24-SP650_123019	Water		30-Dec-2019 14:00	31-Dec-2019 09:10	<input type="checkbox"/>
HS19121486-02	LH18/24-SP650_1230.19_BIX	Water		30-Dec-2019 14:00	31-Dec-2019 09:10	<input type="checkbox"/>

ALS Houston, US

Date: 16-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19121486

CASE NARRATIVE

Work Order Comments

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

Work Order Comments

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

WetChemistry by Method E350.3**Batch ID: R353781**

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

WetChemistry by Method E365.3**Batch ID: R353640**

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

ALS Houston, US

Date: 16-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Weekly Samples
 Sample ID: LH18/24-SP650_123019
 Collection Date: 30-Dec-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19121486
 Lab ID:HS19121486-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)								Analyst: MZD
	Method:E350.3							
Nitrogen, Ammonia (As N)	2.1	a	0.20	0.10	0.20	mg/L	1	03-Jan-2020 11:40
ORTHO PHOSPHATE (PO4) AS P BY E365.3								Analyst: MZD
	Method:E365.3							
Phosphorus, Total Orthophosphate (As P)	0.537	a	0.0100	0.0250	0.0250	mg/L	1	31-Dec-2019 14:00
SUBCONTRACT ANALYSIS - TOC ANALYSIS								Analyst: SUBK
	Method:NA							
Subcontract Analysis	See Attached		0	0		NA	1	09-Jan-2020 15:54

ALS Houston, US

Date: 16-Jan-20

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Weekly Samples
 Sample ID: LH18/24-SP650_1230.19_BIX
 Collection Date: 30-Dec-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19121486
 Lab ID:HS19121486-02
 Matrix:Water

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	15-Jan-2020 16:41

ALS Houston, US

Date: 16-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19121486

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R353640 (0)		Test Name : ORTHO PHOSPHATE (PO4) AS P BY E365.3			Matrix: Water	
HS19121486-01	LH18/24-SP650_123019	30 Dec 2019 14:00			31 Dec 2019 14:00	1
Batch ID: R353781 (0)		Test Name : AMMONIA AS N BY E350.3(ISE)			Matrix: Water	
HS19121486-01	LH18/24-SP650_123019	30 Dec 2019 14:00			03 Jan 2020 11:40	1
Batch ID: R354153 (0)		Test Name : SUBCONTRACT ANALYSIS - TOC ANALYSIS			Matrix: Water	
HS19121486-01	LH18/24-SP650_123019	30 Dec 2019 14:00			09 Jan 2020 15:54	1
Batch ID: R354450 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Water	
HS19121486-02	LH18/24-SP650_1230.19_BIX	30 Dec 2019 14:00			15 Jan 2020 16:41	1

ALS Houston, US

Date: 16-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19121486

QC BATCH REPORT

Batch ID:	R353640 (0)	Instrument:	UV-2450	Method:	ORTHO PHOSPHATE (PO4) AS P BY E365.3					
MBLK	Sample ID: MBLK-353640	Units: mg/L		Analysis Date: 31-Dec-2019 14:00						
Client ID:		Run ID: UV-2450_353640		SeqNo: 5418747	PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.0250	0.0250							U	
LCS	Sample ID: LCS-353640	Units: mg/L		Analysis Date: 31-Dec-2019 14:00						
Client ID:		Run ID: UV-2450_353640		SeqNo: 5418748	PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.235	0.0250	0.25	0	94.0	85 - 115				
MS	Sample ID: HS19121486-01MS	Units: mg/L		Analysis Date: 31-Dec-2019 14:00						
Client ID: LH18/24-SP650_123019		Run ID: UV-2450_353640		SeqNo: 5418750	PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.748	0.0250	0.25	0.537	84.4	80 - 120				
MSD	Sample ID: HS19121486-01MSD	Units: mg/L		Analysis Date: 31-Dec-2019 14:00						
Client ID: LH18/24-SP650_123019		Run ID: UV-2450_353640		SeqNo: 5418751	PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.751	0.0250	0.25	0.537	85.6	80 - 120	0.748	0.4	20	

The following samples were analyzed in this batch:

ALS Houston, US

Date: 16-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19121486

QC BATCH REPORT

Batch ID: R353781 (0)		Instrument: WetChem_HS		Method: AMMONIA AS N BY E350.3(ISE)						
MBLK	Sample ID: MBLK-353781	Units: mg/L			Analysis Date: 03-Jan-2020 11:40					
Client ID:	Run ID: WetChem_HS_353781	SeqNo: 5422659			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Nitrogen, Ammonia (As N)	0.10	0.20							U	
LCS	Sample ID: LCS-353781	Units: mg/L			Analysis Date: 03-Jan-2020 11:40					
Client ID:	Run ID: WetChem_HS_353781	SeqNo: 5422660			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Nitrogen, Ammonia (As N)	9.76	0.20	10	0	97.6	80 - 120				
MS	Sample ID: HS19121490-01MS	Units: mg/L			Analysis Date: 03-Jan-2020 11:40					
Client ID:	Run ID: WetChem_HS_353781	SeqNo: 5422662			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Nitrogen, Ammonia (As N)	9.398	0.20	10	0.183	92.2	80 - 120				
MSD	Sample ID: HS19121490-01MSD	Units: mg/L			Analysis Date: 03-Jan-2020 11:40					
Client ID:	Run ID: WetChem_HS_353781	SeqNo: 5422663			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Nitrogen, Ammonia (As N)	9.626	0.20	10	0.183	94.4	80 - 120	9.398	2.4	20	

The following samples were analyzed in this batch: HS19121486-01

ALS Houston, US

Date: 16-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19121486

**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 Quantitation 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 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: 16-Jan-20

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19121486

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19121486-01	LH18/24-SP650_123019	Login	12/31/2019 11:32:36 AM	PMG	VOA038

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19121486

Date/Time Received: **31-Dec-2019 09:10**
 Received by: **PMG**

Checklist completed by: Paresh M. Giga 31-Dec-2019
 eSignature Date

Reviewed by: RJ Modashia 31-Dec-2019
 eSignature Date

Matrices: **Water**

Carrier name: **FedEx**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes No Not Present
- Chain of custody present? Yes No 1 Page(s)
- Chain of custody signed when relinquished and received? Yes No COC IDs:None
- Samplers name present on COC? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s): 1.2c U/C IR25
 Cooler(s)/Kit(s): 43772
 Date/Time sample(s) sent to storage: 12/31/19 11:55

- 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:

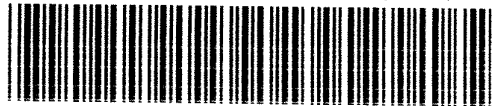
Client Contacted: Date Contacted: Person Contacted:
 Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

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

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS			Project No. NWO1312.0150.0 16.0001			Analyses										HS19121486 Bhate Environmental Associates. Inc. Longhorn GW Treatment Plant Weekly Samples 							
Job: GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES						MS / MSD	No. OF CONTAINERS	AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE											Remarks (Preservatives, etc.)	Lab I.D.#
Prepared By: Scott Beesinger			P.O. Number																				
Field Sample I.D.	Sample Matrix	Date / Time																					
LH18/24-SP650_123019	Water	12/30/19 / 14:00		3	X	X															H2SO4		
LH18/24-SP650_123019	Water	12/30/19 / 14:00		1				X														NONE	
LH18/24-SP650_123019_BIX	Water	12/30/19 / 14:00		1					X													NONE	
Additional Remarks: Standard TAT on all parameters																							
Relinquished By: <i>Scott Beesinger</i>		Date 12/30/19	Time 14:30	Received By:		Date	Time	Relinquished By:		Date	Time	Received By: PG		Date 12/31/19	Time 9:10								
Received At Lab By:		Date	Time	Airbill No.	For Lab Use Only							Temp of Container	Seal No.	Condition									
					Opened By:																		
Remarks: <div style="text-align: right; font-size: 1.2em;">43772 IR25 NIC 102</div> <div style="text-align: center; font-size: 1.5em; margin-top: 10px;">43772</div>																							

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

43772

CUSTODY SEAL

Date: 12/30/19 Time: 1430
 Name: Scott Breinert
 Company: SHATE

Seal Broken By: [Signature]
 Date: 12/30


FedEx
 TRK# 1251 0292 4221
 0221

AB SGRA

TUE - 31 DEC 10:30A
 PRIORITY OVERNIGHT

43772-77099
 TX-US IAH

51/10 43772-77099





ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
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www.alsglobal.com

January 09, 2020

Analytical Report for Service Request No: K2000034

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

RE: HS19121486

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory January 03, 2020
For your reference, these analyses have been assigned our service request number **K2000034**.

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

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

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy
Project Manager



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Table of Contents

Acronyms

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Case Narrative

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General Chemistry

Raw Data

 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.pjllabs.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/bsdwlabservice.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/analyte is offered by that state.



Case Narrative

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



Client: ALS Environmental - US
Project: HS19121486
Sample Matrix: Water

Service Request: K2000034
Date Received: 01/03/2020

CASE NARRATIVE

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

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 01/03/2020. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by

Kelley Avejoy

Date

01/09/2020



Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
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K12000034



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: Dept of Defense

COC ID: 12985

SUBCONTRACT TO:

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

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19121486
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19121486-01	LH18/24-SP650_123019	Water	30 Dec 2019 14:00
TOC Analysis for DOD Level IV			09 Jan 2020

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: [Signature]
Received By: [Signature]
Cooler ID(s): _____

Date/Time: 1/2/20 1800.
Date/Time: 1/3/20 0930
Temperature(s): _____

RIGHT SOLUTIONS | RIGHT PARTNER



PC KL

Cooler Receipt and Preservation Form

Client ALS Houston Service Request K20 00034

Received: 1/3/20 Opened: 1/3/20 By: CG Unloaded: 1/3/20 By: CG

1. Samples were received via? USPS FedEx 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	Tracking Number	NA	Filed
-0.4	-0.5	1.0	0.9	-0.1	397	12985	1251 0293 3579		

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

Notes, Discrepancies, & Resolutions:

RUSH



General Chemistry

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

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: ALS Environmental - US
Project: HS19121486
Sample Matrix: Water
Analysis Method: SM 5310 C
Prep Method: None

Service Request: K2000034
Date Collected: 12/30/19
Date Received: 01/3/20
Units: mg/L
Basis: NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_123019	K2000034-001	2.13	0.50	0.20	0.07	1	01/07/20 22:55	
Method Blank	K2000034-MB	ND U	0.50	0.20	0.07	1	01/07/20 18:52	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19121486
Sample Matrix: Water

Service Request: K2000034
Date Collected: 12/30/19
Date Received: 01/03/20
Date Analyzed: 01/07/20

Replicate Sample Summary
General Chemistry Parameters

Sample Name: LH18/24-SP650_123019
Lab Code: K2000034-001

Units: mg/L
Basis: NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample	Average	RPD	RPD Limit
						K2000034-001DUP Result			
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	2.13	2.11	2.12	<1	10

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

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

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

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19121486
Sample Matrix: Water

Service Request: K2000034
Date Analyzed: 01/07/20
Date Extracted: NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method: SM 5310 C
Prep Method: None

Units: mg/L
Basis: NA
Analysis Lot: 665574

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K2000034-LCS	26.5	25.0	106	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19121486

Service Request: K2000034

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C

Units: mg/L

	Analysis		Date	True	Measured	Percent	Acceptance
	Lot	Lab Code	Analyzed	Value	Value	Recovery	Limits
CCV1	665574	KQ2000092-01	01/07/20 18:23	25.0	25.5	102	90-110
CCV2	665574	KQ2000092-02	01/07/20 22:26	25.0	25.4	102	90-110
CCV3	665574	KQ2000092-03	01/08/20 02:14	25.0	25.3	101	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19121486

Service Request: K2000034

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	665574	KQ2000092-04	01/07/20 18:38	0.50	0.20	0.07	ND	U
CCB2	665574	KQ2000092-05	01/07/20 22:40	0.50	0.20	0.07	ND	U
CCB3	665574	KQ2000092-06	01/08/20 02:28	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

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
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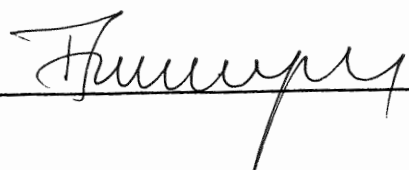
Work Request # ^{Original} (K1911998, 2140, 2160, K2000034, 35, 90, T1901631)
 Tier: IV II II IV IV IV IV
 Date Analyzed: 1/7/2020 TOC: 665574
 Analyst: BCP Run # DOC: 665575
 Analysis: TOC/DOC

**DATA QUALITY REPORT
INORGANICS**

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

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

COMMENTS: K2000035-1/1d, 35-2/2d, 90-1/1d report on high % RSR
However, these samples are less than 5x the MRL.

Final Approved by:  Date: 01/08/20 DQREPORT

Analytical Results Summary

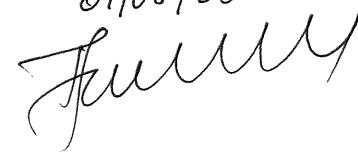
Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 665574 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
K1911998-003	Carbon, Total Organic	N/A		Ground Water	5.81 mg/L	10 ml	291 mg/L	50	4	25			1/7/20 19:36	N	IV
K1912140-002	Carbon, Total Organic	N/A		Water	6.31 mg/L	10 ml	631 mg/L	100	7	50			1/7/20 20:05	N	II
K1912140-003	Carbon, Total Organic	N/A		Water	7.34 mg/L	10 ml	734 mg/L	100	7	50			1/7/20 20:33	N	II
K1912140-004	Carbon, Total Organic	N/A		Water	7.21 mg/L	10 ml	721 mg/L	100	7	50			1/7/20 21:01	N	II
K1912160-001	Carbon, Total Organic	N/A		Water	2.70 mg/L	10 ml	2.70 mg/L	1	0.07	0.50			1/7/20 21:29	N	II
K2000034-001	Carbon, Total Organic	N/A		Water	2.13 mg/L	10 ml	2.13 mg/L	1	0.07	0.50			1/7/20 22:55	N	IV
K2000035-001	Carbon, Total Organic	N/A		Water	0.24 mg/L	10 ml	0.24 mg/L	J 1	0.07	0.50			1/7/20 23:23	N	IV
K2000035-002	Carbon, Total Organic	N/A		Water	0.37 mg/L	10 ml	0.37 mg/L	J 1	0.07	0.50			1/7/20 23:51	N	IV
K2000090-001	Carbon, Total Organic	N/A		Water	0.99 mg/L	10 ml	0.99 mg/L	1	0.07	0.50			1/8/20 01:46	N	IV
KQ2000092-01	Carbon, Total Organic	CCV		Ground Water	25.47 mg/L	10 ml	25.5 mg/L	1					1/7/20 18:23	N	IV
KQ2000092-02	Carbon, Total Organic	CCV		Ground Water	25.44 mg/L	10 ml	25.4 mg/L	1					1/7/20 22:26	N	IV
KQ2000092-03	Carbon, Total Organic	CCV		Ground Water	25.32 mg/L	10 ml	25.3 mg/L	1					1/8/20 02:14	N	IV
KQ2000092-04	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			1/7/20 18:38	N	IV
KQ2000092-05	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			1/7/20 22:40	N	IV
KQ2000092-06	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			1/8/20 02:28	N	IV
KQ2000092-07	Carbon, Total Organic	MB		Ground Water	0.03 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			1/7/20 18:52	N	IV
KQ2000092-08	Carbon, Total Organic	LCS		Ground Water	26.49 mg/L	10 ml	26.5 mg/L	1	0.07	0.50	106		1/7/20 19:07	N	IV
KQ2000092-09	Carbon, Total Organic	MS	K1912160-001	Water	29.87 mg/L	10 ml	29.9 mg/L	1	0.07	0.50	109		1/7/20 21:57	N	II
KQ2000092-10	Carbon, Total Organic	DUP	K1911998-003	Ground Water	5.77 mg/L	10 ml	288 mg/L	50	4	25		<1	1/7/20 19:36	N	IV
KQ2000092-11	Carbon, Total Organic	DUP	K1912160-001	Water	2.59 mg/L	10 ml	2.59 mg/L	1	0.07	0.50		4	1/7/20 21:29	N	II
KQ2000092-12	Carbon, Total Organic	DUP	K1912140-002	Water	6.48 mg/L	10 ml	648 mg/L	100	7	50		3	1/7/20 20:05	N	II
KQ2000092-13	Carbon, Total Organic	DUP	K1912140-003	Water	7.33 mg/L	10 ml	733 mg/L	100	7	50		<1	1/7/20 20:33	N	II
KQ2000092-14	Carbon, Total Organic	DUP	K1912140-004	Water	7.16 mg/L	10 ml	716 mg/L	100	7	50		<1	1/7/20 21:01	N	II
KQ2000092-15	Carbon, Total Organic	DUP	K2000034-001	Water	2.11 mg/L	10 ml	2.11 mg/L	1	0.07	0.50		<1	1/7/20 22:55	N	IV
KQ2000092-16	Carbon, Total Organic	DUP	K2000035-001	Water	0.18 mg/L	10 ml	0.18 mg/L	J 1	0.07	0.50		29*	1/7/20 23:23	N	IV
KQ2000092-17	Carbon, Total Organic	DUP	K2000035-002	Water	0.47 mg/L	10 ml	0.47 mg/L	J 1	0.07	0.50		25*	1/7/20 23:51	N	IV
KQ2000092-18	Carbon, Total Organic	DUP	K2000090-001	Water	0.89 mg/L	10 ml	0.89 mg/L	1	0.07	0.50		11*	1/8/20 01:46	N	IV

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01/08/20


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

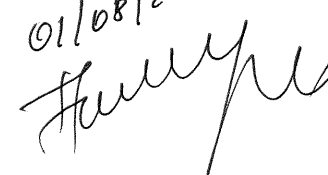
Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 665575 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
KQ2000093-01	Carbon, Dissolved Organic CCV (DOC)			Water	25.44 mg/L	10 ml	25.4 mg/L	1					1/7/20 22:26	N	IV
KQ2000093-02	Carbon, Dissolved Organic CCV (DOC)			Water	25.32 mg/L	10 ml	25.3 mg/L	1					1/8/20 02:14	N	IV
KQ2000093-03	Carbon, Dissolved Organic CCB (DOC)			Water	-0.01 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			1/7/20 22:40	N	IV
KQ2000093-04	Carbon, Dissolved Organic CCB (DOC)			Water	-0.01 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			1/8/20 02:28	N	IV
KQ2000093-05	Carbon, Dissolved Organic MB (DOC)			Water	-0.01 mg/L	10 ml	0.50 mg/L	U 1	0.07	0.50			1/8/20 01:16	N	IV
KQ2000093-06	Carbon, Dissolved Organic LCS (DOC)			Water	26.28 mg/L	10 ml	26.3 mg/L	1	0.07	0.50	105		1/8/20 01:31	N	IV
KQ2000093-07	Carbon, Dissolved Organic MS (DOC)		T1901631-001	Water	31.46 mg/L	10 ml	31.5 mg/L	1	0.07	0.50	112		1/8/20 00:47	N	IV
KQ2000093-08	Carbon, Dissolved Organic DUP (DOC)		T1901631-001	Water	3.55 mg/L	10 ml	3.55 mg/L	1	0.07	0.50		1	1/8/20 00:19	N	IV
T1901631-001	Carbon, Dissolved Organic N/A (DOC)			Water	3.51 mg/L	10 ml	3.51 mg/L	1	0.07	0.50			1/8/20 00:19	Y	IV

01/08/20


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

0.036
0.000
0.000
0.000
0.000

OBSERVATIONS	5	ABOVE
STD Deviation	0.01628	0
AVERAGE	0.00728	0
UCL	0.02356	0
LCL	-0.00900	0

OBSERVATIONS	0	0
STD Deviation	0.00000	0
AVERAGE	#DIV/0!	0
UCL	#DIV/0!	0
LCL	#DIV/0!	0

OBSERVATIONS	0	0
STD Deviation	0.00000	0
AVERAGE	#DIV/0!	0
UCL	#DIV/0!	0
LCL	#DIV/0!	0

OBSERVATIONS	0	0
STD Deviation	#DIV/0!	0
AVERAGE	#DIV/0!	0
		0
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		0
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BCP 1/8/2020

*01/08/20
Hull*

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	25.476	0.0073	25.4682	25.46822	25.5	1/7/2020
3	ccb	1	0.000	0.0073	-0.0073	-0.00728	<0.5	1/7/2020
4	mb	1	0.036	0.0073	0.0291	0.02912	<0.5	1/7/2020
5	lcs	1	26.501	0.0073	26.4935	26.49352	26.5	1/7/2020
6	K1911998-003	50	5.821	0.0073	5.8137	290.686	290.69	1/7/2020
7	K1911998-003	50	5.777	0.0073	5.7699	288.496	288.5	1/7/2020
8	K1912140-002	100	6.313	0.0073	6.3059	630.592	631	1/7/2020
9	K1912140-002	100	6.486	0.0073	6.4783	647.832	647.83	1/7/2020
10	K1912140-003	100	7.343	0.0073	7.3358	733.582	733.58	1/7/2020
11	K1912140-003	100	7.333	0.0073	7.3260	732.602	732.6	1/7/2020
12	K1912140-004	100	7.217	0.0073	7.2096	720.962	720.96	1/7/2020
13	K1912140-004	100	7.163	0.0073	7.1552	715.522	715.52	1/7/2020
14	K1912160-001	1	2.708	0.0073	2.7008	2.70082	2.70	1/7/2020
15	K1912160-001	1	2.595	0.0073	2.5878	2.58782	2.6	1/7/2020
16	KQ2000092-09	1	29.873	0.0073	29.8656	29.86562	29.9	1/7/2020
17	ccv	1	25.451	0.0073	25.4432	25.44322	25.44	1/7/2020
18	ccb	1	0.000	0.0073	-0.0073	-0.00728	<0.5	1/7/2020
19	K2000034-001	1	2.133	0.0073	2.1255	2.12552	2.1	1/7/2020
20	K2000034-001	1	2.118	0.0073	2.1104	2.11042	2.11	1/7/2020
21	K2000035-001	1	0.246	0.0073	0.2382	0.23822	<0.5	1/7/2020
22	K2000035-001	1	0.184	0.0073	0.1770	0.17702	<0.5	1/7/2020
23	K2000035-002	1	0.374	0.0073	0.3668	0.36682	<0.5	1/7/2020
24	K2000035-002	1	0.480	0.0073	0.4727	0.47272	<0.5	1/7/2020
25	K2000090-001	1	0.998	0.0073	0.9908	0.99082	0.99	1/8/2020

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: <i>BU</i>	Date Analyzed	1/7/2020
Reviewed By: <i>h...</i>	Date Reviewed	01/08/20

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

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TOCwaterLims ALS

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	K2000090-001	1	0.895	0.0073	0.8879	0.88792	0.89	1/8/2020
27	ccv	1	25.331	0.0073	25.3234	25.32342	25.32	1/8/2020
28	ccb	1	0.000	0.0073	-0.0073	-0.00728	<0.5	1/8/2020
29		1		0.0000	0.0000	0	<0.5	
30		1		0.0000	0.0000	0	<0.5	
31		1		0.0000	0.0000	0	<0.5	
32		1		0.0000	0.0000	0	<0.5	
33		1		0.0000	0.0000	0	<0.5	
34		1		0.0000	0.0000	0	<0.5	
35		1		0.0000	0.0000	0	<0.5	
36		1		0.0000	0.0000	0	<0.5	
37		1		0.0000	0.0000	0	<0.5	
38		1		0.0000	0.0000	0	<0.5	
39		1		0.0000	0.0000	0	<0.5	
40		1		0.0000	0.0000	0	<0.5	
41		1		0.0000	0.0000	0	<0.5	
42		1		0.0000	0.0000	0	<0.5	
43		1		0.0000	0.0000	0	<0.5	
44		1		0.0000	0.0000	0	<0.5	
45		1		0.0000	0.0000	0	<0.5	
46		1		0.0000	0.0000	0	<0.5	
47		1		0.0000	0.0000	0	<0.5	
48		1		0.0000	0.0000	0	<0.5	
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By: <i>WJ</i>	Date Analyzed: <i>1/7/2020</i>
Reviewed By: <i>Jerry M</i>	Date Reviewed: <i>01/08/20</i>

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	25.451	0.0073	25.4432	25.44322	25.4	1/7/2020
3	ccb	1	0.000	0.0073	-0.0073	-0.00728	<0.5	1/7/2020
4	T1901631-001	1	3.522	0.0073	3.5147	3.51472	3.5	1/8/2020
5	T1901631-001	1	3.562	0.0073	3.5546	3.55462	3.6	1/8/2020
6	T1901631-001 ms	1	31.468	0.0073	31.4609	31.46092	31.46	1/8/2020
7	mb	1	0.000	0.0073	-0.0073	-0.00728	<0.5	1/8/2020
8	lcs	1	26.283	0.0073	26.2760	26.27602	26	1/8/2020
9	ccv	1	25.331	0.0073	25.3234	25.32342	25.32	1/8/2020
10	ccb	1	0.000	0.0073	-0.0073	-0.00728	<0.5	1/8/2020
11		1		0.0000	0.0000	0	<0.5	
12		1		0.0000	0.0000	0	<0.5	
13		1		0.0000	0.0000	0	<0.5	
14		1		0.0000	0.0000	0	<0.5	
15		1		0.0000	0.0000	0	<0.5	
16		1		0.0000	0.0000	0	<0.5	
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)

Analyzed By: <i>BW</i>	Date Analyzed: <i>1/7/2020</i>
Reviewed By: <i>[Signature]</i>	Date Reviewed: <i>01/08/20</i>

TOC:665574
 ROC:665575

Schedule: 01072020

Version: 3

Instrument: Fusion1

Last Saved by: Fusion1 (Fusion1)

Last Saved on: 2020/01/07 16:38 - Tuesday

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
17	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	K1911998-003.02 50x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1912140-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	K1912140-003.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
6	Sample	K1912140-004.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1912160-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K1912160-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
9	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
10	Sample	K2000034-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K2000035-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K2000035-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	T1901631-001.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	T1901631-001.02 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
15	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
16	Sample	MB2	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
18	Sample	K2000090-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

01/08/20
 Fusion1

Fusion Report - 01072020

Tuesday, January 07, 2020 04:29 PM

(View - Repts, Unused Repts, Meta-Data, Signature, History)
Printed on 2020/01/08 09:19 -
Wednesday

Report Summary Information

Company Location: Gen Chem Lab
Schedule Name: 01072020
Instrument Name: Fusion1
Report Version: 1 of 1
Report Creation by Operators (schedule version): Fusion1 (Fusion1) (v2)
Fusion1 (Fusion1) (v3)
Comment:

Engine Version: 1.1.5.1
Firmware Version: 1.2.0696
Connection: RS232 COM1

Report Results

01/08/20
[Signature]

Sample Type: Clean From Schedule Version 2

Pos	Analysis Type	Sample ID	Start Time
◆ (clean)		Clean	2020/01/07 16:29

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	9.80	14.12	4.32	49.51	05:23
2	TC Clean	6.17	9.77	3.60	50.05	04:04
3	TC Clean	2.20	6.08	3.87	50.03	03:48
4	TC Clean	1.58	5.33	3.75	49.99	03:55

Sample Type: Clean From Schedule Version 3

Pos	Analysis Type	Sample ID	Start Time
◆ (clean)		Clean	2020/01/07 16:51

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.55	4.24	3.70	49.65	05:24
2	TC Clean	4.63	8.36	3.73	50.12	04:04
3	TC Clean	2.38	5.95	3.57	49.99	03:50
4	TC Clean	1.72	5.48	3.76	49.98	03:52

Sample Type: Clean							From Schedule Version 3
Pos	Analysis Type	Sample ID			Start Time		
◆ (clean)		Clean			2020/01/07 17:13		
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	IC Clean	0.77	4.34	3.57	49.40	05:20	
2	TC Clean	4.41	8.11	3.70	49.97	04:01	
3	TC Clean	2.09	5.83	3.74	50.05	03:46	
4	TC Clean	1.53	5.40	3.87	50.06	03:54	

Sample Type: Blank (Creating v1339)							From Schedule Version 3
Pos	Analysis Type	Sample ID			Start Time		
◆ (blank)		Reagent/Acid Blank			2020/01/07 17:35		
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	IC Clean	0.54	4.37	3.82	49.48	05:22	
2	TC Clean	4.22	7.99	3.77	50.07	04:00	
3	TC Clean	1.95	5.93	3.97	50.10	03:47	
4	TC Clean	1.53	5.36	3.83	50.00	03:46	
5	Reagent Blank	8.26	12.03	3.77	50.00	05:05	
6	Acid Blank	1.53	5.40	3.87	49.43	05:25	

Sample Type: Sample							From Schedule Version 3	
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
◆ 17	TOC	RB	0.2812 ppm	0.0000 ppm	0.0000%	2020/01/07 18:08		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2812	2.8122	11.51	15.43	3.92	50.11	10:33
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 9.7309 (IC) (v1339)		CAS_salt_010711 (v4)		CAS_salt_010711 (v31)		

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 3

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.4755 ppm (PASS)	0.0000 ppm	0%	2020/01/07 18:23

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.4755	254.7546	171.28	175.15	3.88	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 (v31)	50 ppmC

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

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/07 18:38

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	10.02	13.85	3.83	50.13	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Sample Type: Sample From Schedule Version 3

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 1	TOC	MB1	0.0364 ppm	0.0000 ppm	0.0000%	2020/01/07 18:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0364	0.3639	9.96	13.62	3.66	50.11	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.7309 (IC) (v1339)	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)

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

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	26.5008 ppm (PASS)	0.0000 ppm	0%	2020/01/07 19:07

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
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Type										
C	TOC	25.0 ppm	1	26.5008	265.0080	177.76	181.38	3.62	50.12	10:34
Completion State		Success Action		Method		Calibration		STD Conc - Pos C		
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v31)		25 ppmC		

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
2	TOC	ICS	0.3054 ppm	0.0000 ppm	0.0000%	2020/01/07 19:22		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3054	3.0542	11.66	15.42	3.75	50.09	10:32
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 9.7309 (IC) (v1339)		CAS_salt_010711 (v4)		CAS_salt_010711 (v31)		
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
3	TOC	K1911998-003.02 50x	5.7991 ppm	0.0310 ppm	0.5300%	2020/01/07 19:36		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.8210	58.2099	46.54	50.08	3.55	50.12	10:28
2	TOC	5.7772	57.7718	46.26	50.11	3.85	50.09	10:29
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 9.7309 (IC) (v1339)		CAS_salt_010711 (v4)		CAS_salt_010711 (v31)		
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
4	TOC	K1912140-002.01 100x	6.3994 ppm	0.1219 ppm	1.9000%	2020/01/07 20:05		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.3132	63.1317	49.65	53.44	3.79	50.11	10:27
2	TOC	6.4856	64.8556	50.74	54.40	3.66	50.10	10:29
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 9.7309 (IC) (v1339)		CAS_salt_010711 (v4)		CAS_salt_010711 (v31)		
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
5	TOC	K1912140-003.01 100x	7.3382 ppm	0.0069 ppm	0.0900%	2020/01/07 20:33		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.3431	73.4309	56.16	59.80	3.64	50.10	10:27
2	TOC	7.3333	73.3329	56.10	59.74	3.64	50.12	10:28
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 9.7309 (IC) (v1339)		CAS_salt_010711 (v4)		CAS_salt_010711 (v31)		

(v1339)

(v4)

(v31)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
6	TOC	K1912140-004.01 100x	7.1897 ppm	0.0385 ppm	0.5400%	2020/01/07 21:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.2169	72.1688	55.36	58.94	3.58	50.10	10:25
2	TOC	7.1625	71.6248	55.02	58.83	3.81	50.10	10:27

Dilution 1:10
Blank Contribution (TC) 9.7309 (IC) (v1339)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v31)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
7	TOC	K1912160-001.01	2.6516 ppm	0.0800 ppm	3.0200%	2020/01/07 21:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7081	27.0814	26.85	30.57	3.71	50.07	10:28
2	TOC	2.5951	25.9506	26.14	29.79	3.65	50.08	10:29

Dilution 1:10
Blank Contribution (TC) 9.7309 (IC) (v1339)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v31)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
8	TOC	K1912160-001.01 ms	29.8729 ppm	0.0000 ppm	0.0000%	2020/01/07 21:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.8729	298.7288	198.61	202.22	3.61	50.07	10:29

Dilution 1:10
Blank Contribution (TC) 9.7309 (IC) (v1339)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v31)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
9	TOC	RB	0.0171 ppm	0.0000 ppm	0.0000%	2020/01/07 22:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0171	0.1710	9.84	13.40	3.56	50.05	10:31

Dilution 1:10
Blank Contribution (TC) 9.7309 (IC) (v1339)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 3

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.4505 ppm	0.0000 ppm	0%	2020/01/07 22:26

(PASS)										
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.4505	254.5047	171.12	174.92	3.80	50.04	10:32
Completion State		Success Action		Method		Calibration		STD Conc - Pos B		
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v31)		50 ppmC		

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

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
♦	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/07 22:40

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.95	12.76	3.81	50.03	10:35

Completion State		Success Action		Method		Calibration		STD Conc - Pos D		
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v31)		0 ppmC		

Sample Type: Sample From Schedule Version 3

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
♦	10	TOC	K2000034-001.01	2.1253 ppm	0.0106 ppm	0.5000%	2020/01/07 22:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1328	21.3276	23.22	27.08	3.86	50.02	10:27
2	TOC	2.1177	21.1774	23.12	26.74	3.62	50.03	10:30

Dilution		Blank Contribution		Method		Calibration	
1:10		(TC) 9.7309 (IC) (v1339)		CAS_salt_010711 (v4)		CAS_salt_010711 (v31)	

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
♦	11	TOC	K2000035-001.01	0.2149 ppm	0.0433 ppm	20.1400%	2020/01/07 23:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2455	2.4548	11.28	15.01	3.73	50.01	10:27
2	TOC	0.1843	1.8427	10.90	14.59	3.69	50.03	10:25

Dilution		Blank Contribution		Method		Calibration	
1:10		(TC) 9.7309 (IC) (v1339)		CAS_salt_010711 (v4)		CAS_salt_010711 (v31)	

Pos	Analysis	Sample ID	Result (ppmC)	Std. Dev.	RSD	Start Time
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	Type		(ppmC)			
♦ 12	TOC	K2000035-002.01	0.4270 ppm	0.0749 ppm	17.5500%	2020/01/07 23:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3741	3.7406	12.10	15.92	3.83	50.01	10:26
2	TOC	0.4800	4.8002	12.77	16.42	3.66	50.02	10:28

Dilution 1:10
Blank Contribution (TC) 9.7309 (IC) (v1339)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v31)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 13	TOC	T1901631-001.02 doc	3.5419 ppm	0.0282 ppm	0.8000%	2020/01/08 00:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5220	35.2202	32.00	35.79	3.79	50.01	10:27
2	TOC	3.5619	35.6187	32.25	35.98	3.72	49.99	10:27

Dilution 1:10
Blank Contribution (TC) 9.7309 (IC) (v1339)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v31)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 14	TOC	T1901631-001.02 ms doc	31.4682 ppm	0.0000 ppm	0.0000%	2020/01/08 00:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	31.4682	314.6821	208.70	212.26	3.56	49.99	10:30

Dilution 1:10
Blank Contribution (TC) 9.7309 (IC) (v1339)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v31)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 15	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/08 01:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.10	12.95	3.86	49.98	10:31

Dilution 1:10
Blank Contribution (TC) 9.7309 (IC) (v1339)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v31)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 16	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2020/01/08 01:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.93	11.77	3.84	50.00	10:32

Dilution 1:10
Blank Contribution (TC) 9.7309 (IC)
Method CAS_salt_010711
Calibration CAS_salt_010711

(v1339)

(v4)

(v31)

Sample Type: Check Standard --> LCS

From Schedule Version 3

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	26.2833 ppm (PASS)	0.0000 ppm	0%	2020/01/08 01:31

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	26.2833	262.8333	176.38	180.12	3.73	50.05	10:30

Completion State

Success - Criteria met.

Success Action

Do Nothing

Method

CAS_salt_010711 (v4)

Calibration

CAS_salt_010711 (v31)

STD Conc - Pos C

25 ppmC

Sample Type: Sample

From Schedule Version 3

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 18	TOC	K2000090-001.01	0.9467 ppm	0.0728 ppm	7.6900%	2020/01/08 01:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9981	9.9815	16.04	19.80	3.76	49.97	10:25
2	TOC	0.8952	8.9518	15.39	19.17	3.78	49.97	10:31

Dilution

1:10

Blank Contribution

(TC) 9.7309 (IC) (v1339)

Method

CAS_salt_010711 (v4)

Calibration

CAS_salt_010711 (v31)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 3

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.3307 ppm (PASS)	0.0000 ppm	0%	2020/01/08 02:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.3307	253.3075	170.36	174.01	3.64	50.01	10:36

Completion State

Success - Criteria met.

Success Action

Do Nothing

Method

CAS_salt_010711 (v4)

Calibration

CAS_salt_010711 (v31)

STD Conc - Pos B

50 ppmC

Sample Type: Check Standard --> CCB

From Schedule Version 3

Concentration	Min / Max

Pos	BAT	(ppm)	Dil	Sample ID	(% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2020/01/08 02:28

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.21	11.96	3.75	50.00	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v31)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1338	2.8760	1.7130	0.0000	0.0000	0.0000	2020/01/07 11:53	Fusion1 (Fusion1)
v1339	2.7543	1.5310	0.0000	0.0000	0.0000	2020/01/07 18:08	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v31 Calibration curve formula: TOC: $y = 6.323x + 10.200$

Ver Creation: 2020/01/07 14:30 r^2 value: TOC: $r^2 = 0.99991$

Comment:

Operator: Fusion1 (Fusion1)

Basic Analysis Type: TOC

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	9.5850	0.0000		2020/01/07 13:02
0.500 ppm	12.6160	0.5000		2020/01/07 13:17
1.0 ppm	15.6440	1.0000		2020/01/07 13:31
5.0 ppm	43.7700	5.0000		2020/01/07 13:45
10 ppm	73.2770	10.0000		2020/01/07 14:00
25 ppm	169.4210	25.0000		2020/01/07 14:14
50 ppm	325.6260	50.0000		2020/01/07 14:28

Methods

Name: CAS_salt_010711 (TOC)

Version: v4
 Ver Creation: 2019/02/21 17:57
 Comment:

Operator: Fusion1 (Fusion1)

Parameter	Value	Advanced Parameter	Value
SampleVolume	10.0 mL	NeedleRinseVolume	5.0 ml
Dilution	1:10	VialPrimeVolume	2.0 ml
AcidVolume	0.5 ml	ICSamplePrimeVolume	2.0 ml
ReagentVolume	2.0 ml	ICSpurgeRinseVolume	12.0 ml
UVReactorPrerinse	Off	BaselineStabilizeTime	0.70 min
UVReactorPrerinseVolume	5.0	DetectorPressureFlow	150 ml/min
NumberOfUVReactorPrerinses	1	SyringeSpeedWaste	10
ICSpurgeTime	1.00 mins	SyringeSpeedAcid	7
DetectorSweepFlow	500 ml/min	SyringeSpeedReagent	7
PreSpurgeTime	2.00 mins	SyringeSpeedDIWater	7
SystemFlow	500 ml/min	NDIRPressurization	60 psig
		SyringeSpeedSampleDispense	5
		SyringeSpeedSampleAspirate	4
		SyringeSpeedUVDispense	5
		SyringeSpeedUVAspirate	5
		SyringeSpeedICDispense	5
		SyringeSpeedICAspirate	5
		NDIRPressureStabilize	1.75 min
		SampleMixing	Off
		SampleMixingCycles	1
		SampleMixingVolume	10.0
		LowLevelFilterNDIR	Off

Acceptance / Approval**Electronic Signatures**

Report Version	User Name	Acceptance	Reason	Date

Report History**Report History**

Report Version	User Name	System Reason	User Reason	Date

1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2020/01/08 02:44
---	-------------------	--------------------	--------------------	------------------

ALS Environmental

StarLIMS Run: 665574, 665575
 Analysis: DOC/TOC
 Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-82C 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 1/7/2020

ICAL ID: 11-GEN-05-76H

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-05-83J

21 % H3PO4: 11-GEN-05-83I

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By: <i>BCP</i>	Date Analyzed: <i>1/7/2020</i>
Reviewed By: <i>Hamilton</i>	Date Reviewed: <i>01/08/20</i>



Case Narrative

Method: 6850

Analysis: Perchlorate

Analysis SOP: LC-MS-CLO4

ALS WO ID(s): 2000307; 2000949; 2000952;
2000953

Client: ALS Laboratories (Houston, TX)

Matrix: Water

ELMS Batch (HBN): 2340 (255305)

General Set Information: There were four 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. 50 μL 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 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 2000952001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 691930) was less than 1/2 the CRDL. The recovery for the LCS (692062) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on sample 2000307001 (Client ID: LH24-SP650_1230.19_BIX). 3.0 μ L of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3. μ g/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 μ g/L. Results were calculated in μ g/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (μ g/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 – 691929) is reported from the analysis of the Laboratory Control Sample (LCS – 692062) at a level of 3.0 μ g/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).

Thomas Bosch January 15, 2020
Analyst Date



ANALYTICAL REPORT

Report Date: January 15, 2020

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

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-2000307**

Project ID: HS19121486-02

Purchase Order: HS19121486-02

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_1230.19_BIX	2000307001	12/30/19	01/03/20	HS19121486-02

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

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Environmental 

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER



ANALYTICAL REPORT

Workorder: **34-2000307**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: LH18/24-SP650_1230.19_BIX	Sampling Site: HS19121486-02	Collected: 12/30/2019				
Lab ID: 2000307001	Media: 125 mL Nalgene	Received: 01/03/2020				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2340 (HBN: 255305) Analyzed: 01/15/2020 10:08	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 255305)

Field sample 2000952001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

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

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 01/15/2020 13:34	/S/ Stephen Brose 01/15/2020 14:31

Laboratory Contact Information

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

Phone: (801) 266-7700
Email: als@alst.com
Web: www.alst.com



ANALYTICAL REPORT

Workorder: 34-2000307

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: 2000307
Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2340 (HBN: 255305)
Analyzed By: Thomas Bosch

Blank

LMB: 691930 Analyzed: 01/15/2020 09:54 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 692062 Analyzed: 01/15/2020 09:26 Dilution: 1 Units: ug/L					
Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	3.29	3.00	110	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 2000307001 Analyzed: 01/15/2020 10:08 Dilution: 1 Units: ug/L		MS: 691932 Analyzed: 01/15/2020 10:22 Dilution: 1 Units: ug/L				MSD: 691933 Analyzed: 01/15/2020 10:36 Dilution: 1 Units: ug/L					
Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	3.2	3	107	78.8	123.8	3.46	115	7.86	0.0	20.0

Comments

Field sample 2000952001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

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

Analyst	Peer Review
/S/ Thomas Bosch 01/15/2020 13:39	/S/ Stephen Brose 01/15/2020 14:31

Symbols and Definitions

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

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



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

2000307

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: Dept of Defense

COC ID: 12986

SUBCONTRACT TO:

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

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19121486
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19121486-02	LH18/24- SP650_1230.19_BIX	Water	30 Dec 2019 14:00
SUB_Perch-6850			09 Jan 2020

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

QC Level: DOD IV (DoD Data Package)

Relinquished By:
Received By: Jamin Jusseel
Cooler ID(s): _____

Date/Time: 11/2/20 1800.
Date/Time: 01-03-20 8:42
Temperature(s): _____

CHAIN OF CUSTODY / SIGNATURE

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston Project/Task/Site: HS19121486-02
 Date/Time of Receipt: 01-03-20 8:42 Number of Coolers Received: 1

Condition of Coolers: Acceptable/Unacceptable
 Cooler Custody Seals: Present/Absent/NA
 Container Custody Seals: Present/Absent/NA
 Ice Present: Yes/No/NA
 Temperature Control: Present/Not Included
 Location Temp Taken: Control/Between Samples
 Are all temperatures within project specific guidelines? Yes/No/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	<u>good</u>	<u>2</u> °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C	6		°C	9		°C

Taken By: Jeanette J. Vartassell Signature J. Vartassell Printed Name 01-03-20 Date

CLIENT-RELATED INFORMATION

- | | | | |
|--|---|--|---|
| <input type="checkbox"/> Missing Cooler | <input type="checkbox"/> Missing Samples/Bottles | <input type="checkbox"/> Incorrect Preservation | <input type="checkbox"/> Insufficient Sample Volume |
| <input type="checkbox"/> Cooler Conditions | <input type="checkbox"/> Broken/Leaking Samples | <input type="checkbox"/> pH Criteria Not Met | <input type="checkbox"/> Chain of Custody Problems |
| <input type="checkbox"/> Missing Paperwork | <input type="checkbox"/> Incorrect Bottle Type | <input type="checkbox"/> Residual Chlorine Present | <input type="checkbox"/> Other: |
| <input type="checkbox"/> Missing/Incorrect Bottle Labels | <input type="checkbox"/> Cooler Temperatures Out of Range | <input type="checkbox"/> 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: _____ Returned to Sample Receipt by: _____ Date: _____
Printed Name Signature



**Must Deliver Next Business Day
Time and Tempature Sensitivel**

Form # 53489-034 RTZ EXP 10/20 00

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

SHIP DATE: 02JAN20
ACTWGT: 9.85 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

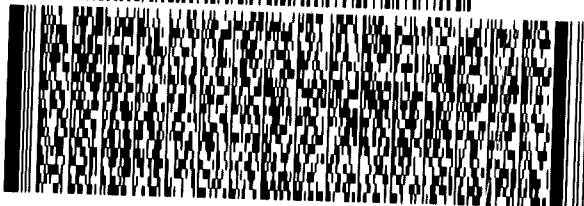
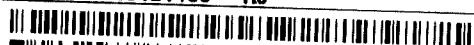
**TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE**

3901/4881/2155

SALT LAKE CITY UT 84123

(801) 268-7700

REF: HS19121486 - RJ



**FedEx
Express**



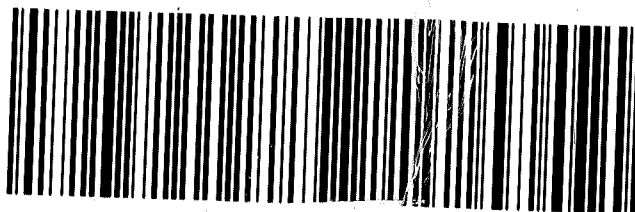
J181118060501 v7

TRK# 1251 0293 3580
0201

**FRI - 03 JAN 3:00P
STANDARD OVERNIGHT**

AX BTFA

**84123
UT-US SLC**



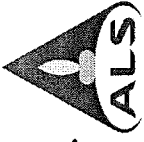


ALS Environmental
CHAIN-OF-CUSTODY

00960335

Project / Job / Task: HS19121486-02		Split:		Workorder ID: 2000307		Level: ENV_LVL4		Requested Analysis																			
Client: ALS Environmental (Houston)				Account: 8101				Type: 125Poly																			
Comments:						Preservatives		EPA 8860, DoD GSM																			
						COOL																					
						Containers																					
						ID(s)		Count																			
Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix																						
2	12/30/2019 14:00	LH18/24-SP650_1230.19_BIX	2000307001		Water	A		1		A																	
3																											
4																											
5																											
6																											
7																											
8																											
9																											
10																											
11																											

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY				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	Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
VanTassell, Tami	01/03/2020 08:42	ALS Sample Receiving	Sample Login				
<i>Tami VanTassell</i>	01-03-20 9:25	<i>ISC</i>	<i>Storage</i>				
<i>R-33.1</i>	01-13-20/08:35	<i>T. Busch</i>	<i>CO2 analysis</i>				



Batch Worklist

Batch: ELMS/ 2340 Created: 1/14/2020 15:38 Instrument: LCMS04 HBN: 255305
 Rule: EPA 6850, DoD QSM Water Analyst: T. Bosch Status: WP



- Workorder: 2000307 [ENV_LVL4]
- Workorder: 2000949 [ENV_LVL4]
- Workorder: 2000952 [ENV_LVL4]
- Workorder: 2000953 [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	691928	CCV for HBN 255305 [ELMS/2340]				CCV	3		E685041C3Q	5311		1/16/2020	1/15/2020
2	691929	RLVS for HBN 255305 [ELMS/2340]				RLVS	3		E685041C3Q	5311		1/16/2020	1/15/2020
3	692062	LCS for HBN 255305 [ELMS/2340]				LCS	3		E6850Q413Q	5311		1/16/2020	
4	691973	ICS for HBN 255305 [ELMS/2340]				ICS	3		E6850..D3Q	5311		1/16/2020	1/15/2020
5	691930	LMB for HBN 255305 [ELMS/2340]				LMB	3		E6850Q413Q	5311		1/16/2020	1/15/2020
6	2000307001	LH18/24-SP650_1230.19_BIX				SAMPLE	3	2000307001-A	E6850Q41.3	5480	1/27/2020	1/16/2020	1/15/2020
7	691932	LH18/24-SP650...(2000307001MS)				MS	3		E6850Q413Q	5311		1/16/2020	1/15/2020
8	691933	LH18/24-SP65...(2000307001MSD)				MSD	3		E6850Q413Q	5311		1/16/2020	1/15/2020
9	2000949001	LH18/24-SP650_010720_BIX Water				SAMPLE	3	2000949001-A	E6850Q41.3	5480	2/4/2020	1/22/2020	1/15/2020
10	2000952001	LH18/24-SP140_010720				SAMPLE	3	2000952001-A	E6850Q41.3	5480	2/4/2020	1/23/2020	1/15/2020
11	2000953001	LH18/24-SP650_010720_BIX Water				SAMPLE	3	2000953001-A	E6850Q41.3	5480	2/4/2020	1/22/2020	1/15/2020
12	691934	CCV for HBN 255305 [ELMS/2340]				CCV	3		E685041C3Q	5311		1/16/2020	1/15/2020



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-upALS Work Order #'s & Sample #()'s: 2000307 (001); 2000949 (001); 2000952 (001); 2000953 (001)ELMS Batch/HBN ID: 2336 (254688)Prep Date: 01/13/2020 Analysis Date: 01/15/2020 Analyst: Tom BoschAnalyte: **Perchlorate** Matrix: **Water** Method: **6850**Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2020\JAN\15JAN20D.sReported 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 692092; Target = 3.0µg/L. ASTM type II water was used for LMB 691930.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on sample 2000307001 (Client ID: LH24-SP650_1230.19_BIX). 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 2000952001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has 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\2020\JAN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alstws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2020\DOD\255305-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATA\REVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 691929) is reported from the analysis of the Laboratory Control Sample (LCS – 692062) 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).

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	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2340 HBN: 255305</u>		
Sample Set IDs if Applicable: <u>2000307/2000949/2000952/2000953</u>		
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



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

CERTIFICATE OF ANALYSIS



43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: Refer to SDS for complete safety information

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



Signal Word: None

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, Inorganic QC Manager



Certificate of Analysis



ISO Guide 34 Reference Material

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



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

Product Name: Perchlorate IC Standard

Description:

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

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

Solvent: water (low TOC, < 50 ppb)

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

Traceability:

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

Estimation of Uncertainties:

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

Homogeneity:

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

Intended Use:

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

Instructions for Use:

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

Hazards:

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

Expiration of Certification:

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



ISO 9001 Registered Quality System – TUV USA

Page 1 of 2



Certificate of Analysis

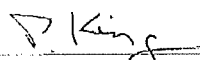


ISO Guide 34 Reference Material

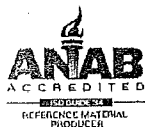
Product Number: ICC-013 Lot Issue Date: 29-Feb 2016
 Lot Number: CP-0860 Expiration Date: 31-Mar 2020

Maintenance of Certification:

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


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


 Daniel J. Lamendola
 Director of QA/RA



ISO 9001 Registered Quality System – TUV USA

Page 2 of 2



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis



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: $\geq 98\%$

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl^*O_4

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

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

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

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)

CIL subscribes to the following standards for different products: ISO Guide 34, ISO/IEC 17025, ISO 13485 and cGMP as appropriate.



