

**LONGHORN ARMY
AMMUNITION PLANT
KARNACK, TEXAS**

**ADMINISTRATIVE
RECORD**

Volume 2

2020

Bate Stamp Numbers

00951822 – 00953696

Prepared for

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

1976–2020

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

VOLUME 2

2020

- A. Title: Report (cont'd) – Quarterly Evaluation Report, 3rd Quarter (July – September) 2019 Groundwater Treatment Plant, Longhorn Army Ammunition Plant, Karnack, Texas
Author(s): Bhate Environmental Associates, Inc.
Recipient: U.S. Army Corps of Engineers, Tulsa District
Date: December 17, 2019
Date Stamp: 00951822 – 00953386
- B. Title: Report – Surface Water Data Transmittal - 2019, Longhorn Army Ammunition Plant, Karnack, TX
Author(s): Department of the Army
Recipient: Environmental Protection Agency and Texas Commission on Environmental Quality
Date: January 7, 2020
Bate Stamp: 00953387 – 00953696

ALS Houston, US

Date: 12-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
Work Order: HS19081495

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19081495-01	LH18/24-SP650_082719	Groundwater		27-Aug-2019 14:00	28-Aug-2019 09:00	<input type="checkbox"/>
HS19081495-02	LH18/24-SP650_082719_AIX	Groundwater		27-Aug-2019 14:00	28-Aug-2019 09:00	<input type="checkbox"/>
HS19081495-03	Trip Blank	Water	C&G- 040119-186	24-Aug-2019 00:00	28-Aug-2019 09:00	<input type="checkbox"/>

ALS Houston, US

Date: 12-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
Work Order: HS19081495

CASE NARRATIVE**Work Order Comments**

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

WetChemistry by Method E350.3**Batch ID: R346062**

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

WetChemistry by Method E365.3**Batch ID: R346013**

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

ALS Houston, US

Date: 12-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
 Sample ID: LH18/24-SP650_082719
 Collection Date: 27-Aug-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19081495
 Lab ID:HS19081495-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)								Analyst: KVL
Nitrogen, Ammonia (As N)	1.0		0.20	0.20	0.20	mg/L	1	10-Sep-2019 10:45
ORTHO PHOSPHATE (PO4) AS P BY E365.3								Analyst: MZD
Phosphorus, Total Orthophosphate (As P)	2.04		0.100	0.250	0.250	mg/L	10	29-Aug-2019 13:10
SUBCONTRACT ANALYSIS - TOC ANALYSIS								Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	12-Sep-2019 12:13

ALS Houston, US

Date: 12-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
 Sample ID: LH18/24-SP650_082719_AIX
 Collection Date: 27-Aug-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19081495
 Lab ID:HS19081495-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA		Analyst: SUB				
Subcontract Analysis	See Attached		0	0		NA	1	05-Sep-2019 15:46

ALS Houston, US

Date: 12-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: HS19081495

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R345608 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Groundwater	
HS19081495-02	LH18/24-SP650_082719_AIX	27 Aug 2019 14:00			05 Sep 2019 15:46	1
Batch ID: R346013 (0)		Test Name : ORTHO PHOSPHATE (PO4) AS P BY E365.3			Matrix: Groundwater	
HS19081495-01	LH18/24-SP650_082719	27 Aug 2019 14:00			29 Aug 2019 13:10	10
Batch ID: R346062 (0)		Test Name : AMMONIA AS N BY E350.3(ISE)			Matrix: Groundwater	
HS19081495-01	LH18/24-SP650_082719	27 Aug 2019 14:00			10 Sep 2019 10:45	1
Batch ID: R346089 (0)		Test Name : SUBCONTRACT ANALYSIS - TOC ANALYSIS			Matrix: Groundwater	
HS19081495-01	LH18/24-SP650_082719	27 Aug 2019 14:00			12 Sep 2019 12:13	1

ALS Houston, US

Date: 12-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: HS19081495

QC BATCH REPORT

Batch ID:	R346013 (0)	Instrument:	UV-2450	Method:	ORTHO PHOSPHATE (PO4) AS P BY E365.3					
MBLK	Sample ID: MBLK-346013	Units: mg/L		Analysis Date: 29-Aug-2019 13:10						
Client ID:	Run ID: UV-2450_346013	SeqNo: 5247242		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-346013	Units: mg/L		Analysis Date: 29-Aug-2019 13:10						
Client ID:	Run ID: UV-2450_346013	SeqNo: 5247243		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)	0.267	0.0250	0.25	0	107	85 - 115				
MS	Sample ID: HS19081495-01MS	Units: mg/L		Analysis Date: 29-Aug-2019 13:10						
Client ID: LH18/24-SP650_082719	Run ID: UV-2450_346013	SeqNo: 5247245		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)	4.55	0.250	2.5	2.04	100	80 - 120				
MSD	Sample ID: HS19081495-01MSD	Units: mg/L		Analysis Date: 29-Aug-2019 13:10						
Client ID: LH18/24-SP650_082719	Run ID: UV-2450_346013	SeqNo: 5247246		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)	4.68	0.250	2.5	2.04	106	80 - 120	4.55	2.82	20	

The following samples were analyzed in this batch:

ALS Houston, US

Date: 12-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: HS19081495

QC BATCH REPORT

Batch ID:	R346062 (0)	Instrument:	WetChem_HS	Method:	AMMONIA AS N BY E350.3(ISE)					
MBLK	Sample ID: MBLK-R346062	Units:	mg/L	Analysis Date:	10-Sep-2019 10:45					
Client ID:		Run ID:	WetChem_HS_346062	SeqNo:	5248518	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)	0.20	0.20								U
LCS	Sample ID: LCS-R346062	Units:	mg/L	Analysis Date:	10-Sep-2019 10:45					
Client ID:		Run ID:	WetChem_HS_346062	SeqNo:	5248517	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)	9.282	0.20	10	0	92.8	80 - 120				
MS	Sample ID: HS19081495-01MS	Units:	mg/L	Analysis Date:	10-Sep-2019 10:45					
Client ID:	LH18/24-SP650_082719	Run ID:	WetChem_HS_346062	SeqNo:	5248520	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)	9.879	0.20	10	1.03	88.5	80 - 120				
MSD	Sample ID: HS19081495-01MSD	Units:	mg/L	Analysis Date:	10-Sep-2019 10:45					
Client ID:	LH18/24-SP650_082719	Run ID:	WetChem_HS_346062	SeqNo:	5248519	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)	9.981	0.20	10	1.03	89.5	80 - 120	9.879	1.03	20	

The following samples were analyzed in this batch: HS19081495-01

ALS Houston, US

Date: 12-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: **HS19081495**

**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	2019-141	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19081495

Date/Time Received: **28-Aug-2019 09:00**
 Received by: **AC**

Checklist completed by: Paresh M. Giga 28-Aug-2019
 eSignature Date

Reviewed by: Corey Grandits 29-Aug-2019
 eSignature Date

Matrices: **GW/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): 3.5c U/c | IR25
 Cooler(s)/Kit(s): 43943
 Date/Time sample(s) sent to storage: 8/28/19 20:05

- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH acceptable upon receipt? Yes No N/A
- pH adjusted? Yes No N/A

pH adjusted by:

Login Notes: Trip Blank logged in on hold

Client Contacted: _____ Date Contacted: _____ Person Contacted: _____

Contacted By: _____ Regarding: _____

Comments:

Corrective Action:



1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Page: _____ of _____

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: _____

Chain of Custody and Analytical Request

Facility/Base I.D.: LHAAP

Sample Analysis Requested (1)

Quality Assurance Samples (6)

Project/Site Name: LHAAP / GWTP WEEKLY EFFLUENT

Client Name:

Collected by: SCOTT BESSINGER

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mm-yyyy)	Time Collected (Military) (hh:mm)	Sample Depth (beginning - ending)	SA Code (1)	Sample Number (2)	Sample Matrix (4)	Number of containers	TDC	AMMONIA-N	ORTHOPHOSPHATE	PERCHLORATE	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
LHA24-SPLSD-08279		27 AUG 2019	1400	-		N	WG	4	X	X	X					
LHA24-SPLSD-08279-AIX		27 AUG 2019	1400	-		N	WG	1				X				

HS19081495

Bhate Environmental Associates, Inc.
Ighorn GW Treatment Plant - GWTP Weekly Effluent

COMMENTS:

STANDARD TAT

Custody Transfers Prior to Receipt by Laboratory				Sample Delivery Details / Laboratory Receipt			
Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time	Delivered Directly to Lab:	Shipped
<u>Scott Bessinger</u>	<u>8/27/19</u>	<u>1430</u>	<u>AC</u>	<u>8/28/19</u>	<u>09:00</u>	_____	_____
2. _____			2. _____			Method of Shipment:	_____
3. _____			3. _____			Fed. _____ Ex. _____ Atrbill _____	Number: _____
				Analytical Lab: <u>ALS 10950 Stensiff Rd. Suite 210 Houston, TX 77099 (281) 530-5656</u>			
				ATTN: SONIA WEST Lab Recipient: _____ Delivery Date/Time: _____			

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)


3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SD = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WC = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

u/c
3-5
1RA#25
CF&C
43943

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CUSTODY SHEET		AL 400	Seal Broken By:
	Date: 8/27/10	Time:		Date:
	Name: [Signature]	Company: [Signature]		





FedEx

TRK# 4809 7836 6377
 WED - 28 AUG 10:30A
PRIORITY OVERNIGHT
AB SGRA
 77099
 TX-US IAH



4475872 08/27 56713/E9E7/05R2



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

September 11, 2019

Analytical Report for Service Request No: K1908011

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

RE: HS19081495-01

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory August 31, 2019
For your reference, these analyses have been assigned our service request number **K1908011**.