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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	
*	691928	CCV@25	Vial 71	1	Control	1	1.72889e6	7.434	23.42373
*	691929	RLVS@3.	Vial 72	1	Control	2	2.18673e5	7.137	3.28544
*	691973	ICS@3.0	Vial 73	1	Control	3	1.35107e5	7.223	2.74699
*	691930	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	2000307001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	691932	03071MS	Vial 76	1	Sample	6	2.05477e5	7.225	3.19824
*	691933	03071SD	Vial 77	1	Sample	7	2.03421e5	7.166	3.45981
*	2000949001		Vial 78	1	Sample	8	1.28802e5	7.167	1.95055
*	2000952001	1K	Vial 79	1	Sample	9	9.69192e5	7.467	1.33675e4
*	2000953001		Vial 80	1	Sample	10	1.27924e5	7.209	1.98446
*	691934	CCV@25	Vial 71	1	Control	11	1.75169e6	7.513	23.40547

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
*	691928	CCV@25	Vial 71	1	Control	1	2.53846e5	7.458	5.00000
*	691929	RLVS@3.	Vial 72	1	Control	2	2.45151e5	7.155	5.00000
*	691973	ICS@3.0	Vial 73	1	Control	3	1.80729e5	7.237	5.00000
*	691930	LMB	Vial 74	1	Control	4	2.29509e5	7.359	5.00000
*	2000307001		Vial 75	1	Sample	5	2.52311e5	7.208	5.00000
*	691932	03071MS	Vial 76	1	Sample	6	2.36573e5	7.234	5.00000
*	691933	03071SD	Vial 77	1	Sample	7	2.16655e5	7.188	5.00000
*	2000949001		Vial 78	1	Sample	8	2.40635e5	7.188	5.00000
*	2000952001	1K	Vial 79	1	Sample	9	2.59889e5	7.488	5000.00000
*	2000953001		Vial 80	1	Sample	10	2.35040e5	7.233	5.00000
*	691934	CCV@25	Vial 71	1	Control	11	2.57415e5	7.543	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
*	691928	CCV@25	Vial 71	1	Control	1	5.16114e5	7.454	22.95643
*	691929	RLVS@3.	Vial 72	1	Control	2	7.08840e4	7.153	3.40228
*	691973	ICS@3.0	Vial 73	1	Control	3	4.90107e4	7.237	3.18375
*	691930	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	2000307001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	691932	03071MS	Vial 76	1	Sample	6	7.10460e4	7.230	3.53797
*	691933	03071SD	Vial 77	1	Sample	7	7.17154e4	7.182	3.91012
*	2000949001		Vial 78	1	Sample	8	4.39331e4	7.199	2.09952
*	2000952001	1K	Vial 79	1	Sample	9	2.85347e5	7.486	1.28498e4
*	2000953001		Vial 80	1	Sample	10	4.63748e4	7.229	2.28052
*	691934	CCV@25	Vial 71	1	Control	11	5.25077e5	7.533	23.02547

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	691928	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	691929	RLVS@3.	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	691973	ICS@3.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	691930	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	2000307001		CLO4-AQN	1	Sample	
6	Vial 76	691932	03071MS	CLO4-AQN	1	Sample	
7	Vial 77	691933	03071SD	CLO4-AQN	1	Sample	
8	Vial 78	2000949001		CLO4-AQN	1	Sample	
9	Vial 79	2000952001	1K	CLO4-AQN	1	Sample	
10	Vial 80	2000953001		CLO4-AQN	1	Sample	
11	Vial 71	691934	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND01.D

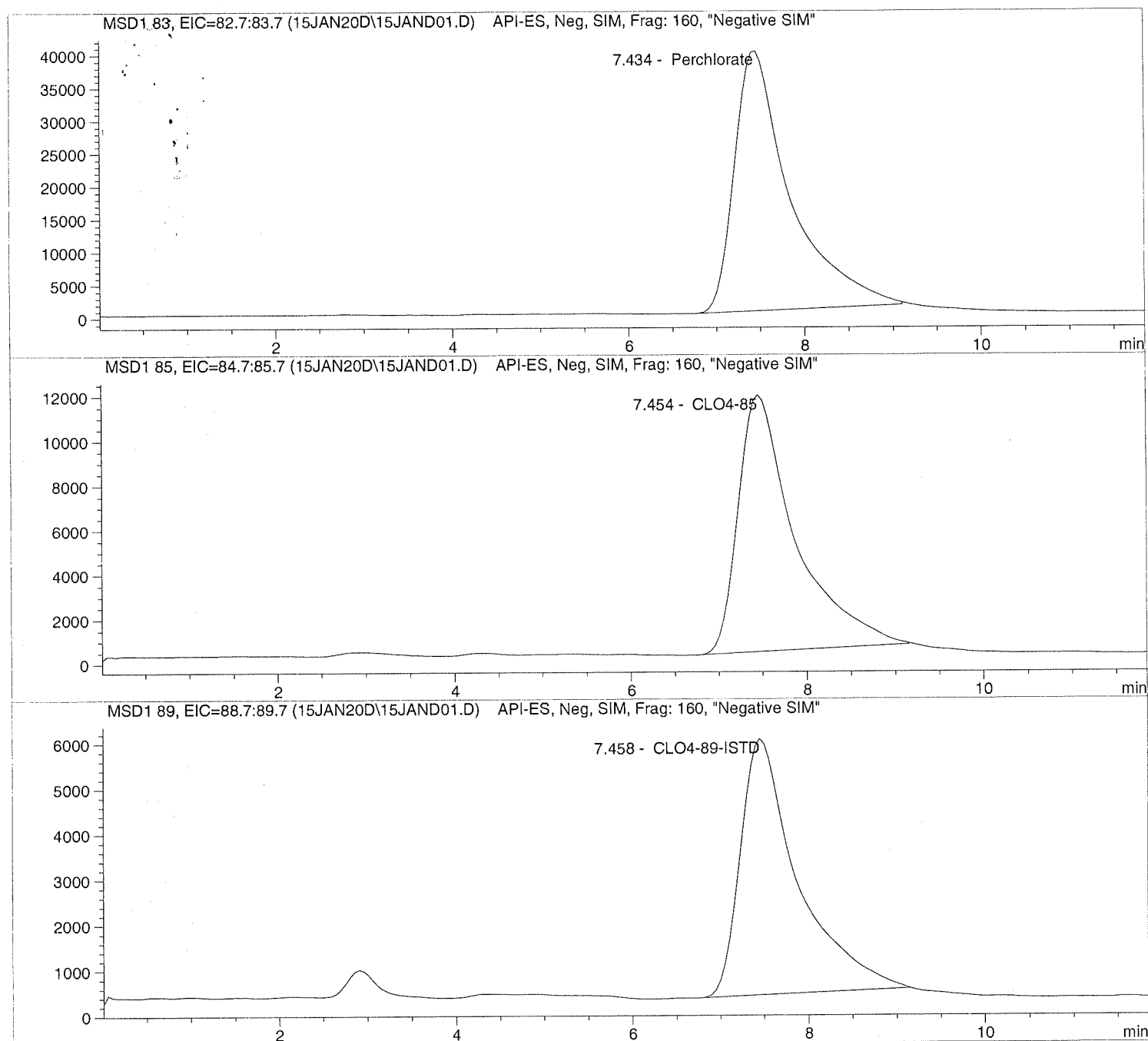
Sample Name: 691928 CCV@25

=====
Injection Date: 1/15/2020 09:13:04
Sample Name: 691928 CCV@25
Acq Operator: TNB

Seq Line: 1
Location: Vial 71
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\15JAN20D\15JAND01.D Sample Name: 691928 CCV@25

```

=====
Injection Date: 1/15/2020 09:13:04      Seq Line: 1
Sample Name: 691928    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
7.434	PBA	1728889.5	23.4237	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.454	PBA	516113.6	22.9564	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.458	PBA	253846.5	5.0000	CLO4-89-ISTD

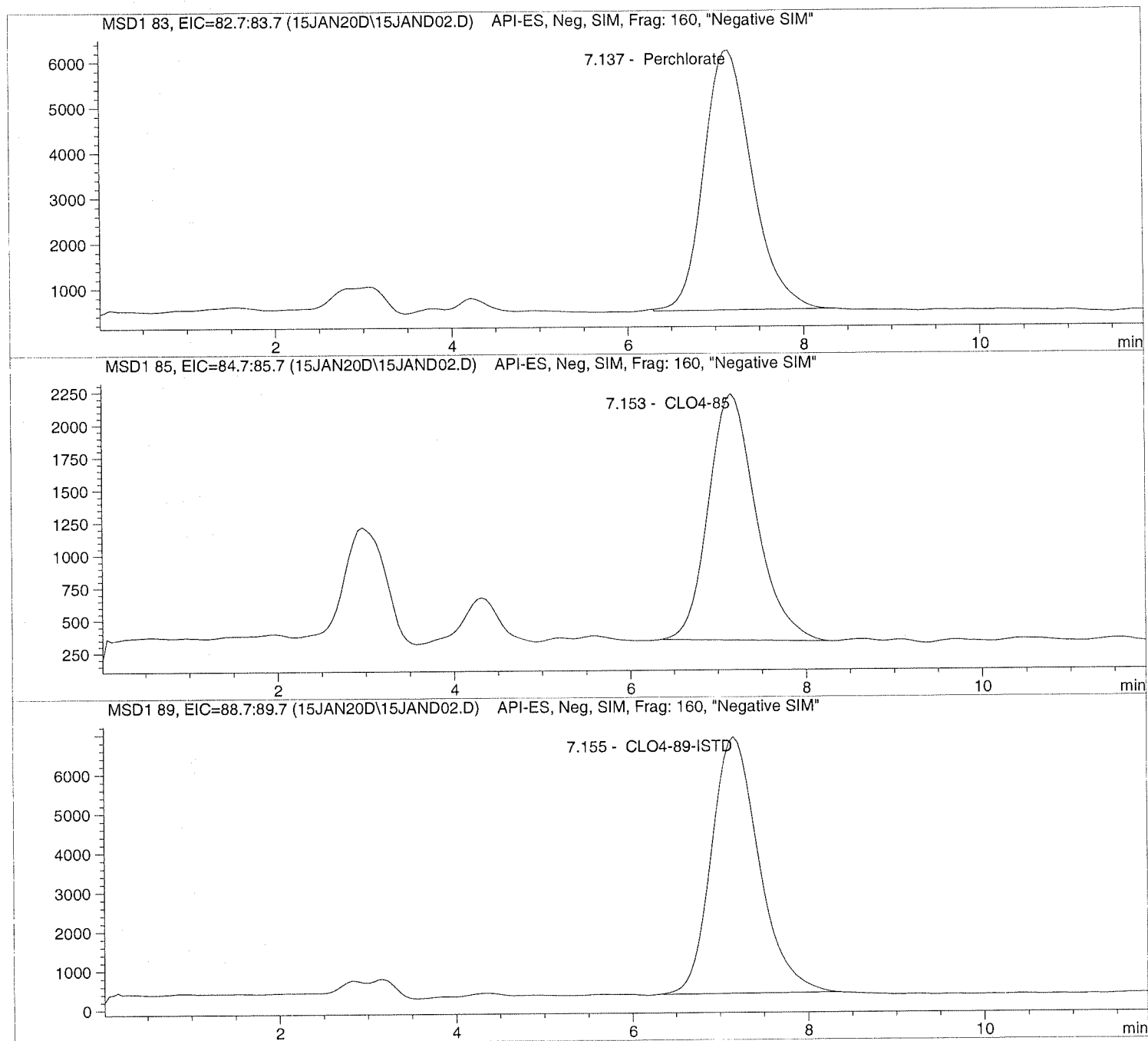
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND02.D Sample Name: 691929 RLVS@3.

```
=====
Injection Date: 1/15/2020 09:26:54      Seq Line:      2
Sample Name:    691929 RLVS@3.           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\15JAN20D\15JAND02.D Sample Name: 691929 RLV@3.

```

=====
Injection Date: 1/15/2020 09:26:54      Seq Line:          2
Sample Name:    691929 RLV@3.           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
7.137	BBA	218673.2	3.2854	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.153	BBA	70884.0	3.4023	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.155	PBA	245151.2	5.0000	CLO4-89-ISTD

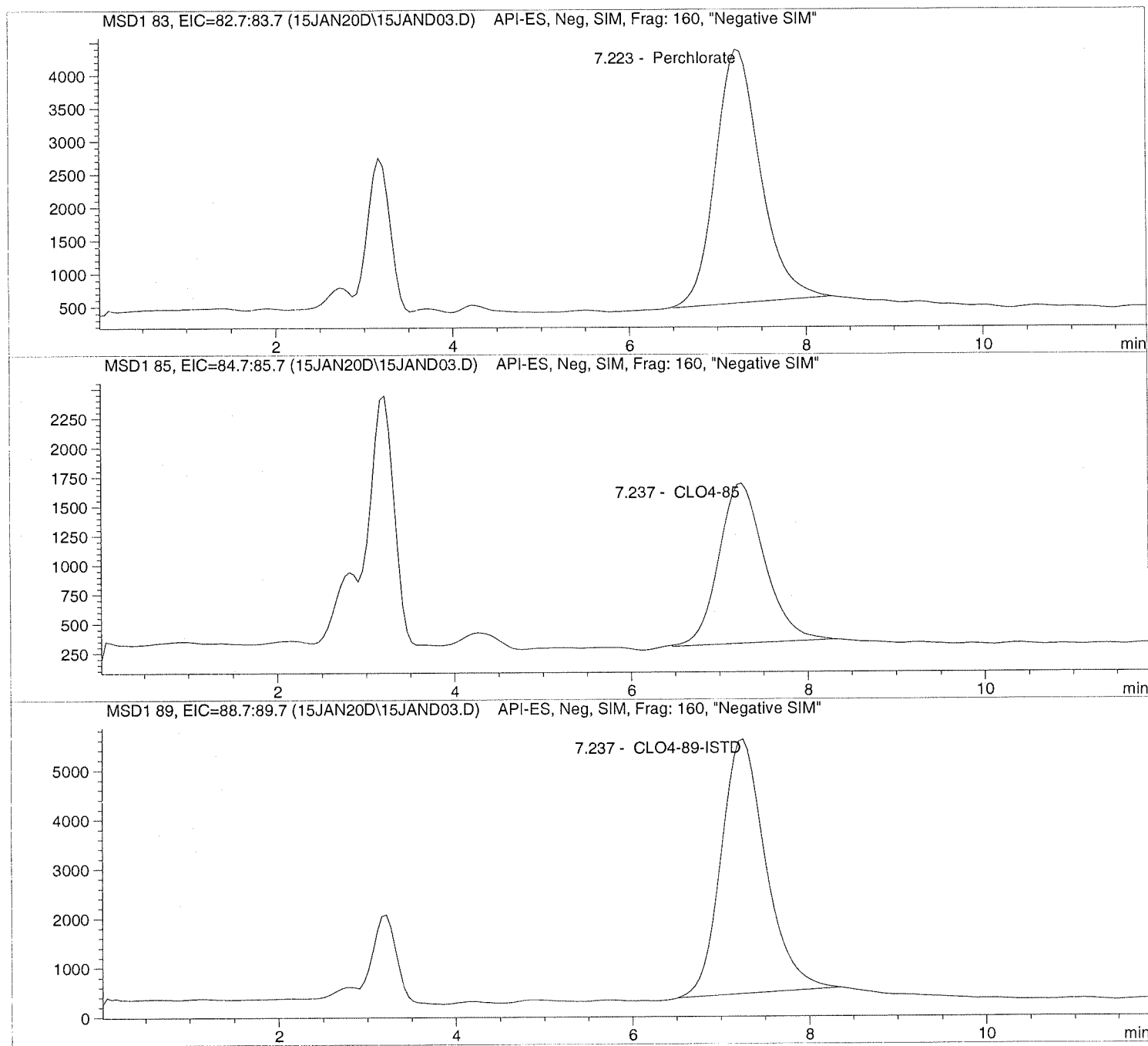
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND03.D Sample Name: 691973 ICS@3.0

```
=====
Injection Date: 1/15/2020 09:40:49      Seq Line: 3
Sample Name: 691973 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\15JAN20D\15JAND03.D Sample Name: 691973 ICS@3.0

```

=====
Injection Date: 1/15/2020 09:40:49      Seq Line:          3
Sample Name:   691973 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
7.223	PBA	135106.7	2.7470	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.237	BBA	49010.7	3.1837	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.237	PBA	180729.3	5.0000	CLO4-89-ISTD

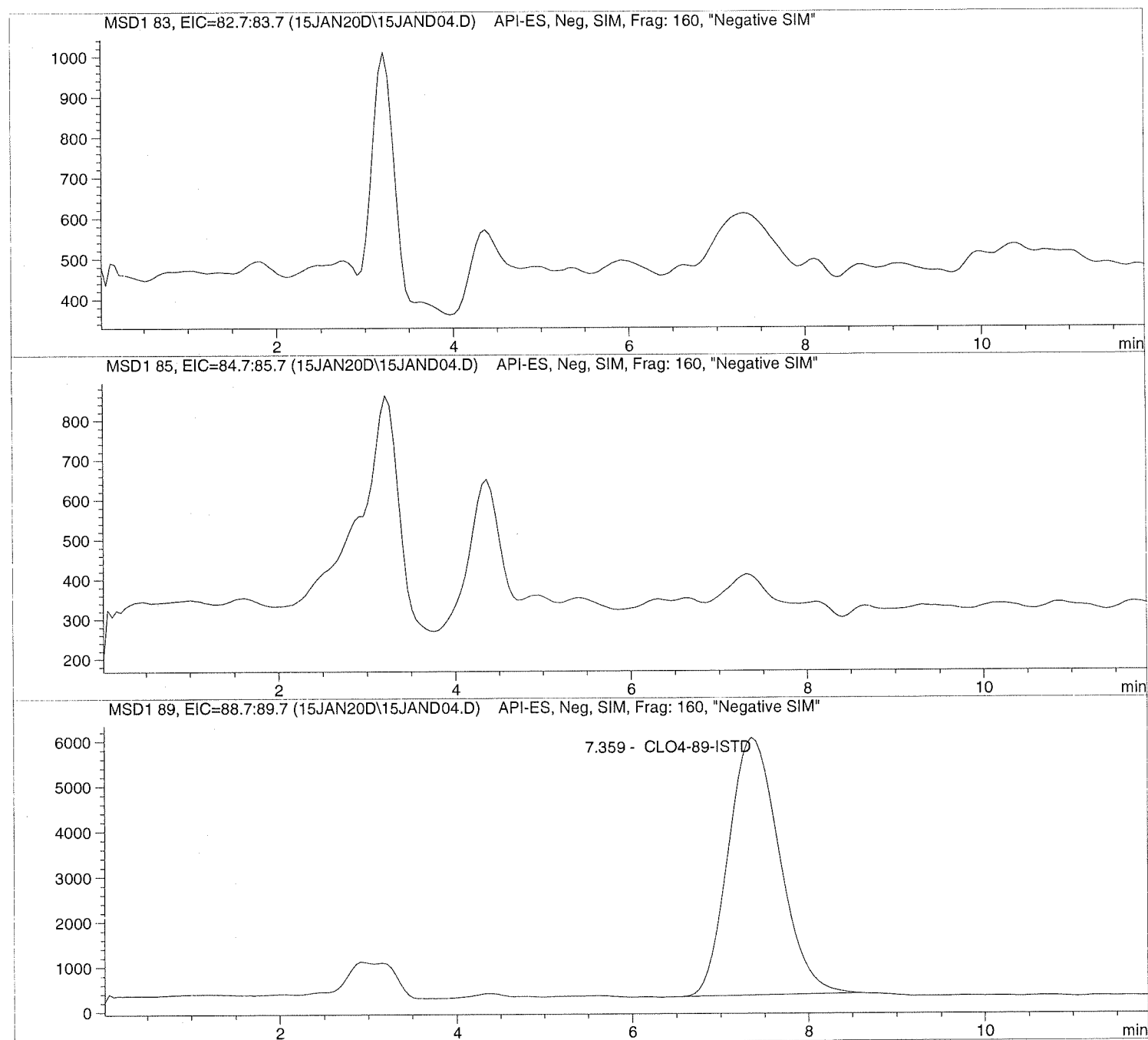
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND04.D Sample Name: 691930 LMB

```
=====
Injection Date: 1/15/2020 09:54:46      Seq Line:      4
Sample Name:    691930 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\15JAN20D\15JAND04.D Sample Name: 691930 LMB

```

=====
Injection Date: 1/15/2020 09:54:46      Seq Line: 4
Sample Name: 691930 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
7.359	PBA	229508.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND05.D

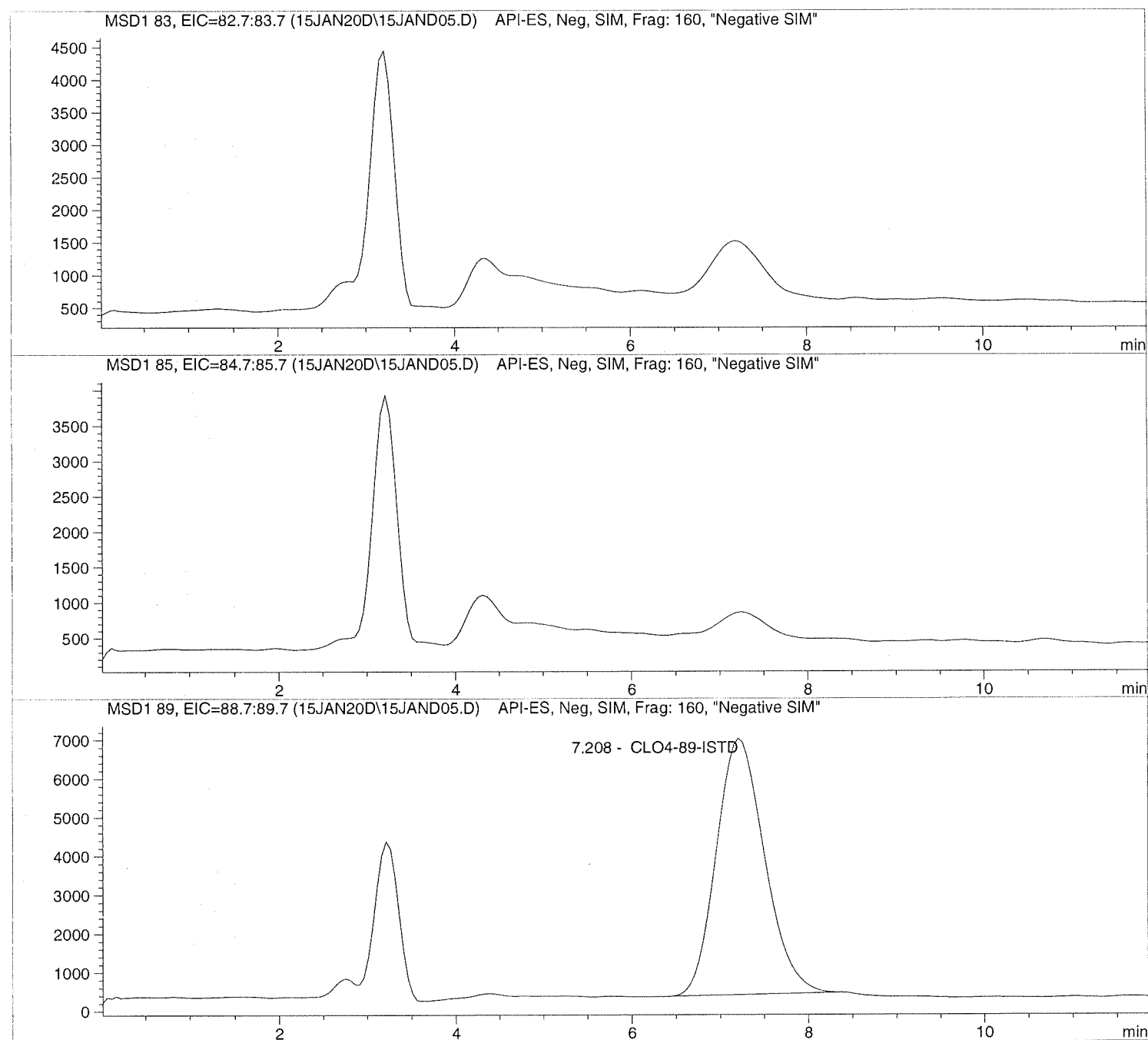
Sample Name: 2000307001

Injection Date: 1/15/2020 10:08:38
Sample Name: 2000307001
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 35 μ l

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\15JAN20D\15JAND05.D

Sample Name: 2000307001

```

=====
Injection Date: 1/15/2020 10:08:38      Seq Line: 5
Sample Name: 2000307001                 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
7.208	PBA	252311.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND06.D

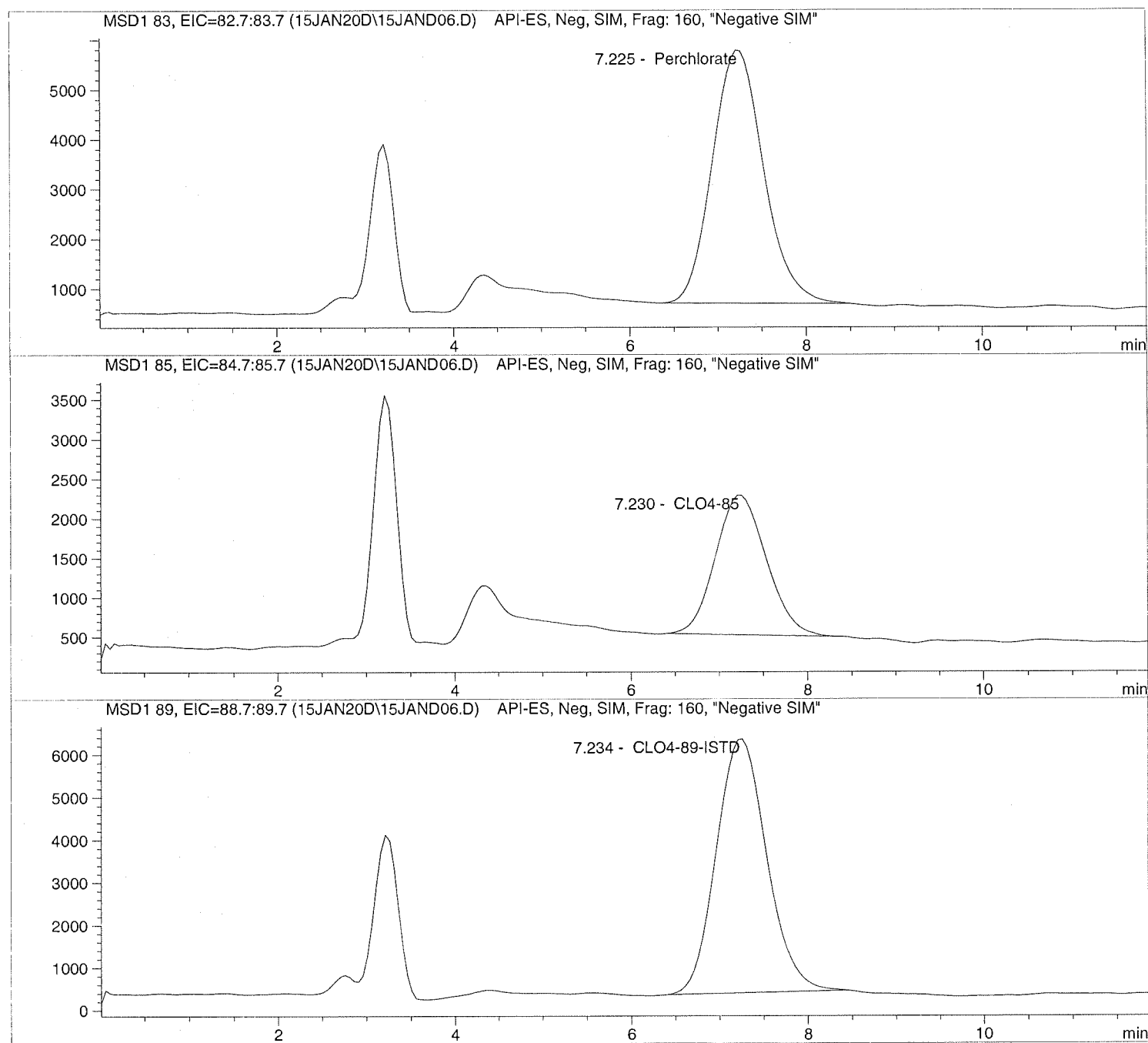
Sample Name: 691932 03071MS

Injection Date: 1/15/2020 10:22:29
Sample Name: 691932 03071MS
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
Inj. No.: 1
Inj. Vol.: 35 μ l

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\15JAN20D\15JAND06.D Sample Name: 691932 03071MS

=====
Injection Date: 1/15/2020 10:22:29 Seq Line: 6
Sample Name: 691932 03071MS 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
7.225	PBA	205477.1	3.1982	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.230	PBA	71046.0	3.5380	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.234	PBA	236573.4	5.0000	CLO4-89-ISTD

=====
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND07.D

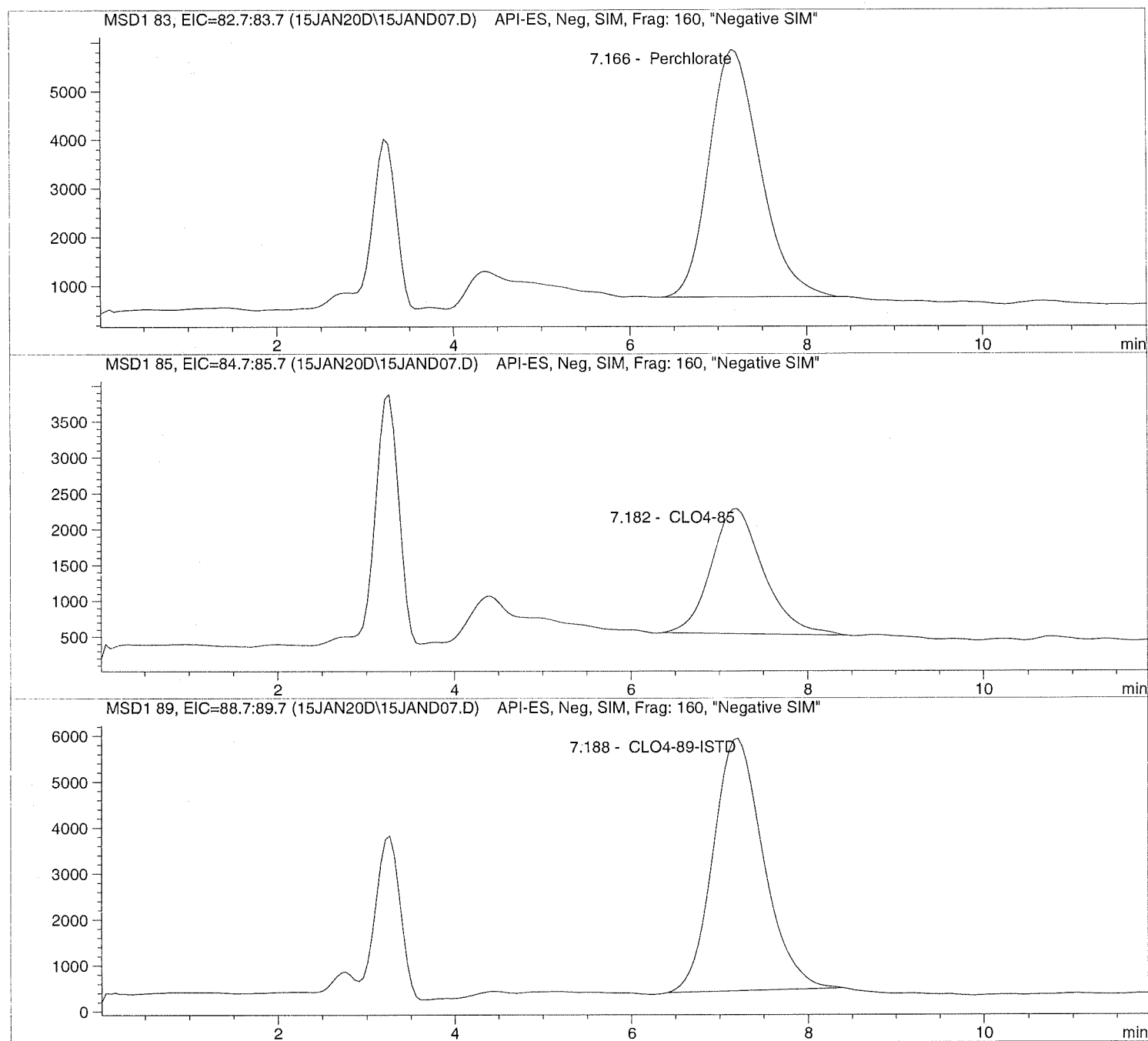
Sample Name: 691933 03071SD

Injection Date: 1/15/2020 10:36:32
Sample Name: 691933 03071SD
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 35 μ l

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\15JAN20D\15JAND07.D Sample Name: 691933 03071SD

```

=====
Injection Date: 1/15/2020 10:36:32      Seq Line: 7
Sample Name: 691933 03071SD           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
7.166	PBA	203421.1	3.4598	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.182	PBA	71715.4	3.9101	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.188	PBA	216654.6	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND08.D

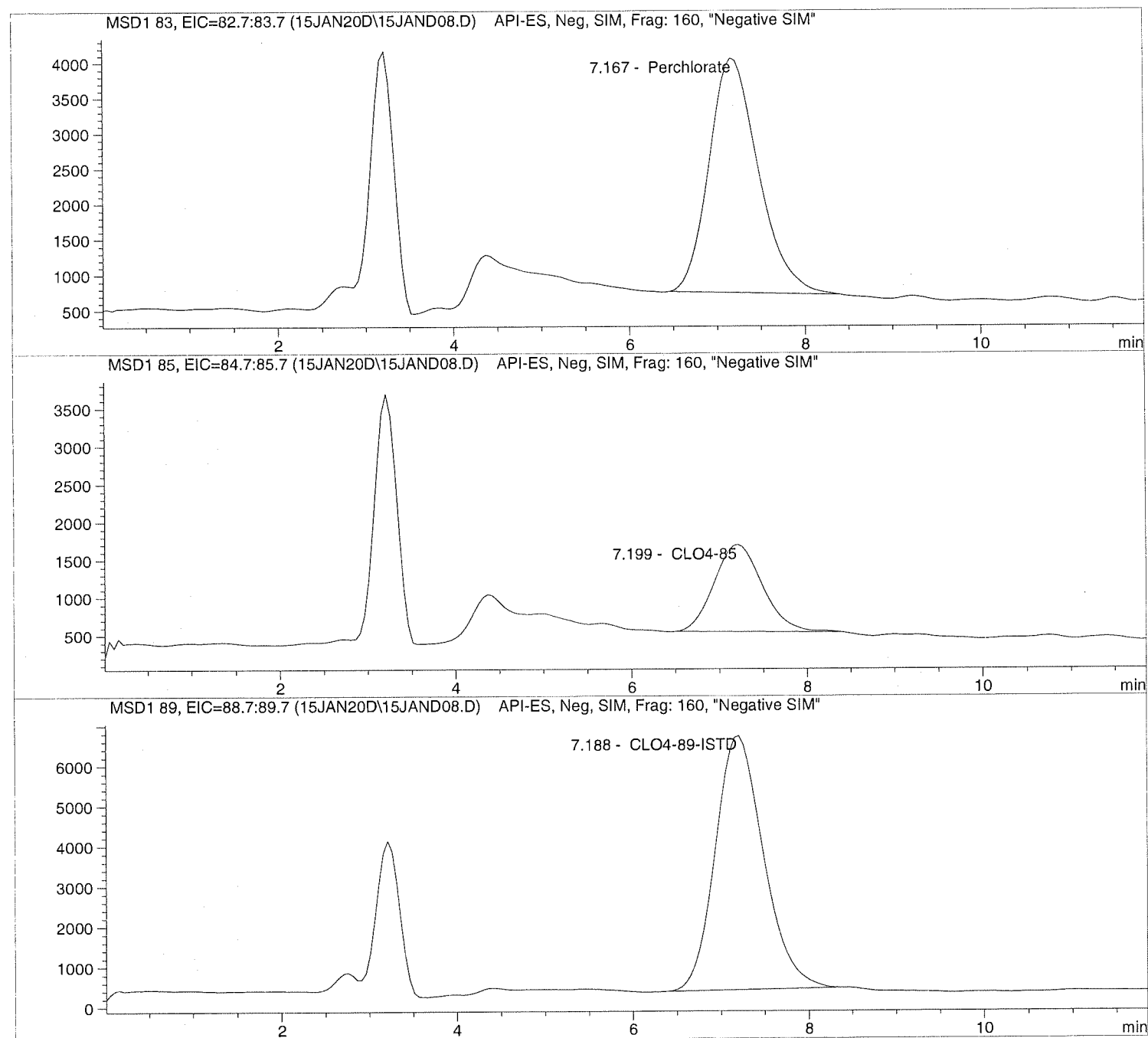
Sample Name: 2000949001

Injection Date: 1/15/2020 10:50:37
Sample Name: 2000949001
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 35 μ l

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\15JAN20D\15JAND08.D Sample Name: 2000949001

```

=====
Injection Date: 1/15/2020 10:50:37      Seq Line:      8
Sample Name:    2000949001              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
7.167	PBA	128801.7	1.9506	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.199	PBA	43933.1	2.0995	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.188	PBA	240635.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND09.D

Sample Name: 2000952001 1K

Injection Date: 1/15/2020 11:04:28

Seq Line: 9

Sample Name: 2000952001 1K

Location: Vial 79

Acq Operator: TNB

Inj. No.: 1

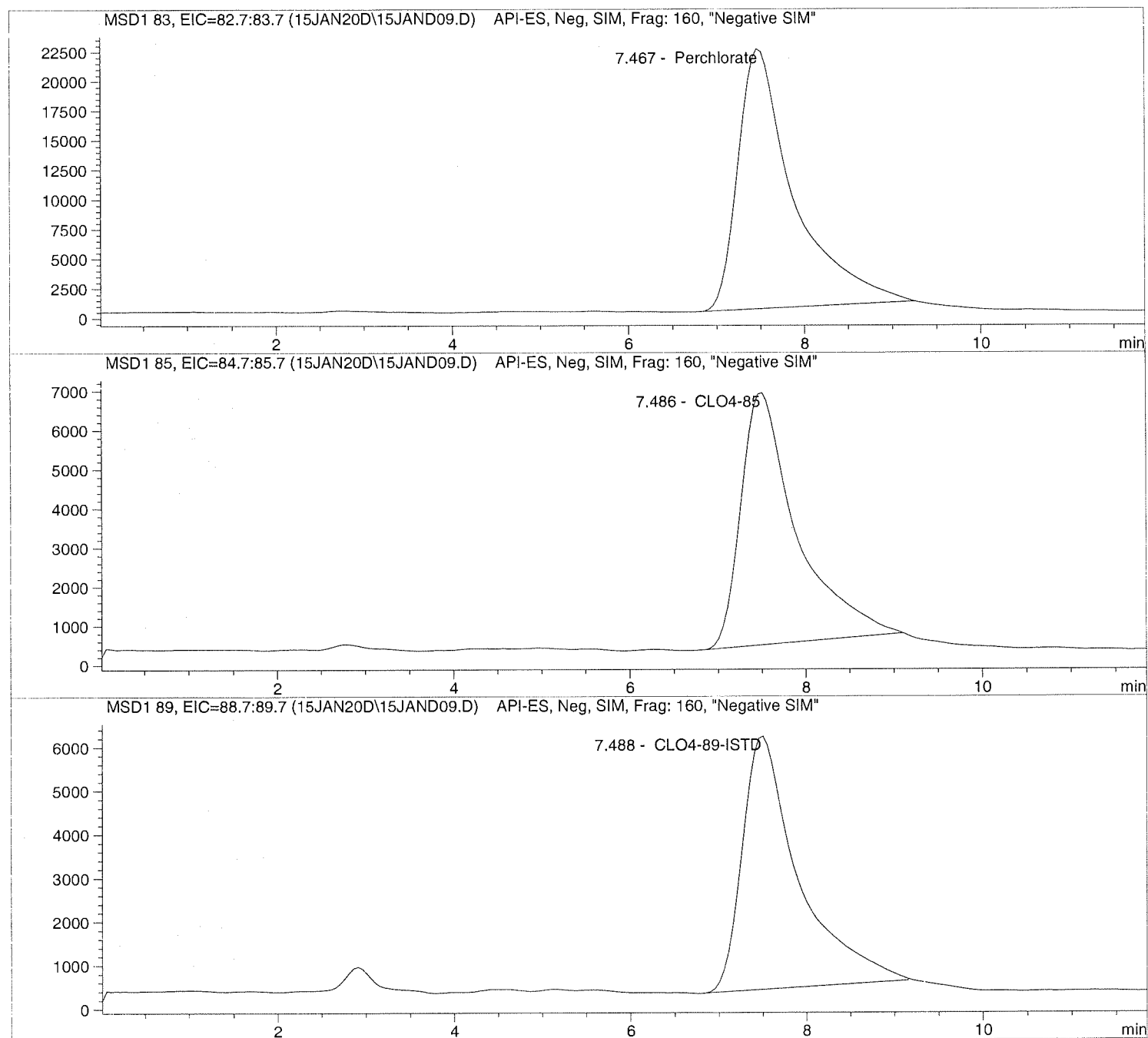
Inj. Vol.: 35 µl

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\15JAN20D\15JAND09.D Sample Name: 2000952001 1K

```

=====
Injection Date: 1/15/2020 11:04:28      Seq Line:          9
Sample Name:    2000952001 1K           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:      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
7.467	PBA	969191.8	13367.4646	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.486	PBA	285347.1	12849.8345	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.488	PBA	259888.6	5000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND10.D

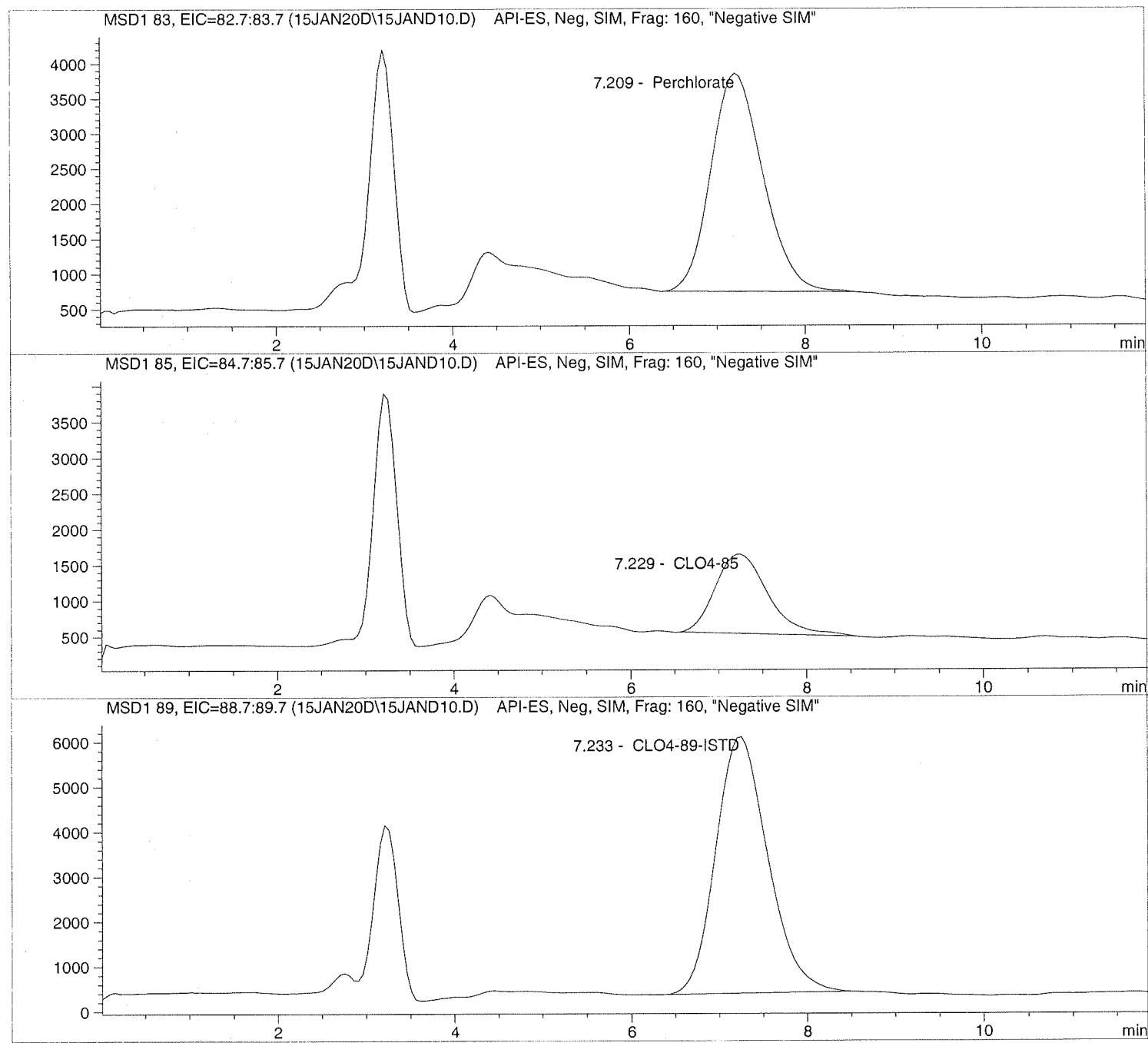
Sample Name: 2000953001

=====
Injection Date: 1/15/2020 11:18:21
Sample Name: 2000953001
Acq Operator: TNB

=====
Seq Line: 10
Location: Vial 80
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\15JAN20D\15JAND10.D Sample Name: 2000953001

```

=====
Injection Date: 1/15/2020 11:18:21      Seq Line:      10
Sample Name:   2000953001                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
7.209	PBA	127923.8	1.9845	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.229	PBA	46374.8	2.2805	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.233	PBA	235039.6	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\15JAN20D\15JAND11.D

Sample Name: 691934 CCV@25

Injection Date: 1/15/2020 11:33:15

Seq Line: 11

Sample Name: 691934 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

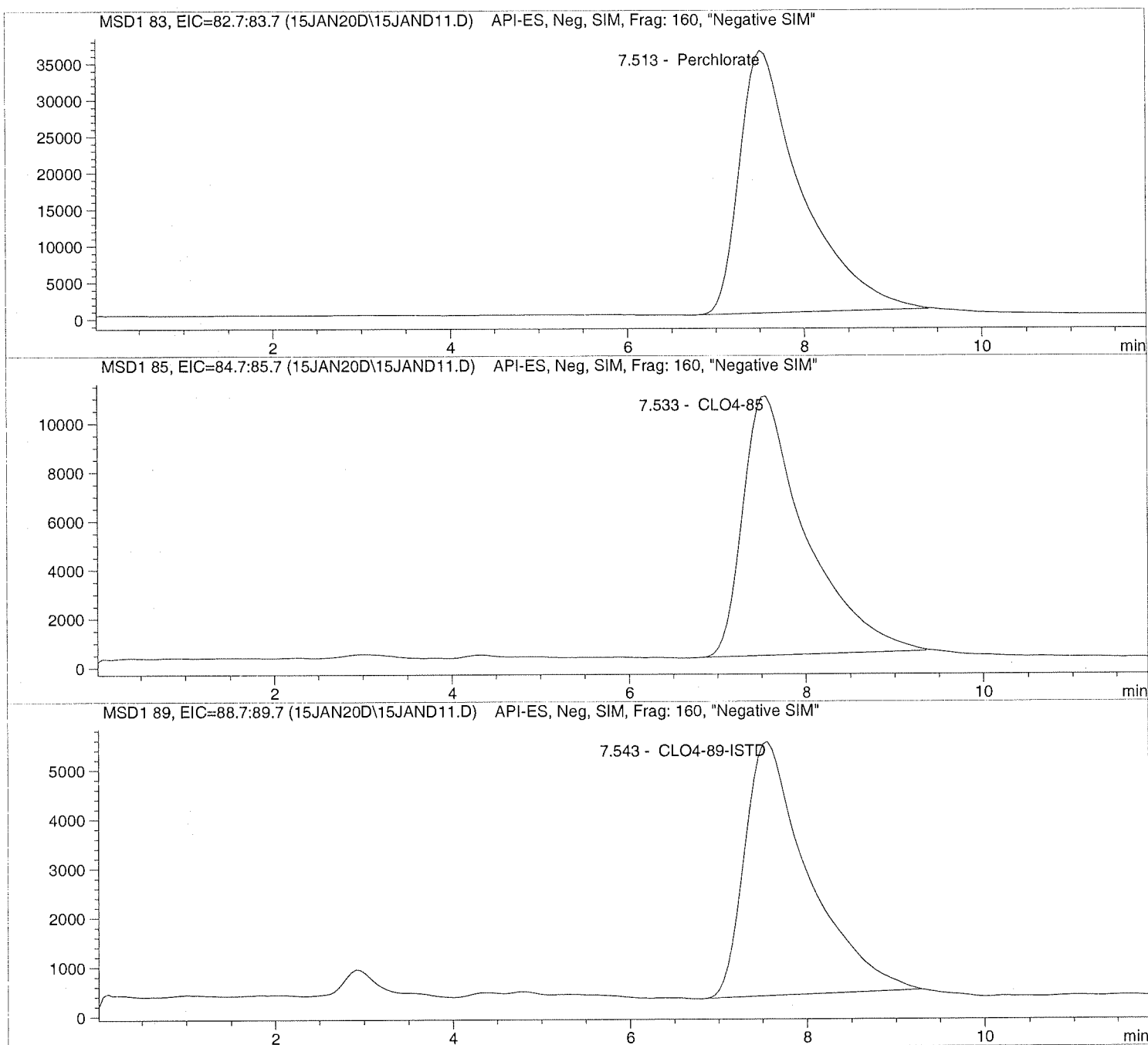
Inj. Vol.: 35 μ l

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\15JAN20D\15JAND11.D Sample Name: 691934 CCV@25

```

=====
Injection Date: 1/15/2020 11:33:15      Seq Line:          11
Sample Name:    691934  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
7.513	PBA	1751693.0	23.4055	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.533	PBA	525076.8	23.0255	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.543	PBA	257414.7	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	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
[min]	Sig						
7.750	1	3	1.00000	5.39218e4	1.85454e-5	1	Perchlorate
		4	2.00000	1.32825e5	1.50574e-5		
		5	5.00000	2.76271e5	1.80982e-5		
		6	10.00000	5.61298e5	1.78159e-5		
		7	25.00000	1.51820e6	1.64669e-5		
		8	50.00000	3.31156e6	1.50986e-5		
		9	75.00000	5.23914e6	1.43153e-5		
7.767	3	3	5.00000	2.14568e5	2.33026e-5	+I1	CLO4-89-ISTD
		4	5.00000	2.04758e5	2.44190e-5		
		5	5.00000	2.13407e5	2.34294e-5		
		6	5.00000	2.09246e5	2.38953e-5		
		7	5.00000	2.07403e5	2.41077e-5		
		8	5.00000	2.02929e5	2.46391e-5		
		9	5.00000	1.97933e5	2.52611e-5		
7.778	2	3	1.00000	1.70436e4	5.86732e-5	1	CLO4-85
		4	2.00000	4.20754e4	4.75337e-5		
		5	5.00000	9.24707e4	5.40712e-5		
		6	10.00000	1.68622e5	5.93041e-5		
		7	25.00000	4.63724e5	5.39114e-5		
		8	50.00000	9.95933e5	5.02042e-5		

Method C:\HPCHEM\1\METHODS\CLO4-DP3.M

RetTime [min]	Lvl Sig	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