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)636-1 068
www.alsglobal.com



Client: ALS Environmental - US
Project: HS19081495-01
Sample Matrix: Ground Water

Service Request: K1908011
Date Received: 08/31/2019

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 ground water sample was received for analysis at ALS Environmental on 08/31/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy

Date 09/11/2019



Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com



121908011

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: 12083

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: HS19081495
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19081495-01	LH18/24-SP650_082719	Groundwater	27 Aug 2019 14:00
TOC Analysis for DOD Level IV			12 Sep 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: M. Pedersen
Cooler ID(s): _____

Date/Time: 8/30/19 1800.
Date/Time: 8.31.19 1005
Temperature(s): _____

RIGHT SOLUTIONS | RIGHT PARTNER



PC KH

Cooler Receipt and Preservation Form

Client ALS Houston Service Request K19 08011

Received: 8-31-19 Opened: 8-31-19 By: NP Unloaded: 8-31-19 By: NP

- Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered
- Samples were received in: (circle) Cooler Box Envelope Other NA
- 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
-0.2	0.0	0.4	0.6	0.2	394	12083 <u>NA</u>	4809 7837 3942		

- Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves
- Were custody papers properly filled out (ink, signed, etc.)? NA Y N
- 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
- Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
- Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
- Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
- Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
- Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
- Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____



General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

Analytical Report

Client: ALS Environmental - US
Project: HS19081495-01
Sample Matrix: Ground Water
Analysis Method: SM 5310 C
Prep Method: None

Service Request: K1908011
Date Collected: 08/27/19
Date Received: 08/31/19
Units: mg/L
Basis: NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_082719	K1908011-001	0.72	0.50	0.20	0.07	1	09/04/19 23:50	
Method Blank	K1908011-MB	ND U	0.50	0.20	0.07	1	09/04/19 16:59	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19081495-01
Sample Matrix: Ground Water

Service Request: K1908011
Date Collected: 08/27/19
Date Received: 08/31/19
Date Analyzed: 09/04/19

Replicate Sample Summary
General Chemistry Parameters

Sample Name: LH18/24-SP650_082719
Lab Code: K1908011-001

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 K1908011-001DUP Result</u>	<u>Average</u>	<u>RPD</u>	<u>RPD Limit</u>
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	0.72	0.66	0.691	9	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: HS19081495-01
Sample Matrix: Ground Water

Service Request: K1908011
Date Analyzed: 09/04/19
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: 649981

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1908011-LCS	24.8	25.0	99	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19081495-01

Service Request: K1908011

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	649981	KQ1912782-05	09/04/19 16:29	25.0	24.5	98	90-110
CCV2	649981	KQ1912782-06	09/04/19 20:32	25.0	24.1	96	90-110
CCV3	649981	KQ1912782-07	09/05/19 01:43	25.0	24.2	97	90-110

Client: ALS Environmental - US
Project: HS19081495-01

Service Request: K1908011

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	649981	KQ1912782-08	09/04/19 16:44	0.50	0.20	0.07	ND	U
CCB2	649981	KQ1912782-09	09/04/19 20:47	0.50	0.20	0.07	ND	U
CCB3	649981	KQ1912782-10	09/05/19 01:57	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)636-1 068
www.alsglobal.com

Original
 Work Request # () K1907610, 7966, 8002, 8011, 7654, 7840, 7883, 7887
 Tier: IV II II IV IV II I II
 Date Analyzed: 9/6/19
 Analyst: AB for BCD
 Analysis: TOC
 Run # TOC: 649981
649984
DOC: 649982
649983

**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:

* K1907883-002 RA due to overdilution.

Final Approved by: *Trumpy* Date: 09/10/19
 DQREPORT

Analytical Results Summary

00951853

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 649984 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
K1907654-001	Carbon, Total Organic	N/A		Surface Water	11.84 mg/L	10 mL	11.8 mg/L	1	0.07	0.50			9/6/19 01:49:00	N	IV
K1907654-002	Carbon, Total Organic	N/A		Surface Water	12.00 mg/L	10 mL	12.0 mg/L	1	0.07	0.50			9/6/19 02:17:00	N	IV
K1907654-004	Carbon, Total Organic	N/A		Surface Water	11.97 mg/L	10 mL	12.0 mg/L	1	0.07	0.50			9/6/19 02:45:00	N	IV
K1907654-005	Carbon, Total Organic	N/A		Surface Water	13.83 mg/L	10 mL	13.8 mg/L	1	0.07	0.50			9/6/19 03:13:00	N	IV
K1907654-006	Carbon, Total Organic	N/A		Surface Water	13.66 mg/L	10 mL	13.7 mg/L	1	0.07	0.50			9/6/19 03:42:00	N	IV
K1907654-007	Carbon, Total Organic	N/A		Surface Water	8.94 mg/L	10 mL	8.94 mg/L	1	0.07	0.50			9/6/19 04:10:00	N	IV
K1907654-008	Carbon, Total Organic	N/A		Surface Water	8.84 mg/L	10 mL	8.84 mg/L	1	0.07	0.50			9/6/19 04:38:00	N	IV
KQ1912799-01	Carbon, Total Organic	MB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/5/19 21:06:00	N	IV
KQ1912799-02	Carbon, Total Organic	LCS		Surface Water	24.48 mg/L	10 mL	24.5 mg/L	1	0.07	0.50	98		9/5/19 21:20:00	N	IV
KQ1912799-03	Carbon, Total Organic	CCV		Surface Water	23.84 mg/L	10 mL	23.8 mg/L	1					9/5/19 20:36:00	N	IV
KQ1912799-04	Carbon, Total Organic	CCV		Surface Water	23.66 mg/L	10 mL	23.7 mg/L	1					9/6/19 01:20:00	N	IV
KQ1912799-05	Carbon, Total Organic	CCV		Surface Water	23.63 mg/L	10 mL	23.6 mg/L	1					9/6/19 05:49:00	N	IV
KQ1912799-06	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/5/19 20:51:00	N	IV
KQ1912799-07	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/6/19 01:34:00	N	IV
KQ1912799-08	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/6/19 06:04:00	N	IV
KQ1912799-09	Carbon, Total Organic	MS	K1907654-008	Surface Water	34.18 mg/L	10 mL	34.2 mg/L	1	0.07	0.50	101		9/6/19 05:06:00	N	IV
KQ1912799-10	Carbon, Total Organic	DUP	K1907654-008	Surface Water	8.74 mg/L	10 mL	8.74 mg/L	1	0.07	0.50		1	9/6/19 04:38:00	N	IV
KQ1912799-11	Carbon, Total Organic	DUP	K1907654-001	Surface Water	11.94 mg/L	10 mL	11.9 mg/L	1	0.07	0.50		<1	9/6/19 01:49:00	N	IV
KQ1912799-12	Carbon, Total Organic	DUP	K1907654-002	Surface Water	12.04 mg/L	10 mL	12.0 mg/L	1	0.07	0.50		<1	9/6/19 02:17:00	N	IV
KQ1912799-13	Carbon, Total Organic	DUP	K1907654-004	Surface Water	11.91 mg/L	10 mL	11.9 mg/L	1	0.07	0.50		<1	9/6/19 02:45:00	N	IV
KQ1912799-14	Carbon, Total Organic	DUP	K1907654-007	Surface Water	8.95 mg/L	10 mL	8.95 mg/L	1	0.07	0.50		<1	9/6/19 04:10:00	N	IV
KQ1912799-15	Carbon, Total Organic	DUP	K1907654-006	Surface Water	13.77 mg/L	10 mL	13.8 mg/L	1	0.07	0.50		<1	9/6/19 03:42:00	N	IV
KQ1912799-16	Carbon, Total Organic	DUP	K1907654-005	Surface Water	13.79 mg/L	10 mL	13.8 mg/L	1	0.07	0.50		<1	9/6/19 03:13:00	N	IV