```

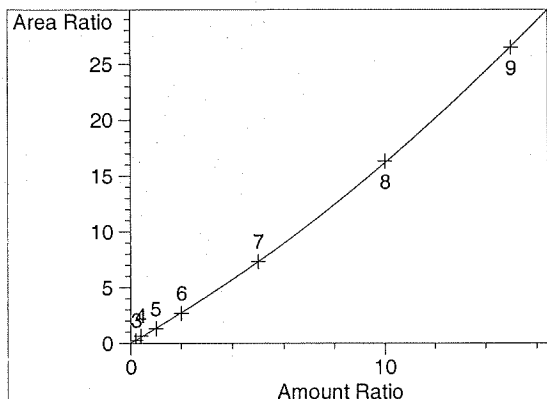
=====
                          Peak Sum Table
=====

```

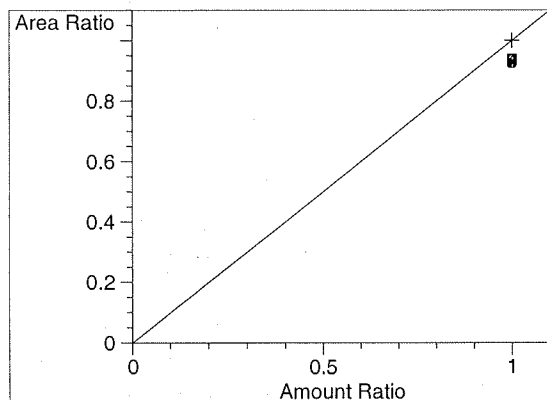
```

***No Entries in table***
=====

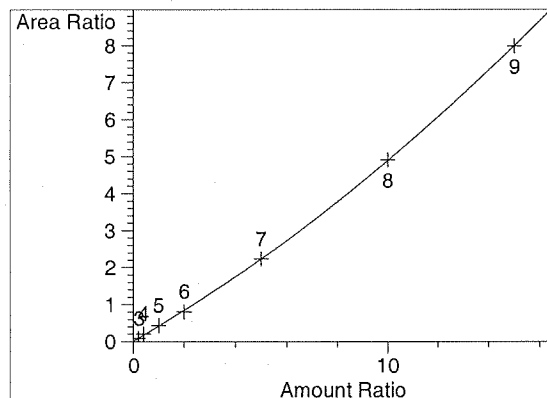
```

=====
 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

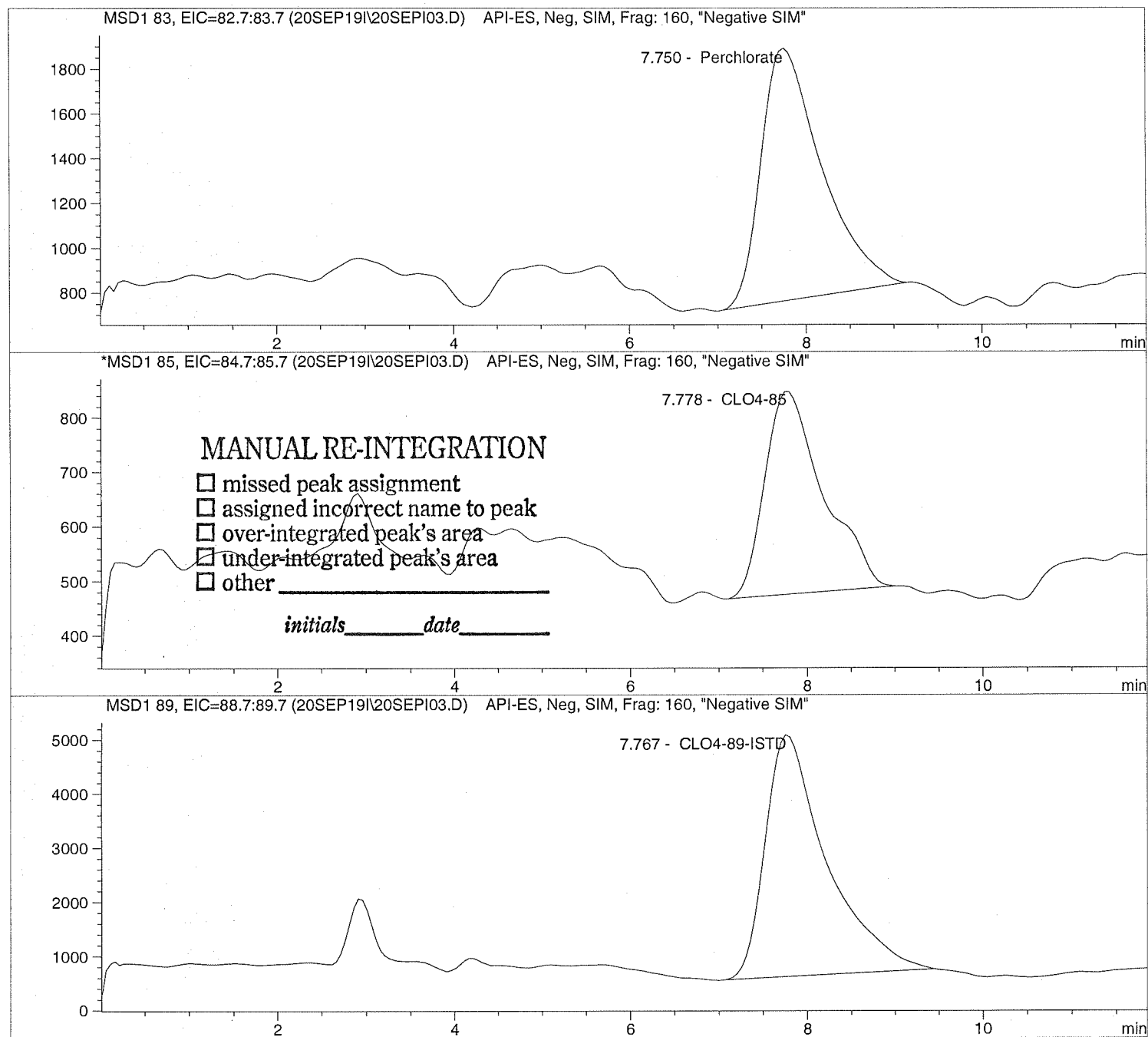
Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05
 Sample Name: CLO4@ 1.0ug/L
 Acq Operator: TNB

Seq Line: 3
 Location: Vial 73
 Inj. No.: 1
 Inj. Vol.: 30 μ l

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

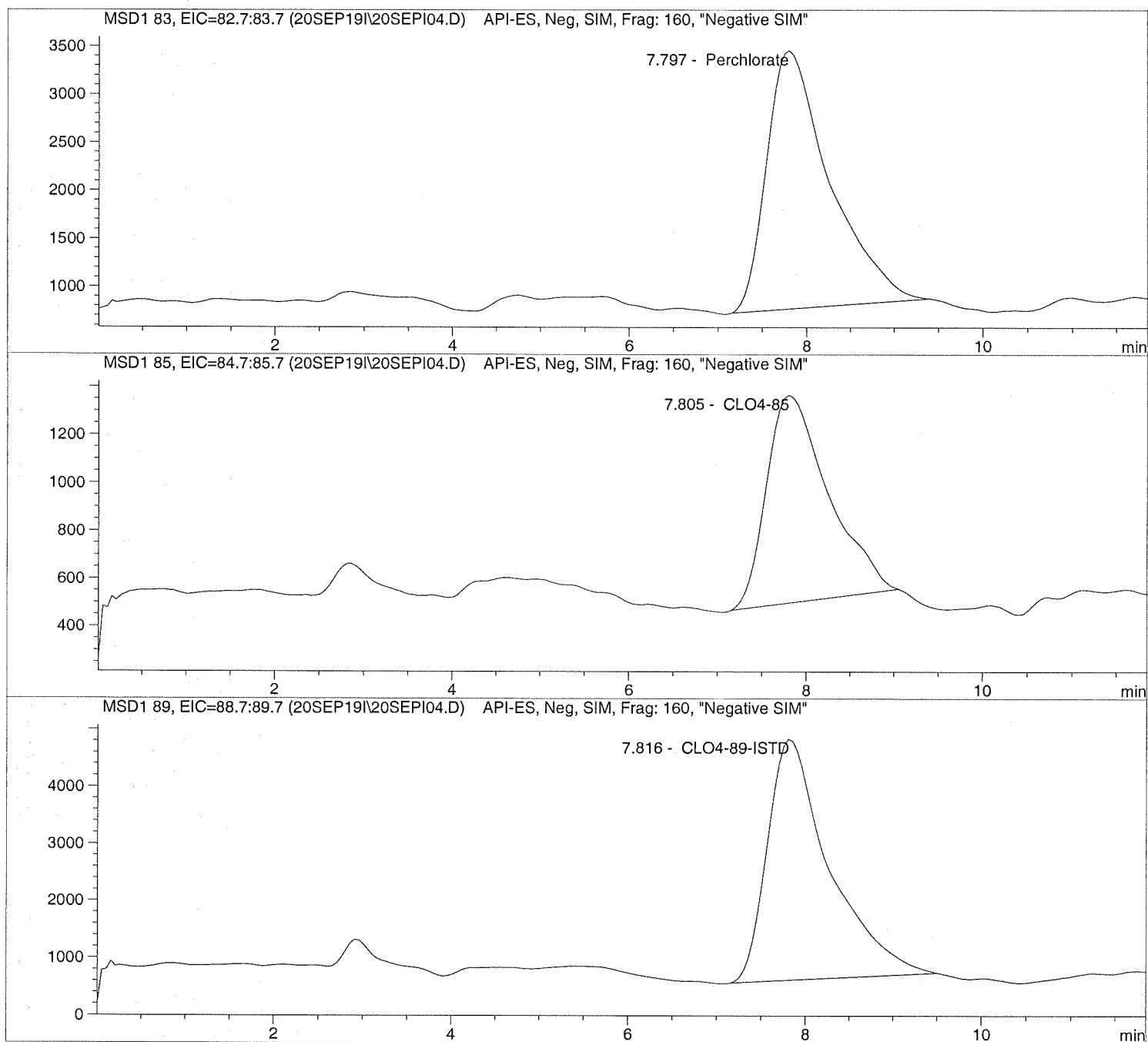
Inj. Vol.: 30 µl

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

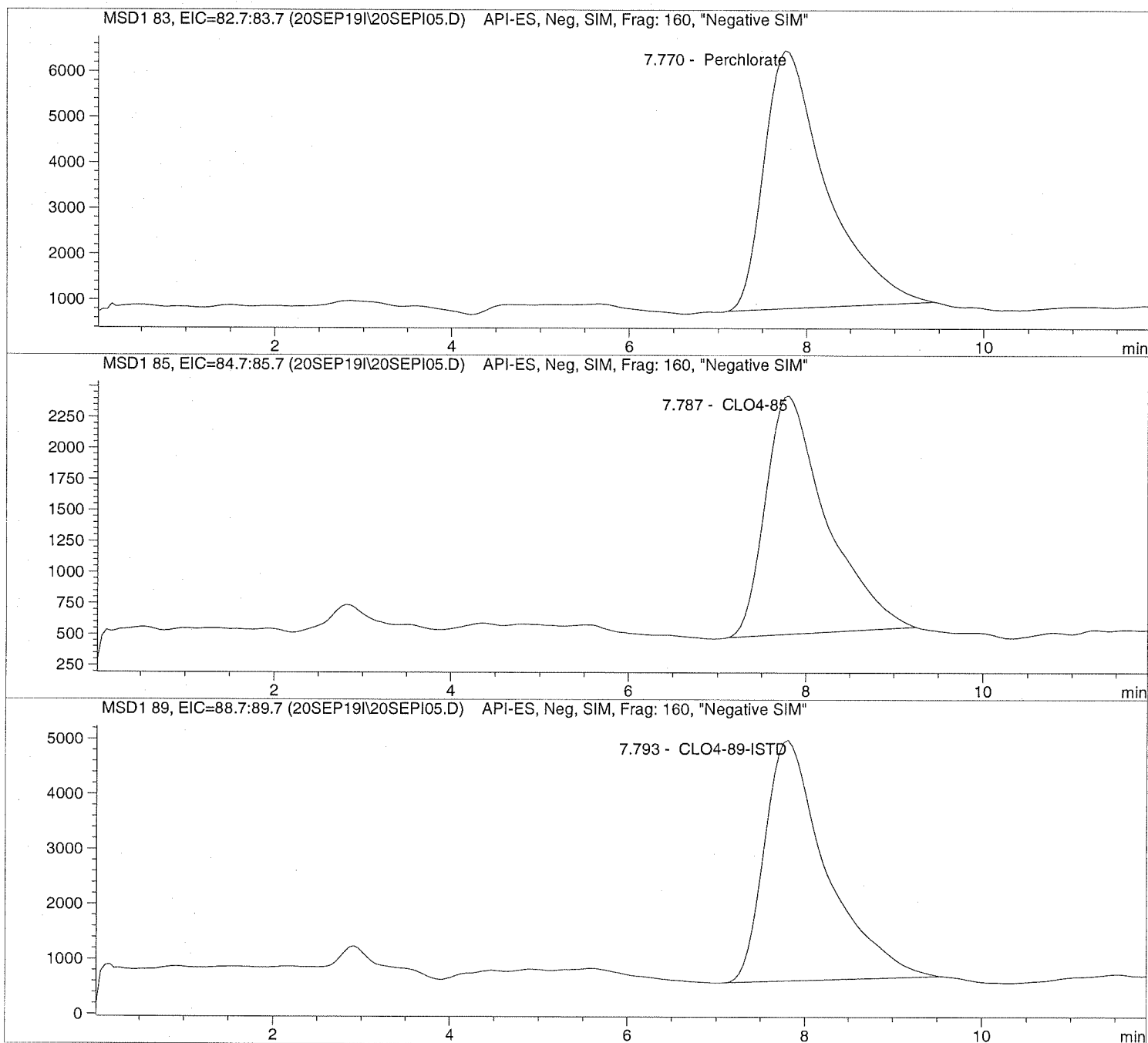
Inj. Vol.: 30 µl

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

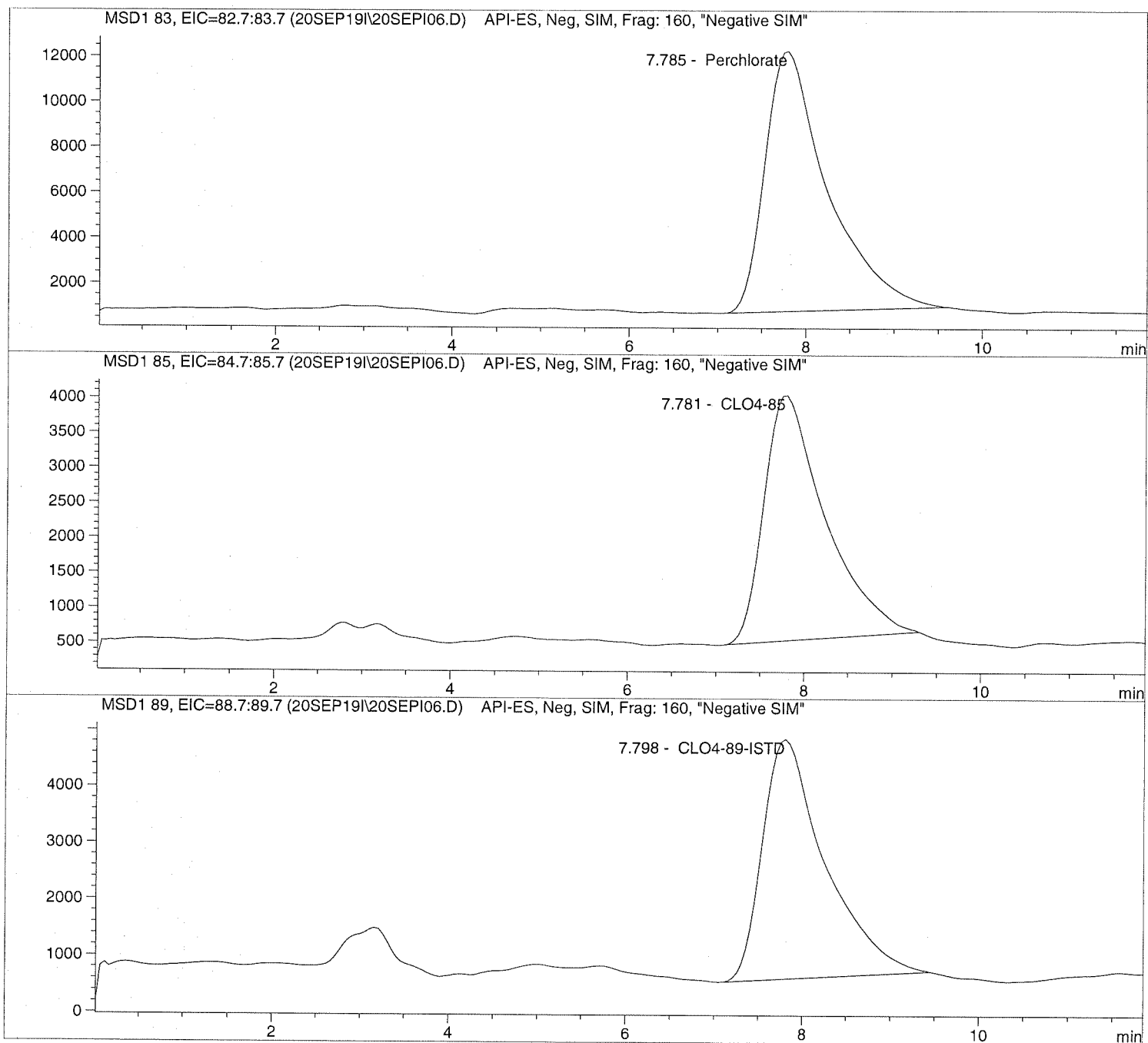
Inj. Vol.: 30 µl

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
 Sample Name: CLO4@ 10.ug/L
 Acq Operator: TNB

Seq Line: 6
 Location: Vial 76
 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

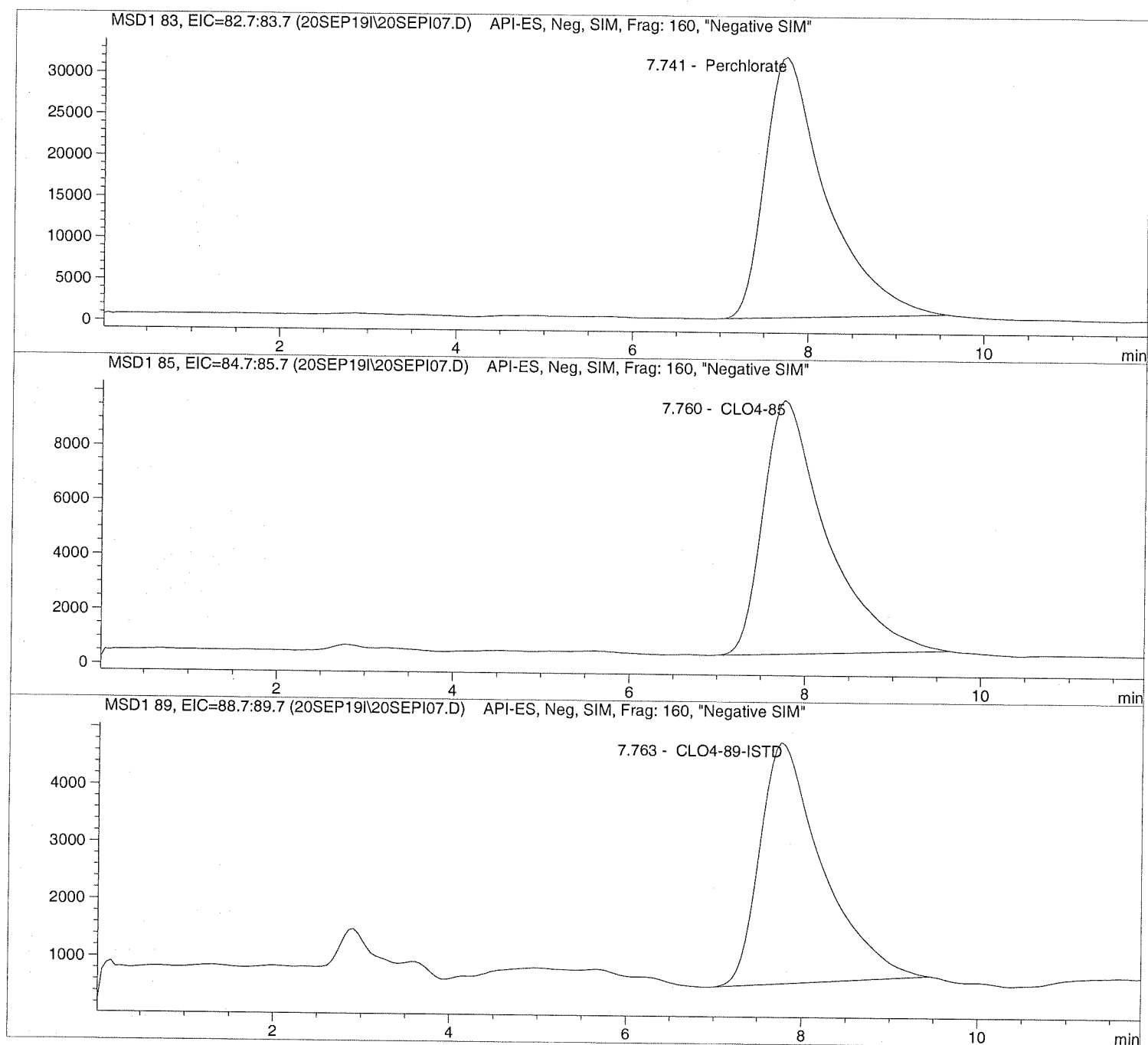
Inj. Vol.: 30 µl

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\20SEP19\20SEPI08.D

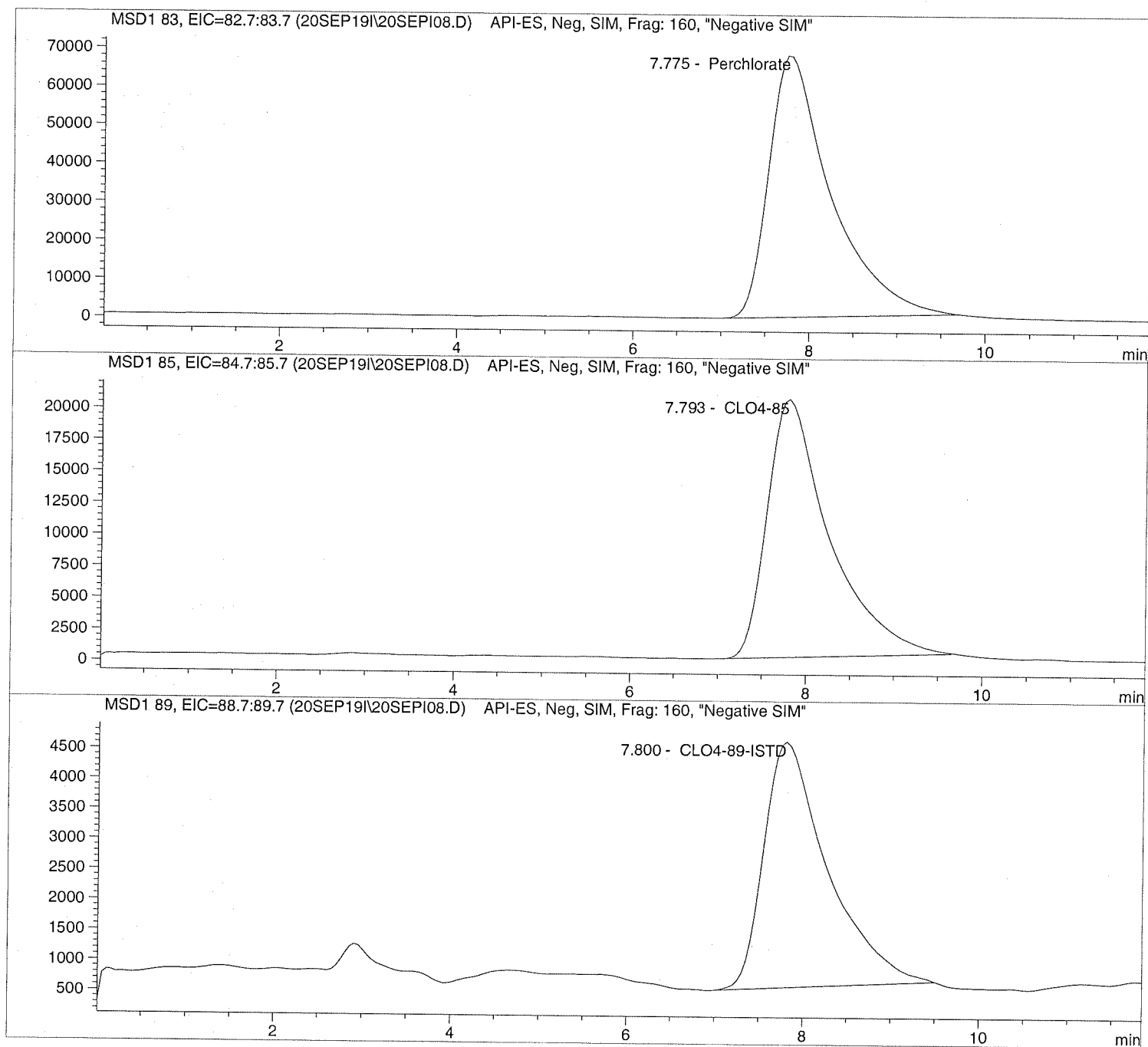
Sample Name: CLO4@ 50.ug/L

=====
Injection Date: 9/20/2019 10:33:18
Sample Name: CLO4@ 50.ug/L
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
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

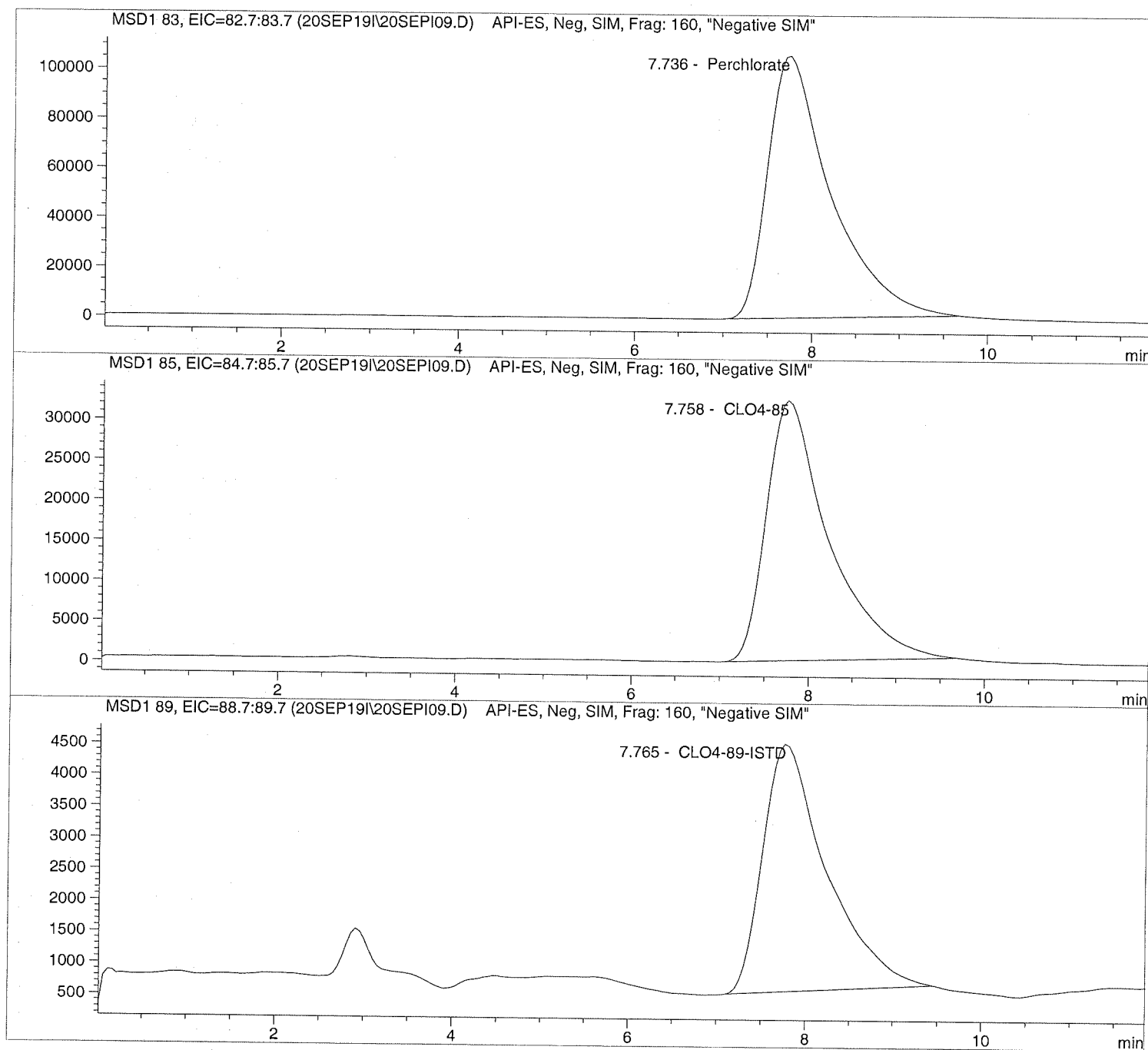
Sample Name: CLO4@ 75.ug/L

Injection Date: 9/20/2019 10:47:05
Sample Name: CLO4@ 75.ug/L
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
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

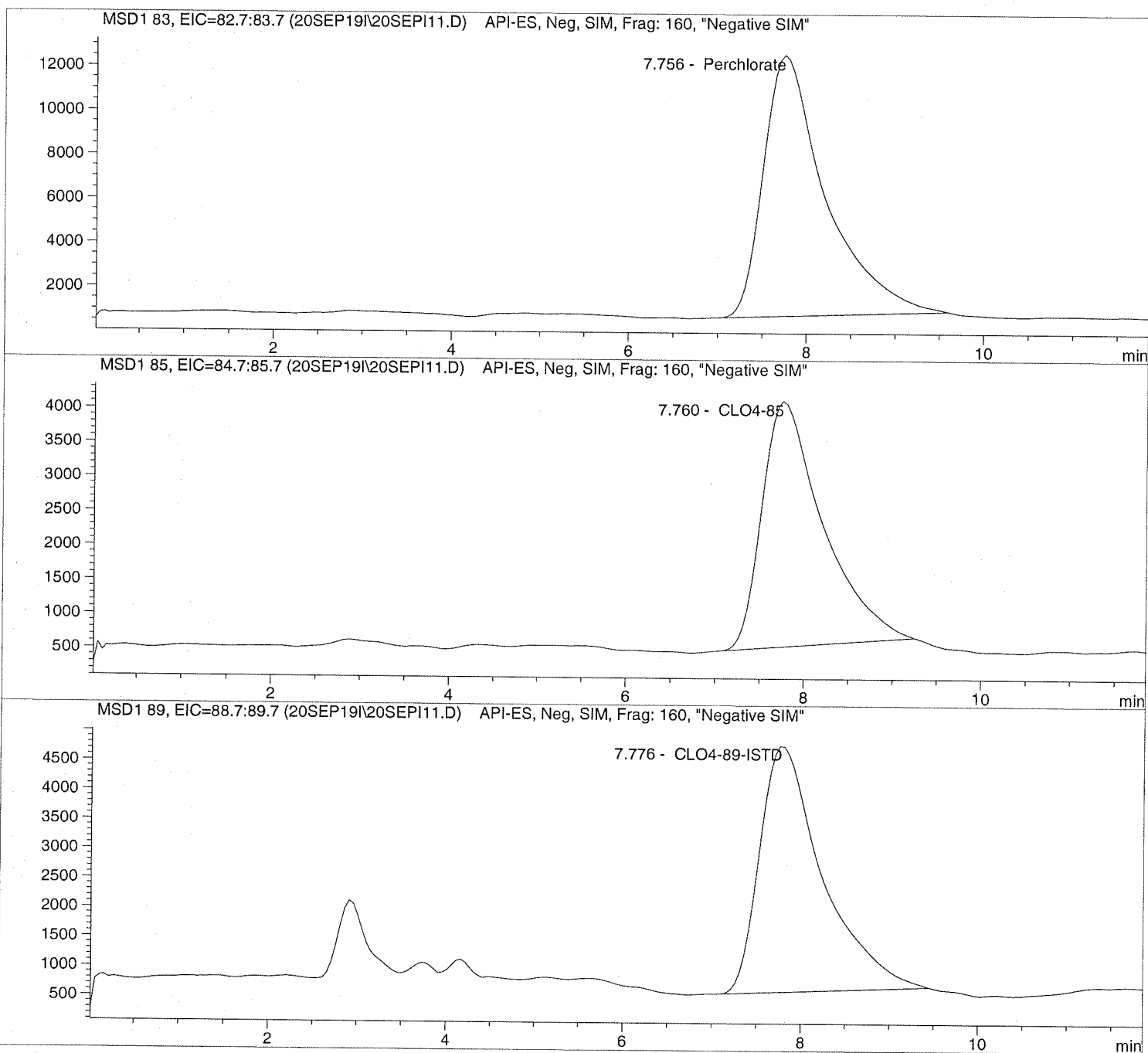
Sample Name: ICAL Verf@10ug/L

=====
Injection Date: 9/20/2019 11:14:45
Sample Name: ICAL Verf@10ug/L
Acq Operator: TNB

Seq Line: 11
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI11.D

Sample Name: ICAL Verf@10ug/L

```

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

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019  12:21:47
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  10.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.756	PBA	574879.4	10.1185	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.760	PBA	171000.4	9.7904	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.776	PBA	206243.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05

Seq Line: 3

Sample Name: CLO4@ 1.0ug/L

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

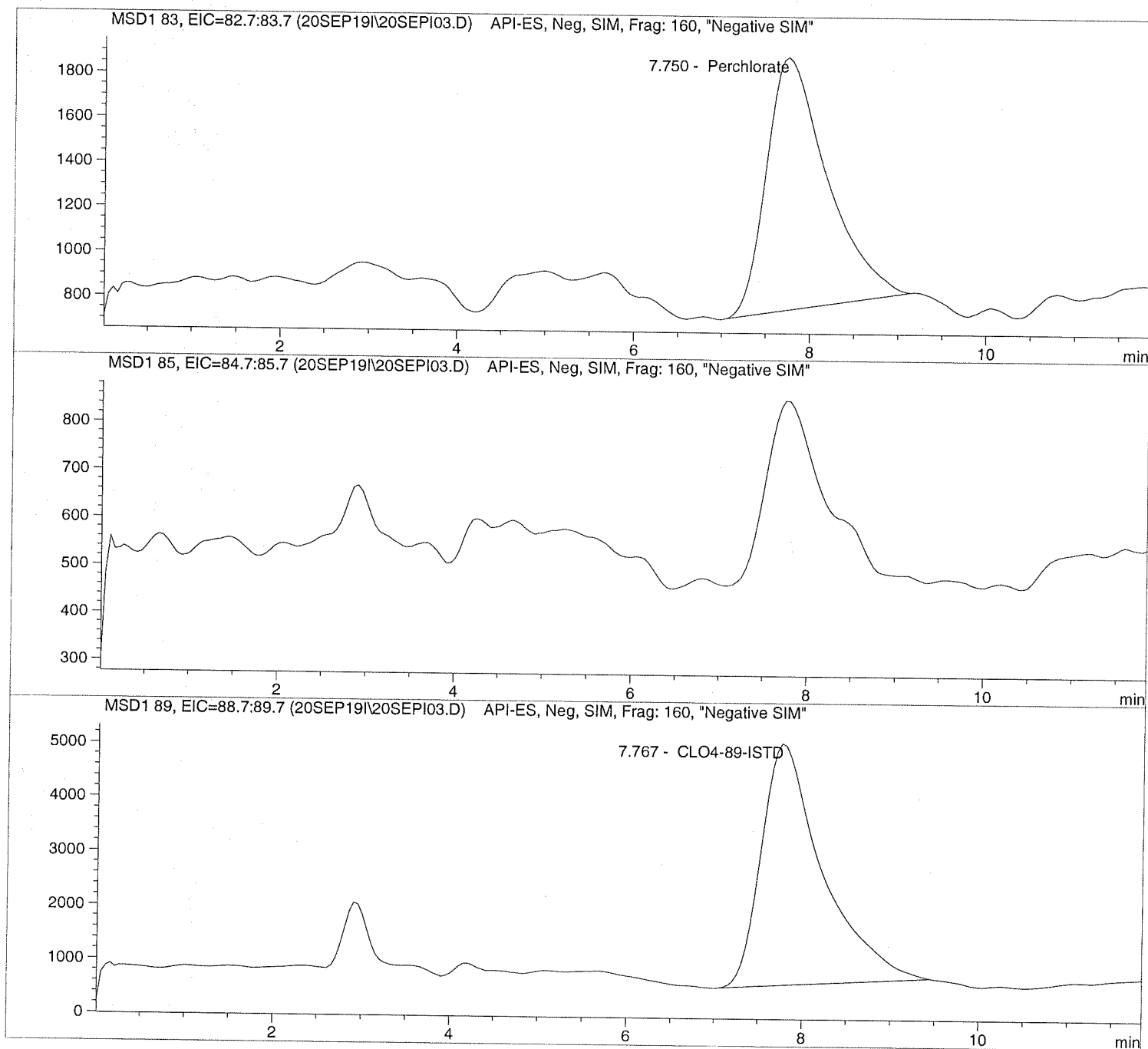
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line:          3
Sample Name:    CLO4@ 1.0ug/L           Location:          Vial 73
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:       30 µl
  
```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:27:11
  
```

Perchlorate analysis

Sample Information

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

*** End of Report ***



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

November 14, 2019

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

Work Order: **HS19110207**

Laboratory Results for: **Longhorn GW Treatment Plant Monthly Influent Samples**

Dear Marcia,

ALS Environmental received 1 sample(s) on Nov 06, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

A handwritten signature in black ink, appearing to read 'Raj. P. Modashia', enclosed in a circular scribble.

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US

Date: 14-Nov-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
Work Order: HS19110207

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19110207-01	LH18/24-SP140_110519	Water		05-Nov-2019 14:00	06-Nov-2019 08:45	<input type="checkbox"/>

ALS Houston, US

Date: 14-Nov-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
Work Order: HS19110207

CASE NARRATIVE

Work Order Comments

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

Metals by Method SW6020**Batch ID: 147466**

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

WetChemistry by Method SW7196**Batch ID: R350105**

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

ALS Houston, US

Date: 14-Nov-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Monthly Influent Samples
 Sample ID: LH18/24-SP140_110519
 Collection Date: 05-Nov-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19110207
 Lab ID:HS19110207-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		Method:SW6020				Prep:SW3010A / 13-Nov-2019		Analyst: JC
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	13-Nov-2019 13:02
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	13-Nov-2019 13:02
HEXAVALENT CHROMIUM BY SW7196A		Method:SW7196						Analyst: KVL
Chromium, Hexavalent	0.0100	U	0.00600	0.0100	0.0100	mg/L	1	06-Nov-2019 12:00
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	14-Nov-2019 17:57

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

Weight / Prep Log

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19110207

Batch ID: 147466 **Start Date:** 13 Nov 2019 07:30 **End Date:** 13 Nov 2019 11:00
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19110207-01		10 (mL)	10 (mL)	1

ALS Houston, US

Date: 14-Nov-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19110207

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 147466 (0)		Test Name : METALS BY ICPMS BY SW6020A			Matrix: Water	
HS19110207-01	LH18/24-SP140_110519	05 Nov 2019 14:00		13 Nov 2019 07:30	13 Nov 2019 13:02	1
Batch ID: R350105 (0)		Test Name : HEXAVALENT CHROMIUM BY SW7196A			Matrix: Water	
HS19110207-01	LH18/24-SP140_110519	05 Nov 2019 14:00			06 Nov 2019 12:00	1
Batch ID: R350525 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Water	
HS19110207-01	LH18/24-SP140_110519	05 Nov 2019 14:00			14 Nov 2019 17:57	1

ALS Houston, US

Date: 14-Nov-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19110207

QC BATCH REPORT

Batch ID: 147466 (0)		Instrument: ICPMS04		Method: METALS BY ICPMS BY SW6020A						
MBLK	Sample ID: MBLK-147466	Units: mg/L		Analysis Date: 13-Nov-2019 12:58						
Client ID:	Run ID: ICPMS04_350354	SeqNo: 5341762		PrepDate: 13-Nov-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
LCS	Sample ID: LCS-147466	Units: mg/L		Analysis Date: 13-Nov-2019 13:00						
Client ID:	Run ID: ICPMS04_350354	SeqNo: 5341753		PrepDate: 13-Nov-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.05316	0.00500	0.05	0	106	80 - 120				
Silver	0.0484	0.00500	0.05	0	96.8	85 - 116				
MS	Sample ID: HS19110207-01MS	Units: mg/L		Analysis Date: 13-Nov-2019 13:07						
Client ID: LH18/24-SP140_110519	Run ID: ICPMS04_350354	SeqNo: 5341756		PrepDate: 13-Nov-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.04941	0.00500	0.05	0.000493	97.8	80 - 120				
Silver	0.04604	0.00500	0.05	0.000033	92.0	85 - 116				
MSD	Sample ID: HS19110207-01MSD	Units: mg/L		Analysis Date: 13-Nov-2019 13:09						
Client ID: LH18/24-SP140_110519	Run ID: ICPMS04_350354	SeqNo: 5341757		PrepDate: 13-Nov-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.05208	0.00500	0.05	0.000493	103	80 - 120	0.04941	5.26	20	
Silver	0.04703	0.00500	0.05	0.000033	94.0	85 - 116	0.04604	2.12	20	
PDS	Sample ID: HS19110207-01PDS	Units: mg/L		Analysis Date: 13-Nov-2019 13:11						
Client ID: LH18/24-SP140_110519	Run ID: ICPMS04_350354	SeqNo: 5341758		PrepDate: 13-Nov-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.1167	0.00500	0.1	0.000493	116	80 - 120				
Silver	0.08561	0.00500	0.1	0.000033	85.6	80 - 120				

ALS Houston, US

Date: 14-Nov-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19110207

QC BATCH REPORT

Batch ID: 147466 (0) **Instrument:** ICPMS04 **Method:** METALS BY ICPMS BY SW6020A

SD		Sample ID: HS19110207-01SD		Units: mg/L		Analysis Date: 13-Nov-2019 13:05				
Client ID: LH18/24-SP140_110519		Run ID: ICPMS04_350354		SeqNo: 5341755		PrepDate: 13-Nov-2019		DF: 5		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	Limit	Qual
Selenium	0.0125	0.0250					0.000493	0	10	U
Silver	0.00250	0.0250					0.000033	0	10	U

The following samples were analyzed in this batch:

ALS Houston, US

Date: 14-Nov-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19110207

QC BATCH REPORT

Batch ID: R350105 (0)		Instrument: UV-2450		Method: HEXAVALENT CHROMIUM BY SW7196A						
MBLK	Sample ID: MBLK-R350105	Units: mg/L		Analysis Date: 06-Nov-2019 12:00						
Client ID:	Run ID: UV-2450_350105	SeqNo: 5336215		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chromium, Hexavalent	0.0100	0.0100							U	
LCS	Sample ID: LCS-R350105	Units: mg/L		Analysis Date: 06-Nov-2019 12:00						
Client ID:	Run ID: UV-2450_350105	SeqNo: 5336214		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chromium, Hexavalent	0.258	0.0100	0.25	0	103	90 - 111				
MS	Sample ID: HS19110211-01MS	Units: mg/L		Analysis Date: 06-Nov-2019 12:00						
Client ID:	Run ID: UV-2450_350105	SeqNo: 5336217		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chromium, Hexavalent	0.267	0.0100	0.25	0.004	105	90 - 111				
MSD	Sample ID: HS19110211-01MSD	Units: mg/L		Analysis Date: 06-Nov-2019 12:00						
Client ID:	Run ID: UV-2450_350105	SeqNo: 5336216		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chromium, Hexavalent	0.266	0.0100	0.25	0.004	105	90 - 111	0.267	0.375	20	

The following samples were analyzed in this batch: HS19110207-01

ALS Houston, US

Date: 14-Nov-19

Client:	Bhate Environmental Associates, Inc.	QUALIFIERS, ACRONYMS, UNITS
Project:	Longhorn GW Treatment Plant Monthly Influent Samples	
WorkOrder:	HS19110207	

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 Quantitation 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: 14-Nov-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
Work Order: HS19110207

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19110207-01	LH18/24-SP140_110519	Login	11/6/2019 10:08:44 AM	PMG	Sub
HS19110207-01	LH18/24-SP140_110519	Login	11/6/2019 10:08:44 AM	PMG	WET282
HS19110207-01	LH18/24-SP140_110519	Login	11/6/2019 10:08:44 AM	PMG	MET018

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19110207

Date/Time Received: **06-Nov-2019 08:45**
 Received by: **NDR**

Checklist completed by: Paresh M. Giga 6-Nov-2019
 eSignature Date

Reviewed by: RJ Modashia 6-Nov-2019
 eSignature Date

Matrices: **Water**

Carrier name: **FedEx**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes No Not Present
- Chain of custody present? Yes No 1 Page(s)
- Chain of custody signed when relinquished and received? Yes No COC IDs:None
- Samplers name present on COC? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s): 1.4c U/C IR25
 Cooler(s)/Kit(s): 6026
 Date/Time sample(s) sent to storage: 11/6/19 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:


CHAIN OF CUSTODY

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

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS			Project No. NWO1312.0150.0 16.0001			Analyses										HS19110207 Bhate Environmental Associates, Inc. Longhorn GW Treatment Plant Monthly Influent Sample 								
Job: GROUNDWATER TREATMENT PLANT MONTHLY INFLUENT SAMPLES						MS / MSD	No. OF CONTAINERS	SILVER & SELENIUM	HEXAVALENT CHROMIUM	PERCHLORATE											Remarks (Preservatives, etc.)	Lab I.D.#		
Prepared By: Scott Beesinger			P.O. Number																					
Field Sample I.D.		Sample Matrix		Date / Time																				
LH18/24-SP140_110519		Water		11/05/19 / 14:00		1	X																	HNO3
LH18/24-SP140_110519		Water		11/05/19 / 14:00		2		X	X															NONE
Additional Remarks: STANDARD TURN AROUND TIME																								
Relinquished By: <i>Scott Beesinger</i>		Date 11/05/19	Time 14:30	Received By: NR		Date 11/6/19	Time 08:45	Relinquished By:		Date	Time	Received By:		Date	Time									
For Lab Use Only																								
Received At Lab By:		Date	Time	Airbill No.		Opened By:		Date	Time	Temp of Container	Seal No.	Condition												
Remarks:																								


6026 Temp dlc 1.4
 11/25
 C/O

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CUSTODY SEAL		Seal Broken By: <i>SM</i>
	Date: <i>11/5/19</i>	Time: <i>1430</i>	Date: <i>11/06/19</i>
	Name: <i>Scott Beesinger</i>		
	Company: <i>SGRA TX</i>		

6026 NOV 06 2019

**Must Deliver Next Business Day
Time and Temperature Sensitive!**


 *6026*

ORIGIN ID: SGRA (903) 930-6193
 ATT: SCOTT BEESINGER
 APTIM ENVIRONMENTAL & INFRASTR. INC
 1209-B EAST GRAND AVE PHB202
 MARSHALL, TX 75670
 UNITED STATES US

SHIP DATE: 12FEB19
 ACTWGT: 1.00 LB MAN
 CMO: 300130/CAF3211
 DIMS: 19x16x13 IN.

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
 (281) 630-5656
 REF: LHAAP-46-BO 63777-RJ


RMA: || || || || ||

FedEx Express


RETURNS MON-SAT
WED - 06 NOV 10:30A
PRIORITY OVERNIGHT

FedEx
 TRK#
 0221 4809 7830 8102

AB SGRA **77099**
 TX-US
 IAH



FTD 162785 05NOV19 666A 56AC1/F330/05A2



Case Narrative

Method: 6850

Analysis: Perchlorate

Analysis SOP: LC-MS-CLO4

ALS WO ID(s): 1931243; 1931587; 1931589;
1931592

Client: ALS Laboratories (Houston, TX)

Matrix: Water

ELMS Batch (HBN): 2315 (251590)

General Set Information: There were nine 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. 50 μL 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 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1931587001 was analyzed and reported from 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 683380) was less than 1/2 the CRDL. The recovery for the LCS (683377) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on sample 1931243001 (Client ID: LH18/24-SP650_110519). 3.0 μ L of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3. μ g/L. The MS/MSD (681876/77) 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 μ g/L. Results were calculated in μ g/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (μ g/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 – 683378) is reported from the analysis of the Laboratory Control Sample (LCS – 683377) at a level of 3.0 μ g/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).

Thomas Bosch November 11, 2019
Analyst Date



ANALYTICAL REPORT

Report Date: November 12, 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: **34-1931587**

Project ID: HS19110207

Purchase Order: HS19110207

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP140_110519	1931587001	11/05/19	11/07/19	

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

ALS GROUP USA, CORP. An ALS Limited Company

Environmental 

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

18 of 103



ANALYTICAL REPORT

Workorder: **34-1931587**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: LH18/24-SP140_110519	Sampling Site: NA	Collected: 11/05/2019				
Lab ID: 1931587001	Media: 125 mL Nalgene	Received: 11/07/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2315 (HBN: 251590) Analyzed: 11/11/2019 11:31	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	10000	1000	2000	4000	1000	

Comments

Workorder: 1931587

Field sample 1931587001 was analyzed and reported from 1:1,000 dilution. The reporting limit has been adjusted accordingly.