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

Printed 9/10/19 14:01

Results Summary

09/10/19
[Handwritten Signature]

as 9/10/19
for BCD

Analytical Results Summary

00951854

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 649983 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
K1907654-020	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	9.24 mg/L	10 mL	9.24 mg/L	1	0.07	0.50			9/5/19 14:29:00	Y	IV
K1907654-023	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	9.34 mg/L	10 mL	9.34 mg/L	1	0.07	0.50			9/5/19 14:57:00	N	IV
K1907654-024	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	9.20 mg/L	10 mL	9.20 mg/L	1	0.07	0.50			9/5/19 15:25:00	N	IV
K1907654-026	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	13.47 mg/L	10 mL	13.5 mg/L	1	0.07	0.50			9/5/19 16:23:00	N	IV
K1907654-027	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	13.80 mg/L	10 mL	13.8 mg/L	1	0.07	0.50			9/5/19 16:51:00	N	IV
K1907840-001	Carbon, Dissolved Organic (DOC)	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/5/19 18:16:00	N	II
K1907840-002	Carbon, Dissolved Organic (DOC)	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/5/19 18:44:00	N	II
K1907840-003	Carbon, Dissolved Organic (DOC)	N/A		Water	0.21 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/5/19 19:12:00	N	II
K1907840-004	Carbon, Dissolved Organic (DOC)	N/A		Water	0.18 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/5/19 19:40:00	N	II
K1907840-005	Carbon, Dissolved Organic (DOC)	N/A		Water	0.04 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/5/19 20:08:00	N	II
K1907840-006	Carbon, Dissolved Organic (DOC)	N/A		Water	0.38 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/5/19 21:35:00	N	II
K1907840-007	Carbon, Dissolved Organic (DOC)	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/5/19 22:03:00	N	II
K1907883-001	Carbon, Dissolved Organic (DOC)	N/A		Water	0.44 mg/L	10 mL	0.44 mg/L	J 1	0.07	0.50			9/5/19 23:56:00	N	II
K1907883-002	Carbon, Dissolved Organic (DOC)	N/A		Water	0.00 mg/L	10 mL	50 mg/L	U 100	7	50			9/6/19 00:24:00	N	I
K1907887-001	Carbon, Dissolved Organic (DOC)	N/A		Water	0.23 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/5/19 22:59:00	N	II
K1907887-002	Carbon, Dissolved Organic (DOC)	N/A		Water	0.17 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/5/19 23:27:00	N	II
KQ1912793-01	Carbon, Dissolved Organic (DOC)	MB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/5/19 11:38:00	N	IV
KQ1912793-03	Carbon, Dissolved Organic (DOC)	MS	K1907654-020	Surface Water	34.90 mg/L	10 mL	34.9 mg/L	1	0.07	0.50	103		9/5/19 17:19:00	N	IV
KQ1912793-04	Carbon, Dissolved Organic (DOC)	DUP	K1907654-020	Surface Water	9.18 mg/L	10 mL	9.18 mg/L	1	0.07	0.50		<1	9/5/19 14:29:00	N	IV
KQ1912793-05	Carbon, Dissolved Organic (DOC)	LCS		Surface Water	24.19 mg/L	10 mL	24.2 mg/L	1	0.07	0.50	97		9/5/19 11:53:00	N	IV
KQ1912793-06	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	23.66 mg/L	10 mL	23.7 mg/L	1					9/5/19 11:09:00	N	IV
KQ1912793-07	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	23.93 mg/L	10 mL	23.9 mg/L	1					9/5/19 15:53:00	N	IV
KQ1912793-08	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	23.84 mg/L	10 mL	23.8 mg/L	1					9/5/19 20:36:00	N	IV

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

Printed 9/10/19 13:57

Results Summary

09/10/19
Fuller
AB for BCD
9/10/19

Analytical Results Summary

00951855

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 649983

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
KQ1912793-09	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	23.66 mg/L	10 mL	23.7 mg/L	1					9/6/19 01:20:00	N	IV
KQ1912793-10	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/5/19 11:24:00	N	IV
KQ1912793-11	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/5/19 16:08:00	N	IV
KQ1912793-12	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/5/19 20:51:00	N	IV
KQ1912793-13	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/6/19 01:34:00	N	IV
KQ1912793-14	Carbon, Dissolved Organic (DOC)	DUP	K1907654-023	Surface Water	9.32 mg/L	10 mL	9.32 mg/L	1	0.07	0.50		<1	9/5/19 14:57:00	N	IV
KQ1912793-15	Carbon, Dissolved Organic (DOC)	DUP	K1907883-002	Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	9/6/19 00:24:00	N	I
KQ1912793-16	Carbon, Dissolved Organic (DOC)	DUP	K1907883-001	Water	0.42 mg/L	10 mL	0.42 mg/L	J 1	0.07	0.50		5	9/5/19 23:56:00	N	I
KQ1912793-17	Carbon, Dissolved Organic (DOC)	DUP	K1907887-002	Water	0.17 mg/L	10 mL	0.17 mg/L	J 1	0.07	0.50		NC	9/5/19 23:27:00	N	II
KQ1912793-18	Carbon, Dissolved Organic (DOC)	DUP	K1907887-001	Water	0.24 mg/L	10 mL	0.24 mg/L	J 1	0.07	0.50		NC	9/5/19 22:59:00	N	II
KQ1912793-19	Carbon, Dissolved Organic (DOC)	DUP	K1907840-007	Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	9/5/19 22:03:00	N	II
KQ1912793-20	Carbon, Dissolved Organic (DOC)	DUP	K1907840-006	Water	0.31 mg/L	10 mL	0.31 mg/L	J 1	0.07	0.50		NC	9/5/19 21:35:00	N	II
KQ1912793-21	Carbon, Dissolved Organic (DOC)	DUP	K1907840-005	Water	0.09 mg/L	10 mL	0.09 mg/L	J 1	0.07	0.50		NC	9/5/19 20:08:00	N	II
KQ1912793-22	Carbon, Dissolved Organic (DOC)	DUP	K1907840-004	Water	0.24 mg/L	10 mL	0.24 mg/L	J 1	0.07	0.50		NC	9/5/19 19:40:00	N	II
KQ1912793-23	Carbon, Dissolved Organic (DOC)	DUP	K1907840-003	Water	0.20 mg/L	10 mL	0.20 mg/L	J 1	0.07	0.50		NC	9/5/19 19:12:00	N	II
KQ1912793-24	Carbon, Dissolved Organic (DOC)	DUP	K1907840-002	Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	9/5/19 18:44:00	N	II
KQ1912793-25	Carbon, Dissolved Organic (DOC)	DUP	K1907840-001	Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	9/5/19 18:16:00	N	II
KQ1912793-26	Carbon, Dissolved Organic (DOC)	DUP	K1907654-027	Surface Water	13.58 mg/L	10 mL	13.6 mg/L	1	0.07	0.50		2	9/5/19 16:51:00	N	IV
KQ1912793-27	Carbon, Dissolved Organic (DOC)	DUP	K1907654-026	Surface Water	13.44 mg/L	10 mL	13.4 mg/L	1	0.07	0.50		<1	9/5/19 16:23:00	N	IV
KQ1912793-28	Carbon, Dissolved Organic (DOC)	DUP	K1907654-024	Surface Water	9.13 mg/L	10 mL	9.13 mg/L	1	0.07	0.50		<1	9/5/19 15:25:00	N	IV