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

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 11/11/2019 13:51	/S/ Stephen Brose 11/12/2019 11:07

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123Phone: (801) 266-7700
Email: alsst.lab@ALSGlobal.com
Web: www.alssl.com



ANALYTICAL REPORT

Workorder: 34-1931587

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: 1931587
Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2315 (HBN: 251590)
Analyzed By: Thomas Bosch

Blank

LMB: 683380 Analyzed: 11/11/2019 09:54 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 683377 Analyzed: 11/11/2019 09:27 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	2.87	3.00	95.6	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1931592001 Analyzed: 11/11/2019 11:58 Dilution: 1 Units: ug/L		MS: 683381 Analyzed: 11/11/2019 12:12 Dilution: 1 Units: ug/L				MSD: 683382 Analyzed: 11/11/2019 12:26 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	2.82	3	94.1	78.8 123.8	2.92	97.2	3.17	0.0 20.0

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

Analyst	Peer Review
/S/ Thomas Bosch 11/11/2019 13:52	/S/ Stephen Brose 11/12/2019 11:07

Symbols and Definitions

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

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



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

Subcontract Chain of Custody

18698/2

SAMPLING STATE: Dept of Defense

COC ID: 12563

SUBCONTRACT TO:

1931587

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

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19110207
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19110207-01	LH18/24-SP140_110519	Water	05 Nov 2019 14:00
	SUB_Perch-6850		14 Nov 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. [Signature]
Received By: [Signature]
Cooler ID(s): _____

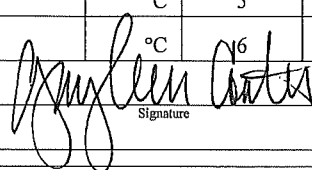
Date/Time: 11/6/19 18:00
Date/Time: 11.7.19 0940
Temperature(s): _____

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: <u>ALS HOUSTON</u>		Project/Task/Site: <u>HS19110207</u>				
Date/Time of Receipt: _____		Number of Coolers Received: <u>0</u> <u>1931587</u>				
Condition of Coolers: <u>Acceptable/Unacceptable</u>		Temperature Control: <u>Present/Not Included</u>				
Cooler Custody Seals: <u>Present/Absent/NA</u>		Location Temp Taken: <u>Control/Between Samples</u>				
Container Custody Seals: <u>Intact/Broken/NA</u>		Are all temperatures within project specific guidelines? <u>Yes/No/NA</u>				
Ice Present: <u>Yes/No/NA</u>		VOA Headspace Present? <u>Yes/No/NA</u>				
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	<u>GOOD</u>	<u>1</u> °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C	6		°C	9		°C

Taken By:  GAYLEEN COATES 11.7.19
Signature Printed Name Date

CLIENT-RELATED INFORMATION

- | | | | |
|--|---|--|---|
| <input type="checkbox"/> Missing Cooler | <input type="checkbox"/> Missing Samples/Bottles | <input type="checkbox"/> Incorrect Preservation | <input type="checkbox"/> Insufficient Sample Volume |
| <input type="checkbox"/> Cooler Conditions | <input type="checkbox"/> Broken/Leaking Samples | <input type="checkbox"/> pH Criteria Not Met | <input type="checkbox"/> Chain of Custody Problems |
| <input type="checkbox"/> Missing Paperwork | <input type="checkbox"/> Incorrect Bottle Type | <input type="checkbox"/> Residual Chlorine Present | <input type="checkbox"/> Other: |
| <input type="checkbox"/> Missing/Incorrect Bottle Labels | <input type="checkbox"/> Cooler Temperatures Out of Range | <input type="checkbox"/> 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: _____ Returned to Sample Receipt by: _____ Date: _____
Printed Name Signature



Post # 183433-434 RT EXP 0720 00

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

SHIP DATE: 06NOV19
ACTWGT: 11.50 LB
CAD: 900190/CAFE3211
DIMS: 19x16x13 IN

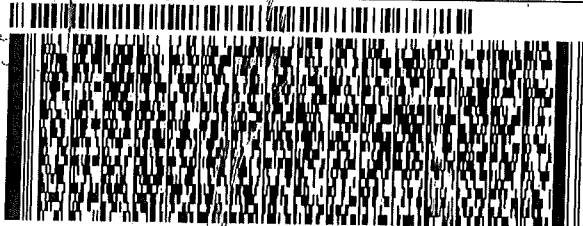
BILL THIRD PARTY

TO **SAMPLE RECEIVING**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123

(801) 288-7700

REF: HS19110207/208/211 RJ



FedEx
Express



RT **907**
ST **15**

5
15:00

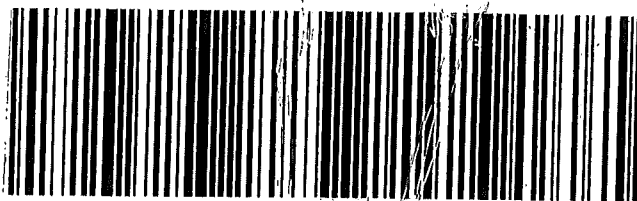
A
4676
11.07

TRK# 1251 0201 4676
0201

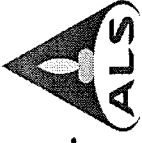
THU - 07 NOV 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC



Seal Broken By:	Date:



Batch Worklist

HBN: 251590



Instrument: WP
Status: WP

Created: 11/11/2019 09:05
Analyst: T. Bosch

Batch: ELMS/ 2315
Rule: EPA 6850, DoD QSM Water

 Workorder: 1931243 [ENV_LVL4]
 Workorder: 1931587 [ENV_LVL4]
 Workorder: 1931589 [ENV_LVL4]
 Workorder: 1931592 [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	683376	CCV for HBN 251590 [ELMS/2315]				CCV	3		E685041C3Q	5311		11/14/2019	
2	683377	LCS for HBN 251590 [ELMS/2315]				LCS	3		E6850Q413Q	5311		11/14/2019	
3	683378	RLVS for HBN 251590 [ELMS/2315]				RLVS	3		E685041C3Q	5311		11/14/2019	
4	683379	ICS for HBN 251590 [ELMS/2315]				ICS	3		E6850..D3Q	5311		11/14/2019	
5	683380	LMB for HBN 251590 [ELMS/2315]				LMB	3		E6850Q413Q	5311		11/14/2019	
6	1931243001	HBW7_103119				SAMPLE	3	1931243001-A	E6850Q41.3	5480	11/28/2019	11/14/2019	
7	1931243002	HBW10_103119				SAMPLE	3	1931243002-A	E6850Q41.3	5480	11/28/2019	11/14/2019	
8	1931243003	HBW1_103119				SAMPLE	3	1931243003-A	E6850Q41.3	5480	11/28/2019	11/14/2019	
9	1931243004	HBW1_103119_a				SAMPLE	3	1931243004-A	E6850Q41.3	5480	11/28/2019	11/14/2019	
10	1931243005	GPW3_103119				SAMPLE	3	1931243005-A	E6850Q41.3	5480	11/28/2019	11/14/2019	
11	1931243006	GPW1_103119				SAMPLE	3	1931243006-A	E6850Q41.3	5480	11/28/2019	11/14/2019	
12	1931587001	LH18/24-SP140_110519				SAMPLE	3	1931587001-A	E6850Q41.3	5480	12/3/2019	11/20/2019	
13	1931589001	LH18/24-SP650_110519_AIX				SAMPLE	3	1931589001-A	E6850Q41.3	5480	12/3/2019	11/20/2019	
14	1931592001	LH18/24-SP650_110519				SAMPLE	3	1931592001-A	E6850Q41.3	5480	12/3/2019	11/20/2019	
15	683381	LH18/24-SP650...(1931592001MS)				MS	3		E6850Q413Q	5311		11/14/2019	
16	683382	LH18/24-SP65...(1931592001MSD)				MSD	3		E6850Q413Q	5311		11/14/2019	
17	683383	CCV for HBN 251590 [ELMS/2315]				CCV	3		E685041C3Q	5311		11/14/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-upALS Work Order #'s & Sample #()'s: 1931243 (001-06); 1931587 (001); 1931589 (001); 1931592 (001)ELMS Batch/HBN ID: 2315 (251590)Prep Date: 11/11/2019 Analysis Date: 11/11/2019 Analyst: Tom BoschAnalyte: **Perchlorate** Matrix: **Water** Method: **6850**Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\NOV\11NOV19D.sReported 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: 7 Injection Volume: 30µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1 Run time: 12.0min.

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 3.0µL of QC Solution Horizon ID 47516 was used for LCS 683377; Target = 3.0µg/L. ASTM type II water was used for LMB 683380.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on sample 1931592001 (Client ID's: LH18/24-SP650_110519. 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 1931587001 was analyzed and reported from 1:1,000 dilution. The reporting limit has 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\251590-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 683378) is reported from the analysis of the Laboratory Control Sample (LCS – 683377) 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).

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	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2315 HBN: 251590</u>		
Sample Set IDs if Applicable: <u>1931243/1931587/1931589/1931592</u>		
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



AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: Refer to SDS for complete safety information

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



Signal Word: None

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. 5/16



Certificate of Analysis



ISO Guide 34 Reference Material

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



S

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

Product Name: Perchlorate IC Standard

Description:

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

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

Solvent: water (low TOC, < 50 ppb)

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

Traceability:

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

Estimation of Uncertainties:

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

Homogeneity:

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

Intended Use:

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

Instructions for Use:

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

Hazards:

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

Expiration of Certification:

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



ISO 9001 Registered Quality System – TUV USA

Page 1 of 2



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013 Lot Issue Date: 29-Feb 2016
 Lot Number: CP-0860 Expiration Date: 31-Mar 2020

Maintenance of Certification:

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

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

Daniel J. Lamendola
Director of QA/RA



ISO 9001 Registered Quality System – TUV USA

Page 2 of 2



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis



Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

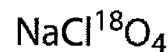
Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl^*O_4

Storage: Store at room temperature away from light and moisture.
Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

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

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

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)

CIL subscribes to the following standards for different products: ISO Guide 34, ISO/IEC 17025, ISO 13485 and cGMP as appropriate.



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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	
*	683376	CCV@25	Vial 71	1	Control	1	1.41625e6	7.617	25.90411
*	683377	QC@3.0	Vial 72	1	Control	2	1.84151e5	7.616	2.86887
*	683379	ICS@3.0	Vial 73	1	Control	3	1.51199e5	7.437	2.85555
*	683380	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1931243001		Vial 75	1	Sample	5	1.09434e5	7.550	1.63920
*	1931243002		Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	1931243003		Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	1931243004		Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1931243005		Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1931243006		Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1931587001	1K	Vial 81	1	Sample	11	5.18902e5	7.709	1.01804e4
*	1931589001		Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1931592001		Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	683381	315921S	Vial 84	1	Sample	14	1.43683e5	7.355	2.82421
*	683382	315921D	Vial 85	1	Sample	15	1.36416e5	7.340	2.91526
*	683383	CCV@25	Vial 71	1	Control	16	1.53592e6	7.637	25.74431

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
*	683376	CCV@25	Vial 71	1	Control	1	1.86117e5	7.636	5.00000
*	683377	QC@3.0	Vial 72	1	Control	2	2.36033e5	7.647	5.00000
*	683379	ICS@3.0	Vial 73	1	Control	3	1.94687e5	7.462	5.00000
*	683380	LMB	Vial 74	1	Control	4	2.14662e5	7.652	5.00000
*	1931243001		Vial 75	1	Sample	5	2.41744e5	7.595	5.00000
*	1931243002		Vial 76	1	Sample	6	1.99280e5	7.575	5.00000
*	1931243003		Vial 77	1	Sample	7	2.45933e5	7.602	5.00000
*	1931243004		Vial 78	1	Sample	8	2.77014e5	7.613	5.00000
*	1931243005		Vial 79	1	Sample	9	2.06933e5	7.675	5.00000
*	1931243006		Vial 80	1	Sample	10	2.08438e5	7.663	5.00000
*	1931587001	1K	Vial 81	1	Sample	11	1.84987e5	7.729	5000.00000
*	1931589001		Vial 82	1	Sample	12	1.79883e5	7.433	5.00000
*	1931592001		Vial 83	1	Sample	13	1.60081e5	7.390	5.00000
*	683381	315921S	Vial 84	1	Sample	14	1.87030e5	7.399	5.00000
*	683382	315921D	Vial 85	1	Sample	15	1.72107e5	7.365	5.00000
*	683383	CCV@25	Vial 71	1	Control	16	2.03231e5	7.654	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
*	683376	CCV@25	Vial 71	1	Control	1	4.27538e5	7.631	25.67562
*	683377	QC@3.0	Vial 72	1	Control	2	6.18317e4	7.616	3.07140
*	683379	ICS@3.0	Vial 73	1	Control	3	5.17735e4	7.459	3.11978
*	683380	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1931243001		Vial 75	1	Sample	5	3.24669e4	7.610	1.50458
*	1931243002		Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	1931243003		Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	1931243004		Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1931243005		Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1931243006		Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1931587001	1K	Vial 81	1	Sample	11	1.55449e5	7.734	9919.43518
*	1931589001		Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1931592001		Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	683381	315921S	Vial 84	1	Sample	14	5.09993e4	7.390	3.20197
*	683382	315921D	Vial 85	1	Sample	15	4.84316e4	7.346	3.30816
*	683383	CCV@25	Vial 71	1	Control	16	4.72008e5	7.655	25.93427

Sequence Table:

Method and Injection Info Part:

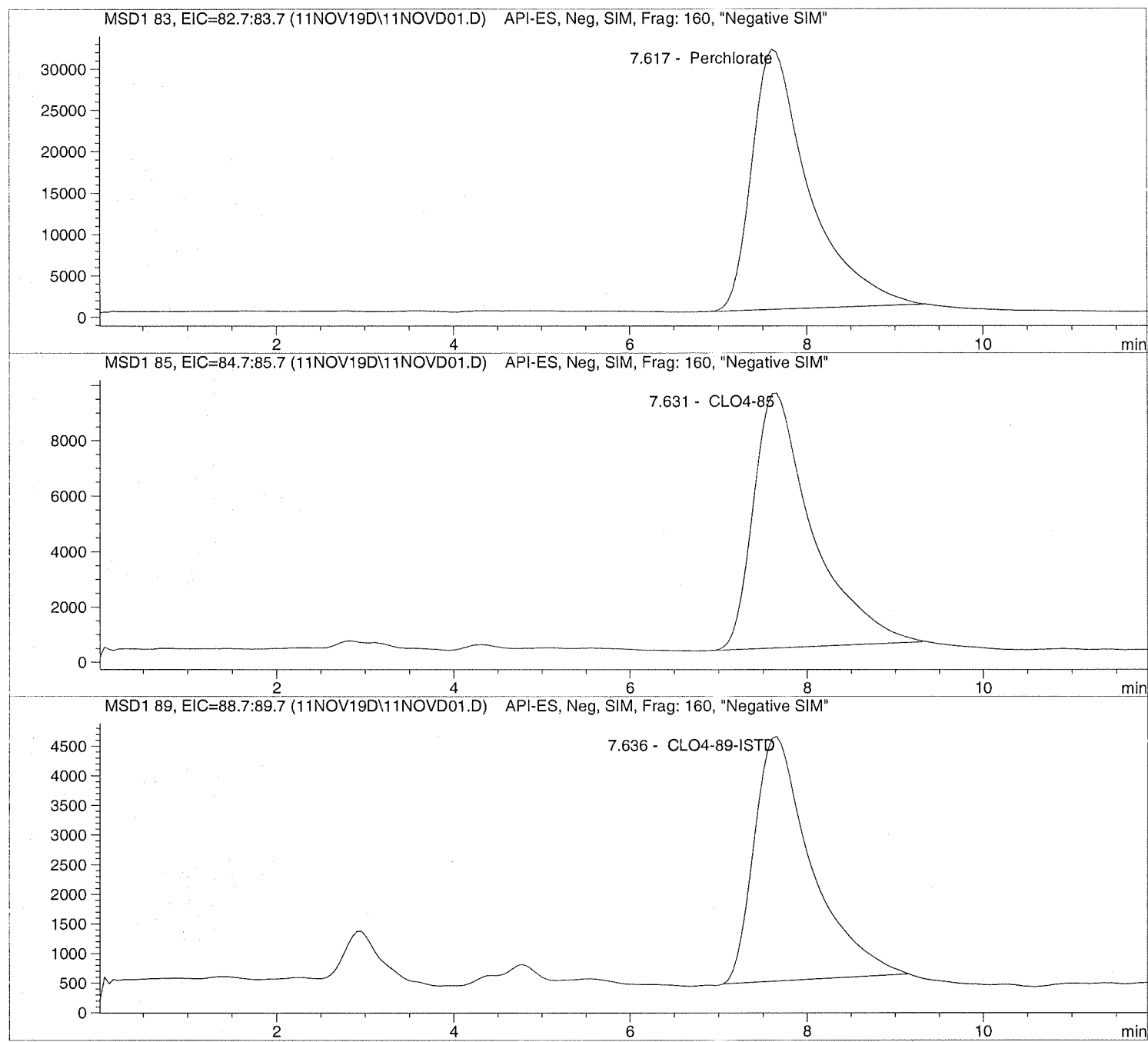
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	683376	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	683377	QC@3.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	683379	ICS@3.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	683380	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1931243001		CLO4-AQN	1	Sample	
6	Vial 76	1931243002		CLO4-AQN	1	Sample	
7	Vial 77	1931243003		CLO4-AQN	1	Sample	
8	Vial 78	1931243004		CLO4-AQN	1	Sample	
9	Vial 79	1931243005		CLO4-AQN	1	Sample	
10	Vial 80	1931243006		CLO4-AQN	1	Sample	
11	Vial 81	1931587001	1K	CLO4-AQN	1	Sample	
12	Vial 82	1931589001		CLO4-AQN	1	Sample	
13	Vial 83	1931592001		CLO4-AQN	1	Sample	
14	Vial 84	683381	315921S	CLO4-AQN	1	Sample	
15	Vial 85	683382	315921D	CLO4-AQN	1	Sample	
16	Vial 71	683383	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD01.D Sample Name: 683376 CCV@25

=====
Injection Date: 11/11/2019 09:12:09 Seq Line: 1
Sample Name: 683376 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 μ l

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\11NOV19D\11NOVD01.D Sample Name: 683376 CCV@25

```

=====
Injection Date: 11/11/2019 09:12:09      Seq Line: 1
Sample Name: 683376 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
7.617	PBA	1416249.7	25.9041	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.631	PBA	427538.1	25.6756	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.636	PBA	186117.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

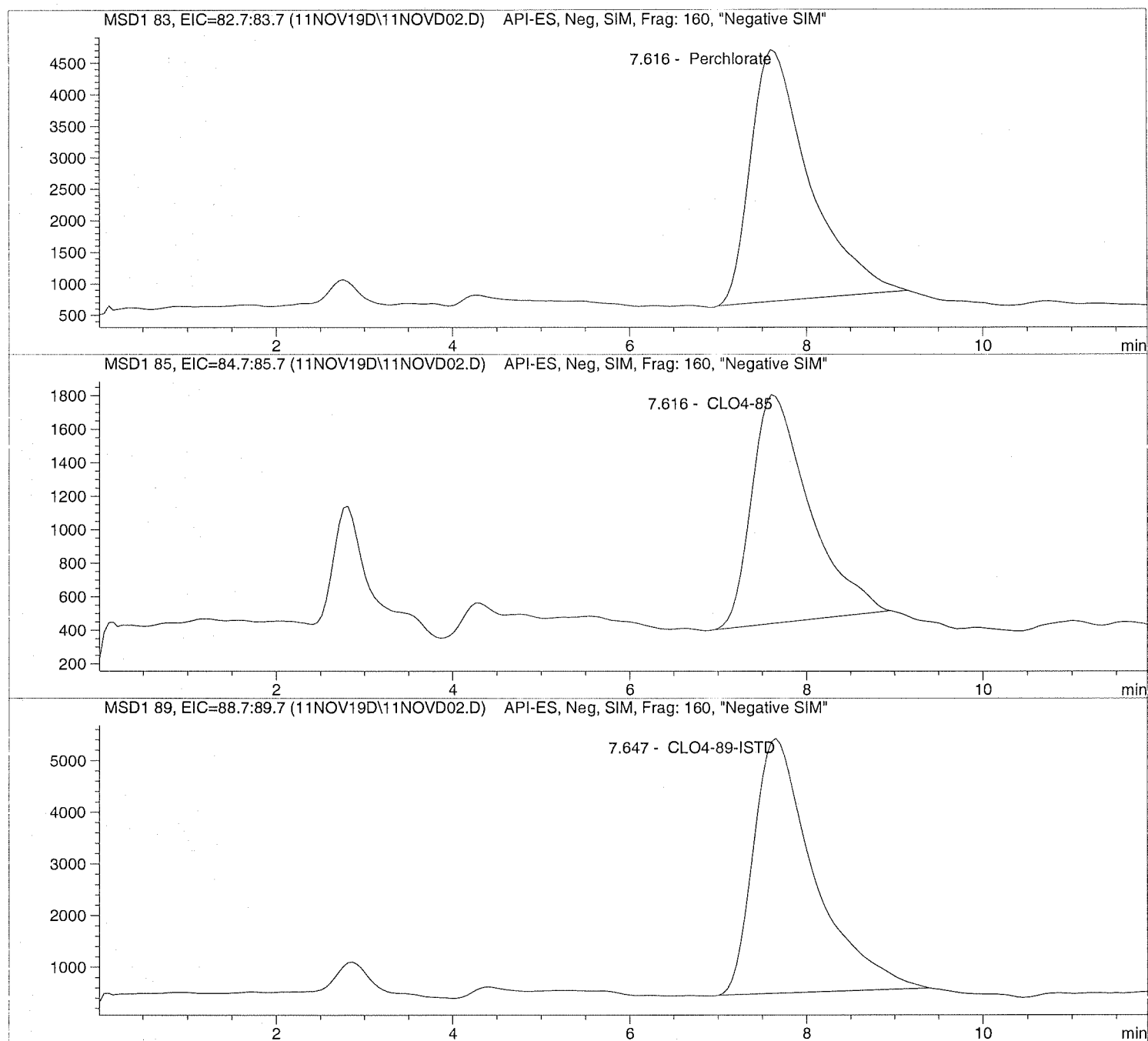
```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD02.D Sample Name: 683377 QC@3.0

=====
Injection Date: 11/11/2019 09:27:09 Seq Line: 2
Sample Name: 683377 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\11NOV19D\11NOVD02.D Sample Name: 683377 QC@3.0

```

=====
Injection Date: 11/11/2019 09:27:09      Seq Line:      2
Sample Name:   683377   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
7.616	PBA	184151.3	2.8689	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.616	PBA	61831.7	3.0714	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.647	PBA	236032.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

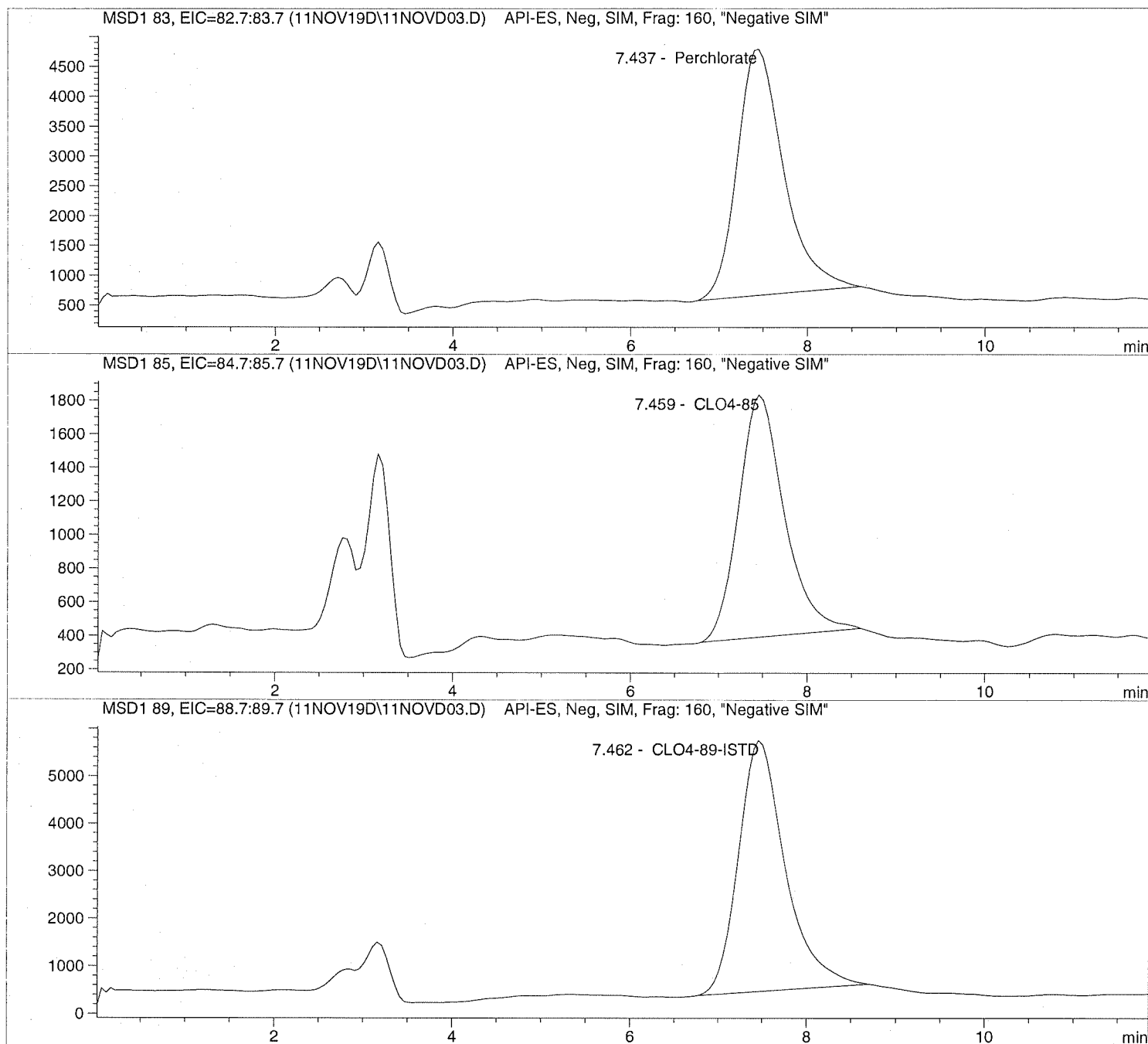
```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD03.D Sample Name: 683379 ICS@3.0

=====
Injection Date: 11/11/2019 09:40:56 Seq Line: 3
Sample Name: 683379 ICS@3.0 Location: Vial 73
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl
=====

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

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD03.D Sample Name: 683379 ICS@3.0

```

=====
Injection Date: 11/11/2019 09:40:56      Seq Line: 3
Sample Name: 683379 ICS@3.0             Location: Vial 73
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 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
7.437	PBA	151199.3	2.8556	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.459	PBA	51773.5	3.1198	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.462	PBA	194687.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

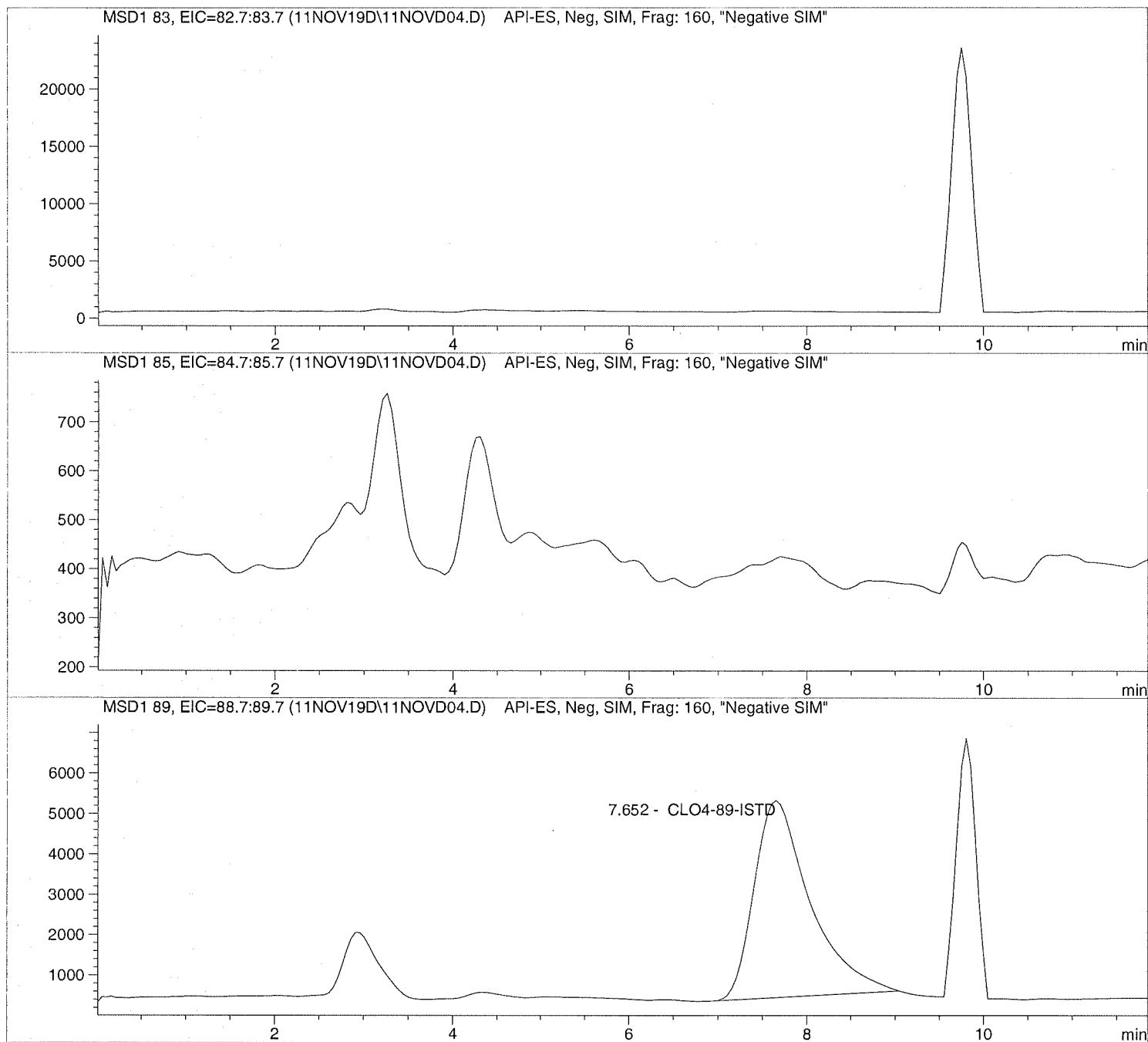
```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD04.D Sample Name: 683380 LMB

```
=====
Injection Date: 11/11/2019 09:54:51      Seq Line:      4
Sample Name:    683380 LMB                Location:      Vial 74
Acq Operator:   TNB                      Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====
```

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

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD04.D Sample Name: 683380 LMB

```

=====
Injection Date: 11/11/2019 09:54:51      Seq Line: 4
Sample Name: 683380 LMB                  Location: Vial 74
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 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
7.652	PBA	214661.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD05.D

Sample Name: 1931243001

Injection Date: 11/11/2019 10:08:37

Seq Line: 5

Sample Name: 1931243001

Location: Vial 75

Acq Operator: TNB

Inj. No.: 1

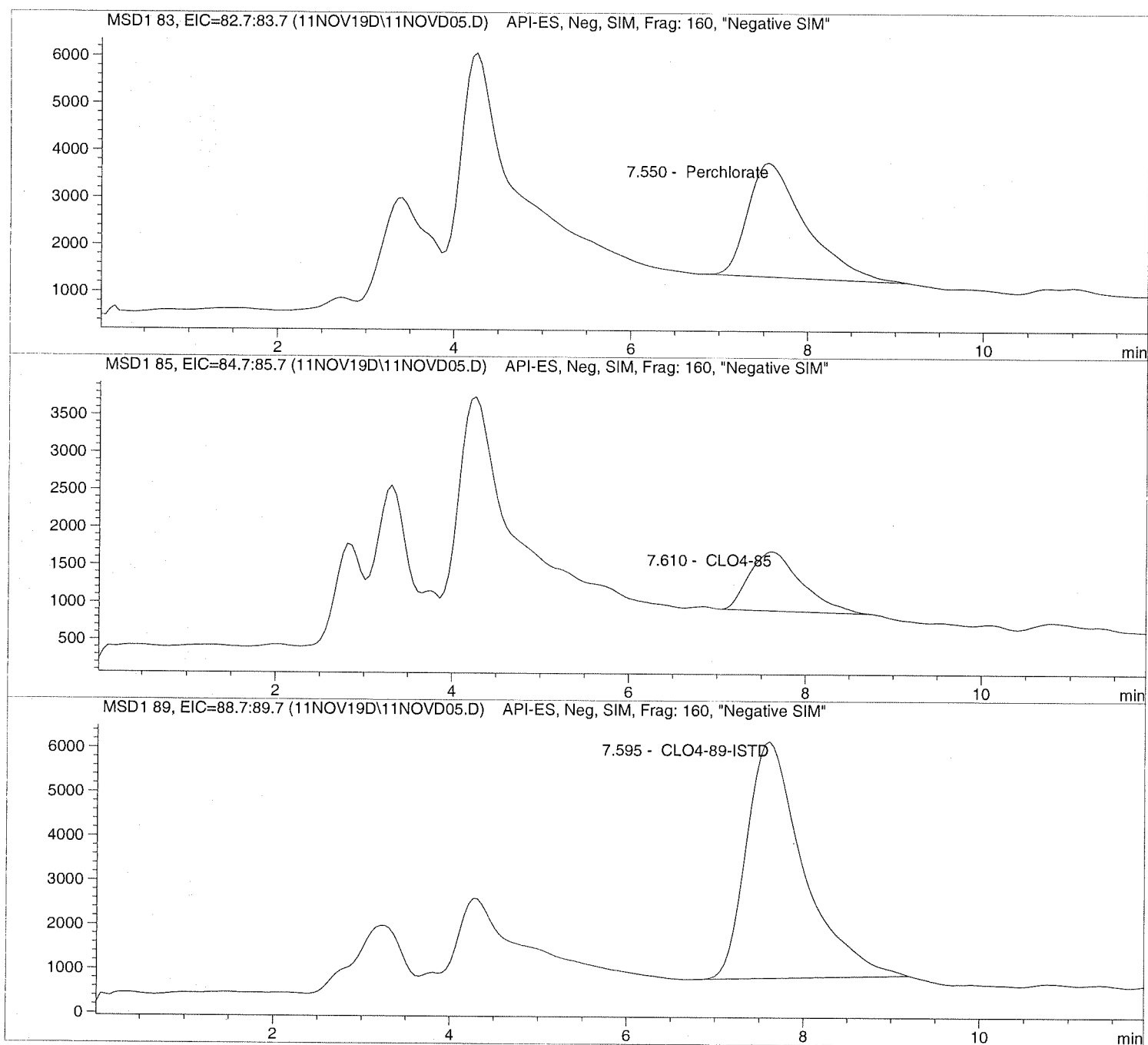
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 11/5/2019 08:44:45

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD05.D

Sample Name: 1931243001

```

=====
Injection Date: 11/11/2019 10:08:37      Seq Line:          5
Sample Name:    1931243001                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:   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
7.550	PBA	109434.2	1.6392	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.610	PBA	32466.9	1.5046	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.595	PBA	241743.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD06.D

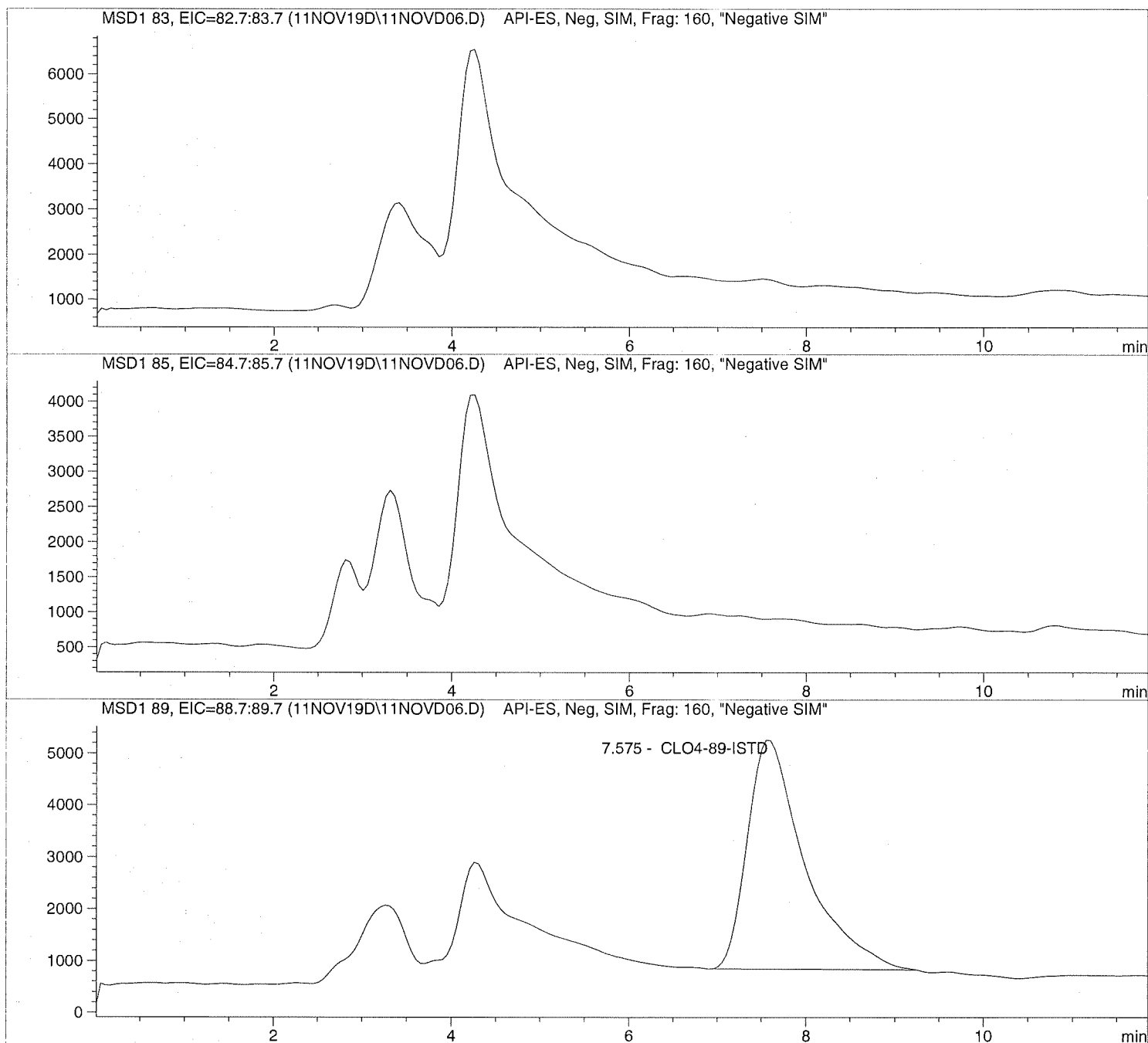
Sample Name: 1931243002

Injection Date: 11/11/2019 10:22:24
Sample Name: 1931243002
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
Inj. No.: 1
Inj. Vol.: 30 μ l

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\11NOV19D\11NOVD06.D

Sample Name: 1931243002

```

=====
Injection Date: 11/11/2019 10:22:24      Seq Line:           6
Sample Name:    1931243002                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:   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
7.575	PBA	199279.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD07.D

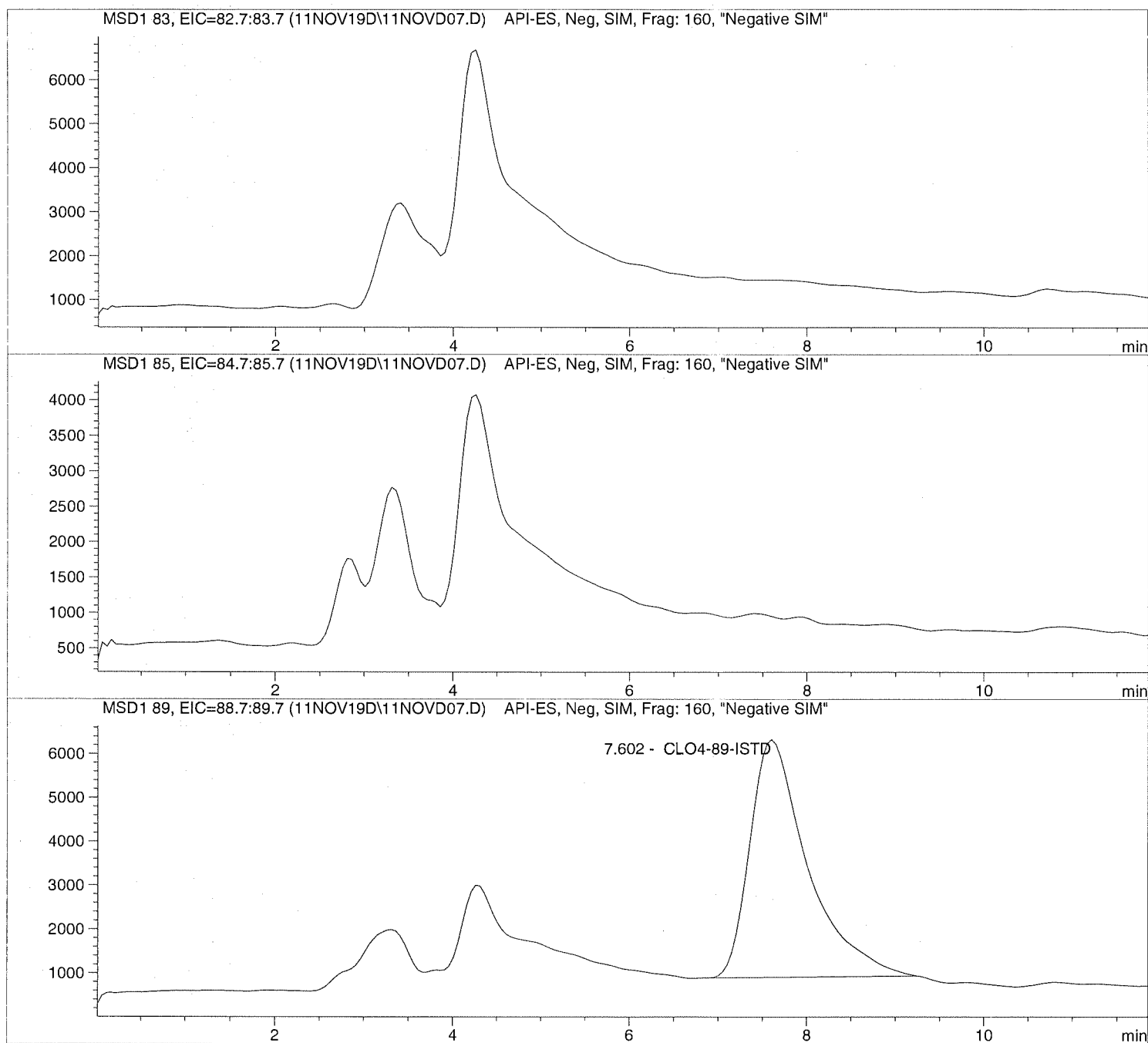
Sample Name: 1931243003

=====
Injection Date: 11/11/2019 10:36:16
Sample Name: 1931243003
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 30 μ l

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\11NOV19D\11NOVD07.D

Sample Name: 1931243003

```

=====
Injection Date: 11/11/2019 10:36:16      Seq Line:      7
Sample Name:   1931243003                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:  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
7.602	PBA	245933.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD08.D

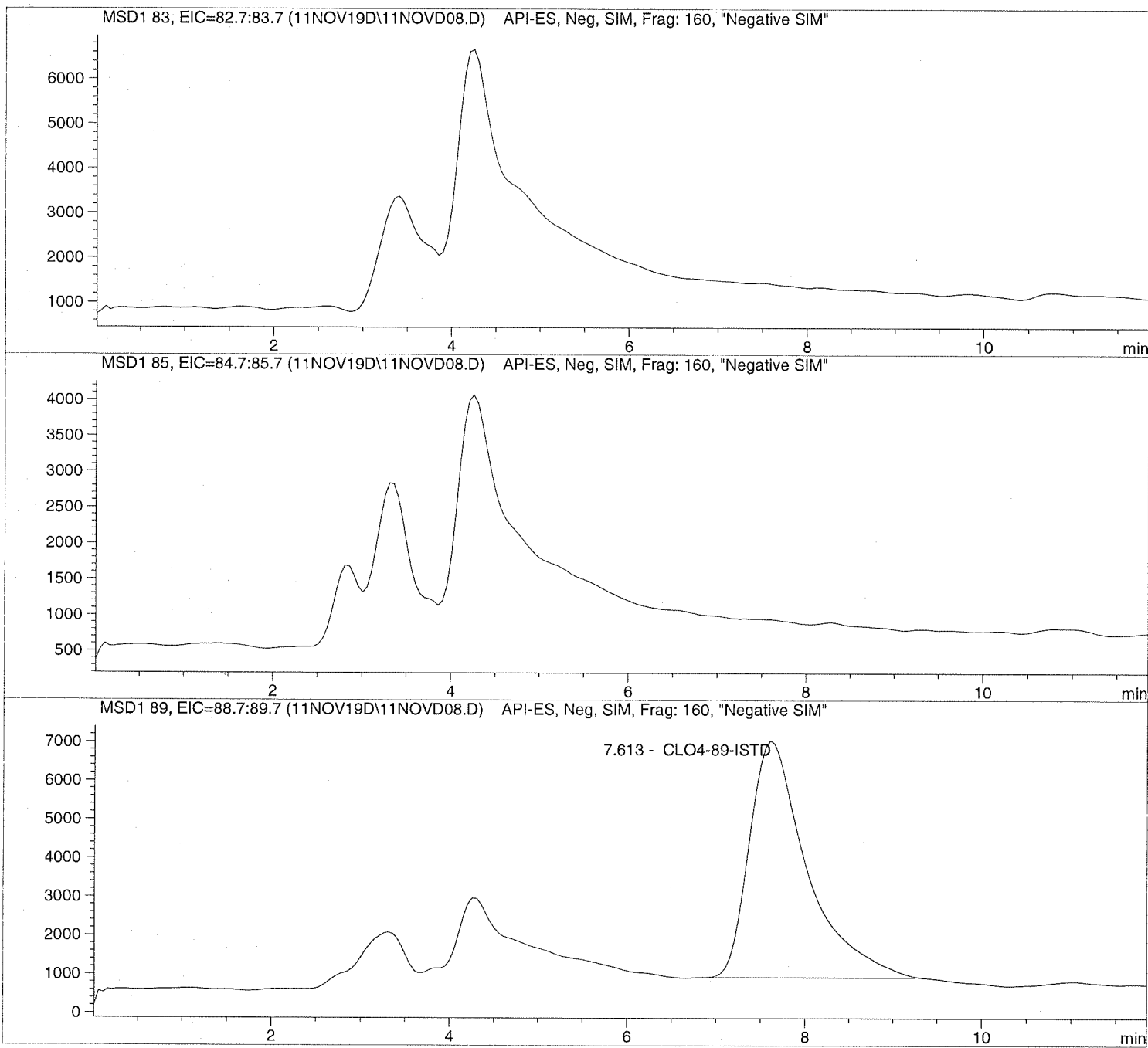
Sample Name: 1931243004

Injection Date: 11/11/2019 10:50:03
Sample Name: 1931243004
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 30 μ l

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\11NOV19D\11NOVD08.D Sample Name: 1931243004

```

=====
Injection Date: 11/11/2019 10:50:03      Seq Line:      8
Sample Name:   1931243004                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:  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
7.613	PBA	277013.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD09.D

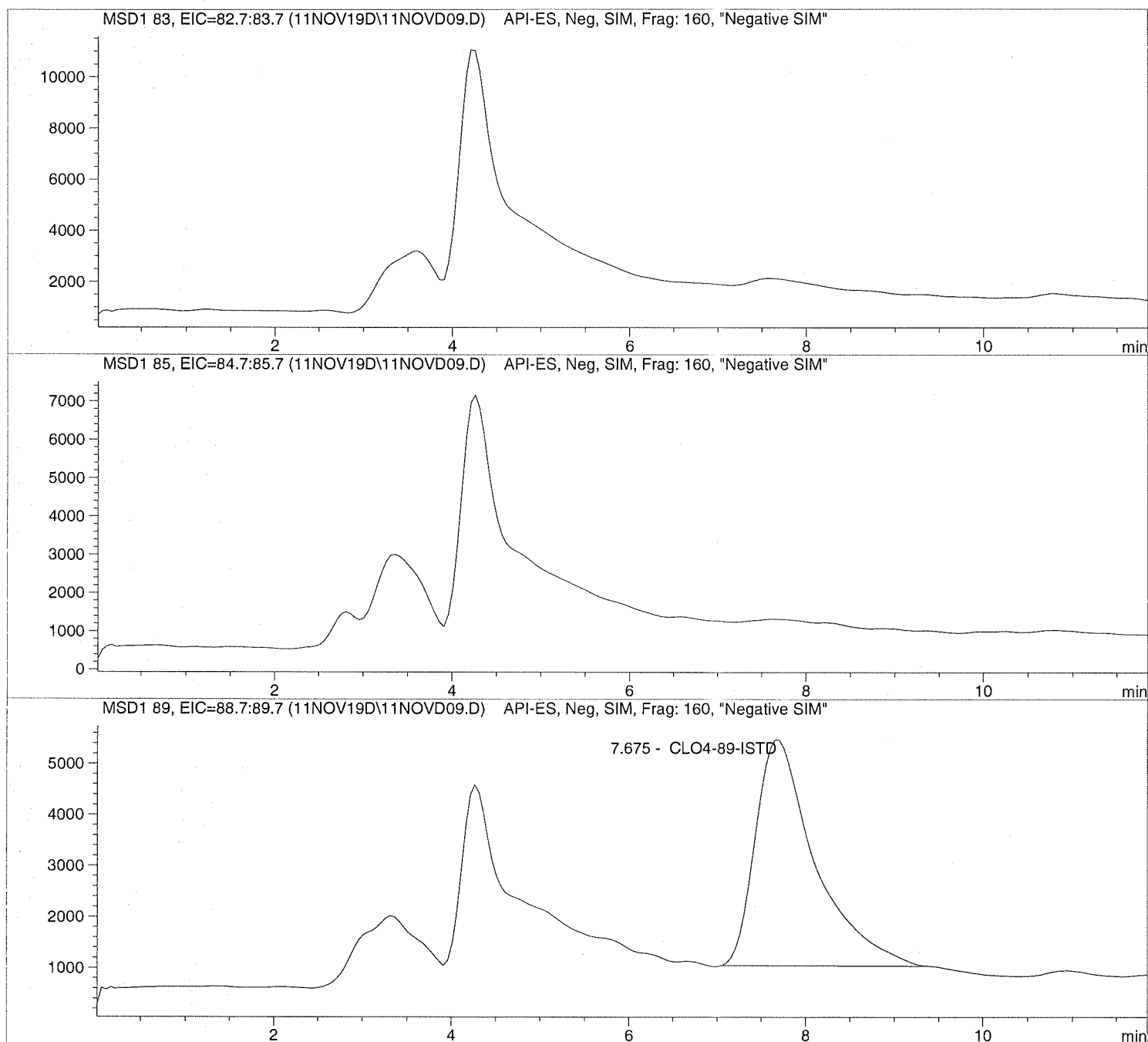
Sample Name: 1931243005

Injection Date: 11/11/2019 11:03:50
Sample Name: 1931243005
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 30 μ l

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\11NOV19D\11NOVD09.D

Sample Name: 1931243005

```

=====
Injection Date: 11/11/2019 11:03:50      Seq Line: 9
Sample Name: 1931243005                  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: 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
7.675	PBA	206932.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD10.D