Page 28 of 47

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

AB for BCD
9/10/19

Analytical Results Summary

00951856

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 649982

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
K1907610-001	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	11.81 mg/L	10 mL	11.8 mg/L	1	0.07	0.50			9/5/19 03:10:00	N	IV
K1907610-002	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	12.02 mg/L	10 mL	12.0 mg/L	1	0.07	0.50			9/5/19 03:38:00	N	IV
K1907610-003	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	12.06 mg/L	10 mL	12.1 mg/L	1	0.07	0.50			9/5/19 04:06:00	N	IV
K1907654-001	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	11.81 mg/L	10 mL	11.8 mg/L	1	0.07	0.50			9/5/19 05:02:00	N	IV
K1907654-002	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	11.64 mg/L	10 mL	11.6 mg/L	1	0.07	0.50			9/5/19 05:30:00	N	IV
K1907654-004	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	11.84 mg/L	10 mL	11.8 mg/L	1	0.07	0.50			9/5/19 05:58:00	N	IV
K1907654-005	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	13.40 mg/L	10 mL	13.4 mg/L	1	0.07	0.50			9/5/19 06:56:00	N	IV
K1907654-006	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	13.68 mg/L	10 mL	13.7 mg/L	1	0.07	0.50			9/5/19 07:24:00	N	IV
K1907654-007	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	8.49 mg/L	10 mL	8.49 mg/L	1	0.07	0.50			9/5/19 07:52:00	N	IV
K1907654-008	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	8.60 mg/L	10 mL	8.60 mg/L	1	0.07	0.50			9/5/19 08:20:00	N	IV
K1907654-009	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	8.71 mg/L	10 mL	8.71 mg/L	1	0.07	0.50			9/5/19 08:48:00	N	IV
K1907654-010	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	13.62 mg/L	10 mL	13.6 mg/L	1	0.07	0.50			9/5/19 09:16:00	N	IV
K1907654-011	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	13.71 mg/L	10 mL	13.7 mg/L	1	0.07	0.50			9/5/19 09:44:00	N	IV
K1907654-012	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	13.47 mg/L	10 mL	13.5 mg/L	1	0.07	0.50			9/5/19 10:12:00	Y	IV
K1907654-013	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	13.58 mg/L	10 mL	13.6 mg/L	1	0.07	0.50			9/5/19 12:08:00	N	IV
K1907654-014	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	13.64 mg/L	10 mL	13.6 mg/L	1	0.07	0.50			9/5/19 12:36:00	N	IV
K1907654-015	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	13.65 mg/L	10 mL	13.6 mg/L	1	0.07	0.50			9/5/19 13:04:00	N	IV
K1907654-018	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	13.58 mg/L	10 mL	13.6 mg/L	1	0.07	0.50			9/5/19 13:32:00	N	IV
K1907654-019	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	13.83 mg/L	10 mL	13.8 mg/L	1	0.07	0.50			9/5/19 14:00:00	N	IV
KQ1912792-01	Carbon, Dissolved Organic (DOC)	MB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/5/19 02:12:00	N	IV
KQ1912792-02	Carbon, Dissolved Organic (DOC)	LCS		Surface Water	24.44 mg/L	10 mL	24.4 mg/L	1	0.07	0.50	98		9/5/19 02:27:00	N	IV
KQ1912792-03	Carbon, Dissolved Organic (DOC)	MS	K1907654-012	Surface Water	38.09 mg/L	10 mL	38.1 mg/L	1	0.07	0.50	98		9/5/19 10:40:00	N	IV
KQ1912792-04	Carbon, Dissolved Organic (DOC)	DUP	K1907654-012	Surface Water	13.46 mg/L	10 mL	13.5 mg/L	1	0.07	0.50		<1	9/5/19 10:12:00	N	IV

Page 23 of 57

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

Printed 9/10/19 13:49

Results Summary

09/10/19
Alyssa

as for BCO
all 10/19

Analytical Results Summary

00951857

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 649982

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
KQ1912792-06	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.18 mg/L	10 mL	24.2 mg/L	1					9/5/19 01:43:00	N	IV
KQ1912792-07	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	23.60 mg/L	10 mL	23.6 mg/L	1					9/5/19 06:26:00	N	IV
KQ1912792-08	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	23.93 mg/L	10 mL	23.9 mg/L	1					9/5/19 15:53:00	N	IV
KQ1912792-09	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/5/19 01:57:00	N	IV
KQ1912792-10	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/5/19 06:41:00	N	IV
KQ1912792-11	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/5/19 11:24:00	N	IV
KQ1912792-12	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/5/19 16:08:00	N	IV
KQ1912792-13	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	23.66 mg/L	10 mL	23.6626 mg/L	1					9/5/19 11:09:00	N	IV
KQ1912792-14	Carbon, Dissolved Organic (DOC)	DUP	K1907610-001	Surface Water	11.70 mg/L	10 mL	11.7 mg/L	1	0.07	0.50		<1	9/5/19 03:10:00	N	IV
KQ1912792-15	Carbon, Dissolved Organic (DOC)	DUP	K1907610-002	Surface Water	11.78 mg/L	10 mL	11.8 mg/L	1	0.07	0.50		2	9/5/19 03:38:00	N	IV
KQ1912792-16	Carbon, Dissolved Organic (DOC)	DUP	K1907610-003	Surface Water	12.08 mg/L	10 mL	12.1 mg/L	1	0.07	0.50		<1	9/5/19 04:06:00	N	IV
KQ1912792-17	Carbon, Dissolved Organic (DOC)	DUP	K1907654-019	Surface Water	13.76 mg/L	10 mL	13.8 mg/L	1	0.07	0.50		<1	9/5/19 14:00:00	N	IV
KQ1912792-18	Carbon, Dissolved Organic (DOC)	DUP	K1907654-018	Surface Water	13.44 mg/L	10 mL	13.4 mg/L	1	0.07	0.50		1	9/5/19 13:32:00	N	IV
KQ1912792-19	Carbon, Dissolved Organic (DOC)	DUP	K1907654-015	Surface Water	13.63 mg/L	10 mL	13.6 mg/L	1	0.07	0.50		<1	9/5/19 13:04:00	N	IV
KQ1912792-20	Carbon, Dissolved Organic (DOC)	DUP	K1907654-014	Surface Water	13.58 mg/L	10 mL	13.6 mg/L	1	0.07	0.50		<1	9/5/19 12:36:00	N	IV
KQ1912792-21	Carbon, Dissolved Organic (DOC)	DUP	K1907654-013	Surface Water	13.45 mg/L	10 mL	13.4 mg/L	1	0.07	0.50		<1	9/5/19 12:08:00	N	IV
KQ1912792-22	Carbon, Dissolved Organic (DOC)	DUP	K1907654-011	Surface Water	13.60 mg/L	10 mL	13.6 mg/L	1	0.07	0.50		<1	9/5/19 09:44:00	N	IV
KQ1912792-23	Carbon, Dissolved Organic (DOC)	DUP	K1907654-010	Surface Water	13.54 mg/L	10 mL	13.5 mg/L	1	0.07	0.50		<1	9/5/19 09:16:00	N	IV
KQ1912792-24	Carbon, Dissolved Organic (DOC)	DUP	K1907654-009	Surface Water	8.66 mg/L	10 mL	8.66 mg/L	1	0.07	0.50		<1	9/5/19 08:48:00	N	IV
KQ1912792-25	Carbon, Dissolved Organic (DOC)	DUP	K1907654-008	Surface Water	8.50 mg/L	10 mL	8.50 mg/L	1	0.07	0.50		1	9/5/19 08:20:00	N	IV
KQ1912792-26	Carbon, Dissolved Organic (DOC)	DUP	K1907654-007	Surface Water	8.48 mg/L	10 mL	8.48 mg/L	1	0.07	0.50		<1	9/5/19 07:52:00	N	IV
KQ1912792-27	Carbon, Dissolved Organic (DOC)	DUP	K1907654-006	Surface Water	13.50 mg/L	10 mL	13.5 mg/L	1	0.07	0.50		1	9/5/19 07:24:00	N	IV
KQ1912792-28	Carbon, Dissolved Organic (DOC)	DUP	K1907654-005	Surface Water	13.42 mg/L	10 mL	13.4 mg/L	1	0.07	0.50		<1	9/5/19 06:56:00	N	IV

Page 24 of 57

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

AB for BCD
9/10/19

Analytical Results Summary

00951858

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 649982 Method/Testcode: SM 5310 C/TOC D

<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>
KQ1912792-29	Carbon, Dissolved Organic (DOC)	DUP	K1907654-004	Surface Water	11.74 mg/L	10 mL	11.7 mg/L	1	0.07	0.50		<1	9/5/19 05:58:00	N	IV
KQ1912792-30	Carbon, Dissolved Organic (DOC)	DUP	K1907654-002	Surface Water	11.58 mg/L	10 mL	11.6 mg/L	1	0.07	0.50		<1	9/5/19 05:30:00	N	IV
KQ1912792-31	Carbon, Dissolved Organic (DOC)	DUP	K1907654-001	Surface Water	11.82 mg/L	10 mL	11.8 mg/L	1	0.07	0.50		<1	9/5/19 05:02:00	N	IV

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

Printed 9/10/19 13:49

Results Summary

*AB for BCD
9/10/19*

Analytical Results Summary

00951859

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 649981 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
K1907610-001	Carbon, Total Organic	N/A		Surface Water	11.93 mg/L	10 mL	11.9 mg/L	1	0.07	0.50			9/5/19 00:18:00	N	IV
K1907610-002	Carbon, Total Organic	N/A		Surface Water	12.13 mg/L	10 mL	12.1 mg/L	1	0.07	0.50			9/5/19 00:46:00	N	IV
K1907610-003	Carbon, Total Organic	N/A		Surface Water	12.38 mg/L	10 mL	12.4 mg/L	1	0.07	0.50			9/5/19 01:14:00	N	IV
K1907966-014	Carbon, Total Organic	N/A		Water	3.56 mg/L	10 mL	3.56 mg/L	1	0.07	0.50			9/4/19 17:43:00	N	II
K1907966-015	Carbon, Total Organic	N/A		Water	4.76 mg/L	10 mL	4.76 mg/L	1	0.07	0.50			9/4/19 18:40:00	N	II
K1907966-016	Carbon, Total Organic	N/A		Water	4.30 mg/L	10 mL	4.30 mg/L	1	0.07	0.50			9/4/19 19:08:00	N	II
K1907966-017	Carbon, Total Organic	N/A		Water	11.42 mg/L	10 mL	11.4 mg/L	1	0.07	0.50			9/4/19 19:36:00	N	II
K1907966-018	Carbon, Total Organic	N/A		Water	2.96 mg/L	10 mL	2.96 mg/L	1	0.07	0.50			9/4/19 20:04:00	N	II
K1907966-019	Carbon, Total Organic	N/A		Water	5.24 mg/L	10 mL	5.24 mg/L	1	0.07	0.50			9/4/19 21:02:00	N	II
K1907966-020	Carbon, Total Organic	N/A		Water	3.51 mg/L	10 mL	3.51 mg/L	1	0.07	0.50			9/4/19 21:30:00	N	II
K1907966-021	Carbon, Total Organic	N/A		Water	6.46 mg/L	10 mL	6.46 mg/L	1	0.07	0.50			9/4/19 21:58:00	N	II
K1907966-022	Carbon, Total Organic	N/A		Water	3.78 mg/L	10 mL	3.78 mg/L	1	0.07	0.50			9/4/19 22:26:00	N	II
K1907966-023	Carbon, Total Organic	N/A		Water	6.46 mg/L	10 mL	6.46 mg/L	1	0.07	0.50			9/4/19 22:54:00	N	II
K1908002-001	Carbon, Total Organic	N/A		Water	1.37 mg/L	10 mL	1.37 mg/L	1	0.07	0.50			9/4/19 23:22:00	N	II
K1908011-001	Carbon, Total Organic	N/A		Ground Water	0.72 mg/L	10 mL	0.72 mg/L	1	0.07	0.50			9/4/19 23:50:00	N	II
KQ1912782-01	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/4/19 16:59:00	N	II
KQ1912782-01	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/4/19 16:59:00	N	II
KQ1912782-02	Carbon, Total Organic	LCS		Water	24.80 mg/L	10 mL	24.8 mg/L	1	0.07	0.50	99		9/4/19 17:14:00	N	II
KQ1912782-02	Carbon, Total Organic	LCS		Water	24.80 mg/L	10 mL	24.8 mg/L	1	0.07	0.50	99		9/4/19 17:14:00	N	II
KQ1912782-03	Carbon, Total Organic	MS	K1907966-014	Water	29.10 mg/L	10 mL	29.1 mg/L	1	0.07	0.50	102		9/4/19 18:11:00	N	II
KQ1912782-04	Carbon, Total Organic	DUP	K1907966-014	Water	3.56 mg/L	10 mL	3.56 mg/L	1	0.07	0.50		<1	9/4/19 17:43:00	N	II
KQ1912782-05	Carbon, Total Organic	CCV		Water	24.54 mg/L	10 mL	24.5 mg/L	1					9/4/19 16:29:00	N	II
KQ1912782-05	Carbon, Total Organic	CCV		Water	24.54 mg/L	10 mL	24.5 mg/L	1					9/4/19 16:29:00	N	II
KQ1912782-06	Carbon, Total Organic	CCV		Water	24.12 mg/L	10 mL	24.1 mg/L	1					9/4/19 20:32:00	N	II
KQ1912782-06	Carbon, Total Organic	CCV		Water	24.12 mg/L	10 mL	24.1 mg/L	1					9/4/19 20:32:00	N	II
KQ1912782-07	Carbon, Total Organic	CCV		Water	24.18 mg/L	10 mL	24.2 mg/L	1					9/5/19 01:43:00	N	II
KQ1912782-07	Carbon, Total Organic	CCV		Water	24.18 mg/L	10 mL	24.2 mg/L	1					9/5/19 01:43:00	N	II
KQ1912782-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/4/19 16:44:00	N	II
KQ1912782-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/4/19 16:44:00	N	II
KQ1912782-09	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/4/19 20:47:00	N	II
KQ1912782-09	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/4/19 20:47:00	N	II
KQ1912782-10	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/5/19 01:57:00	N	II
KQ1912782-10	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/5/19 01:57:00	N	II

Page 26 of 87

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

Printed 9/10/19 13:42

Results Summary

09/10/19
Freeze YU AB for BCD
9/10/19

Analytical Results Summary

00951860

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 649981

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
KQ1912782-11	Carbon, Total Organic	N/A		Surface Water	3.56 mg/L	10 mL	3.56 mg/L	1	0.07	0.50			9/4/19 17:43:00	N	IV
KQ1912782-12	Carbon, Total Organic	MS	KQ1912782-11	Surface Water	29.10 mg/L	10 mL	29.1 mg/L	1	0.07	0.50	102		9/4/19 18:11:00	N	IV
KQ1912782-13	Carbon, Total Organic	DUP	KQ1912782-11	Surface Water	3.56 mg/L	10 mL	3.56 mg/L	1	0.07	0.50		<1	9/4/19 17:43:00	N	IV
KQ1912782-14	Carbon, Total Organic	DUP	K1907966-015	Water	4.67 mg/L	10 mL	4.67 mg/L	1	0.07	0.50		2	9/4/19 18:40:00	N	II
KQ1912782-15	Carbon, Total Organic	DUP	K1907966-016	Water	4.33 mg/L	10 mL	4.33 mg/L	1	0.07	0.50		<1	9/4/19 19:08:00	N	II
KQ1912782-16	Carbon, Total Organic	DUP	K1907966-017	Water	11.52 mg/L	10 mL	11.5 mg/L	1	0.07	0.50		<1	9/4/19 19:36:00	N	II
KQ1912782-17	Carbon, Total Organic	DUP	K1907966-018	Water	2.84 mg/L	10 mL	2.84 mg/L	1	0.07	0.50		4	9/4/19 20:04:00	N	II
KQ1912782-18	Carbon, Total Organic	DUP	K1907966-019	Water	5.18 mg/L	10 mL	5.18 mg/L	1	0.07	0.50		1	9/4/19 21:02:00	N	II
KQ1912782-19	Carbon, Total Organic	DUP	K1907966-020	Water	3.44 mg/L	10 mL	3.44 mg/L	1	0.07	0.50		2	9/4/19 21:30:00	N	II
KQ1912782-20	Carbon, Total Organic	DUP	K1907966-021	Water	6.35 mg/L	10 mL	6.35 mg/L	1	0.07	0.50		2	9/4/19 21:58:00	N	II
KQ1912782-21	Carbon, Total Organic	DUP	K1907966-022	Water	3.65 mg/L	10 mL	3.65 mg/L	1	0.07	0.50		3	9/4/19 22:26:00	N	II
KQ1912782-22	Carbon, Total Organic	DUP	K1907966-023	Water	6.22 mg/L	10 mL	6.22 mg/L	1	0.07	0.50		4	9/4/19 22:54:00	N	II
KQ1912782-23	Carbon, Total Organic	DUP	K1908002-001	Water	1.25 mg/L	10 mL	1.25 mg/L	1	0.07	0.50		9	9/4/19 23:22:00	N	II
KQ1912782-24	Carbon, Total Organic	DUP	K1908011-001	Ground Water	0.66 mg/L	10 mL	0.66 mg/L	1	0.07	0.50		9	9/4/19 23:50:00	N	IV
KQ1912782-25	Carbon, Total Organic	DUP	K1907610-001	Surface Water	11.87 mg/L	10 mL	11.9 mg/L	1	0.07	0.50		<1	9/5/19 00:18:00	N	IV
KQ1912782-26	Carbon, Total Organic	DUP	K1907610-002	Surface Water	12.12 mg/L	10 mL	12.1 mg/L	1	0.07	0.50		<1	9/5/19 00:46:00	N	IV
KQ1912782-27	Carbon, Total Organic	DUP	K1907610-003	Surface Water	12.19 mg/L	10 mL	12.2 mg/L	1	0.07	0.50		2	9/5/19 01:14:00	N	IV

Page 27 of 57

AB for BCD
Alioka

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

TOC: 649981
 649984
 DOC: 649982
 649983

Schedule: 09042019

Version: 2

Instrument: Fusion1

Last Saved by: Fusion1 (Fusion1)