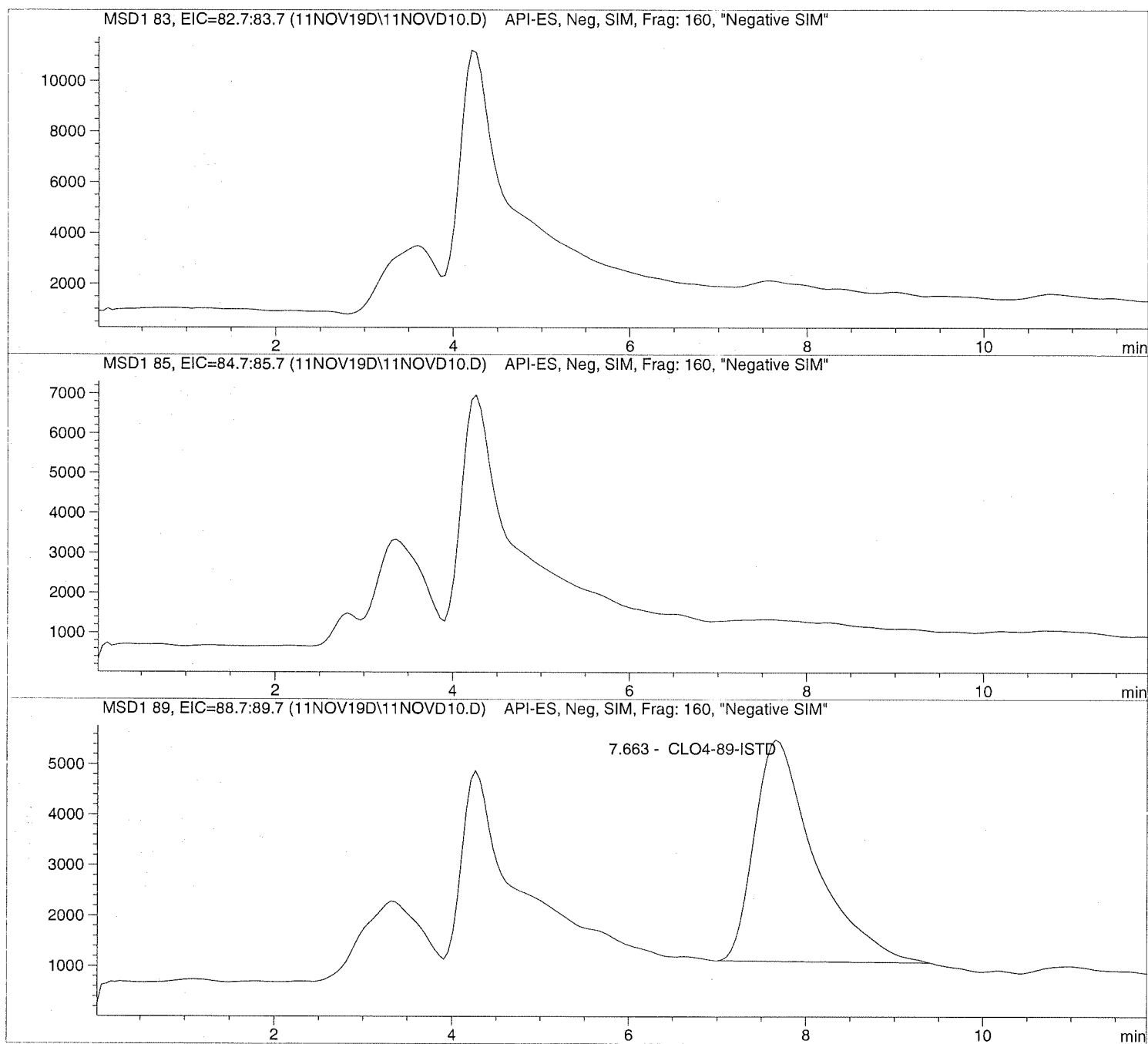
Sample Name: 1931243006

=====
Injection Date: 11/11/2019 11:17:41
Sample Name: 1931243006
Acq Operator: TNB

Seq Line: 10
Location: Vial 80
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\11NOV19D\11NOVD10.D

Sample Name: 1931243006

```

=====
Injection Date: 11/11/2019 11:17:41      Seq Line:          10
Sample Name:   1931243006                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:  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
7.663	PBA	208438.4	5.0000	CLO4-89-ISTD

```

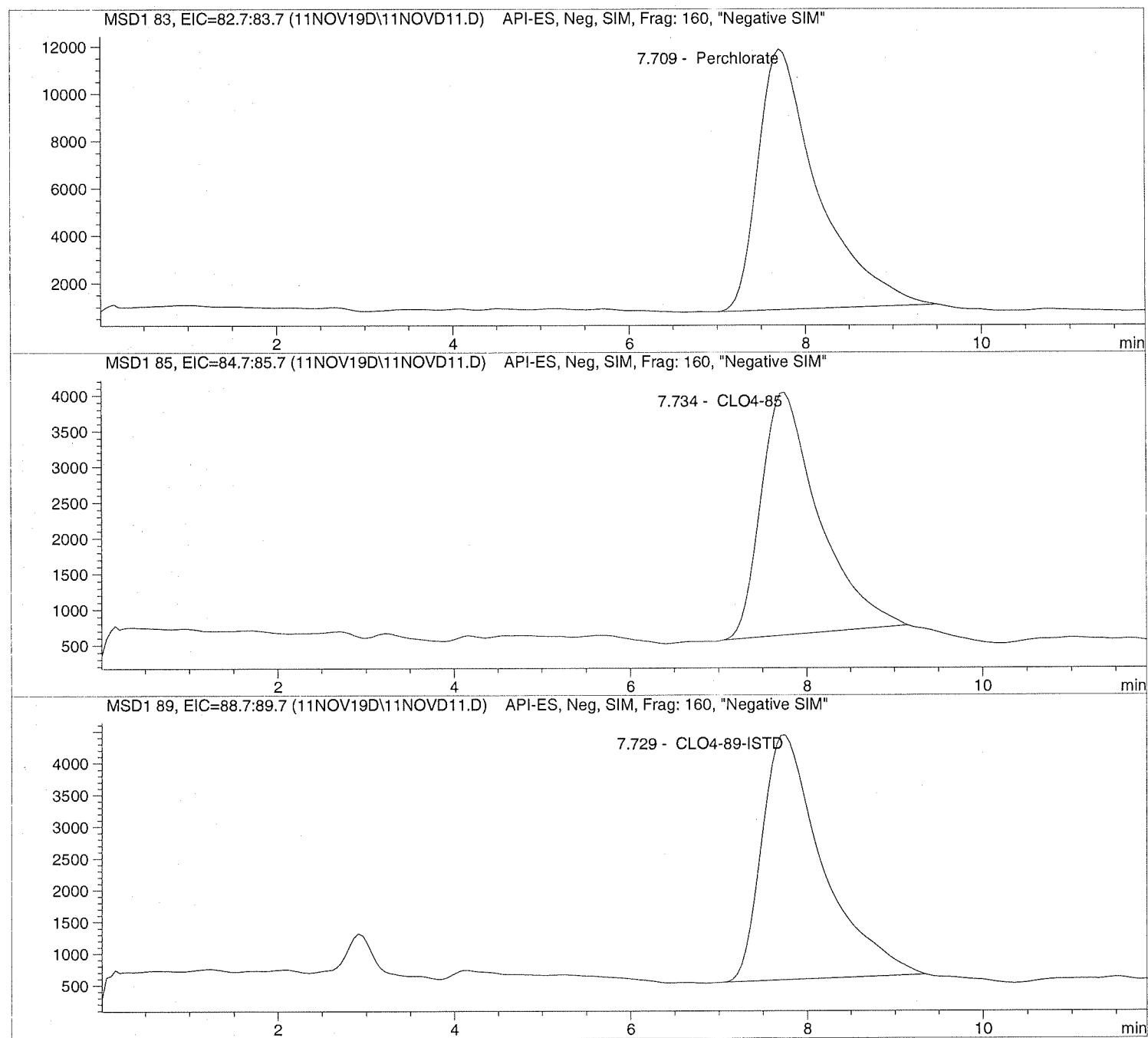
=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD11.D Sample Name: 1931587001 1K

=====
Injection Date: 11/11/2019 11:31:27 Seq Line: 11
Sample Name: 1931587001 1K Location: Vial 81
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

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

Perchlorate analysis
=====

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD11.D Sample Name: 1931587001 1K

```

=====
Injection Date: 11/11/2019 11:31:27      Seq Line:          11
Sample Name:   1931587001 1K             Location:          Vial 81
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  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
7.709	PBA	518901.9	10180.4025	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.734	PBA	155448.7	9919.4352	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.729	PBA	184987.1	5000.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD12.D

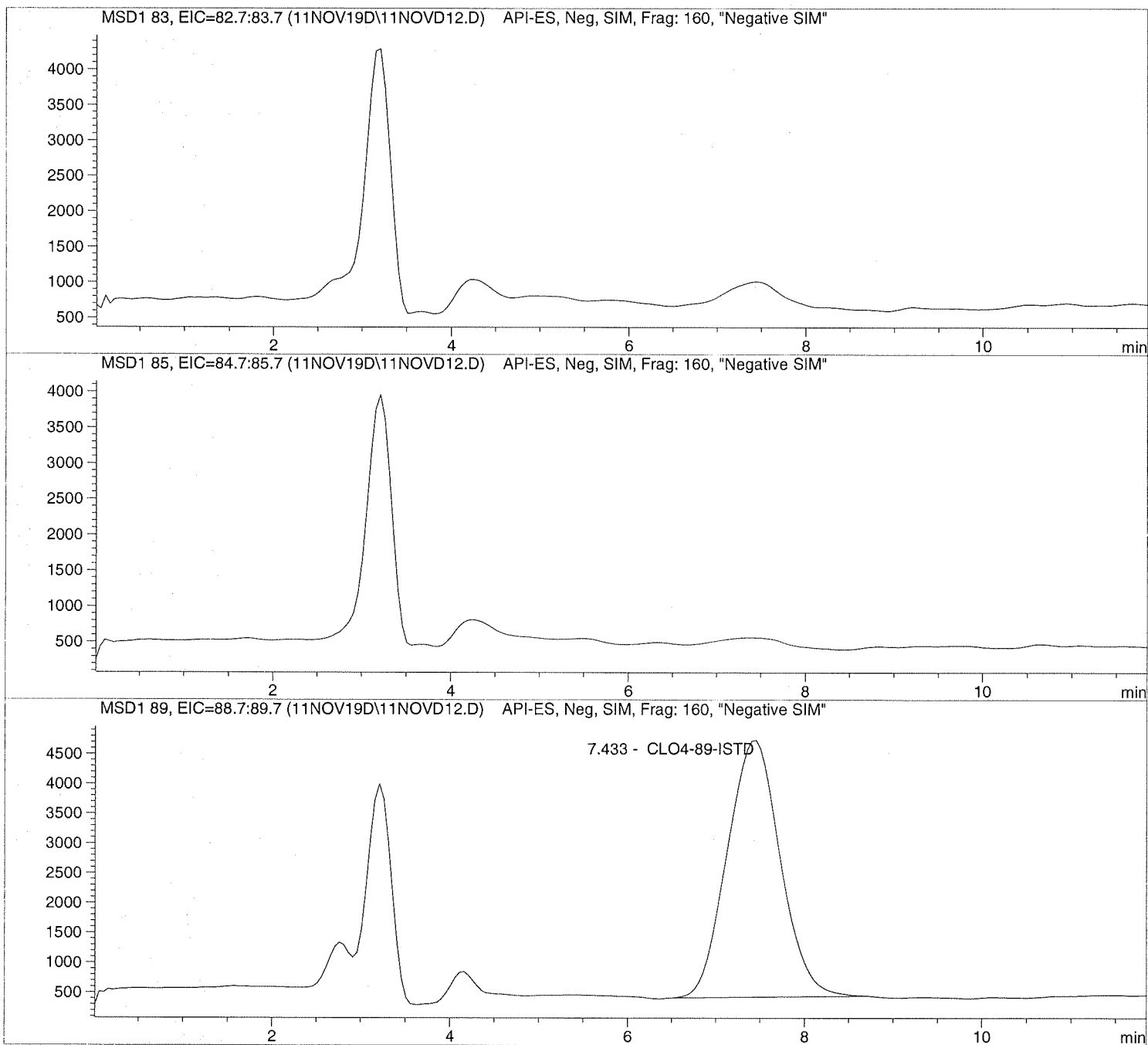
Sample Name: 1931589001

=====
Injection Date: 11/11/2019 11:45:10
Sample Name: 1931589001
Acq Operator: TNB

=====
Seq Line: 12
Location: Vial 82
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\11NOV19D\11NOVD12.D

Sample Name: 1931589001

```

=====
Injection Date: 11/11/2019 11:45:10      Seq Line:          12
Sample Name:   1931589001                Location:          Vial 82
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:       30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  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
7.433	PBA	179882.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```


Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD13.D

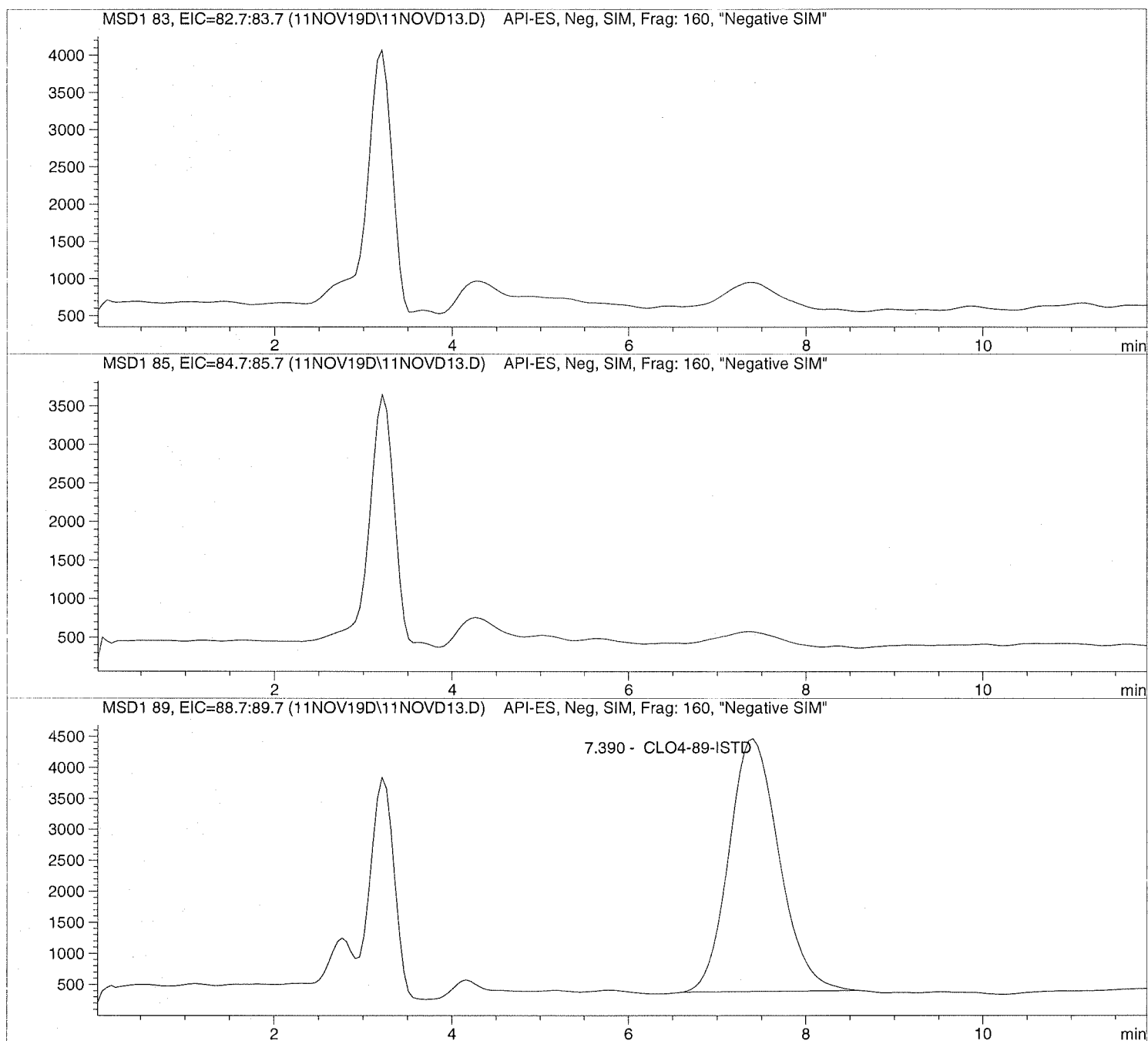
Sample Name: 1931592001

Injection Date: 11/11/2019 11:58:58
Sample Name: 1931592001
Acq Operator: TNB

Seq Line: 13
Location: Vial 83
Inj. No.: 1
Inj. Vol.: 30 μ l

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\11NOV19D\11NOVD13.D

Sample Name: 1931592001

```

=====
Injection Date: 11/11/2019 11:58:58      Seq Line:          13
Sample Name:   1931592001                Location:          Vial 83
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:       30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  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
7.390	PBA	160080.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD14.D

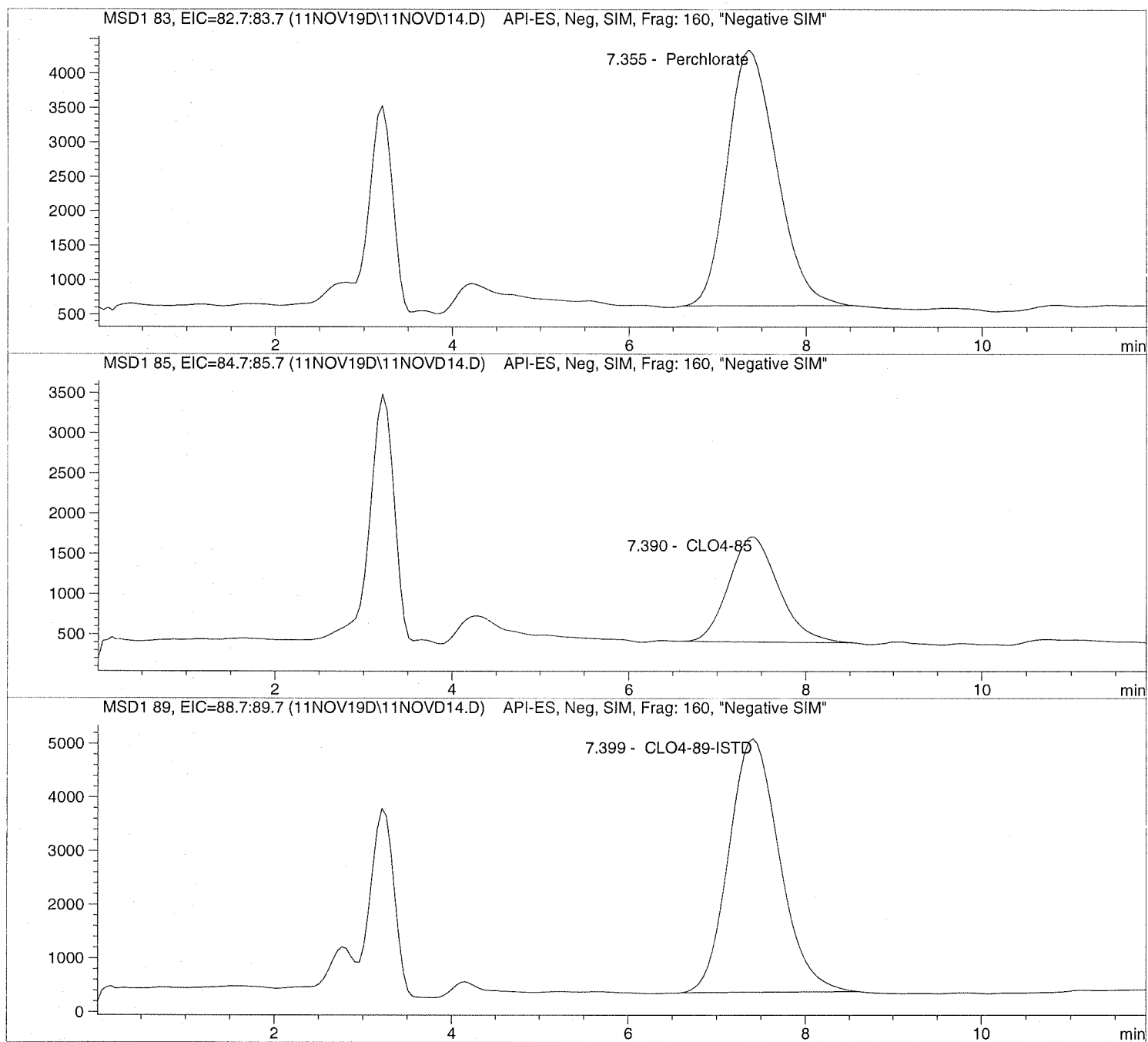
Sample Name: 683381 315921S

Injection Date: 11/11/2019 12:12:42
Sample Name: 683381 315921S
Acq Operator: TNB

Seq Line: 14
Location: Vial 84
Inj. No.: 1
Inj. Vol.: 30 μ l

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\11NOV19D\11NOVD14.D Sample Name: 683381 315921S

```

=====
Injection Date: 11/11/2019 12:12:42      Seq Line:          14
Sample Name:    683381 315921S           Location:          Vial 84
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:       30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   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
7.355	PBA	143683.0	2.8242	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.390	PBA	50999.3	3.2020	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.399	PBA	187030.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD15.D

Sample Name: 683382 315921D

Injection Date: 11/11/2019 12:26:30

Seq Line: 15

Sample Name: 683382 315921D

Location: Vial 85

Acq Operator: TNB

Inj. No.: 1

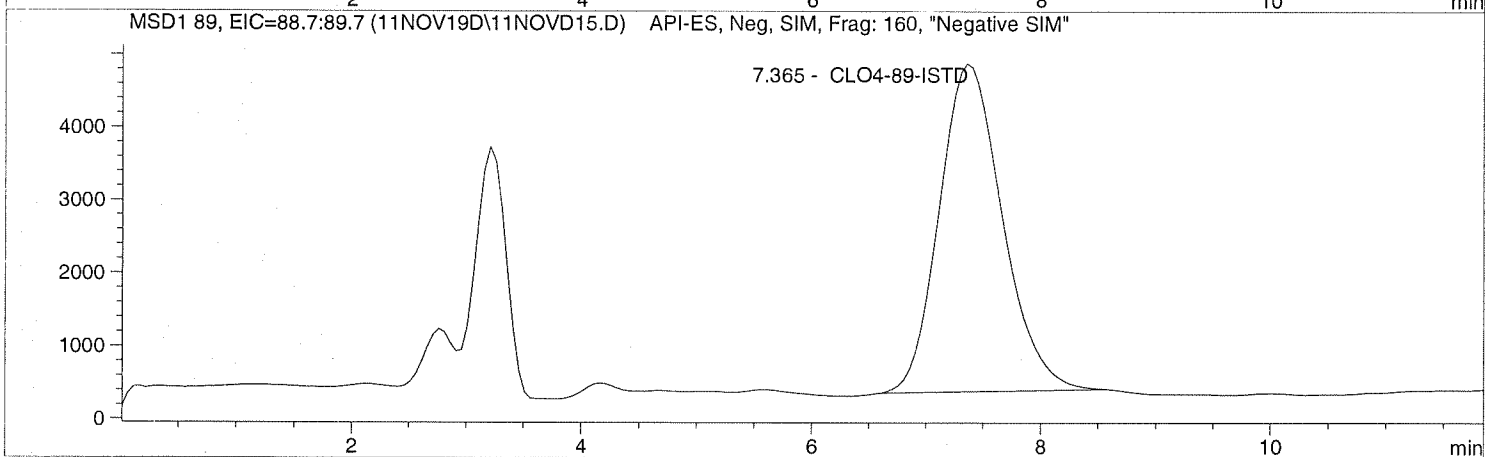
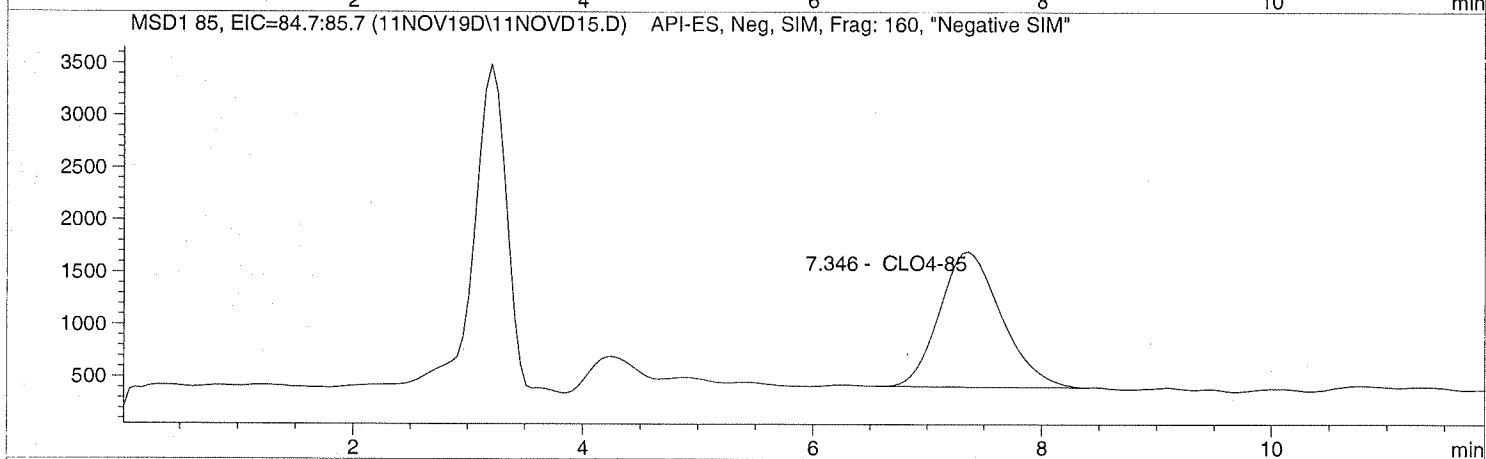
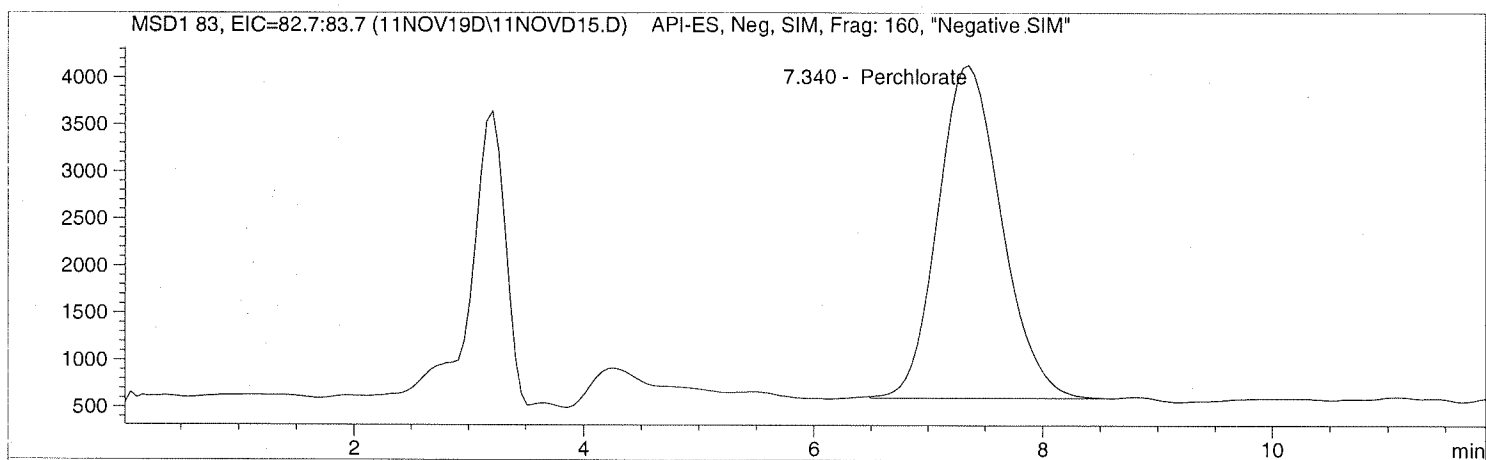
Inj. Vol.: 30 μ l

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\11NOV19D\11NOVD16.D

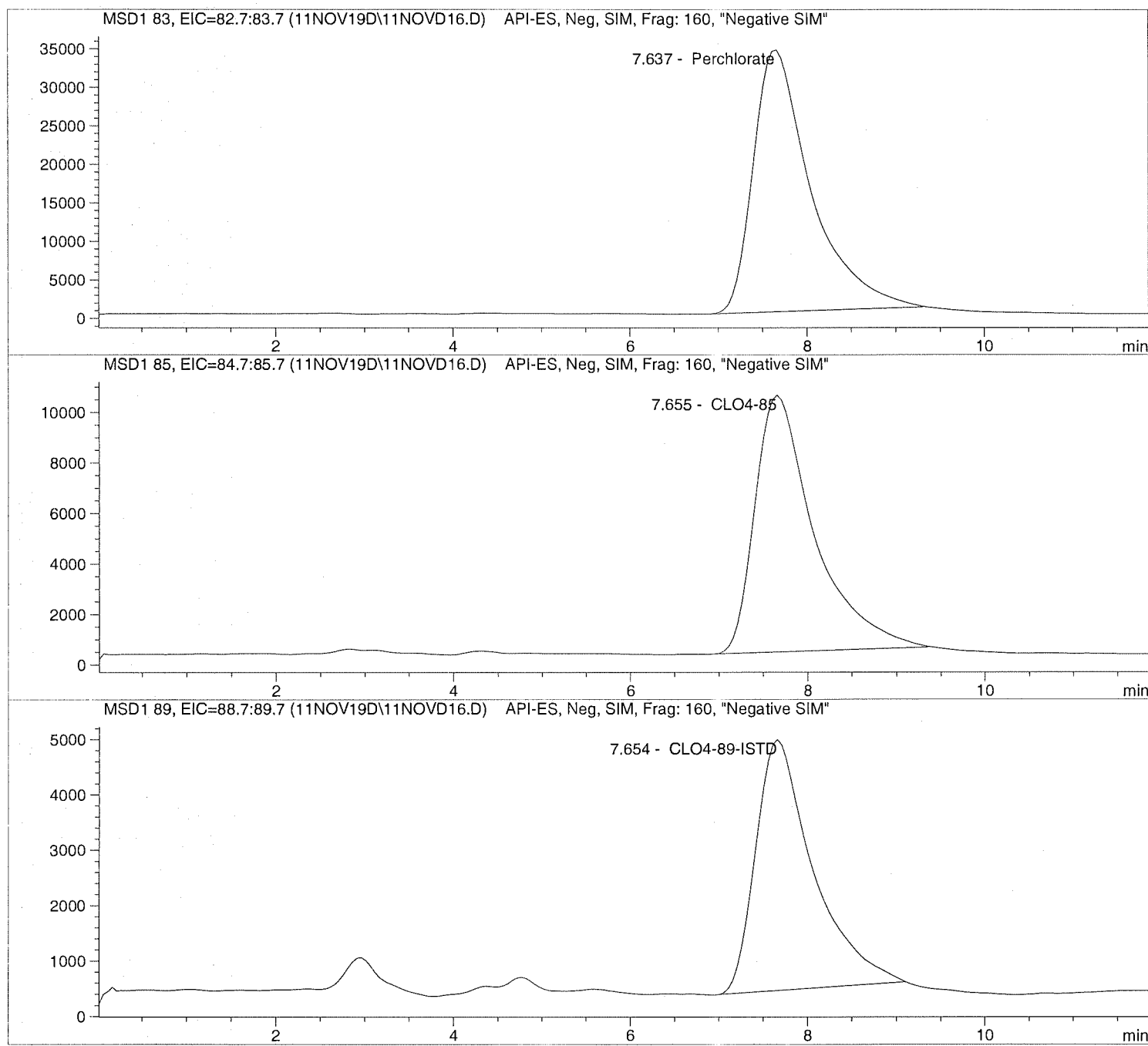
Sample Name: 683383 CCV@25

Injection Date: 11/11/2019 12:44:18
Sample Name: 683383 CCV@25
Acq Operator: TNB

Seq Line: 16
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 30 μ l

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\11NOV19D\11NOVD16.D Sample Name: 683383 CCV@25

```

=====
Injection Date: 11/11/2019 12:44:18      Seq Line:          16
Sample Name:    683383   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
7.637	PBA	1535921.6	25.7443	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.655	PBA	472007.8	25.9343	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.654	PBA	203230.7	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

#

#	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	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
[min]	Sig						
7.750	1	3	1.00000	5.39218e4	1.85454e-5	1	Perchlorate
		4	2.00000	1.32825e5	1.50574e-5		
		5	5.00000	2.76271e5	1.80982e-5		
		6	10.00000	5.61298e5	1.78159e-5		
		7	25.00000	1.51820e6	1.64669e-5		
		8	50.00000	3.31156e6	1.50986e-5		
		9	75.00000	5.23914e6	1.43153e-5		
7.767	3	3	5.00000	2.14568e5	2.33026e-5	+I1	CLO4-89-ISTD
		4	5.00000	2.04758e5	2.44190e-5		
		5	5.00000	2.13407e5	2.34294e-5		
		6	5.00000	2.09246e5	2.38953e-5		
		7	5.00000	2.07403e5	2.41077e-5		
		8	5.00000	2.02929e5	2.46391e-5		
		9	5.00000	1.97933e5	2.52611e-5		
7.778	2	3	1.00000	1.70436e4	5.86732e-5	1	CLO4-85
		4	2.00000	4.20754e4	4.75337e-5		
		5	5.00000	9.24707e4	5.40712e-5		
		6	10.00000	1.68622e5	5.93041e-5		
		7	25.00000	4.63724e5	5.39114e-5		
		8	50.00000	9.95933e5	5.02042e-5		

Method C:\HPCHEM\1\METHODS\CLO4-DP3.M

RetTime [min]	Lvl Sig	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

```

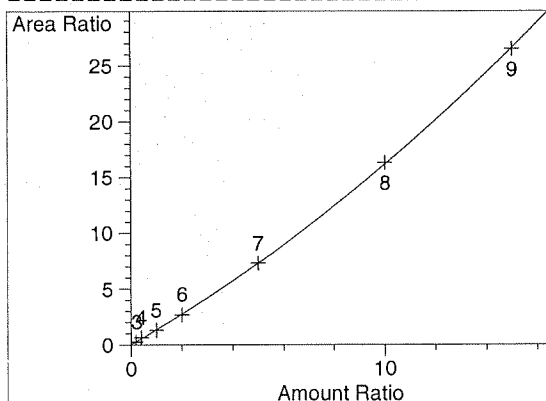
=====
                          Peak Sum Table
=====

```

```

***No Entries in table***
=====

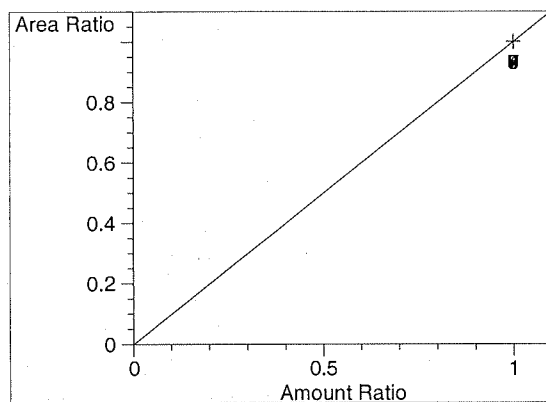
```

=====
 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:

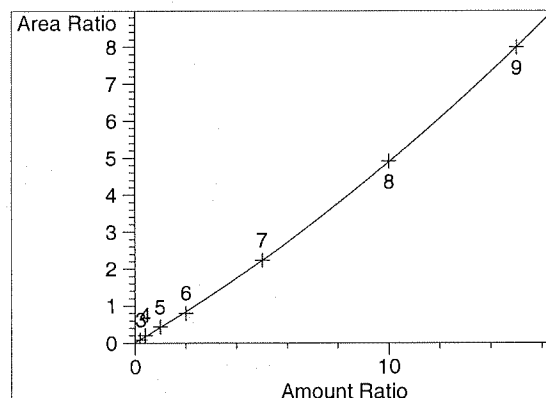
Level 3	: 1
Level 4	: 0.5
Level 5	: 0.2
Level 6	: 0.1
Level 7	: 0.04
Level 8	: 0.02
Level 9	: 0.013333



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

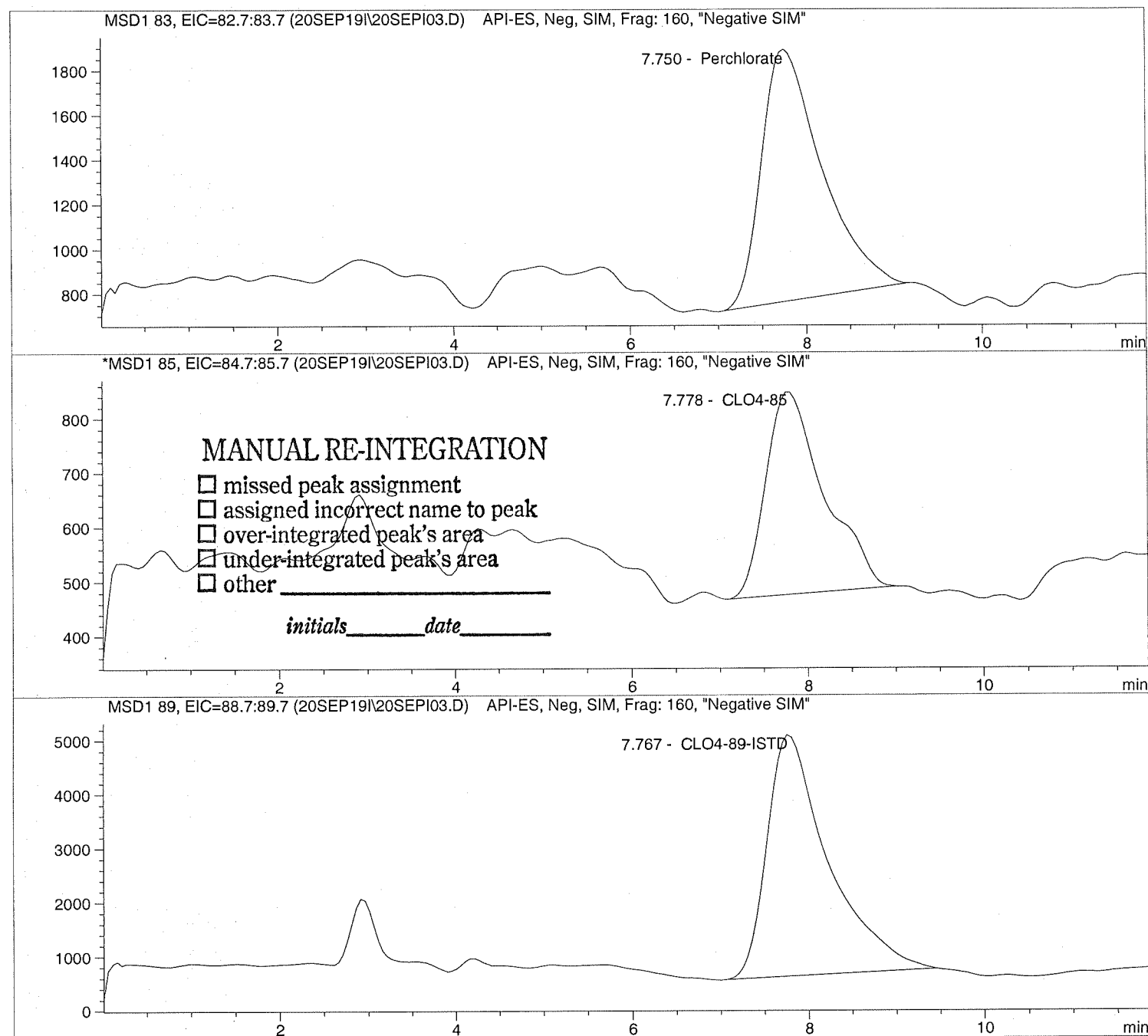
Inj. Vol.: 30 µl

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\20SEP19\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

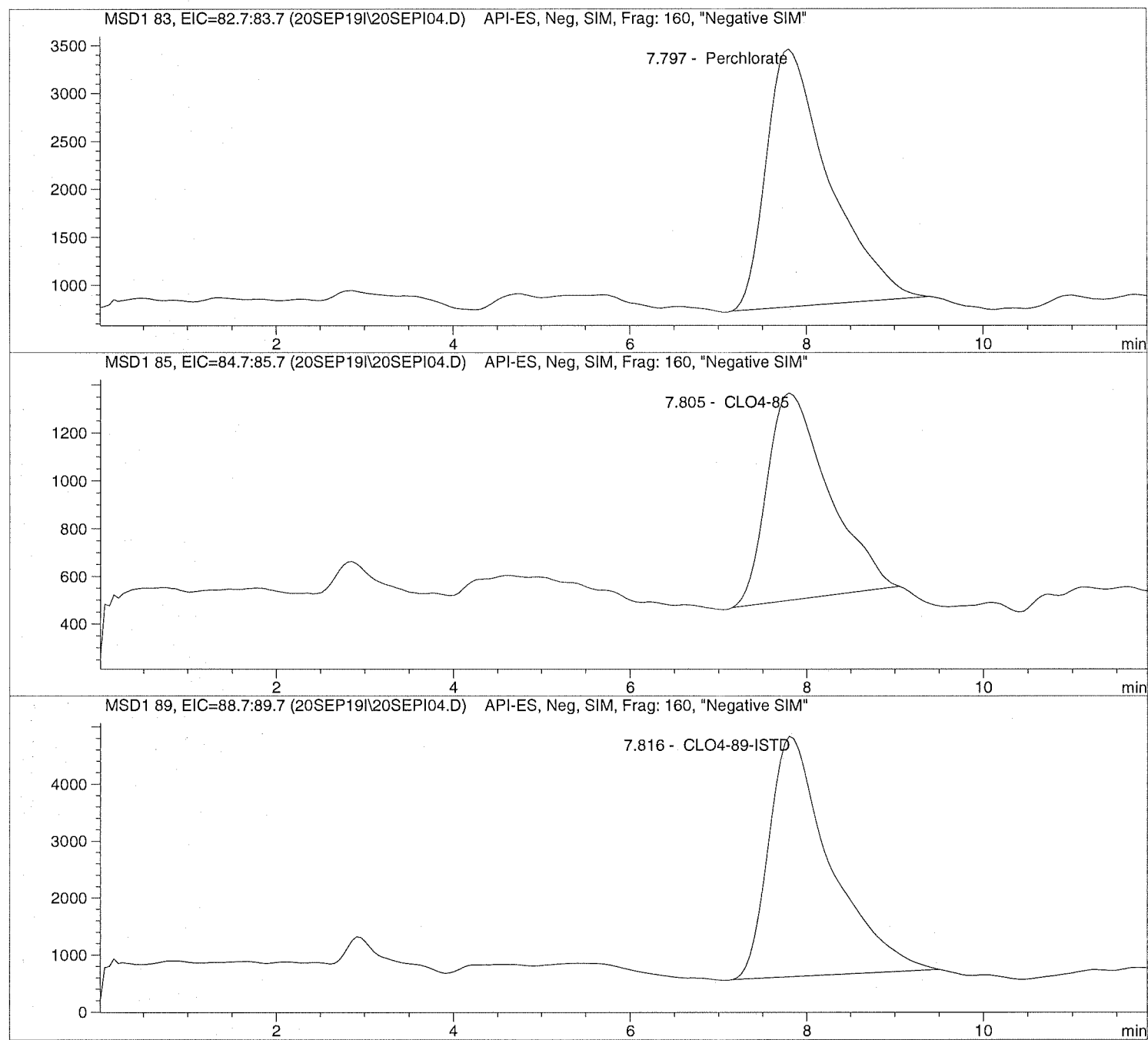
Inj. Vol.: 30 μ l

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

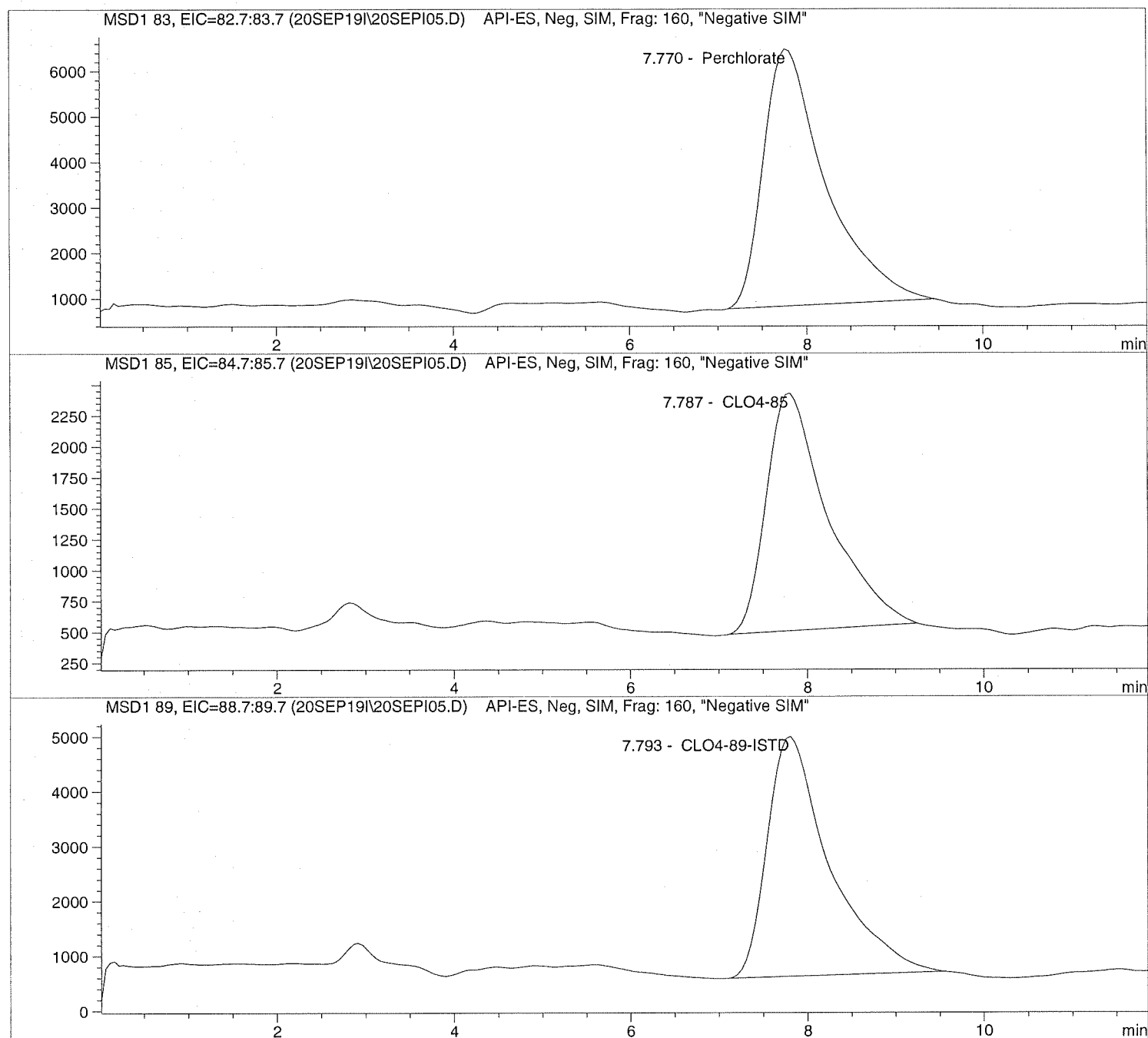
Sample Name: CLO4@ 5.0ug/L

Injection Date: 9/20/2019 09:51:49
Sample Name: CLO4@ 5.0ug/L
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
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

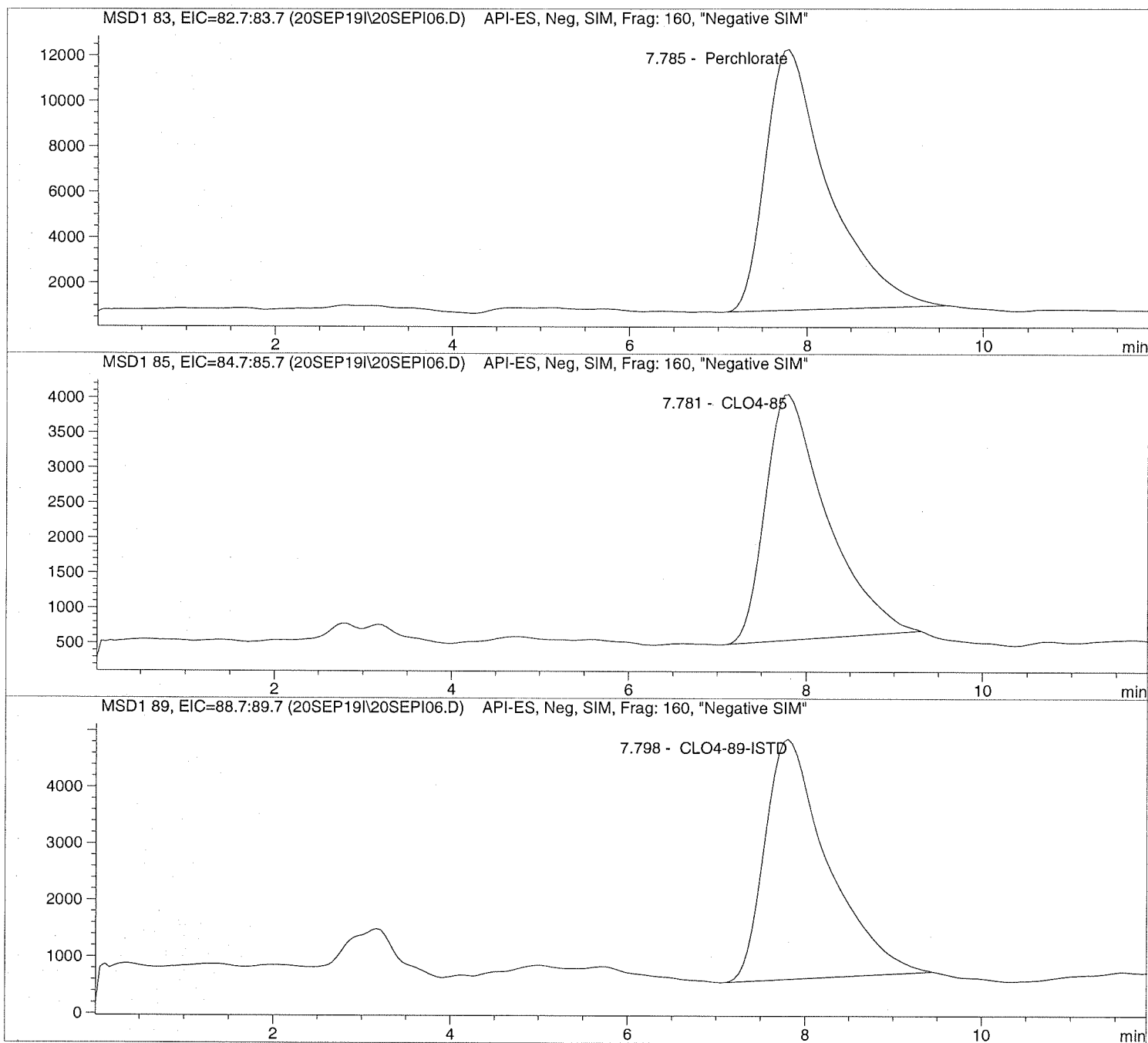
Sample Name: CLO4@ 10.ug/L

=====
Injection Date: 9/20/2019 10:05:36
Sample Name: CLO4@ 10.ug/L
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
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

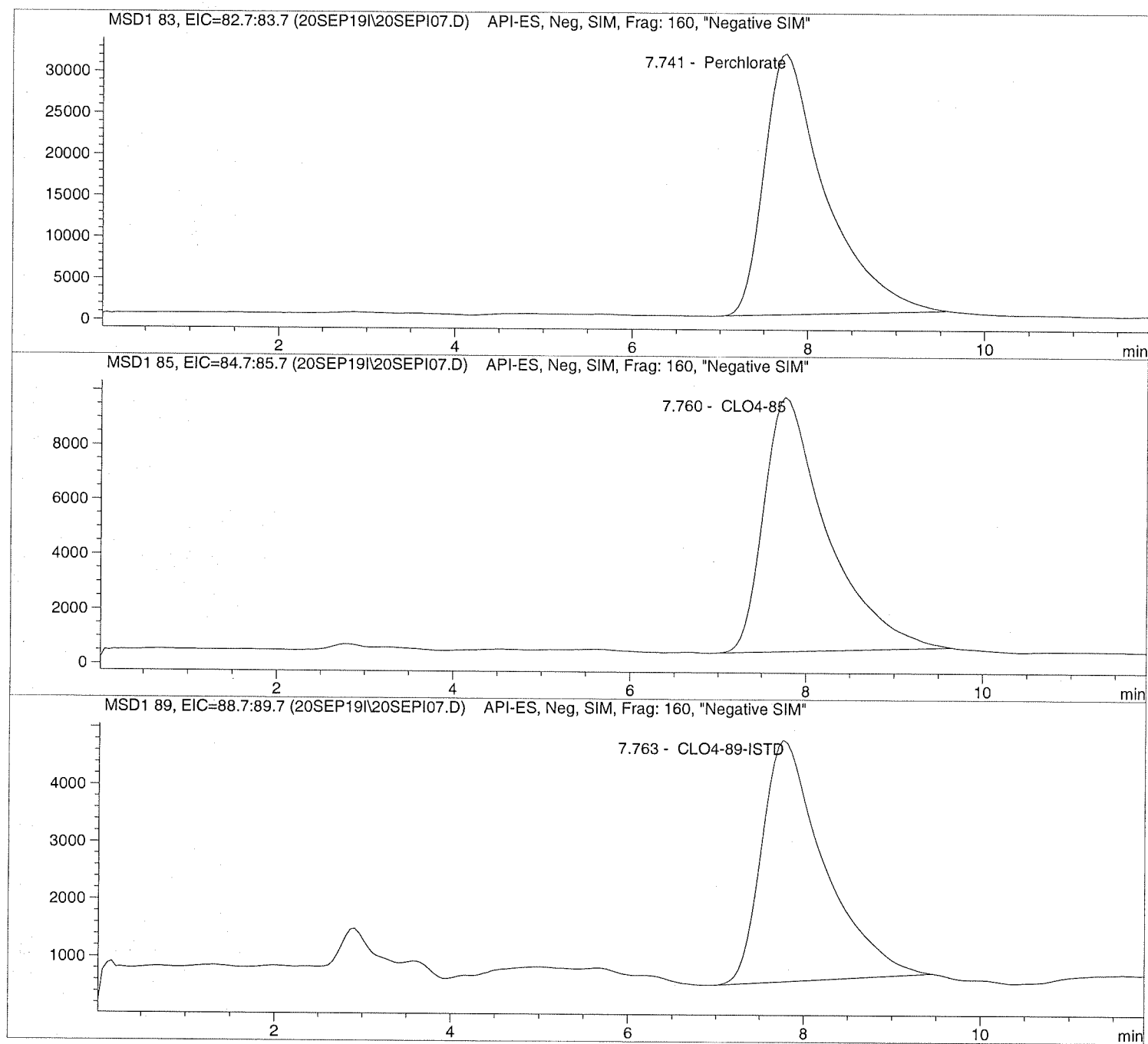
Sample Name: CLO4@ 25.ug/L

=====
Injection Date: 9/20/2019 10:19:23
Sample Name: CLO4@ 25.ug/L
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
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

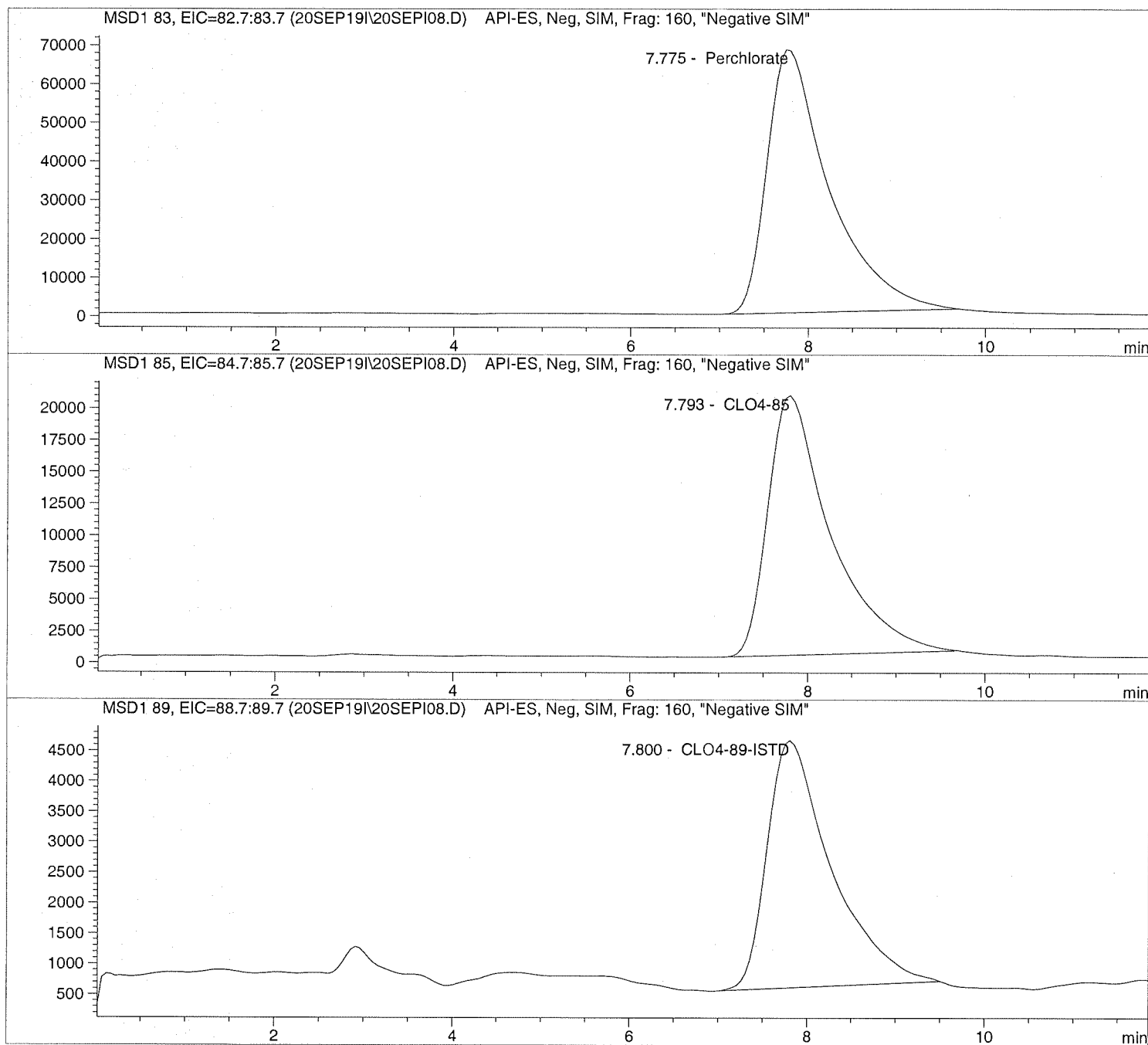
Sample Name: CLO4@ 50.ug/L

Injection Date: 9/20/2019 10:33:18
Sample Name: CLO4@ 50.ug/L
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
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\20SEP19\20SEPI09.D

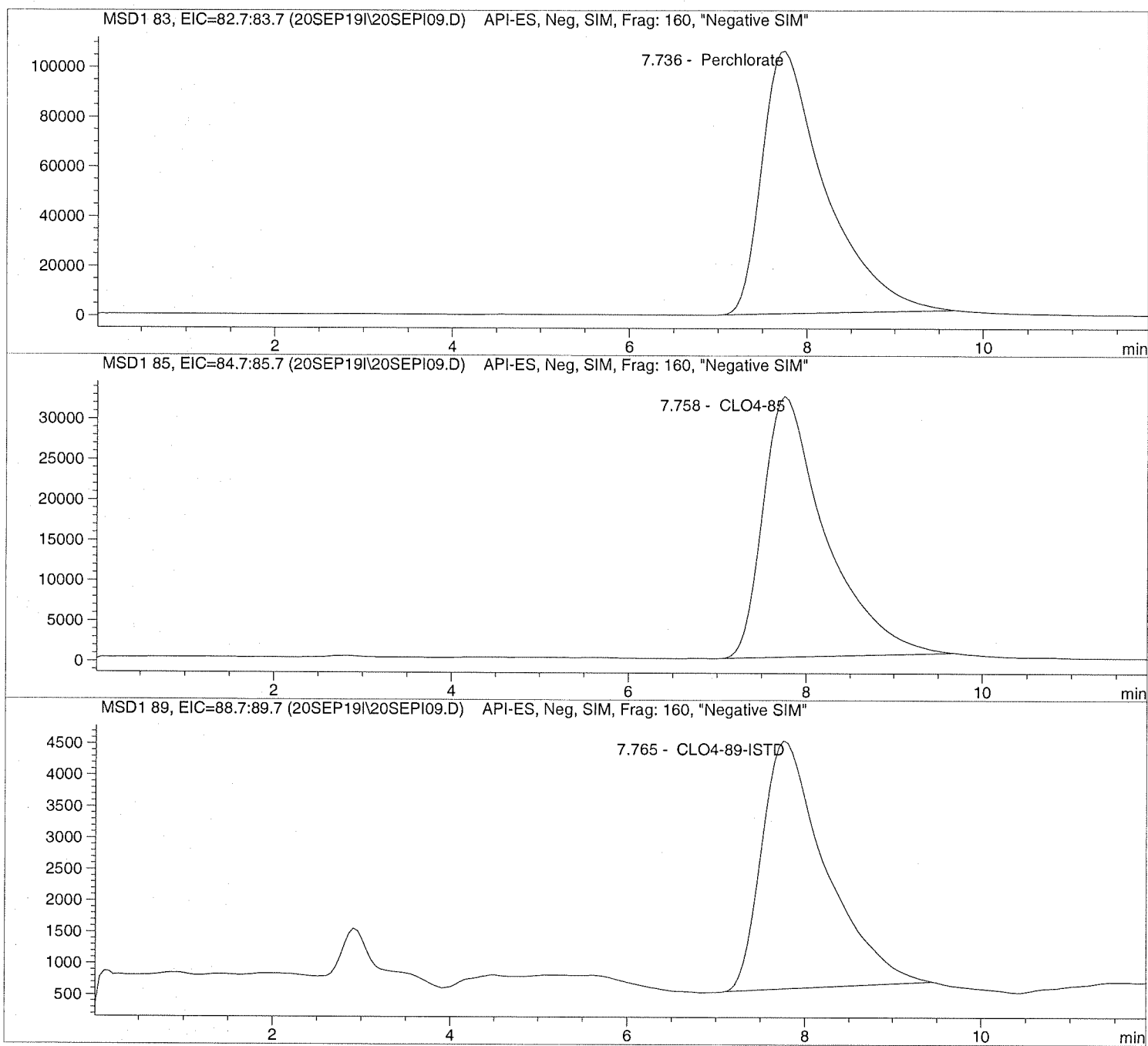
Sample Name: CLO4@ 75.ug/L

=====
Injection Date: 9/20/2019 10:47:05
Sample Name: CLO4@ 75.ug/L
Acq Operator: TNB

=====
Seq Line: 9
Location: Vial 79
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

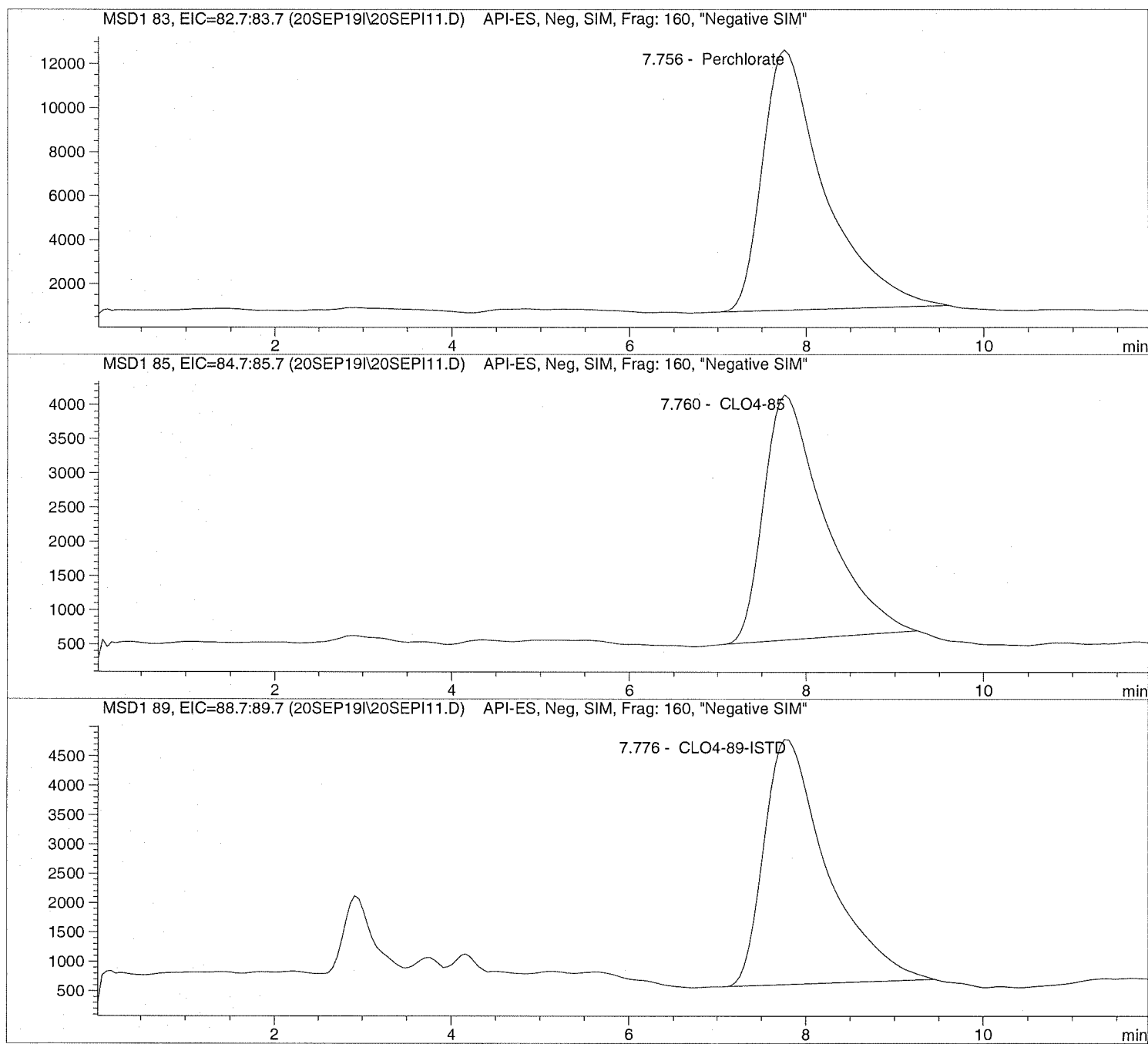
Sample Name: ICAL Verf@10ug/L

Injection Date: 9/20/2019 11:14:45
Sample Name: ICAL Verf@10ug/L
Acq Operator: TNB

Seq Line: 11
Location: Vial 80
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

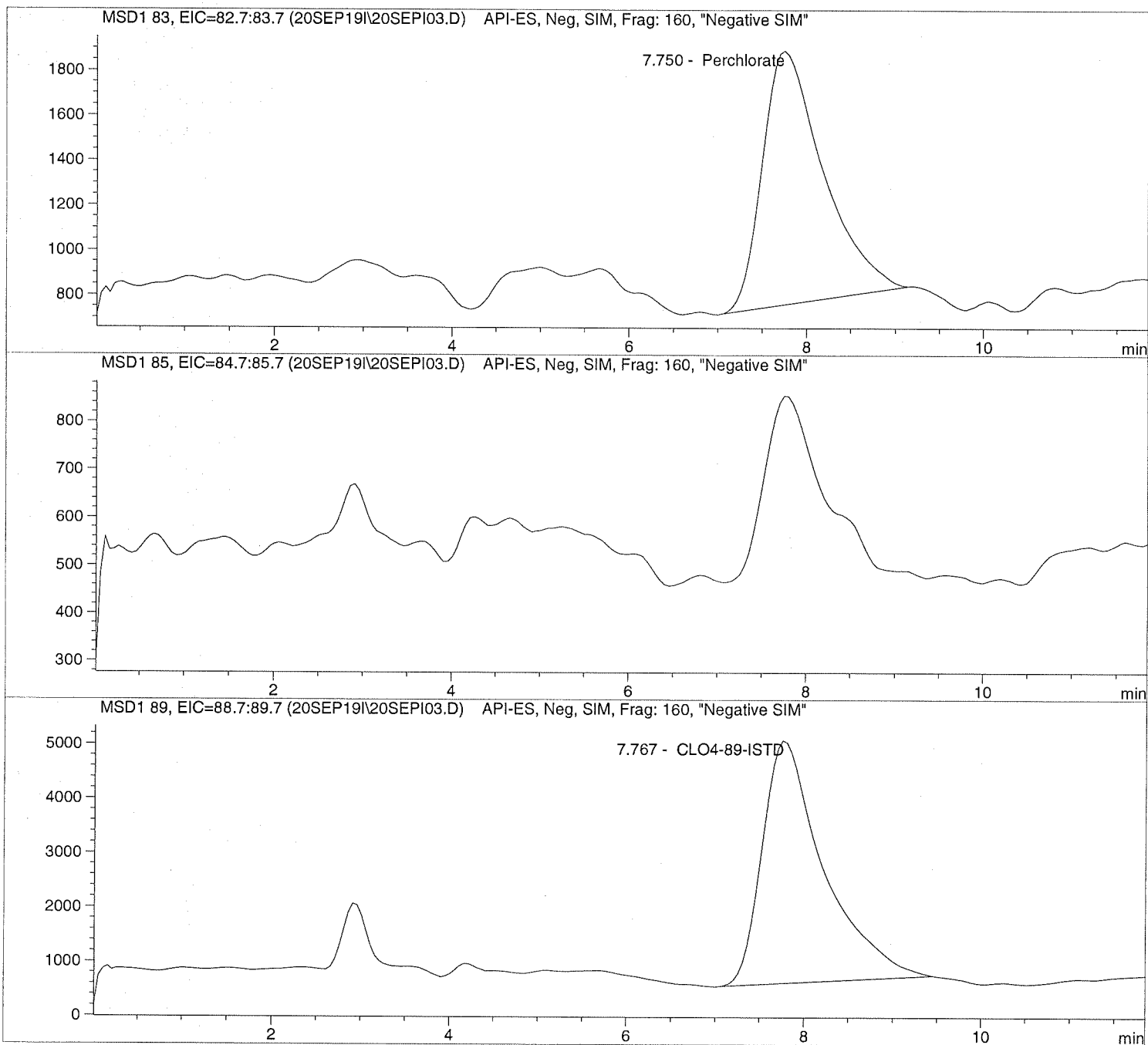
Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05
Sample Name: CLO4@ 1.0ug/L
Acq Operator: TNB

Seq Line: 3
Location: Vial 73
Inj. No.: 1
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line: 3
Sample Name:    CLO4@ 1.0ug/L           Location:  Vial 73
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:27:11
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	214568.1	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```



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

November 19, 2019

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

Work Order: **HS19110208**

Laboratory Results for: **Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 1 sample(s) on Nov 06, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

A handwritten signature in black ink, appearing to read 'Raj. P. Modashia', enclosed in a circular scribble.

Generated By: DAYNA.FISHER

RJ Modashia
Project Manager

ALS Houston, US

Date: 19-Nov-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19110208

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19110208-01	LH18/24-SP650_110519	Water		05-Nov-2019 14:00	06-Nov-2019 08:45	<input type="checkbox"/>

ALS Houston, US

Date: 19-Nov-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19110208

CASE NARRATIVE**Work Order Comments**

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

Work Order Comments

- The analysis for TOC was subcontracted to ALS Environmental in Kelso, WA. Final Report attached.
-

WetChemistry by Method E350.3**Batch ID: R350293**

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

WetChemistry by Method E365.3**Batch ID: R350020**

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

ALS Houston, US

Date: 19-Nov-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Weekly Samples
 Sample ID: LH18/24-SP650_110519
 Collection Date: 05-Nov-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19110208
 Lab ID:HS19110208-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)								Analyst: MZD
	Method:E350.3							
Nitrogen, Ammonia (As N)	13	a	0.20	0.10	0.20	mg/L	1	12-Nov-2019 16:00
ORTHO PHOSPHATE (PO4) AS P BY E365.3								Analyst: MZD
	Method:E365.3							
Phosphorus, Total Orthophosphate (As P)	2.20	a	0.100	0.250	0.250	mg/L	10	07-Nov-2019 12:22
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)								Analyst: SUB
	Method:NA							
Subcontract Analysis	See Attached		0	0		NA	1	14-Nov-2019 17:57
SUBCONTRACT ANALYSIS - TOC ANALYSIS								Analyst: SUBK
	Method:NA							
Subcontract Analysis	See Attached		0	0		NA	1	19-Nov-2019 13:34

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

ALS Houston, US

Date: 19-Nov-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19110208

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R350020 (0)		Test Name : ORTHO PHOSPHATE (PO4) AS P BY E365.3			Matrix: Water	
HS19110208-01	LH18/24-SP650_110519	05 Nov 2019 14:00			07 Nov 2019 12:22	10
Batch ID: R350293 (0)		Test Name : AMMONIA AS N BY E350.3(ISE)			Matrix: Water	
HS19110208-01	LH18/24-SP650_110519	05 Nov 2019 14:00			12 Nov 2019 16:00	1
Batch ID: R350525 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Water	
HS19110208-01	LH18/24-SP650_110519	05 Nov 2019 14:00			14 Nov 2019 17:57	1
Batch ID: R350797 (0)		Test Name : SUBCONTRACT ANALYSIS - TOC ANALYSIS			Matrix: Water	
HS19110208-01	LH18/24-SP650_110519	05 Nov 2019 14:00			19 Nov 2019 13:34	1

ALS Houston, US

Date: 19-Nov-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19110208

QC BATCH REPORT

Batch ID:	R350020 (0)	Instrument:	UV-2450	Method:	ORTHO PHOSPHATE (PO4) AS P BY E365.3					
MBLK	Sample ID: MBLK-R350020	Units: mg/L		Analysis Date: 07-Nov-2019 12:22						
Client ID:	Run ID: UV-2450_350020	SeqNo: 5334275		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.0250	0.0250							U	
LCS	Sample ID: LCS-R350020	Units: mg/L		Analysis Date: 07-Nov-2019 12:22						
Client ID:	Run ID: UV-2450_350020	SeqNo: 5334274		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	0.219	0.0250	0.25	0	87.6	85 - 115				
MS	Sample ID: HS19110208-01MS	Units: mg/L		Analysis Date: 07-Nov-2019 12:22						
Client ID: LH18/24-SP650_110519	Run ID: UV-2450_350020	SeqNo: 5334277		PrepDate:		DF: 10				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	4.36	0.250	2.5	2.2	86.4	80 - 120				
MSD	Sample ID: HS19110208-01MSD	Units: mg/L		Analysis Date: 07-Nov-2019 12:22						
Client ID: LH18/24-SP650_110519	Run ID: UV-2450_350020	SeqNo: 5334276		PrepDate:		DF: 10				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Phosphorus, Total Orthophosphate (As P)	4.26	0.250	2.5	2.2	82.4	80 - 120	4.36	2.32	20	

The following samples were analyzed in this batch: HS19110208-01

ALS Houston, US

Date: 19-Nov-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19110208

QC BATCH REPORT

Batch ID:	R350293 (0)	Instrument:	WetChem_HS	Method:	AMMONIA AS N BY E350.3(ISE)					
MBLK	Sample ID: MBLK-R350293	Units:	mg/L	Analysis Date:	12-Nov-2019 16:00					
Client ID:	Run ID: WetChem_HS_350293	SeqNo:	5340271	PrepDate:	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	0.10	0.20								U
LCS	Sample ID: LCS-R350293	Units:	mg/L	Analysis Date:	12-Nov-2019 16:00					
Client ID:	Run ID: WetChem_HS_350293	SeqNo:	5340270	PrepDate:	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	9.097	0.20	10	0	91.0	80 - 120				
MS	Sample ID: HS19110420-01MS	Units:	mg/L	Analysis Date:	12-Nov-2019 16:00					
Client ID:	Run ID: WetChem_HS_350293	SeqNo:	5350325	PrepDate:	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	13.33	0.20	10	2.332	110	80 - 120				
MSD	Sample ID: HS19110420-01MSD	Units:	mg/L	Analysis Date:	12-Nov-2019 16:00					
Client ID:	Run ID: WetChem_HS_350293	SeqNo:	5350326	PrepDate:	DF: 1					
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	12.84	0.20	10	2.332	105	80 - 120	13.33	3.76	20	

The following samples were analyzed in this batch: HS19110208-01

ALS Houston, US

Date: 19-Nov-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19110208

**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 Quantitation 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: 19-Nov-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19110208

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19110208-01	LH18/24-SP650_110519	Login	11/6/2019 10:25:17 AM	PMG	WET279
HS19110208-01	LH18/24-SP650_110519	Login	11/6/2019 10:25:17 AM	PMG	WET279
HS19110208-01	LH18/24-SP650_110519	Login	11/6/2019 10:25:17 AM	PMG	Sub

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19110208

Date/Time Received: 06-Nov-2019 08:45
Received by: NDR

Checklist completed by: Paresh M. Giga
eSignature Date 6-Nov-2019

Reviewed by: RJ Modashia
eSignature Date 6-Nov-2019

Matrices: Water

Carrier name: FedEx

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes No Not Present
- Chain of custody present? Yes No 1 Page(s)
- Chain of custody signed when relinquished and received? Yes No COC IDs:none
- Samplers name present on COC? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s): 1.4c U/C IR25

Cooler(s)/Kit(s): 6026

Date/Time sample(s) sent to storage: 11/6/19 10:40

- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH acceptable upon receipt? Yes No N/A
- pH adjusted? Yes No N/A

pH adjusted by:


Login Notes: Received an extra bottle for Perchlorate (Fraction D), not on COC
Logged in with analysis

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:


Comments:

Corrective Action:

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CUSTODY SEAL		Seal Broken By: <i>SM</i>	
	Date: <i>11/5/19</i>	Time: <i>1430</i>	Date:	
	Name: <i>Scott Beesinger</i>			<i>11/06/19</i>
	Company: <i>EHA TX</i>			

6026 NOV 06 2019

Must Deliver Next Business Day
Time and Temperature Sensitive!



6026

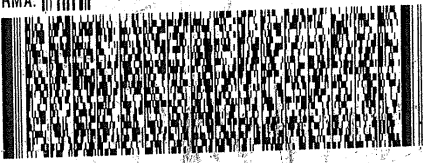
ORIGIN ID: SGRA (903) 930-5193
 ART: SCOTT BEESINGER
 APT: ENVIRONMENTAL & INFRASTR. INC
 1209-B EAST GRAND AVE PHB202
 MARSHALL, TX 75670
 UNITED STATES US

SHIP DATE: 12FEB19
 ACTWGT: 1.00 LB MAN
 CWD: 300130/CAFE3211
 DIMS: 19x16x13 IN.

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099

(281) 530-6666
 REF: LHAAP-46-BO 63777-RJ

RMA: ||| ||| |||




FedEx
Express

RETURNS MON-SAT
WED - 06 NOV 10:30A
PRIORITY OVERNIGHT

FedEx
 TRK# **4809 7830 8102**

AB SGRA **77099**
TX-US
IAH



FID 162785 05NOV19 G6GA 56AC1/F338/0562



Case Narrative

Method: 6850

Analysis: Perchlorate

Analysis SOP: LC-MS-CLO4

ALS WO ID(s): 1931243; 1931587; 1931589;
1931592

Client: ALS Laboratories (Houston, TX)

Matrix: Water

ELMS Batch (HBN): 2315 (251590)

General Set Information: There were nine 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. 50 μL 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 0.45 μm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1931587001 was analyzed and reported from 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 683380) was less than 1/2 the CRDL. The recovery for the LCS (683377) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on sample 1931243001 (Client ID: LH18/24-SP650_110519). 3.0 μ L of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. The spike target was 3. μ g/L. The MS/MSD (681876/77) 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 μ g/L. Results were calculated in μ g/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (μ g/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 – 683378) is reported from the analysis of the Laboratory Control Sample (LCS – 683377) at a level of 3.0 μ g/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).

Thomas Bosch November 11, 2019
Analyst Date



ANALYTICAL REPORT

Report Date: November 12, 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: **34-1931592**

Project ID: HS19110208

Purchase Order: HS19110208

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_110519	1931592001	11/05/19	11/07/19	

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

ALS GROUP USA, CORP. An ALS Limited Company

Environmental 

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER



ANALYTICAL REPORT

Workorder: **34-1931592**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: LH18/24-SP650_110519	Sampling Site: NA	Collected: 11/05/2019				
Lab ID: 1931592001	Media: 125 mL Nalgene	Received: 11/07/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2315 (HBN: 251590) Analyzed: 11/11/2019 11:58	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

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

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 11/11/2019 13:51	/S/ Stephen Brose 11/12/2019 11:07

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: 34-1931592

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: 1931592
Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2315 (HBN: 251590)
Analyzed By: Thomas Bosch

Blank

LMB: 683380 Analyzed: 11/11/2019 09:54 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 683377 Analyzed: 11/11/2019 09:27 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	2.87	3.00	95.6	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1931592001 Analyzed: 11/11/2019 11:58 Dilution: 1 Units: ug/L		MS: 683381 Analyzed: 11/11/2019 12:12 Dilution: 1 Units: ug/L				MSD: 683382 Analyzed: 11/11/2019 12:26 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	2.82	3	94.1	78.8 123.8	2.92	97.2	3.17	0.0 20.0

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

Analyst	Peer Review
/S/ Thomas Bosch 11/11/2019 13:52	/S/ Stephen Brose 11/12/2019 11:07

Symbols and Definitions

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

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



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

Subcontract Chain of Custody

18698/#2

SAMPLING STATE: Dept of Defense

COC ID: 12566

SUBCONTRACT TO:

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

Phone: +1 801 266 7700

1931592

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19110208
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19110208-01	LH18/24-SP650_110519	Water	05 Nov 2019 14:00
SUB_Perch-6850			14 Nov 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. [Signature]
Received By: [Signature]
Cooler ID(s): _____

Date/Time: 11/6/19 18:00
Date/Time: 11.7.19 0940
Temperature(s): _____

PROPERTY OF ALS GLOBAL (A) (S) (C) (P) (R) (E) (D)

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS HOUSTON Project/Task/Site: H519110208
 Date/Time of Receipt: _____ Number of Coolers Received: 1 1931592

Condition of Coolers: <u>Acceptable/Unacceptable</u>	Temperature Control: <u>Present/Not Included</u>																									
Cooler Custody Seals: <u>Present/Absent/NA</u>	Location Temp Taken: <u>Control/Between Samples</u>																									
Container Custody Seals: <u>Present/Absent/NA</u>	Are all temperatures within project specific guidelines? <u>Yes/No/NA</u>																									
Ice Present: <u>Yes/No/NA</u>	VOA Headspace Present? <u>Yes/No/NA</u>																									
<table border="1"> <tr> <td rowspan="4">pH Check Performed:</td> <td>Metals</td> <td>Yes/No/NA</td> <td>Total Phenolics</td> <td>Yes/No/NA</td> <td>NO3/NO2</td> <td>Yes/No/NA</td> </tr> <tr> <td>Cyanide</td> <td>Yes/No/NA</td> <td>TPH - 418.1</td> <td>Yes/No/NA</td> <td>Oil & Grease</td> <td>Yes/No/NA</td> </tr> <tr> <td>Sulfide</td> <td>Yes/No/NA</td> <td>COD</td> <td>Yes/No/NA</td> <td>Total Phosphorous</td> <td>Yes/No/NA</td> </tr> <tr> <td>Ammonia</td> <td>Yes/No/NA</td> <td>TKN</td> <td>Yes/No/NA</td> <td>Gross A.B, Gamma Spec</td> <td>Yes/No/NA</td> </tr> </table>	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	
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	<u>GOOD</u>	<u>1</u> °C	4		°C	7		°C
2		°C	5		°C	8		°C
3		°C	6		°C	9		°C

Taken By: [Signature] BAY LEEN COATES 11-7-19
Signature Printed Name Date

CLIENT-RELATED INFORMATION

<input type="checkbox"/> Missing Cooler	<input type="checkbox"/> Missing Samples/Bottles	<input type="checkbox"/> Incorrect Preservation	<input type="checkbox"/> Insufficient Sample Volume
<input type="checkbox"/> Cooler Conditions	<input type="checkbox"/> Broken/Leaking Samples	<input type="checkbox"/> pH Criteria Not Met	<input type="checkbox"/> Chain of Custody Problems
<input type="checkbox"/> Missing Paperwork	<input type="checkbox"/> Incorrect Bottle Type	<input type="checkbox"/> Residual Chlorine Present	<input type="checkbox"/> Other:
<input type="checkbox"/> Missing/Incorrect Bottle Labels	<input type="checkbox"/> Cooler Temperatures Out of Range	<input type="checkbox"/> 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: _____ Returned to Sample Receipt by: _____ Date: _____
Printed Name Signature



Part # 40143-001 RIT EXP 07/20 00

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

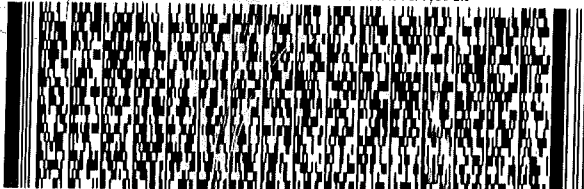
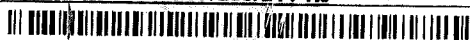
SHIP DATE: 06NOV19
ACTWTG: 11.50 LB
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN
BILL THIRD PARTY

TO **SAMPLE RECEIVING**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123

(801) 286-7700

REF: HS19110207/208/211 RJ



FedEx
Express



JT511180605011

RT **907**
ST **15**

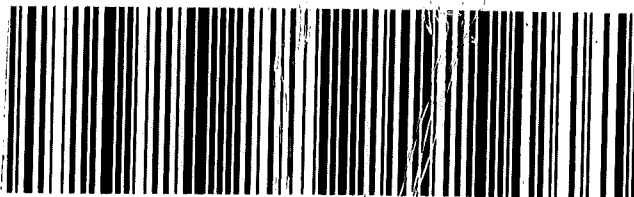
5
15:00
A
4676
11.07

TRK# 1251 0291 4676
0201

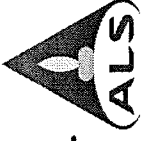
THU - 07 NOV 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC



Seal Broken By:	Date:
L	11/07
	W



Batch Worklist

Batch: ELMS/ 2315

Rule: EPA 6850, DoD QSM Water

Created: 11/11/2019 09:05

Analyst: T. Bosch

Instrument:

Status: WP

HBN: 251590



Workorder: 1931243 [ENV_LVL4]

Workorder: 1931587 [ENV_LVL4]

Workorder: 1931589 [ENV_LVL4]

Workorder: 1931592 [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	683376	CCV for HBN 251590 [ELMS/2315]				CCV	3		E685041C3Q	5311		11/14/2019	
2	683377	LCS for HBN 251590 [ELMS/2315]				LCS	3		E6850Q413Q	5311		11/14/2019	
3	683378	RLVS for HBN 251590 [ELMS/2315]				RLVS	3		E685041C3Q	5311		11/14/2019	
4	683379	ICS for HBN 251590 [ELMS/2315]				ICS	3		E6850..D3Q	5311		11/14/2019	
5	683380	LMB for HBN 251590 [ELMS/2315]				LMB	3		E6850Q413Q	5311		11/14/2019	
6	1931243001	HBW7_103119				SAMPLE	3	1931243001-A	E6850Q41.3	5480	11/28/2019	11/14/2019	
7	1931243002	HBW10_103119				SAMPLE	3	1931243002-A	E6850Q41.3	5480	11/28/2019	11/14/2019	
8	1931243003	HBW1_103119				SAMPLE	3	1931243003-A	E6850Q41.3	5480	11/28/2019	11/14/2019	
9	1931243004	HBW1_103119_a				SAMPLE	3	1931243004-A	E6850Q41.3	5480	11/28/2019	11/14/2019	
10	1931243005	GPW3_103119				SAMPLE	3	1931243005-A	E6850Q41.3	5480	11/28/2019	11/14/2019	
11	1931243006	GPW1_103119				SAMPLE	3	1931243006-A	E6850Q41.3	5480	11/28/2019	11/14/2019	
12	1931587001	LH18/24-SP140_110519				SAMPLE	3	1931587001-A	E6850Q41.3	5480	12/3/2019	11/20/2019	
13	1931589001	LH18/24-SP650_110519_AIX				SAMPLE	3	1931589001-A	E6850Q41.3	5480	12/3/2019	11/20/2019	
14	1931592001	LH18/24-SP650_110519				SAMPLE	3	1931592001-A	E6850Q41.3	5480	12/3/2019	11/20/2019	
15	683381	LH18/24-SP650...(1931592001MS)				MS	3		E6850Q413Q	5311		11/14/2019	
16	683382	LH18/24-SP65...(1931592001MSD)				MSD	3		E6850Q413Q	5311		11/14/2019	
17	683383	CCV for HBN 251590 [ELMS/2315]				CCV	3		E685041C3Q	5311		11/14/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-upALS Work Order #'s & Sample #()'s: 1931243 (001-06); 1931587 (001); 1931589 (001); 1931592 (001)ELMS Batch/HBN ID: 2315 (251590)Prep Date: 11/11/2019 Analysis Date: 11/11/2019 Analyst: Tom BoschAnalyte: **Perchlorate** Matrix: **Water** Method: **6850**Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\NOV\11NOV19D.sReported 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: 7 Injection Volume: 30µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1 Run time: 12.0min.

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 3.0µL of QC Solution Horizon ID 47516 was used for LCS 683377; Target = 3.0µg/L. ASTM type II water was used for LMB 683380.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on sample 1931592001 (Client ID's: LH18/24-SP650_110519. 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 1931587001 was analyzed and reported from 1:1,000 dilution. The reporting limit has 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\251590-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 683378) is reported from the analysis of the Laboratory Control Sample (LCS – 683377) 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).

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	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS: 2315 HBN: 251590</u>		
Sample Set IDs if Applicable: <u>1931243/1931587/1931589/1931592</u>		
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



AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO₄)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: Refer to SDS for complete safety information

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



Signal Word: None

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



Certificate of Analysis



ISO Guide 34 Reference Material

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



S

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

Product Name: Perchlorate IC Standard

Description:

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

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

Solvent: water (low TOC, < 50 ppb)

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

Traceability:

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

Estimation of Uncertainties:

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

Homogeneity:

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

Intended Use:

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

Instructions for Use:

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

Hazards:

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

Expiration of Certification:

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



ISO 9001 Registered Quality System – TUV USA

Page 1 of 2



Certificate of Analysis



ISO Guide 34 Reference Material

Product Number: ICC-013 Lot Issue Date: 29-Feb 2016
 Lot Number: CP-0860 Expiration Date: 31-Mar 2020

Maintenance of Certification:

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

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

Daniel J. Lamendola
Director of QA/RA



ISO 9001 Registered Quality System – TUV USA

Page 2 of 2



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis



Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDIH-016

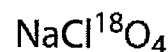
Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

MW*: 130.44
* For isotopically labeled compounds, MW listed is for the fully enriched product.

Labeled CAS Number: NA



Unlabeled CAS Number: 7601-89-0

Chemical Formula: NaCl^*O_4

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated. CIL Certificates of Analysis are occasionally updated with new data following recertification. We recommend checking the website for the latest version.

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

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

Approved by: Sashi Sivendran-Basak

Sashi Sivendran-Basak, Ph.D., Quality Review

Quality Control Tests and Results

QC Release Date	12/05/2018
Expiration Date	12/05/2028
Concentration Based on Gravimetry	100.0 \pm 1.0 $\mu\text{g/mL}$ (k=2)
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	105.4 \pm 1.1 $\mu\text{g/mL}$ (k=2)

CIL subscribes to the following standards for different products: ISO Guide 34, ISO/IEC 17025, ISO 13485 and cGMP as appropriate.



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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	
*	683376	CCV@25	Vial 71	1	Control	1	1.41625e6	7.617	25.90411
*	683377	QC@3.0	Vial 72	1	Control	2	1.84151e5	7.616	2.86887
*	683379	ICS@3.0	Vial 73	1	Control	3	1.51199e5	7.437	2.85555
*	683380	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1931243001		Vial 75	1	Sample	5	1.09434e5	7.550	1.63920
*	1931243002		Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	1931243003		Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	1931243004		Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1931243005		Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1931243006		Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1931587001	1K	Vial 81	1	Sample	11	5.18902e5	7.709	1.01804e4
*	1931589001		Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1931592001		Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	683381	315921S	Vial 84	1	Sample	14	1.43683e5	7.355	2.82421
*	683382	315921D	Vial 85	1	Sample	15	1.36416e5	7.340	2.91526
*	683383	CCV@25	Vial 71	1	Control	16	1.53592e6	7.637	25.74431

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
*	683376	CCV@25	Vial 71	1	Control	1	1.86117e5	7.636	5.00000
*	683377	QC@3.0	Vial 72	1	Control	2	2.36033e5	7.647	5.00000
*	683379	ICS@3.0	Vial 73	1	Control	3	1.94687e5	7.462	5.00000
*	683380	LMB	Vial 74	1	Control	4	2.14662e5	7.652	5.00000
*	1931243001		Vial 75	1	Sample	5	2.41744e5	7.595	5.00000
*	1931243002		Vial 76	1	Sample	6	1.99280e5	7.575	5.00000
*	1931243003		Vial 77	1	Sample	7	2.45933e5	7.602	5.00000
*	1931243004		Vial 78	1	Sample	8	2.77014e5	7.613	5.00000
*	1931243005		Vial 79	1	Sample	9	2.06933e5	7.675	5.00000
*	1931243006		Vial 80	1	Sample	10	2.08438e5	7.663	5.00000
*	1931587001	1K	Vial 81	1	Sample	11	1.84987e5	7.729	5000.00000
*	1931589001		Vial 82	1	Sample	12	1.79883e5	7.433	5.00000
*	1931592001		Vial 83	1	Sample	13	1.60081e5	7.390	5.00000
*	683381	315921S	Vial 84	1	Sample	14	1.87030e5	7.399	5.00000
*	683382	315921D	Vial 85	1	Sample	15	1.72107e5	7.365	5.00000
*	683383	CCV@25	Vial 71	1	Control	16	2.03231e5	7.654	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
*	683376	CCV@25	Vial 71	1	Control	1	4.27538e5	7.631	25.67562
*	683377	QC@3.0	Vial 72	1	Control	2	6.18317e4	7.616	3.07140
*	683379	ICS@3.0	Vial 73	1	Control	3	5.17735e4	7.459	3.11978
*	683380	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1931243001		Vial 75	1	Sample	5	3.24669e4	7.610	1.50458
*	1931243002		Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	1931243003		Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	1931243004		Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1931243005		Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1931243006		Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1931587001	1K	Vial 81	1	Sample	11	1.55449e5	7.734	9919.43518
*	1931589001		Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1931592001		Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	683381	315921S	Vial 84	1	Sample	14	5.09993e4	7.390	3.20197
*	683382	315921D	Vial 85	1	Sample	15	4.84316e4	7.346	3.30816
*	683383	CCV@25	Vial 71	1	Control	16	4.72008e5	7.655	25.93427

Sequence Table:

Method and Injection Info Part:

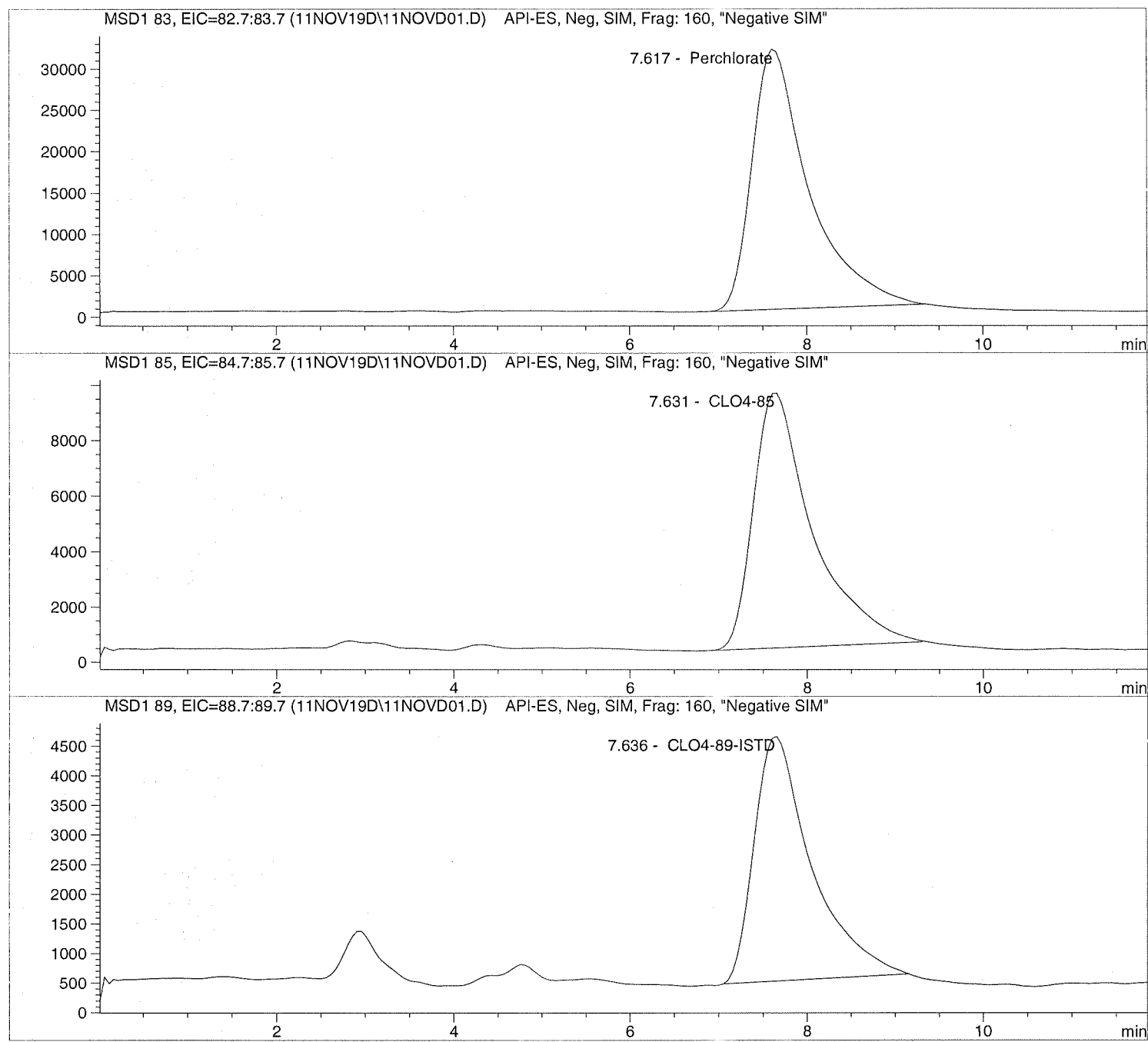
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	683376	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	683377	QC@3.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	683379	ICS@3.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	683380	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1931243001		CLO4-AQN	1	Sample	
6	Vial 76	1931243002		CLO4-AQN	1	Sample	
7	Vial 77	1931243003		CLO4-AQN	1	Sample	
8	Vial 78	1931243004		CLO4-AQN	1	Sample	
9	Vial 79	1931243005		CLO4-AQN	1	Sample	
10	Vial 80	1931243006		CLO4-AQN	1	Sample	
11	Vial 81	1931587001	1K	CLO4-AQN	1	Sample	
12	Vial 82	1931589001		CLO4-AQN	1	Sample	
13	Vial 83	1931592001		CLO4-AQN	1	Sample	
14	Vial 84	683381	315921S	CLO4-AQN	1	Sample	
15	Vial 85	683382	315921D	CLO4-AQN	1	Sample	
16	Vial 71	683383	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD01.D Sample Name: 683376 CCV@25

=====
Injection Date: 11/11/2019 09:12:09 Seq Line: 1
Sample Name: 683376 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\11NOV19D\11NOVD01.D Sample Name: 683376 CCV@25

```

=====
Injection Date: 11/11/2019 09:12:09      Seq Line:          1
Sample Name:   683376   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
7.617	PBA	1416249.7	25.9041	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.631	PBA	427538.1	25.6756	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.636	PBA	186117.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD02.D