Last Saved on: 2019/09/04 14:57 - Wednesday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1907966-014.26	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1907966-014.26 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
5	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K1907966-015.26	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1907966-016.26	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K1907966-017.26	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1907966-018.26	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	K1907966-019.26	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1907966-020.26	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1907966-021.26	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1907966-022.26	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1907966-023.26	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1908002-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1908011-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1907610-001.07	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1907610-002.07	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1907610-003.07	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	FB 8/13/19 old lot	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1907610-001.12 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1907610-002.12 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1907610-003.12 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	FB 8/23/19 new lot	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1907654-001.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1907654-002.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1907654-004.01 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
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1907654-005.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1907654-006.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K1907654-007.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	K1907654-008.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K1907654-009.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K1907654-010.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K1907654-011.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1907654-012.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1907654-012.01 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
38	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

Printed on: September 6, 2019 09:44:47

09/10/19


Schedule: 09042019

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	K1907654-013.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K1907654-014.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K1907654-015.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	K1907654-018.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	K1907654-019.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K1907654-020.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K1907654-023.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	K1907654-024.01 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
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
48	Sample	K1907654-026.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	K1907654-027.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
50	Sample	K1907654-020.01 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
51	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
52	Sample	FB 8/27/19	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	K1907840-001.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
54	Sample	K1907840-002.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	K1907840-003.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	K1907840-004.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
57	Sample	K1907840-005.01 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
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	K1907840-006.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
60	Sample	K1907840-007.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
61	Sample	FB 8/29/19	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
62	Sample	K1907887-001.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
63	Sample	K1907887-002.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
64	Sample	K1907883-001.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
65	Sample	K1907883-002.01 doc 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
66	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
67	Sample	K1907654-001.07	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
68	Sample	K1907654-002.07	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
69	Sample	K1907654-004.07	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
70	Sample	K1907654-005.07	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
71	Sample	K1907654-006.07	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
72	Sample	K1907654-007.07	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
73	Sample	K1907654-008.07	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
74	Sample	K1907654-008.07 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
75	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

Fusion Report - 09042019

Wednesday, September 04, 2019 02:19 PM

(View - Repts, Unused Repts, Meta-Data, Signature, History)
Printed on 2019/09/06 09:44 - Friday

Report Summary Information

Company Location: Gen Chem Lab
 Schedule Name: 09042019
 Instrument Name: Fusion1
 Report Version: 1 of 1
 Report Creation by Operators (schedule version): Fusion1 (Fusion1) (v1)
 Fusion1 (Fusion1) (v2)
 Comment:

Engine 1.1.5.1
 Version:
 Firmware 1.2.0696
 Version:
 Connection: RS232 COM1

Report Results

09/10/19
[Signature]

Sample Type: Clean From Schedule Version 1

Pos	Analysis Type	Sample ID	Start Time
◆ (clean)		Clean	2019/09/04 14:19

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.35	17.92	5.57	49.65	05:19
2	TC Clean	15.40	18.86	3.46	50.11	04:03
3	TC Clean	3.10	6.65	3.55	50.14	03:46
4	TC Clean	2.54	5.89	3.34	50.23	03:57

Sample Type: Clean From Schedule Version 2

Pos	Analysis Type	Sample ID	Start Time
◆ (clean)		Clean	2019/09/04 14:57

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.79	15.25	3.47	49.76	05:22
2	TC Clean	7.16	10.54	3.38	50.08	04:01
3	TC Clean	2.61	6.31	3.70	50.12	03:46
4	TC Clean	2.04	5.50	3.46	50.22	03:48

Sample Type: Clean From Schedule Version 2

Pos	Analysis Type	Sample ID			Start Time	
◊ (clean)		Clean			2019/09/04 15:19	

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.77	4.29	3.52	49.75	05:13
2	TC Clean	5.35	8.72	3.37	50.20	04:01
3	TC Clean	2.96	6.22	3.27	50.19	03:45
4	TC Clean	2.11	5.52	3.41	50.14	03:54

Sample Type: Blank (Creating v1291) From Schedule Version 2

Pos	Analysis Type	Sample ID			Start Time	
◊ (blank)		Reagent/Acid Blank			2019/09/04 15:41	

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.86	4.29	3.43	49.62	05:21
2	TC Clean	5.70	9.20	3.50	50.16	04:02
3	TC Clean	2.73	6.16	3.43	50.22	03:55
4	TC Clean	2.50	5.95	3.45	50.21	03:56
5	Reagent Blank	3.74	7.32	3.59	50.19	05:06
6	Acid Blank	1.08	4.50	3.42	49.68	05:28

Sample Type: Sample From Schedule Version 2

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ D	TOC	RB	0.4406 ppm	0.0000 ppm	0.0000%	2019/09/04 16:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4406	4.4059	11.76	15.39	3.63	50.35	10:31

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7653 (IC) (v1291)	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)	24.5368 ppm (PASS)	0.0000 ppm	0%	2019/09/04 16:29

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5368	245.3682	176.02	179.55	3.53	50.35	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)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/04 16:44

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.46	10.08	3.61	50.33	10:31

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

Sample Type: Sample From Schedule Version 2

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/04 16:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.27	9.77	3.50	50.35	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7653 (IC) (v1291)	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)	24.7974 ppm (PASS)	0.0000 ppm	0%	2019/09/04 17:14

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

	Type									
C	TOC	25.0 ppm	1	24.7974	247.9743	177.79	181.15	3.36	50.35	10:30
Completion State		Success Action		Method		Calibration		STD Conc - Pos C		
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		25 ppmC		

Sample Type: Sample From Schedule Version 2

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
2	TOC	ICS	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/04 17:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.73	12.21	3.48	50.31	10:31

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
3	TOC	K1907966-014.26	3.5591 ppm	0.0022 ppm	0.0600%	2019/09/04 17:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5576	35.5759	32.91	36.45	3.54	50.34	10:31
2	TOC	3.5607	35.6068	32.94	36.34	3.40	50.33	10:26

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
4	TOC	K1907966-014.26 ms	29.0971 ppm	0.0000 ppm	0.0000%	2019/09/04 18:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.0971	290.9714	206.28	209.76	3.48	50.33	10:32

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
5	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/04 18:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.42	10.01	3.60	50.35	10:33

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
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	K1907966-015.26	4.7142 ppm	0.0677 ppm	1.4400%	2019/09/04 18:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.7621	47.6208	41.09	44.64	3.55	50.32	10:26
2	TOC	4.6663	46.6632	40.44	43.97	3.53	50.26	10:26

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
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	K1907966-016.26	4.3150 ppm	0.0146 ppm	0.3400%	2019/09/04 19:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.3046	43.0465	37.98	41.49	3.50	50.22	10:31
2	TOC	4.3253	43.2527	38.12	41.29	3.16	50.17	10:26

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
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	K1907966-017.26	11.4699 ppm	0.0678 ppm	0.5900%	2019/09/04 19:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.4220	114.2198	86.30	89.52	3.22	50.17	10:26
2	TOC	11.5179	115.1788	86.95	90.24	3.29	50.14	10:27

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
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	K1907966-018.26	2.9000 ppm	0.0855 ppm	2.9500%	2019/09/04 20:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9605	29.6050	28.86	32.23	3.37	50.12	10:29
2	TOC	2.8395	28.3955	28.04	31.28	3.24	50.12	10:27

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
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. (ppm)	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.1195 ppm	0.0000 ppm	0%	2019/09/04 20:32

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1195	241.1947	173.18	176.55	3.37	50.13	10:28

(PASS)

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)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/04 20:47

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.84	9.29	3.44	50.16	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
10	TOC	K1907966-019.26	5.2065 ppm	0.0403 ppm	0.7700%	2019/09/04 21:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.2350	52.3497	44.30	47.55	3.25	50.16	10:28
2	TOC	5.1780	51.7796	43.91	47.29	3.38	50.15	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7653 (IC) (v1291)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
11	TOC	K1907966-020.26	3.4741 ppm	0.0539 ppm	1.5500%	2019/09/04 21:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5122	35.1221	32.61	36.02	3.41	50.19	10:27
2	TOC	3.4360	34.3605	32.09	35.64	3.55	50.22	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7653 (IC) (v1291)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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

Type	(ppmC)
12 TOC K1907966-021.26	6.4080 ppm 0.0801 ppm 1.2500%

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.4647	64.6465	52.65	56.15	3.50	50.25	10:29
2	TOC	6.3514	63.5137	51.88	55.35	3.47	50.23	10:26

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
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	K1907966-022.26	3.7150 ppm	0.0868 ppm	2.3400%	2019/09/04 22:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.7764	37.7636	34.40	37.85	3.45	50.25	10:26
2	TOC	3.6536	36.5364	33.57	37.05	3.49	50.26	10:26