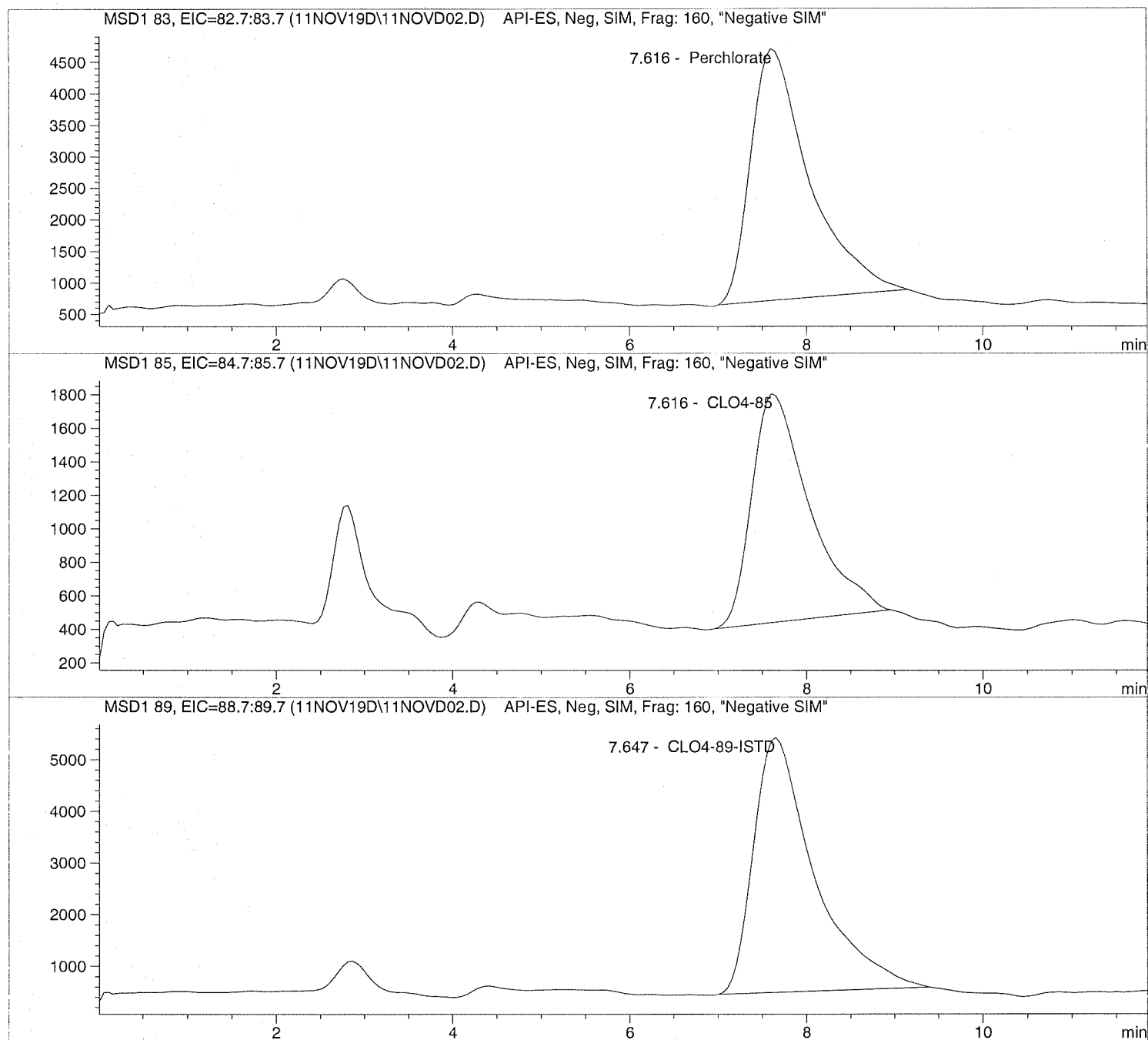
Sample Name: 683377 QC@3.0

Injection Date: 11/11/2019 09:27:09
Sample Name: 683377 QC@3.0
Acq Operator: TNB

Seq Line: 2
Location: Vial 72
Inj. No.: 1
Inj. Vol.: 30 μ l

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\11NOV19D\11NOVD02.D Sample Name: 683377 QC@3.0

```

=====
Injection Date: 11/11/2019 09:27:09      Seq Line:      2
Sample Name:   683377 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
7.616	PBA	184151.3	2.8689	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.616	PBA	61831.7	3.0714	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.647	PBA	236032.8	5.0000	CLO4-89-ISTD

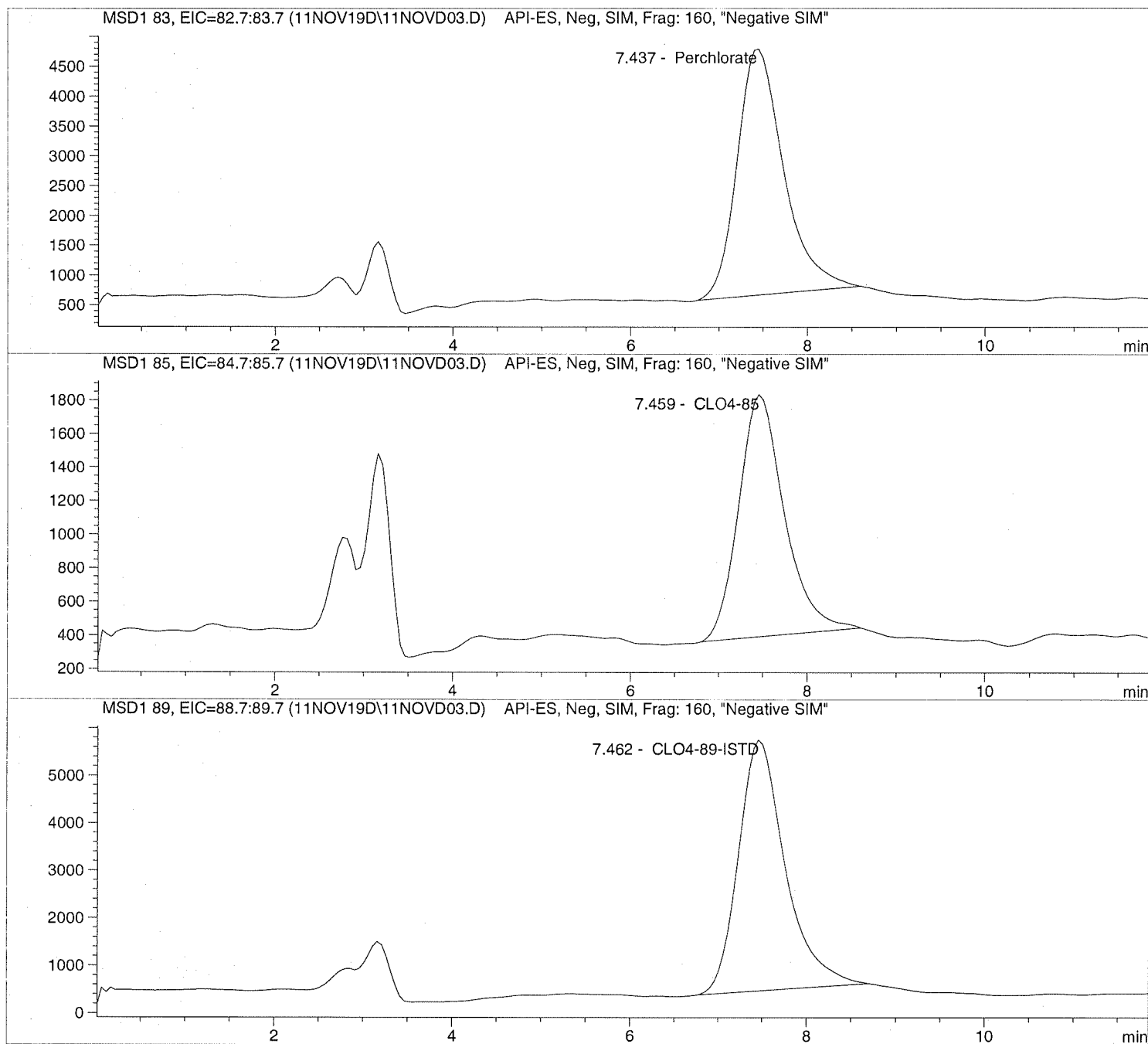
=====
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD03.D Sample Name: 683379 ICS@3.0

=====
Injection Date: 11/11/2019 09:40:56 Seq Line: 3
Sample Name: 683379 ICS@3.0 Location: Vial 73
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 μ l

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\11NOV19D\11NOVD03.D Sample Name: 683379 ICS@3.0

```

=====
Injection Date: 11/11/2019 09:40:56      Seq Line:          3
Sample Name:    683379 ICS@3.0          Location:          Vial 73
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:        30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   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
7.437	PBA	151199.3	2.8556	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.459	PBA	51773.5	3.1198	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.462	PBA	194687.2	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD04.D

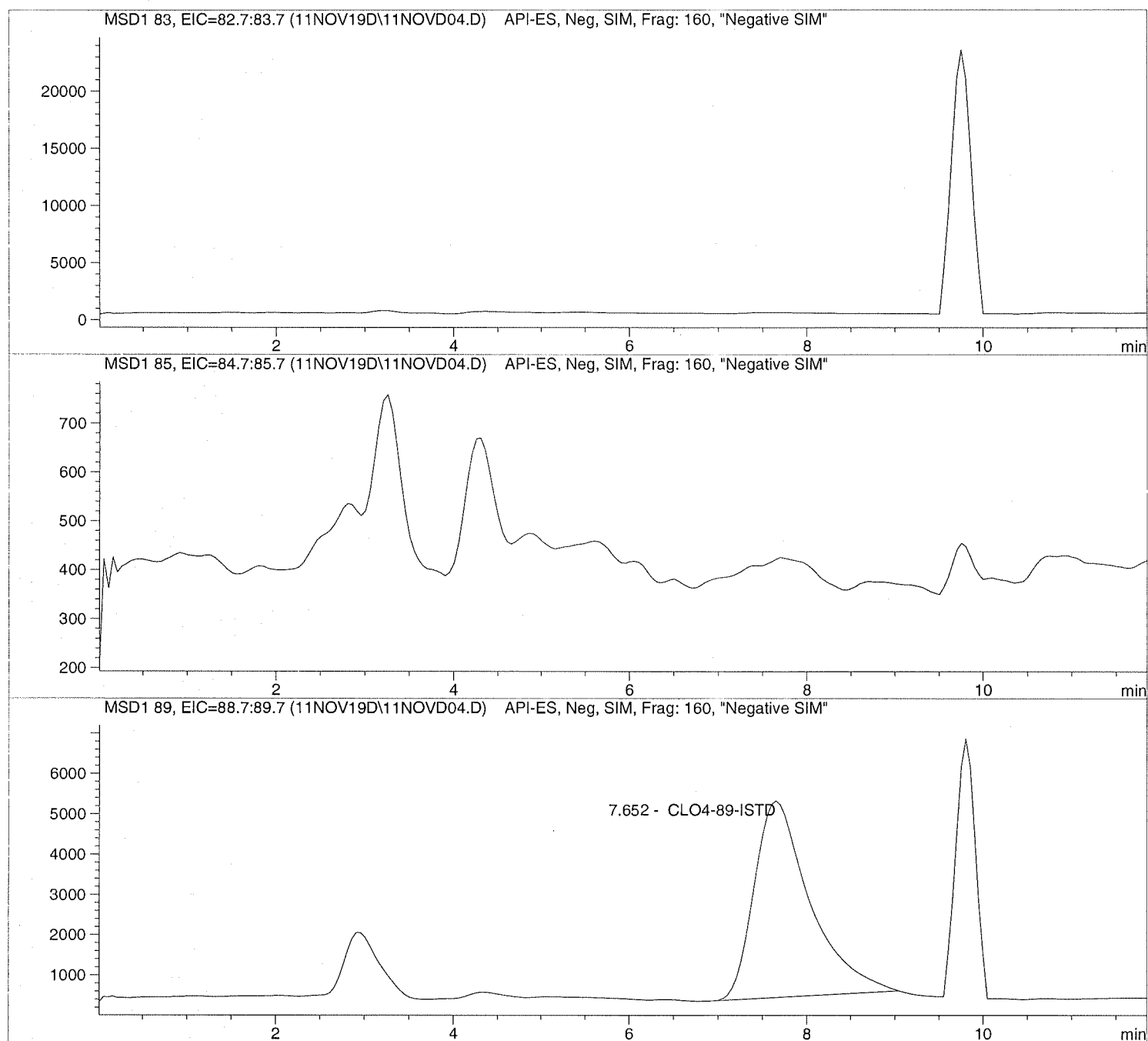
Sample Name: 683380 LMB

Injection Date: 11/11/2019 09:54:51
Sample Name: 683380 LMB
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
Inj. No.: 1
Inj. Vol.: 30 μ l

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\11NOV19D\11NOVD04.D Sample Name: 683380 LMB

```

=====
Injection Date: 11/11/2019 09:54:51      Seq Line: 4
Sample Name: 683380 LMB                  Location: Vial 74
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 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
7.652	PBA	214661.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD05.D

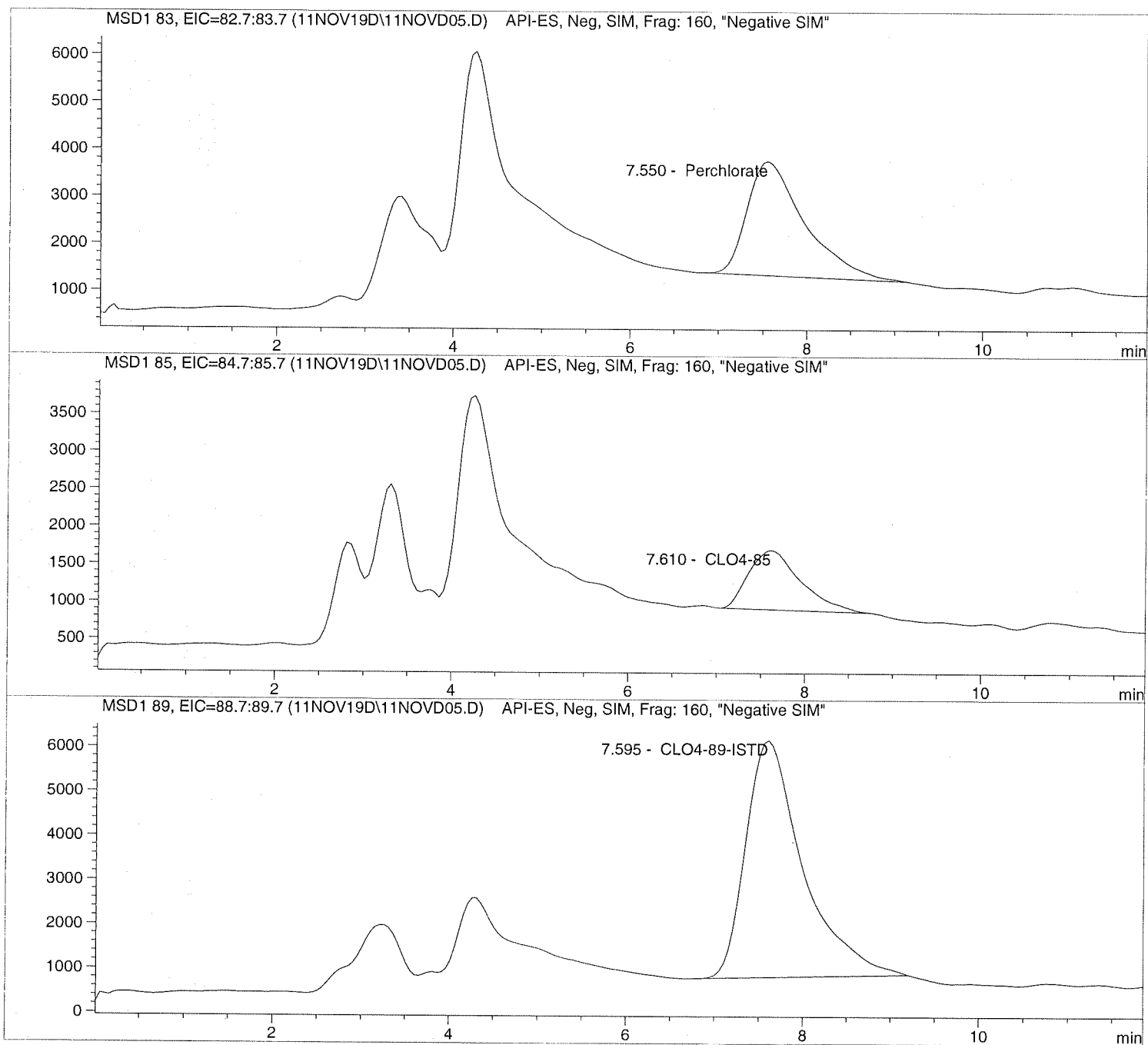
Sample Name: 1931243001

Injection Date: 11/11/2019 10:08:37
Sample Name: 1931243001
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 30 μ l

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\11NOV19D\11NOVD05.D Sample Name: 1931243001

```

=====
Injection Date: 11/11/2019 10:08:37      Seq Line:          5
Sample Name:    1931243001                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:   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
7.550	PBA	109434.2	1.6392	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.610	PBA	32466.9	1.5046	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.595	PBA	241743.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***

```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD06.D

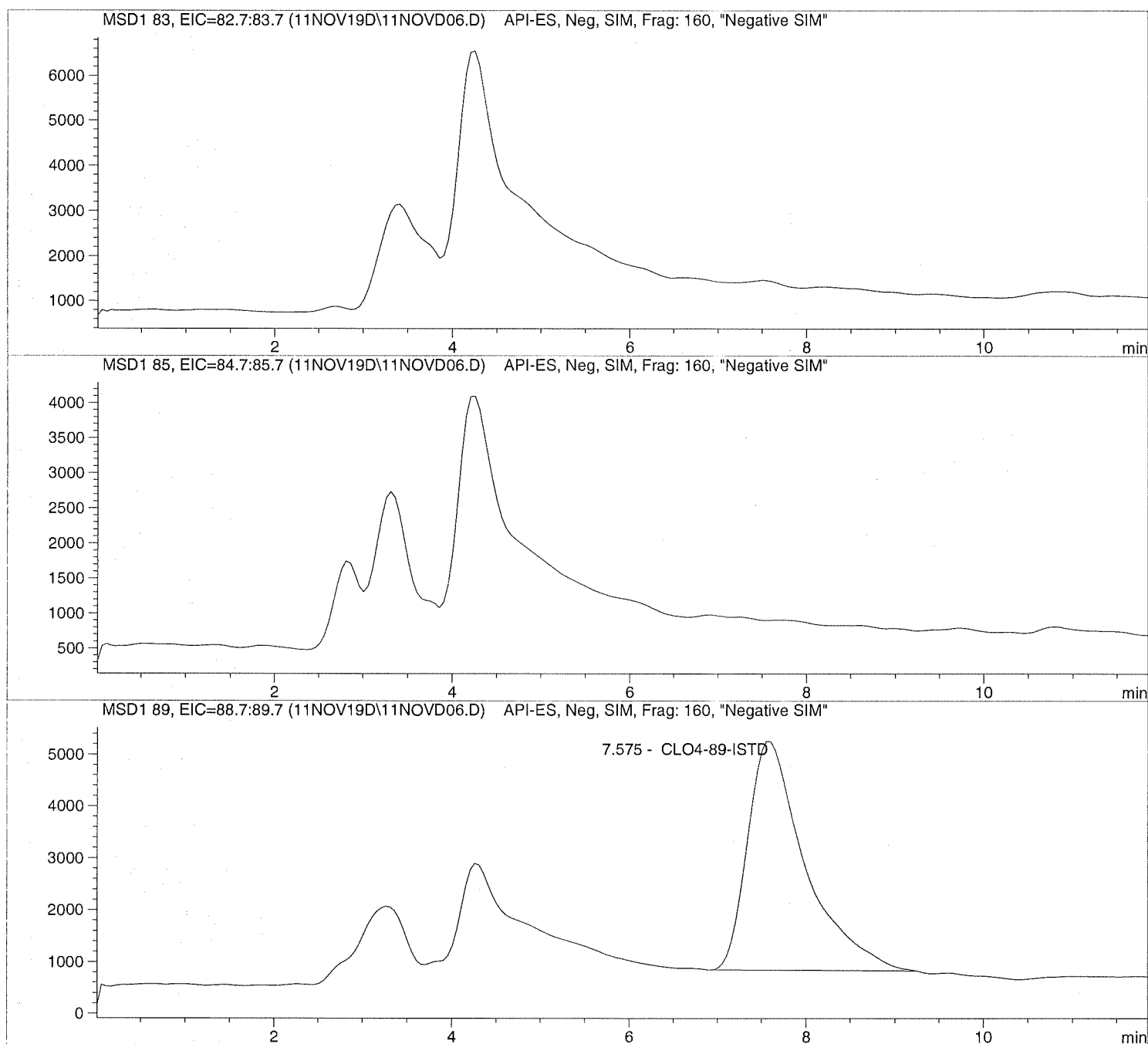
Sample Name: 1931243002

Injection Date: 11/11/2019 10:22:24
Sample Name: 1931243002
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
Inj. No.: 1
Inj. Vol.: 30 μ l

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\11NOV19D\11NOVD06.D

Sample Name: 1931243002

```

=====
Injection Date: 11/11/2019 10:22:24      Seq Line: 6
Sample Name: 1931243002                  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: 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
7.575	PBA	199279.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD07.D

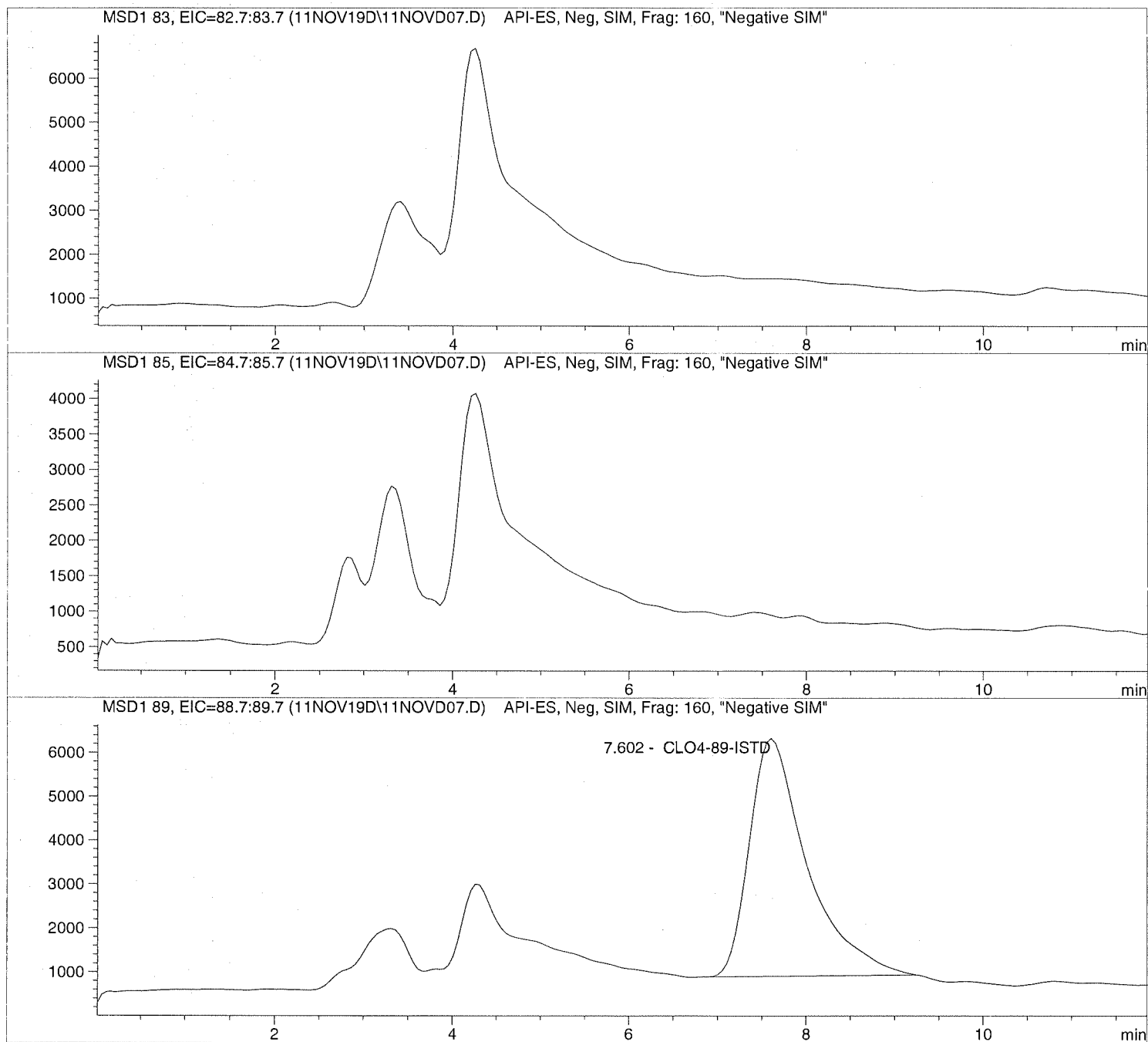
Sample Name: 1931243003

Injection Date: 11/11/2019 10:36:16
Sample Name: 1931243003
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 30 μ l

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\11NOV19D\11NOVD07.D Sample Name: 1931243003

```

=====
Injection Date: 11/11/2019 10:36:16      Seq Line:          7
Sample Name:    1931243003                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:   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
7.602	PBA	245933.3	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD08.D

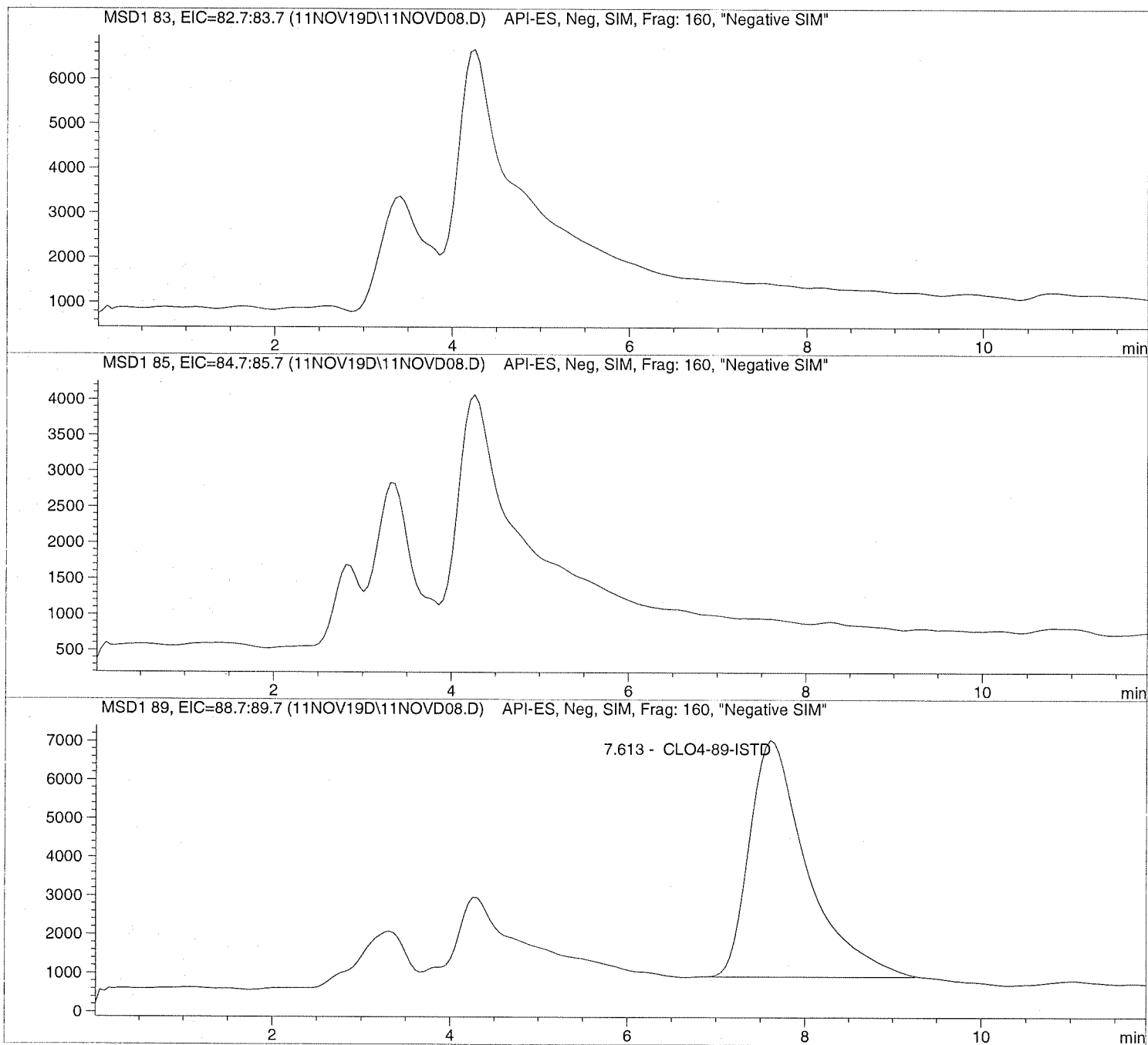
Sample Name: 1931243004

Injection Date: 11/11/2019 10:50:03
Sample Name: 1931243004
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 30 μ l

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\11NOV19D\11NOVD08.D Sample Name: 1931243004

```

=====
Injection Date: 11/11/2019 10:50:03      Seq Line:      8
Sample Name:   1931243004                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:  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
7.613	PBA	277013.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD09.D

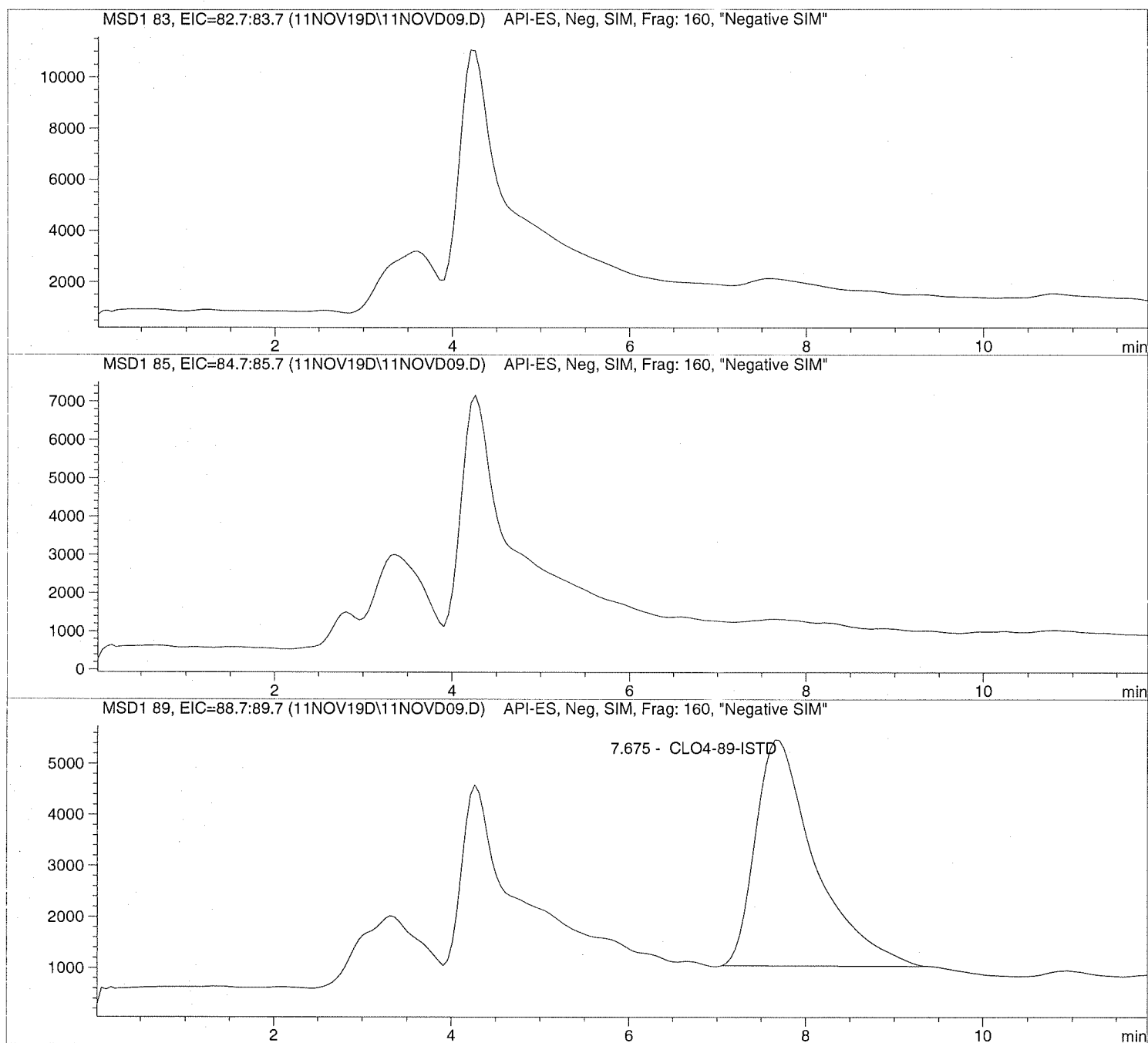
Sample Name: 1931243005

Injection Date: 11/11/2019 11:03:50
Sample Name: 1931243005
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
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\11NOV19D\11NOVD09.D

Sample Name: 1931243005

```

=====
Injection Date: 11/11/2019 11:03:50      Seq Line:          9
Sample Name:   1931243005                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:  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
7.675	PBA	206932.9	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD10.D

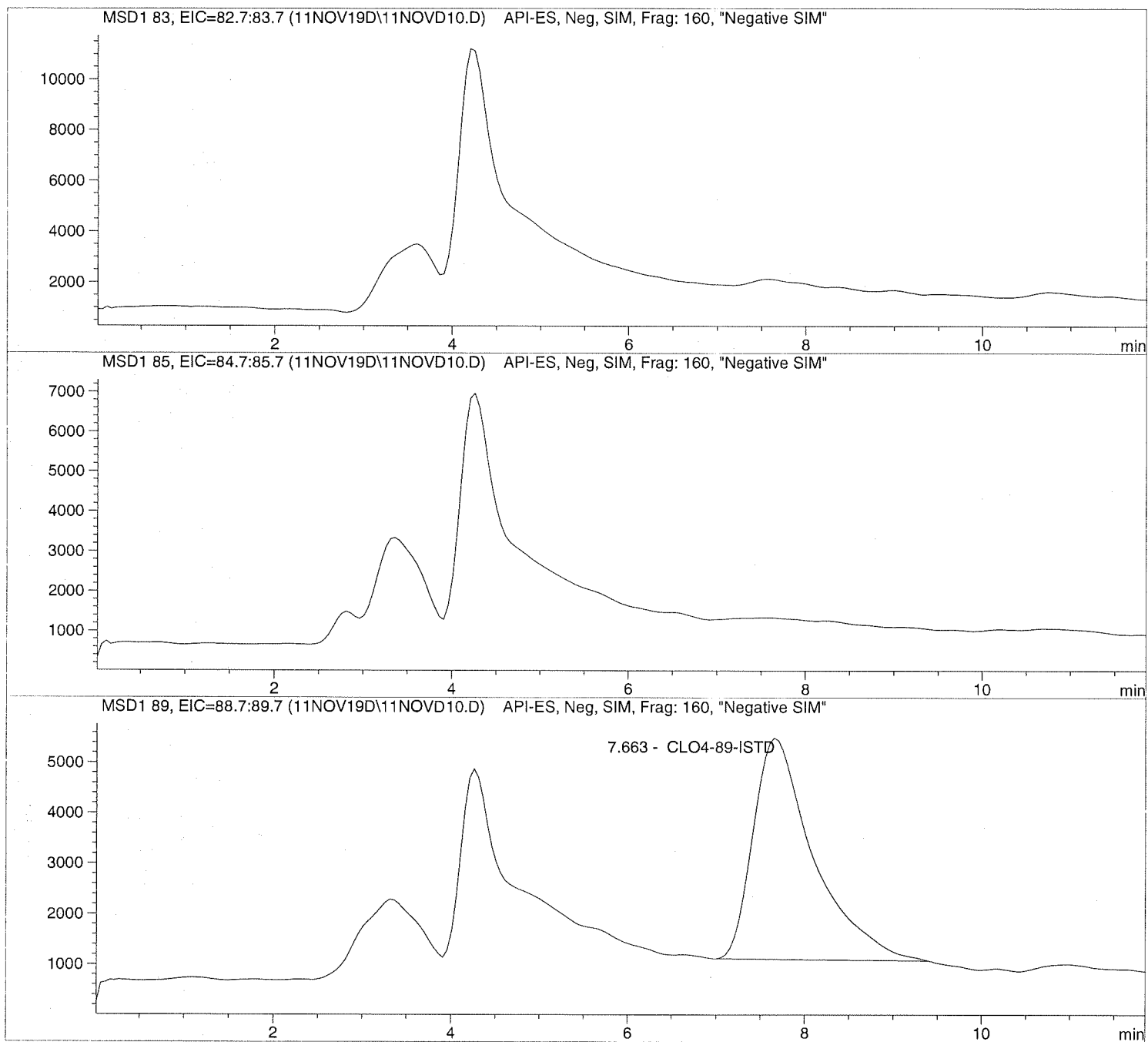
Sample Name: 1931243006

Injection Date: 11/11/2019 11:17:41
Sample Name: 1931243006
Acq Operator: TNB

Seq Line: 10
Location: Vial 80
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\11NOV19D\11NOVD10.D

Sample Name: 1931243006

```

=====
Injection Date: 11/11/2019 11:17:41      Seq Line:      10
Sample Name:    1931243006                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:   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
7.663	PBA	208438.4	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

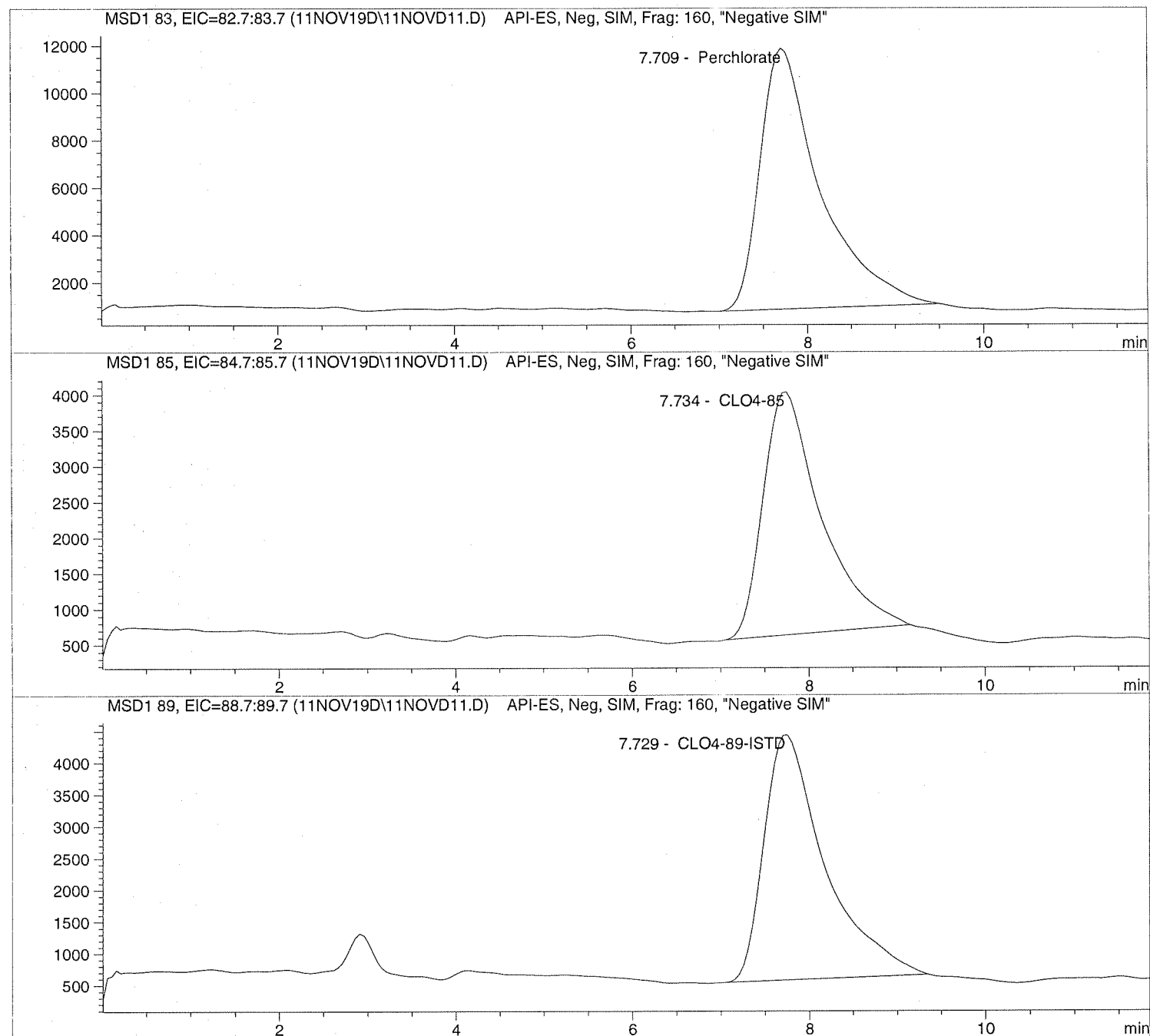
```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD11.D Sample Name: 1931587001 1K

=====
Injection Date: 11/11/2019 11:31:27 Seq Line: 11
Sample Name: 1931587001 1K Location: Vial 81
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

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

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD11.D Sample Name: 1931587001 1K

```

=====
Injection Date: 11/11/2019 11:31:27      Seq Line:      11
Sample Name:   1931587001 1K             Location:      Vial 81
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  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
7.709	PBA	518901.9	10180.4025	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.734	PBA	155448.7	9919.4352	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.729	PBA	184987.1	5000.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD12.D

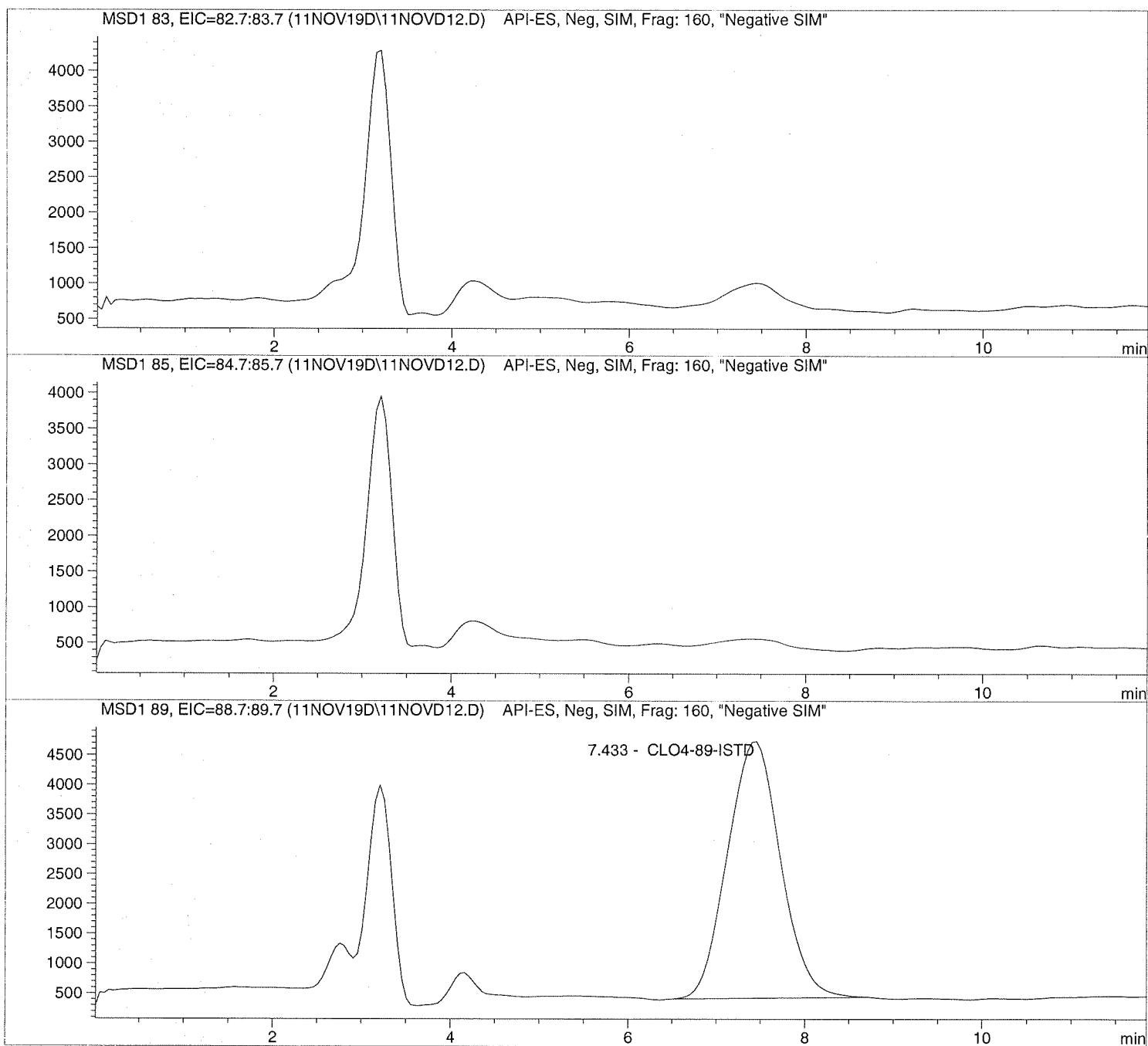
Sample Name: 1931589001

=====
Injection Date: 11/11/2019 11:45:10
Sample Name: 1931589001
Acq Operator: TNB

Seq Line: 12
Location: Vial 82
Inj. No.: 1
Inj. Vol.: 30 μ l

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\11NOV19D\11NOVD12.D

Sample Name: 1931589001

```

=====
Injection Date: 11/11/2019 11:45:10      Seq Line:          12
Sample Name:    1931589001                Location:          Vial 82
Acq Operator:   TNB                        Inj. No.:         1
                                           Inj. Vol.:       30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   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
7.433	PBA	179882.8	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD13.D

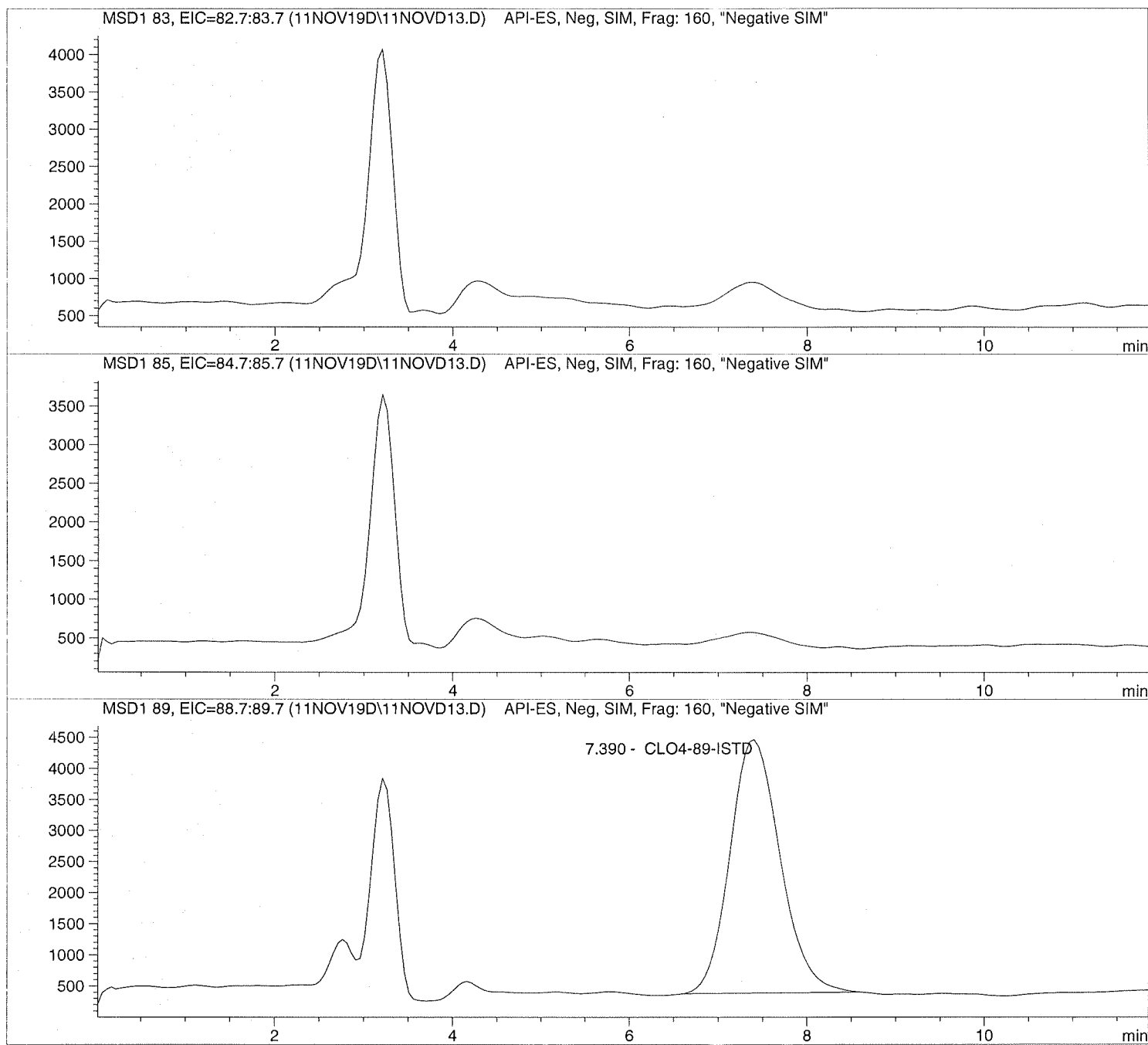
Sample Name: 1931592001

=====
Injection Date: 11/11/2019 11:58:58
Sample Name: 1931592001
Acq Operator: TNB

=====
Seq Line: 13
Location: Vial 83
Inj. No.: 1
Inj. Vol.: 30 μ l

=====
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\11NOV19D\11NOVD13.D

Sample Name: 1931592001

```

=====
Injection Date: 11/11/2019 11:58:58      Seq Line:      13
Sample Name:    1931592001                Location:      Vial 83
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   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
7.390	PBA	160080.7	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD14.D

Sample Name: 683381 315921S

Injection Date: 11/11/2019 12:12:42

Seq Line: 14

Sample Name: 683381 315921S

Location: Vial 84

Acq Operator: TNB

Inj. No.: 1

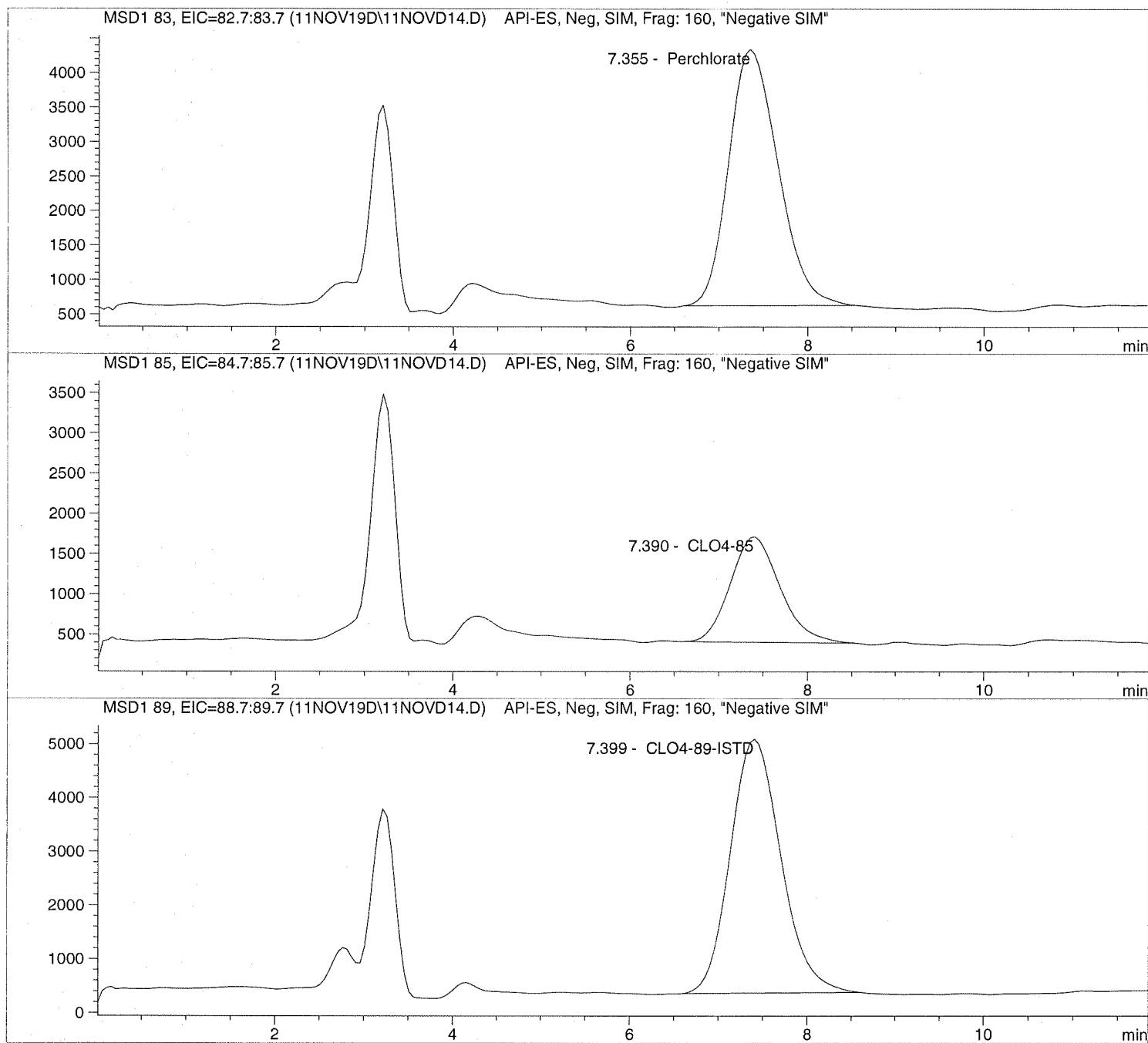
Inj. Vol.: 30 μ l

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\11NOV19D\11NOVD14.D Sample Name: 683381 315921S

```

=====
Injection Date: 11/11/2019 12:12:42      Seq Line:      14
Sample Name:    683381 315921S          Location:      Vial 84
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   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
7.355	PBA	143683.0	2.8242	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.390	PBA	50999.3	3.2020	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.399	PBA	187030.5	5.0000	CLO4-89-ISTD

```

=====
*** End of Report ***
=====

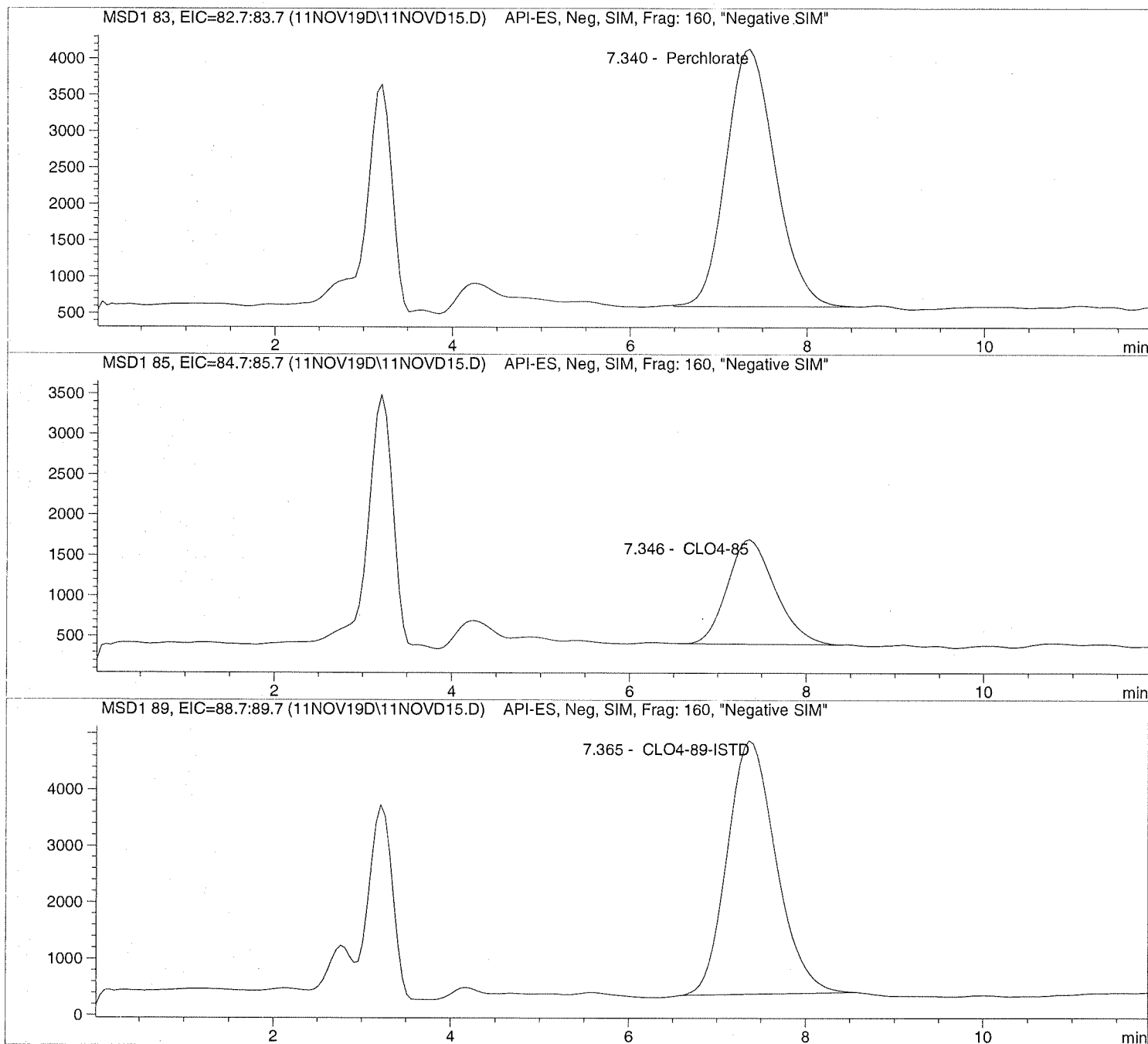
```

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD15.D Sample Name: 683382 315921D

=====
Injection Date: 11/11/2019 12:26:30 Seq Line: 15
Sample Name: 683382 315921D 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\11NOV19D\11NOVD15.D Sample Name: 683382 315921D

```

=====
Injection Date: 11/11/2019 12:26:30      Seq Line: 15
Sample Name: 683382 315921D      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
7.340	BBA	136415.9	2.9153	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.346	BBA	48431.6	3.3082	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.365	PBA	172106.9	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11NOV19D\11NOVD16.D

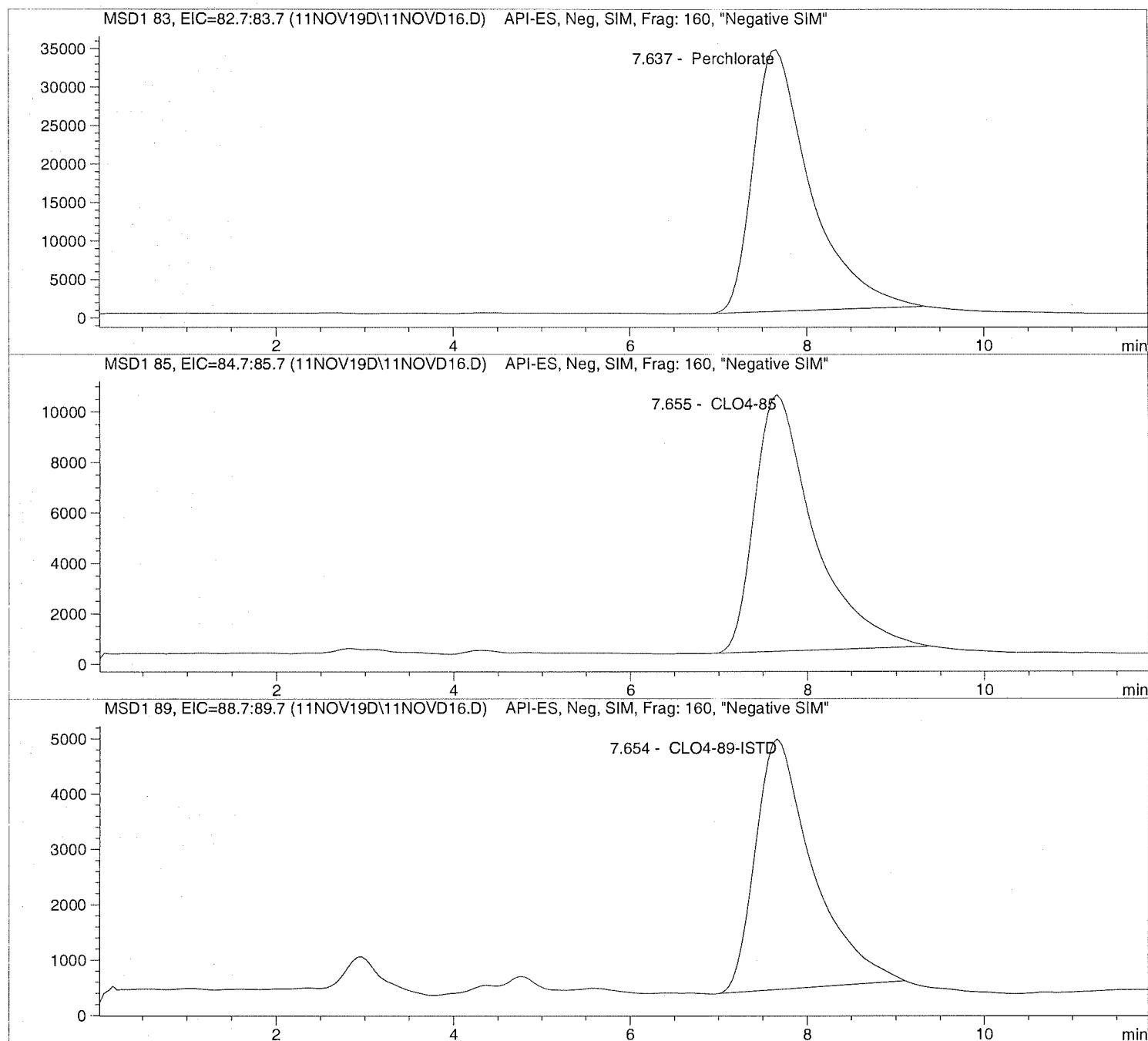
Sample Name: 683383 CCV@25

Injection Date: 11/11/2019 12:44:18
Sample Name: 683383 CCV@25
Acq Operator: TNB

Seq Line: 16
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 30 μ l

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\11NOV19D\11NOVD16.D Sample Name: 683383 CCV@25

```

=====
Injection Date: 11/11/2019 12:44:18      Seq Line: 16
Sample Name:    683383 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
7.637	PBA	1535921.6	25.7443	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.655	PBA	472007.8	25.9343	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.654	PBA	203230.7	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]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp	Name
7.750	1 3	1.00000	5.39218e4	1.85454e-5	1	Perchlorate
	4	2.00000	1.32825e5	1.50574e-5		
	5	5.00000	2.76271e5	1.80982e-5		
	6	10.00000	5.61298e5	1.78159e-5		
	7	25.00000	1.51820e6	1.64669e-5		
	8	50.00000	3.31156e6	1.50986e-5		
	9	75.00000	5.23914e6	1.43153e-5		
7.767	3 3	5.00000	2.14568e5	2.33026e-5	+I1	CLO4-89-ISTD
	4	5.00000	2.04758e5	2.44190e-5		
	5	5.00000	2.13407e5	2.34294e-5		
	6	5.00000	2.09246e5	2.38953e-5		
	7	5.00000	2.07403e5	2.41077e-5		
	8	5.00000	2.02929e5	2.46391e-5		
	9	5.00000	1.97933e5	2.52611e-5		
7.778	2 3	1.00000	1.70436e4	5.86732e-5	1	CLO4-85
	4	2.00000	4.20754e4	4.75337e-5		
	5	5.00000	9.24707e4	5.40712e-5		
	6	10.00000	1.68622e5	5.93041e-5		
	7	25.00000	4.63724e5	5.39114e-5		
	8	50.00000	9.95933e5	5.02042e-5		

Method C:\HPCHEM\1\METHODS\CLO4-DP3.M

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp Name
9		75.00000	1.58066e6	4.74484e-5	

More compound-specific settings:

Compound: Perchlorate

Time Window : From 3.581 min To 11.899 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

Compound: CLO4-89-ISTD

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

Compound: CLO4-85

Time Window : From 3.601 min To 11.913 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

```

=====
                          Peak Sum Table
=====

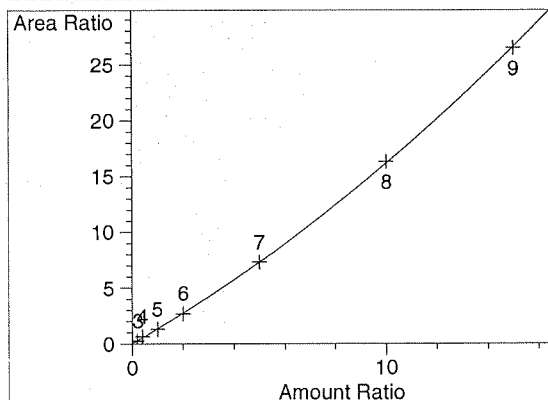
```

```

***No Entries in table***
=====

```

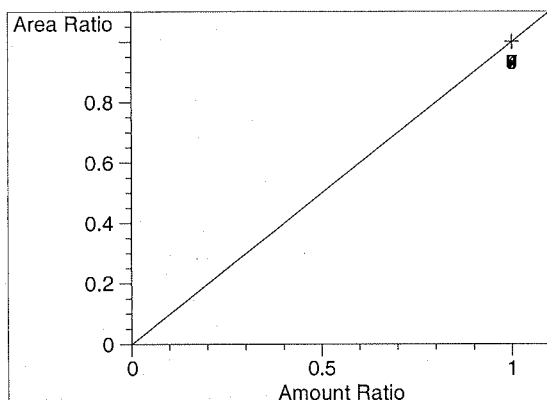

Method C:\HPCHEM\1\METHODS\CLO4-DP3.M

 =====
 Calibration Curves
 =====


Perchlorate at exp. RT: 7.750
 MSD1 83, EIC=82.7:83.7
 Correlation: 0.99975
 Residual Std. Dev.: 0.10284
 Formula: $y = ax^2 + bx + c$
 a: 3.10463e-2
 b: 1.30369
 c: 2.19496e-2
 x: Amount Ratio
 y: Area Ratio

Calibration Level Weights:

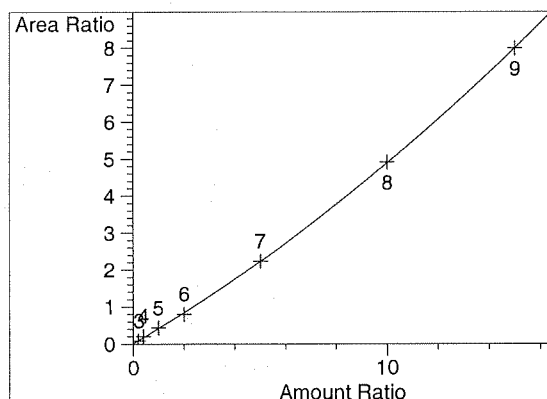
Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333



CLO4-89-ISTD at exp. RT: 7.767
 MSD1 89, EIC=88.7:89.7
 Correlation: 1.00000
 Residual Std. Dev.: 0.00000
 Formula: $y = mx + b$
 m: 1.00000
 b: 0.00000
 x: Amount Ratio
 y: Area Ratio

Calibration Level Weights:

Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1
 Level 8 : 1
 Level 9 : 1



CLO4-85 at exp. RT: 7.778
 MSD1 85, EIC=84.7:85.7
 Correlation: 0.99969
 Residual Std. Dev.: 0.02601
 Formula: $y = ax^2 + bx + c$
 a: 8.85207e-3
 b: 3.99283e-1
 c: 1.33505e-2
 x: Amount Ratio
 y: Area Ratio

Calibration Level Weights:

Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

 =====

Batch Report: C:\HPCHEM\1\DATA\20SEP19I\20SEP19D.B

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method

['*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	5.39218e4	7.750	8.75982e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.32825e5	7.797	2.37682
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.76271e5	7.770	4.77237
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	5.61298e5	7.785	9.75097
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	1.51820e6	7.741	25.01082
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	3.31156e6	7.775	50.40300
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.23914e6	7.736	74.79107
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	5.74879e5	7.756	10.11855

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.14568e5	7.767	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.04758e5	7.816	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.13407e5	7.793	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.09246e5	7.798	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.07403e5	7.763	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.02929e5	7.800	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.97933e5	7.765	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	2.06243e5	7.776	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	1.70436e4	7.778	8.24488e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.20754e4	7.805	2.38090
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	9.24707e4	7.787	5.14166
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	1.68622e5	7.781	9.52209
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	4.63724e5	7.760	25.04916
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	9.95933e5	7.793	50.14223
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.58066e6	7.758	74.93659
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	1.71000e5	7.760	9.79043

*** End of Report ***

Sequence 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

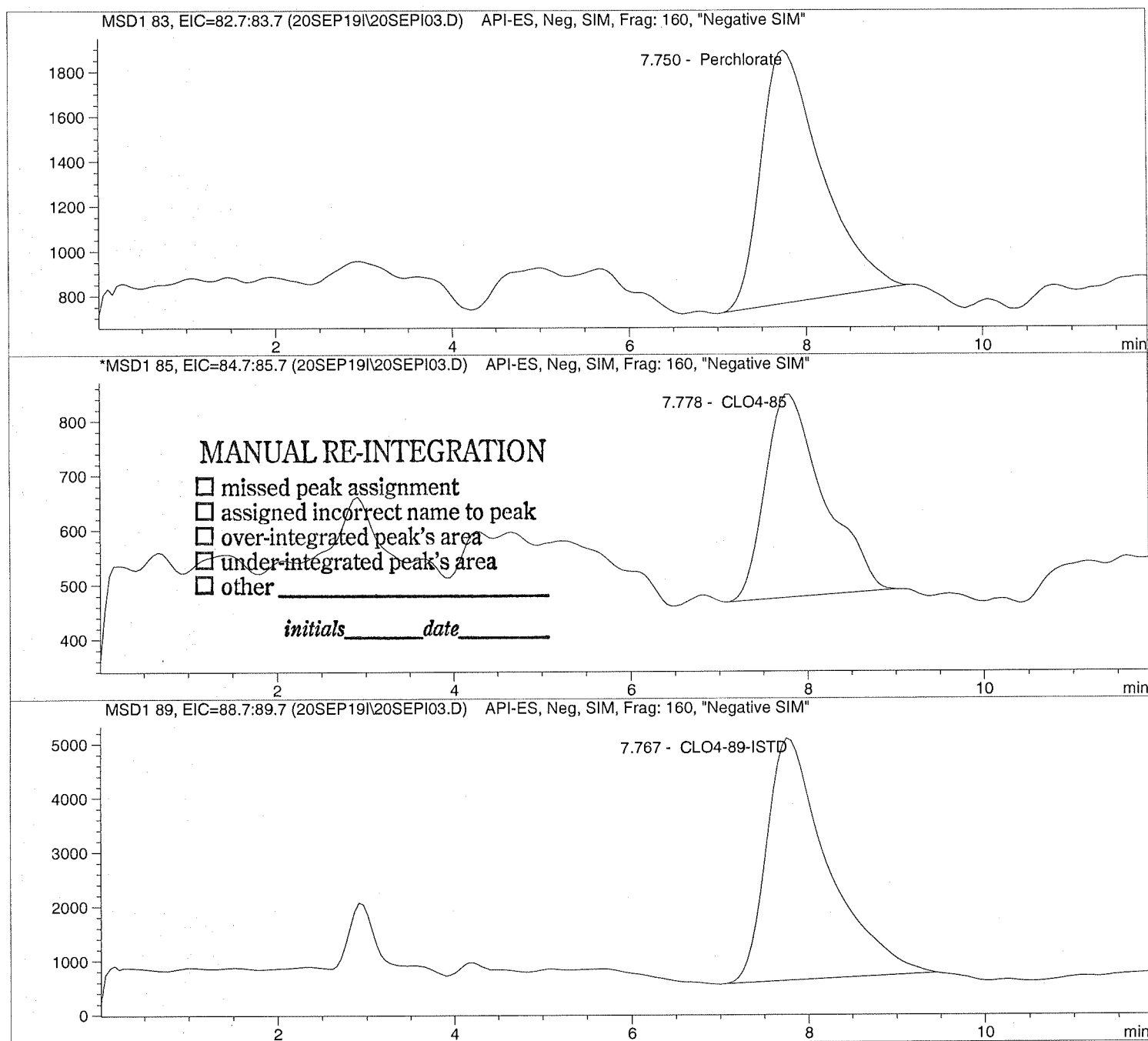
Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05
 Sample Name: CLO4@ 1.0ug/L
 Acq Operator: TNB

Seq Line: 3
 Location: Vial 73
 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

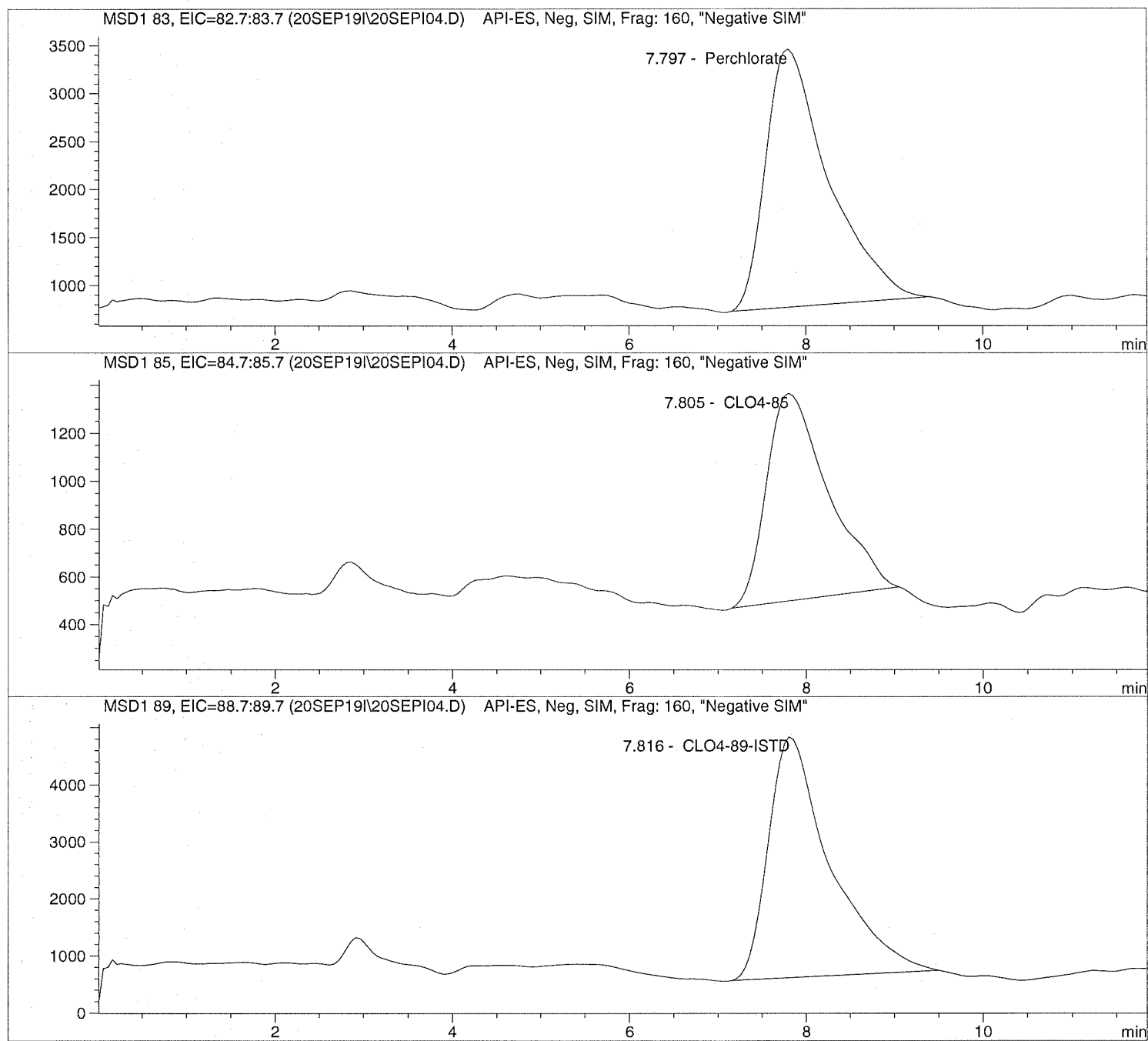
Sample Name: CLO4@ 2.0ug/L

=====
Injection Date: 9/20/2019 09:37:58
Sample Name: CLO4@ 2.0ug/L
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
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

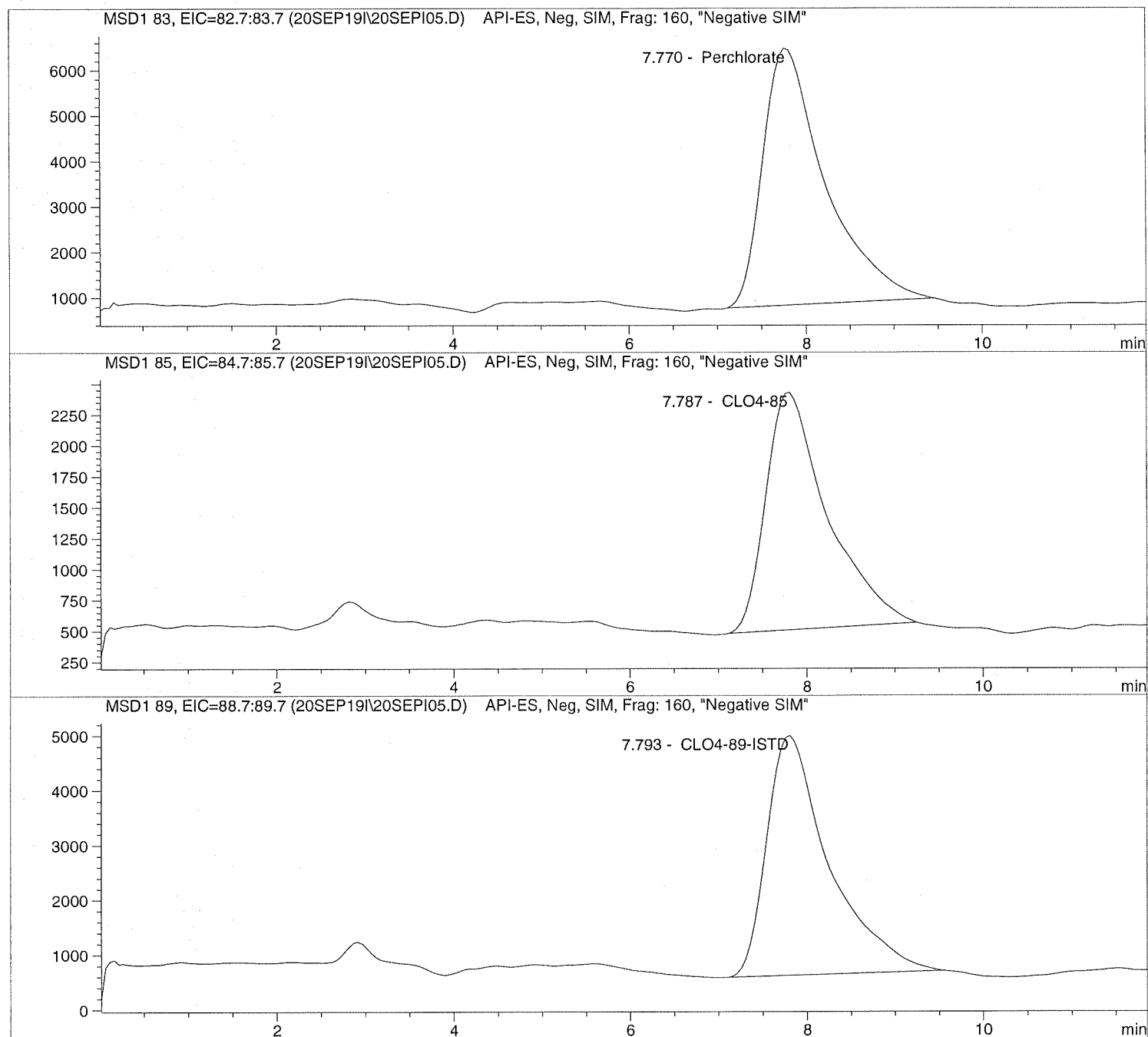
Sample Name: CLO4@ 5.0ug/L

Injection Date: 9/20/2019 09:51:49
Sample Name: CLO4@ 5.0ug/L
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
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

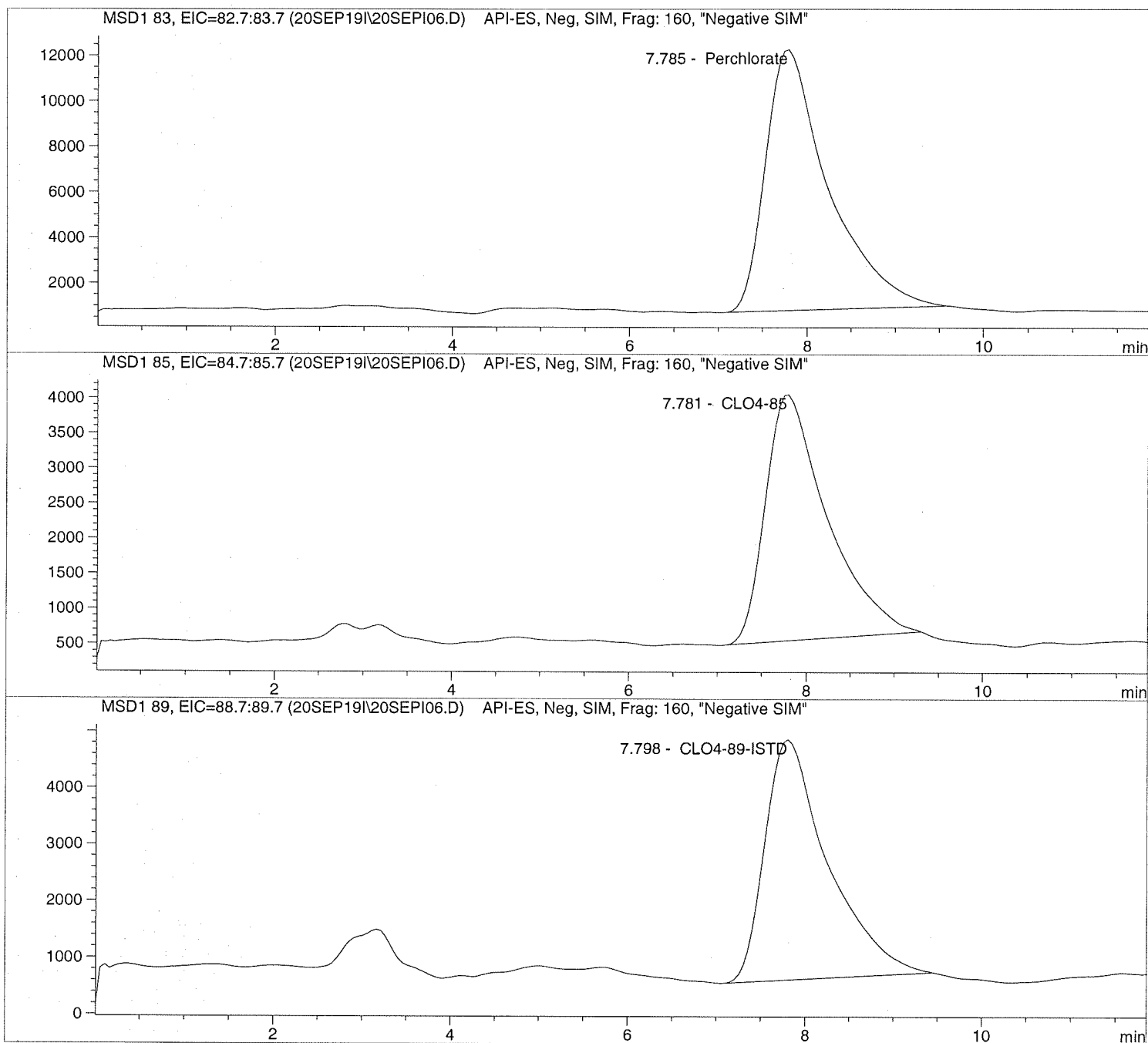
Sample Name: CLO4@ 10.ug/L

Injection Date: 9/20/2019 10:05:36
Sample Name: CLO4@ 10.ug/L
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
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

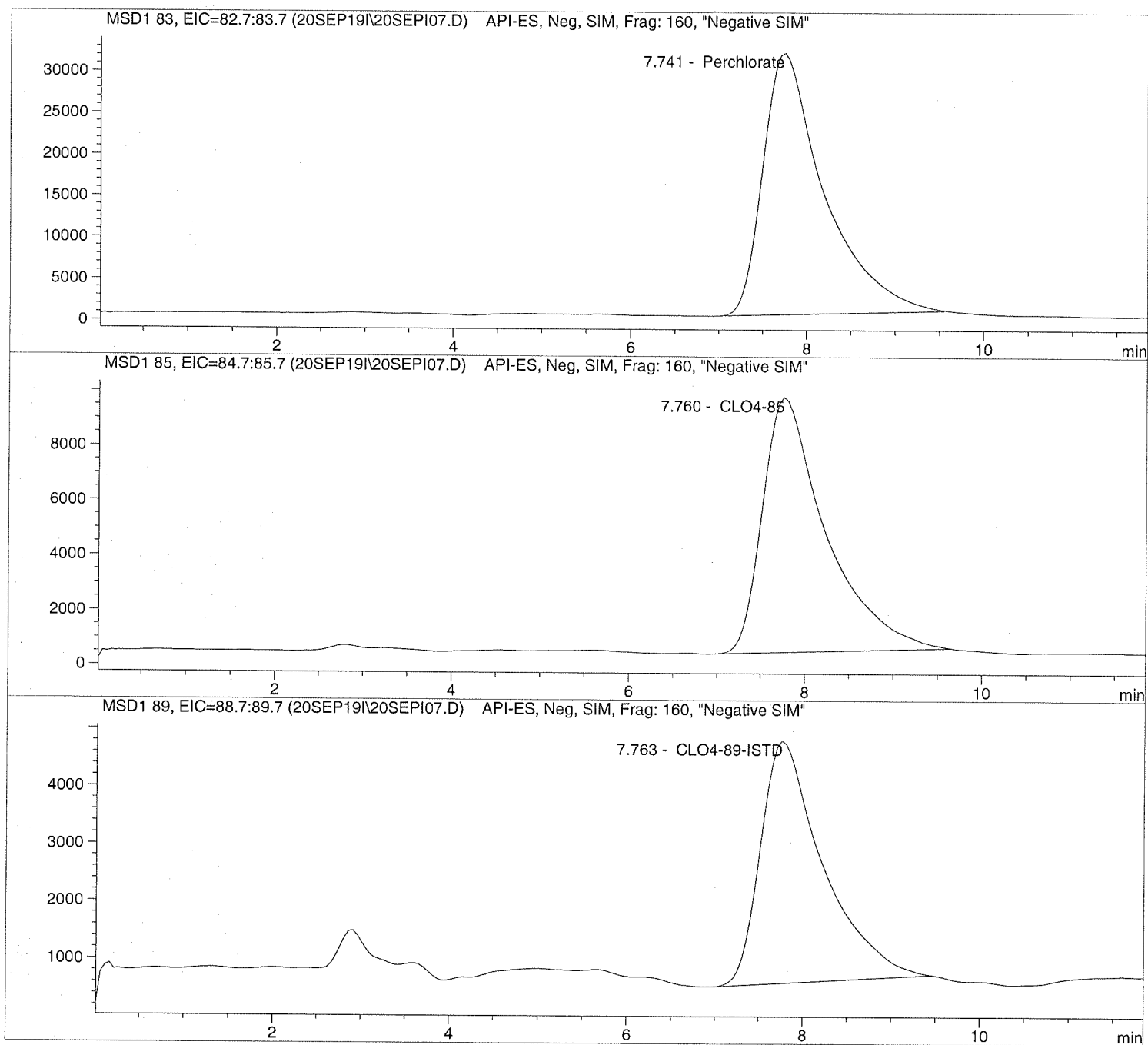
Inj. Vol.: 30 µl

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

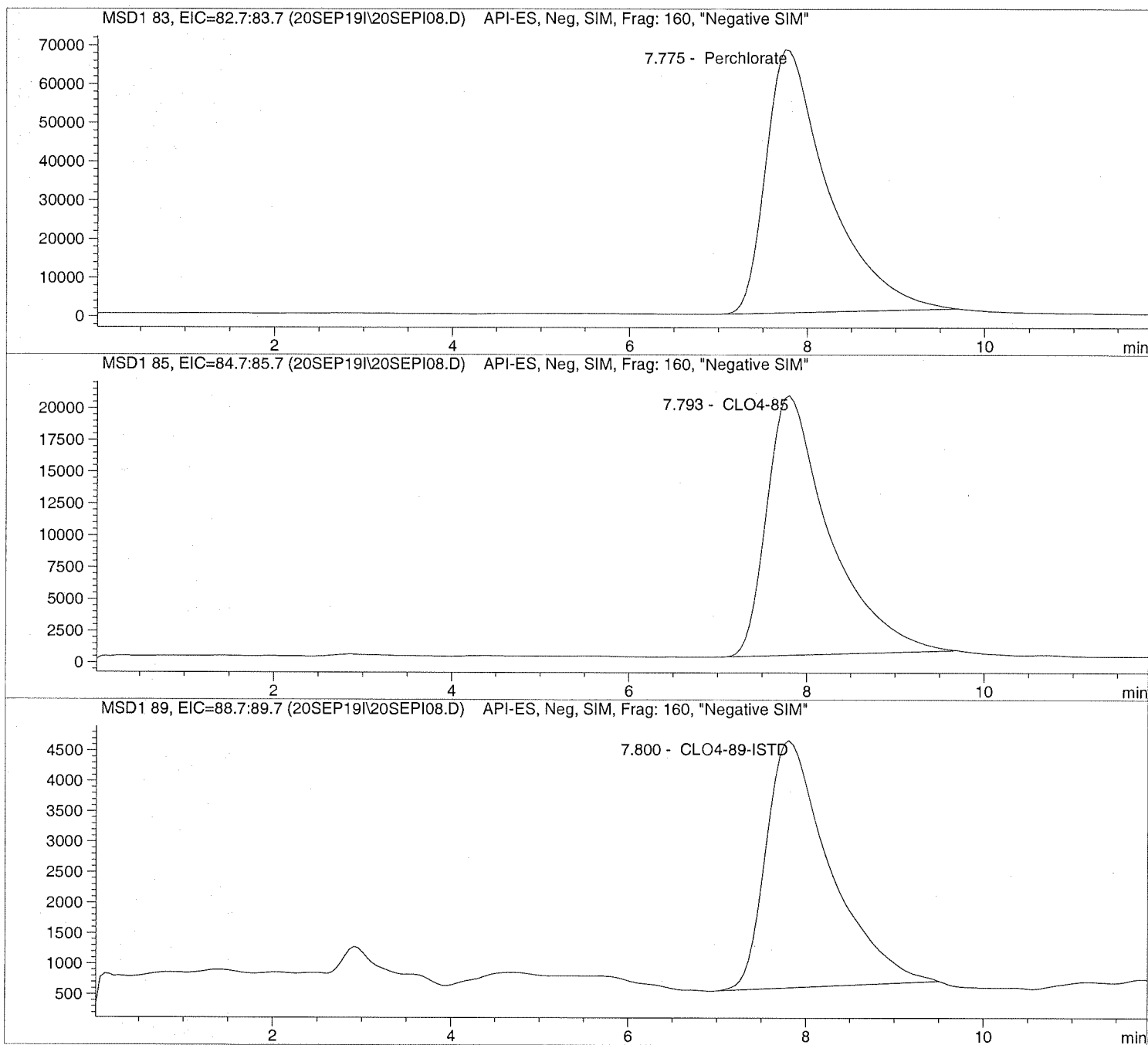
Inj. Vol.: 30 µl

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

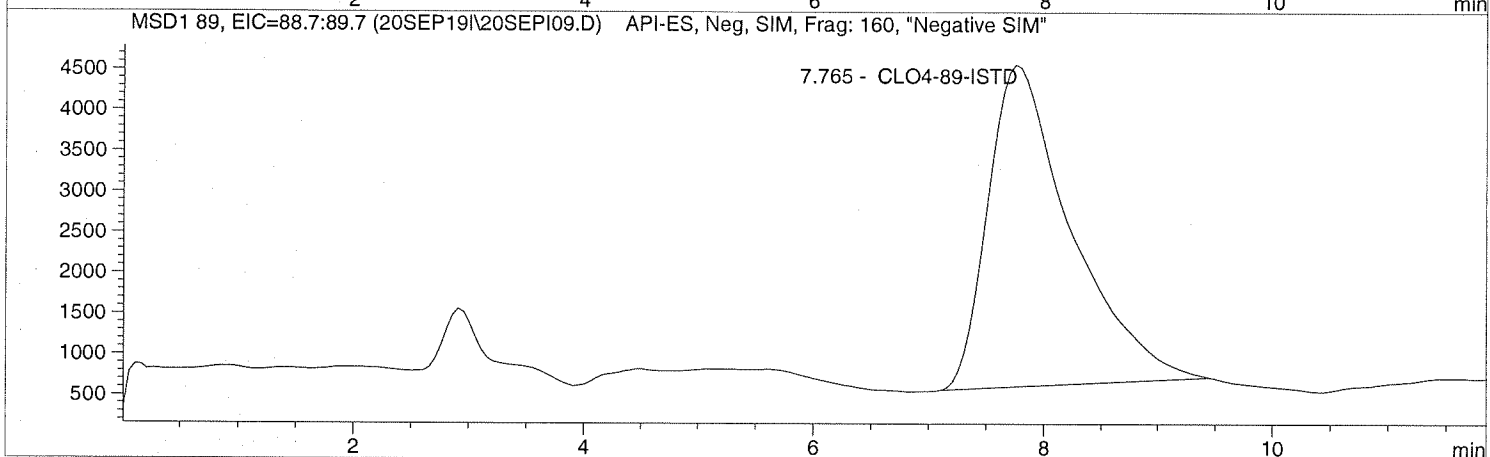
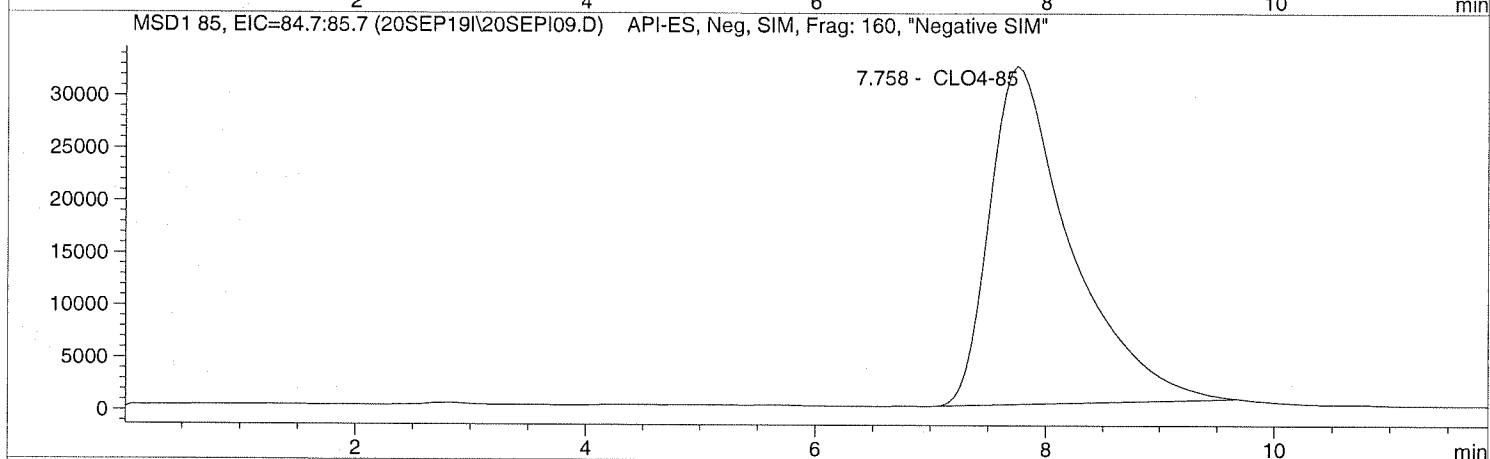
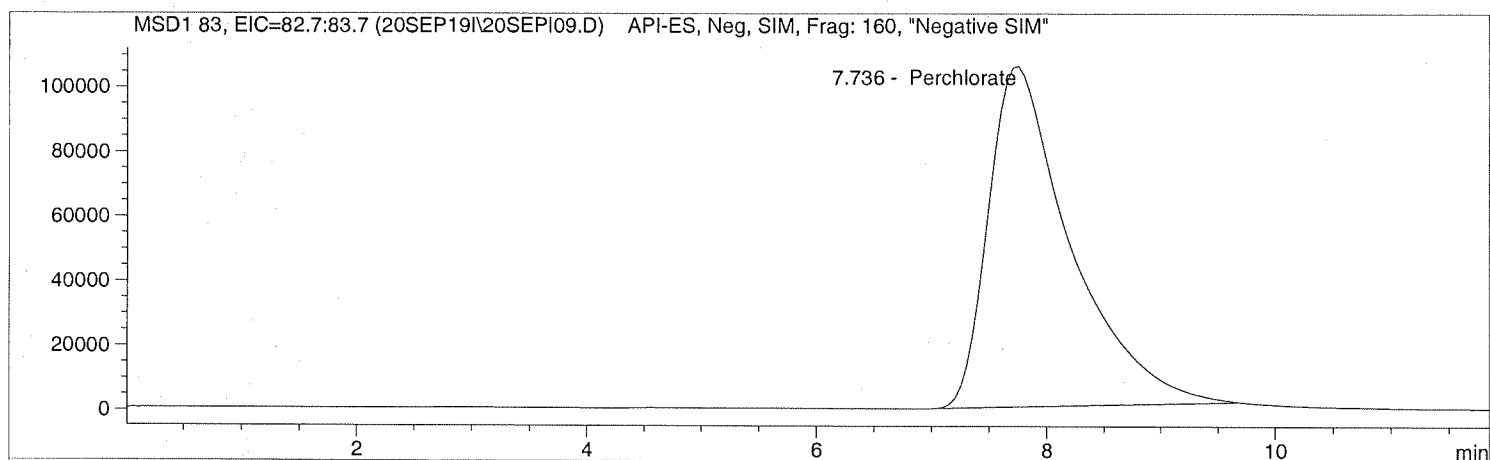
Inj. Vol.: 30 µl

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

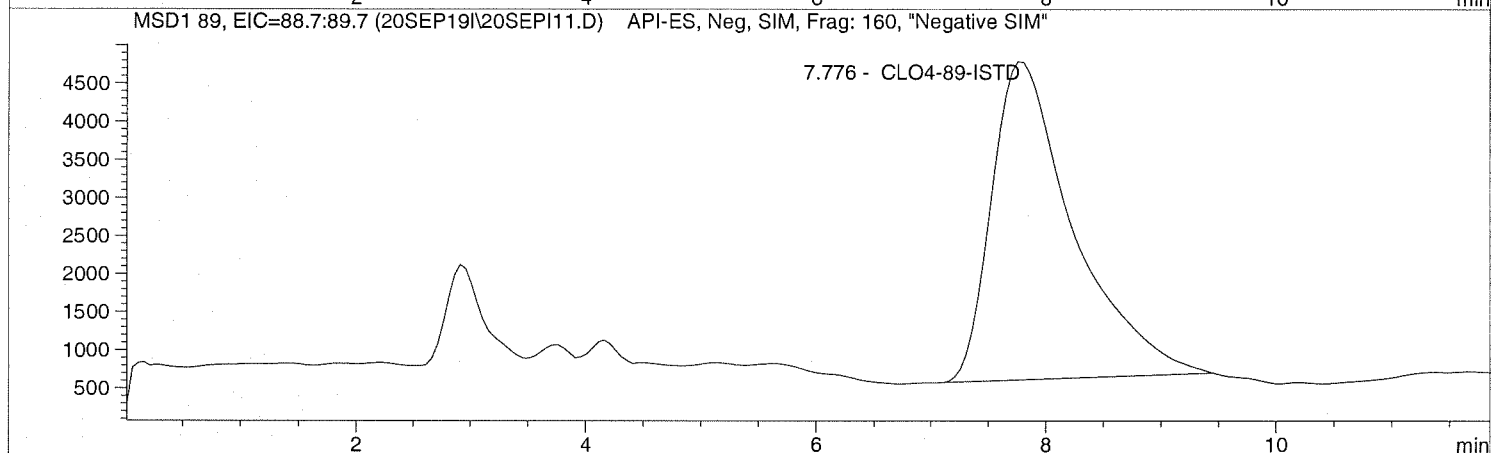
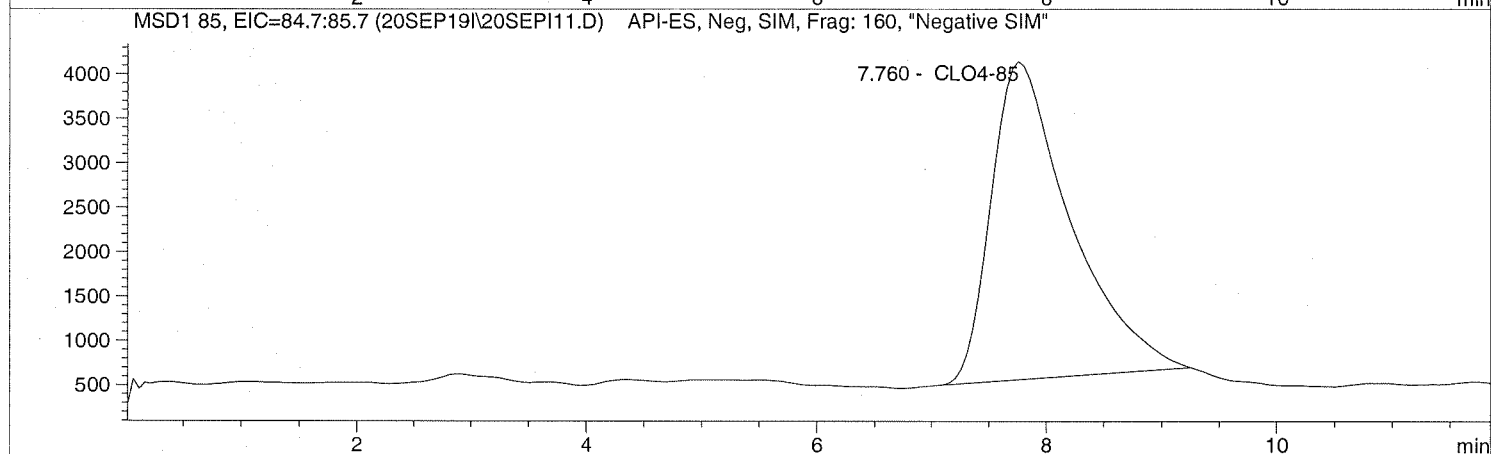
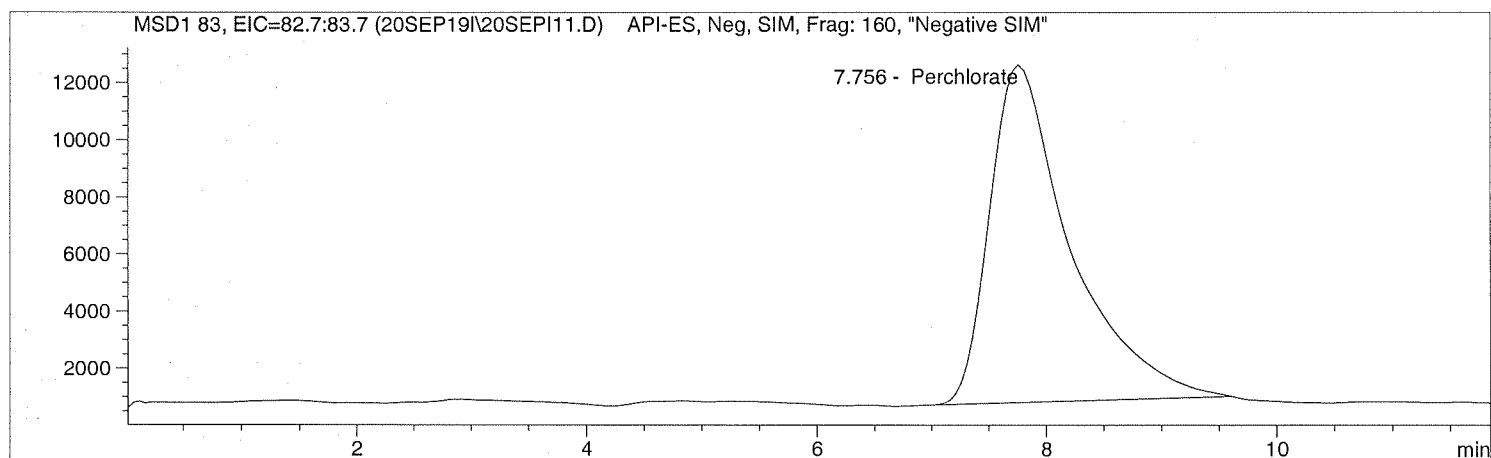
Sample Name: ICAL Verf@10ug/L

Injection Date: 9/20/2019 11:14:45
Sample Name: ICAL Verf@10ug/L
Acq Operator: TNB

Seq Line: 11
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 30 μ l

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\20SEP19\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05
Sample Name: CLO4@ 1.0ug/L
Acq Operator: TNB

Seq Line: 3
Location: Vial 73
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