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
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	K1907966-023.26	6.3413 ppm	0.1650 ppm	2.6000%	2019/09/04 22:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.4580	64.5803	52.60	56.06	3.46	50.28	10:26
2	TOC	6.2247	62.2467	51.02	54.43	3.41	50.29	10:29

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
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	K1908002-001.01	1.3077 ppm	0.0860 ppm	6.5800%	2019/09/04 23:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3686	13.6856	18.06	21.32	3.26	50.33	10:26
2	TOC	1.2469	12.4687	17.23	20.73	3.50	50.35	10:27

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
16	TOC	K1908011-001.01	0.6910 ppm	0.0418 ppm	6.0500%	2019/09/04 23:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7205	7.2050	13.66	17.13	3.47	50.36	10:25
2	TOC	0.6614	6.6142	13.26	16.83	3.57	50.39	10:30

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
17	TOC	K1907610-001.07	11.8984 ppm	0.0467 ppm	0.3900%	2019/09/05 00:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.9314	119.3141	89.76	93.13	3.38	50.41	10:29
2	TOC	11.8654	118.6541	89.31	92.72	3.41	50.43	10:32

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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	K1907610-002.07	12.1238 ppm	0.0040 ppm	0.0300%	2019/09/05 00:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.1266	121.2661	91.08	94.43	3.35	50.45	10:26
2	TOC	12.1210	121.2101	91.04	94.47	3.43	50.45	10:24

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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	K1907610-003.07	12.2872 ppm	0.1319 ppm	1.0700%	2019/09/05 01:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.3804	123.8044	92.80	96.25	3.45	50.47	10:27
2	TOC	12.1939	121.9393	91.54	95.05	3.52	50.47	10:26

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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)	24.1837 ppm (PASS)	0.0000 ppm	0%	2019/09/05 01:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1837	241.8370	173.62	177.08	3.46	50.51	10:33

Completion State Success - Criteria **Success Action** Do Nothing **Method** CAS_salt_010711 **Calibration** CAS_salt_010711 **STD Conc - Pos B** 50 ppmC

met.

(v4)

(v30)

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%	2019/09/05 01:57

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.02	9.46	3.44	50.52	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 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%	2019/09/05 02:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.39	8.76	3.38	50.55	10:30

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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 [24.0 ppm]	0 / infinity (NA / NA)	24.4421 ppm (PASS)	0.0000 ppm	0%	2019/09/05 02:27

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.4421	244.4210	175.37	178.87	3.50	50.53	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

21	TOC	FB 8/13/19 old lot	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/05 02:41
----	-----	--------------------	------------	------------	---------	------------------

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.67	9.13	3.46	50.57	10:29
2	TOC	0.0000	0.0000	4.83	8.28	3.45	50.58	10:29

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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	K1907610-001.12 doc	11.7542 ppm	0.0746 ppm	0.6300%	2019/09/05 03:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.8069	118.0692	88.91	92.20	3.29	50.59	10:26
2	TOC	11.7014	117.0144	88.19	91.46	3.27	50.61	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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	K1907610-002.12 doc	11.8959 ppm	0.1685 ppm	1.4200%	2019/09/05 03:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.0151	120.1509	90.32	93.68	3.36	50.62	10:28
2	TOC	11.7767	117.7672	88.71	92.17	3.46	50.65	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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	K1907610-003.12 doc	12.0689 ppm	0.0139 ppm	0.1100%	2019/09/05 04:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.0591	120.5913	90.62	93.97	3.35	50.68	10:27
2	TOC	12.0787	120.7873	90.76	94.25	3.50	50.65	10:24

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
25	TOC	FB 8/23/19 new lot	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/05 04:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.81	9.28	3.47	50.70	10:28
2	TOC	0.0000	0.0000	5.38	8.78	3.40	50.68	10:29

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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	K1907654-001.01 doc	11.8138 ppm	0.0073 ppm	0.0600%	2019/09/05 05:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.8087	118.0869	88.92	92.37	3.45	50.72	10:31
2	TOC	11.8190	118.1900	88.99	92.44	3.45	50.71	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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	K1907654-002.01 doc	11.6100 ppm	0.0407 ppm	0.3500%	2019/09/05 05:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.6388	116.3883	87.77	91.28	3.51	50.71	10:27
2	TOC	11.5812	115.8123	87.38	90.78	3.40	50.74	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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	K1907654-004.01 doc	11.7904 ppm	0.0738 ppm	0.6300%	2019/09/05 05:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.8426	118.4257	89.15	92.59	3.44	50.76	10:25
2	TOC	11.7383	117.3827	88.44	91.96	3.52	50.74	10:30

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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)	23.5996 ppm (PASS)	0.0000 ppm	0%	2019/09/05 06:26

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.5996	235.9957	169.66	173.11	3.45	50.77	10:32

Completion State Success - Criteria **Success Action** Do Nothing **Method** CAS_salt_010711 **Calibration** CAS_salt_010711 **STD Conc - Pos B** 50 ppmC

met.

(v4)

(v30)

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%	2019/09/05 06:41

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.29	8.94	3.65	50.78	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 2

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 29	TOC	K1907654-005.01 doc	13.4094 ppm	0.0089 ppm	0.0700%	2019/09/05 06:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.4031	134.0314	99.74	103.15	3.41	50.77	10:29
2	TOC	13.4157	134.1566	99.83	103.39	3.56	50.78	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7653 (IC) (v1291)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 30	TOC	K1907654-006.01 doc	13.5899 ppm	0.1294 ppm	0.9500%	2019/09/05 07:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.6814	136.8142	101.63	105.14	3.51	50.78	10:27
2	TOC	13.4985	134.9845	100.39	103.79	3.40	50.78	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7653 (IC) (v1291)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 31	TOC	K1907654-007.01 doc	8.4833 ppm	0.0078 ppm	0.0900%	2019/09/05 07:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.4888	84.8883	66.39	69.83	3.44	50.78	10:31
2	TOC	8.4778	84.7778	66.31	69.89	3.58	50.74	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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	K1907654-008.01 doc	8.5500 ppm	0.0747 ppm	0.8700%	2019/09/05 08:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.6029	86.0286	67.16	70.69	3.53	50.74	10:30
2	TOC	8.4972	84.9723	66.44	69.80	3.36	50.73	10:29

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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	K1907654-009.01 doc	8.6859 ppm	0.0365 ppm	0.4200%	2019/09/05 08:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.7117	87.1173	67.90	71.24	3.34	50.72	10:25
2	TOC	8.6602	86.6017	67.55	70.91	3.36	50.71	10:26

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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	K1907654-010.01 doc	13.5832 ppm	0.0569 ppm	0.4200%	2019/09/05 09:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.6234	136.2338	101.24	104.63	3.39	50.69	10:27
2	TOC	13.5429	135.4294	100.69	104.01	3.32	50.68	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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	K1907654-011.01 doc	13.6581 ppm	0.0803 ppm	0.5900%	2019/09/05 09:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.7149	137.1487	101.86	105.27	3.41	50.65	10:26
2	TOC	13.6013	136.0128	101.09	104.68	3.59	50.64	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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	K1907654-012.01 doc	13.4649 ppm	0.0003 ppm	0.0000%	2019/09/05 10:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.4652	134.6516	100.17	103.55	3.39	50.73	10:26
2	TOC	13.4647	134.6472	100.16	103.57	3.41	50.64	10:25
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7653 (IC) (v1291)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
37	TOC	K1907654-012.01 ms doc	38.0856 ppm	0.0000 ppm	0.0000%	2019/09/05 10:40		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	38.0856	380.8559	267.29	270.76	3.47	50.62	10:30
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7653 (IC) (v1291)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
38	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/05 10:55		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.56	9.99	3.43	50.63	10:34
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7653 (IC) (v1291)		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)	23.6626 ppm (PASS)	0.0000 ppm	0%	2019/09/05 11:09	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6626	236.6263	170.08	173.54	3.46	50.58	10:34
<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 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	0.0000 ppm	0%	2019/09/05 11:24

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.49	8.90	3.41	50.57	10:29
(PASS)										
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%	2019/09/05 11:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.93	8.30	3.37	50.53	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7653 (IC) (v1291)	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)	24.1928 ppm (PASS)	0.0000 ppm	0%	2019/09/05 11:53

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.1928	241.9283	173.68	177.06	3.37	50.53	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	K1907654-013.01 doc	13.5152 ppm	0.0934 ppm	0.6900%	2019/09/05 12:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.5812	135.8125	100.95	104.43	3.47	50.50	10:27
2	TOC	13.4491	134.4910	100.06	103.65	3.59	50.48	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7653 (IC)	CAS_salt_010711	CAS_salt_010711

(v1291) (v4) (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
41	TOC	K1907654-014.01 doc	13.6096 ppm	0.0422 ppm	0.3100%	2019/09/05 12:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.6394	136.3944	101.35	104.70	3.36	50.47	10:26
2	TOC	13.5798	135.7977	100.94	104.18	3.24	50.43	10:29

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
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	K1907654-015.01 doc	13.6408 ppm	0.0083 ppm	0.0600%	2019/09/05 13:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.6467	136.4666	101.40	104.58	3.18	50.40	10:26
2	TOC	13.6349	136.3487	101.32	104.84	3.52	50.34	10:27

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
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	K1907654-018.01 doc	13.5088 ppm	0.1012 ppm	0.7500%	2019/09/05 13:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.5804	135.8036	100.95	104.28	3.33	50.31	10:30
2	TOC	13.4373	134.3731	99.98	103.35	3.38	50.28	10:28

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
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	K1907654-019.01 doc	13.7920 ppm	0.0484 ppm	0.3500%	2019/09/05 14:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.8262	138.2624	102.62	106.03	3.42	50.28	10:25
2	TOC	13.7577	137.5774	102.15	105.43	3.27	50.22	10:29

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
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	K1907654-020.01 doc	9.2072 ppm	0.0411 ppm	0.4500%	2019/09/05 14:29

Rep	Base	ppm	µg	Adjusted	NDIR (Abs)	Baseline	Pressure	Run
-----	------	-----	----	----------	------------	----------	----------	-----

#	Analysis Type			(Abs)		(Abs)	(psig)	Time
1	TOC	9.2363	92.3633	71.46	74.78	3.32	50.19	10:26
2	TOC	9.1781	91.7814	71.07	74.46	3.40	50.23	10:29

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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	K1907654-023.01 doc	9.3308 ppm	0.0135 ppm	0.1500%	2019/09/05 14:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.3403	93.4034	72.17	75.50	3.33	50.28	10:30
2	TOC	9.3212	93.2119	72.04	75.44	3.40	50.34	10:29

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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	K1907654-024.01 doc	9.1635 ppm	0.0455 ppm	0.5000%	2019/09/05 15:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.1957	91.9567	71.18	74.73	3.54	50.31	10:27
2	TOC	9.1313	91.3130	70.75	74.07	3.33	50.33	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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)	23.9324 ppm (PASS)	0.0000 ppm	0%	2019/09/05 15:53

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9324	239.3237	171.91	175.24	3.33	50.34	10:30

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	0 / infinity	0.0000	0.0000	0%	2019/09/05 16:08

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.40	8.90	3.50	50.32	10:34
Completion State		Success Action		Method		Calibration		STD Conc - Pos D		
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		0 ppmC		

Sample Type: Sample From Schedule Version 2

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
48	TOC	K1907654-026.01 doc	13.4543 ppm	0.0211 ppm	0.1600%	2019/09/05 16:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.4693	134.6928	100.19	103.57	3.37	50.37	10:26
2	TOC	13.4394	134.3938	99.99	103.53	3.54	50.37	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7653 (IC) (v1291)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
49	TOC	K1907654-027.01 doc	13.6892 ppm	0.1537 ppm	1.1200%	2019/09/05 16:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.7978	137.9781	102.42	105.85	3.42	50.40	10:25
2	TOC	13.5805	135.8051	100.95	104.37	3.42	50.38	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7653 (IC) (v1291)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
50	TOC	K1907654-020.01 ms doc	34.9044 ppm	0.0000 ppm	0.0000%	2019/09/05 17:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	34.9044	349.0436	245.69	249.02	3.32	50.40	10:35

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7653 (IC) (v1291)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
51	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/05 17:33

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

1	TOC	0.0000	0.0000	6.37	9.78	3.41	50.40	10:31
---	-----	--------	--------	------	------	------	-------	-------

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
52	TOC	FB 8/27/19	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/05 17:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.82	8.35	3.53	50.39	10:30
2	TOC	0.0000	0.0000	5.14	8.60	3.45	50.40	10:24

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
53	TOC	K1907840-001.01 doc	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/05 18:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.42	10.83	3.42	50.40	10:31
2	TOC	0.0000	0.0000	7.51	10.97	3.46	50.38	10:28

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
54	TOC	K1907840-002.01 doc	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/05 18:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.47	11.91	3.44	50.32	10:26
2	TOC	0.0000	0.0000	8.64	12.17	3.53	50.24	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
55	TOC	K1907840-003.01 doc	0.2077 ppm	0.0082 ppm	3.9600%	2019/09/05 19:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2136	2.1357	10.22	13.73	3.51	50.20	10:24
2	TOC	0.2019	2.0193	10.14	13.52	3.39	50.15	10:30

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

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

56	TOC	K1907840-004.01 doc	0.2123 ppm	0.0445 ppm	20.9500%	2019/09/05 19:40		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1809	1.8086	9.99	13.41	3.42	50.13	10:28
2	TOC	0.2438	2.4377	10.42	13.63	3.21	50.08	10:25
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7653 (IC) (v1291)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
57	TOC	K1907840-005.01 doc	0.0695 ppm	0.0350 ppm	50.3700%	2019/09/05 20:08		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0447	0.4474	9.07	12.39	3.33	50.07	10:30
2	TOC	0.0942	0.9424	9.40	12.76	3.36	50.05	10:29
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7653 (IC) (v1291)		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)	23.8403 ppm (PASS)	0.0000 ppm	0%	2019/09/05 20:36	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8403	238.4030	171.29	174.69	3.40	50.08	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 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%	2019/09/05 20:51	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.65	8.91	3.26	50.08	10:28
<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
58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/05 21:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.90	8.29	3.39	50.06	10:33

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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)	24.4769 ppm (PASS)	0.0000 ppm	0%	2019/09/05 21:20

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.4769	244.7687	175.61	178.97	3.36	50.05	10:28

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	K1907840-006.01 doc	0.3463 ppm	0.0504 ppm	14.5600%	2019/09/05 21:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3820	3.8196	11.36	14.72	3.37	50.07	10:30
2	TOC	0.3107	3.1065	10.87	14.20	3.33	50.07	10:29

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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	K1907840-007.01 doc	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/05 22:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.14	11.67	3.53	50.10	10:27
2	TOC	0.0000	0.0000	8.04	11.45	3.41	50.09	10:26

Dilution **Blank Contribution** **Method** **Calibration**

1:10 (TC) 8.7653 (IC) CAS_salt_010711 CAS_salt_010711
(v1291) (v4) (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
61	TOC	FB 8/29/19	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/05 22:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.28	7.68	3.40	50.11	10:26
2	TOC	0.0000	0.0000	4.42	7.80	3.37	50.09	10:28

Dilution 1:10 Blank Contribution (TC) 8.7653 (IC) (v1291) 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	K1907887-001.01 doc	0.2350 ppm	0.0061 ppm	2.6200%	2019/09/05 22:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2307	2.3066	10.33	13.70	3.37	50.10	10:25
2	TOC	0.2393	2.3935	10.39	13.82	3.43	50.14	10:30

Dilution 1:10 Blank Contribution (TC) 8.7653 (IC) (v1291) 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	K1907887-002.01 doc	0.1725 ppm	0.0017 ppm	0.9700%	2019/09/05 23:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1736	1.7365	9.94	13.45	3.50	50.16	10:28
2	TOC	0.1713	1.7129	9.93	13.36	3.43	50.16	10:31

Dilution 1:10 Blank Contribution (TC) 8.7653 (IC) (v1291) 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	K1907883-001.01 doc	0.4284 ppm	0.0151 ppm	3.5300%	2019/09/05 23:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4391	4.3912	11.75	15.30	3.55	50.16	10:29
2	TOC	0.4178	4.1775	11.60	15.09	3.49	50.16	10:26

Dilution 1:10 Blank Contribution (TC) 8.7653 (IC) (v1291) 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	K1907883-002.01 doc 100x	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/06 00:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.46	11.82	3.35	50.19	10:29
2	TOC	0.0000	0.0000	8.57	12.00	3.43	50.21	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/06 00:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.37	7.63	3.26	50.20	10:26
2	TOC	0.0000	0.0000	4.73	8.10	3.37	50.22	10:28

Dilution 1:10 **Blank Contribution** (TC) 8.7653 (IC) (v1291) **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)	23.6567 ppm (PASS)	0.0000 ppm	0%	2019/09/06 01:20

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6567	236.5673	170.04	173.40	3.35	50.24	10:26

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%	2019/09/06 01:34

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.18	8.44	3.27	50.27	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 2

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
67	TOC	K1907654-001.07	11.8900 ppm	0.0713 ppm	0.6000%	2019/09/06 01:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.8396	118.3963	89.13	92.41	3.27	50.28	10:27
2	TOC	11.9404	119.4039	89.82	93.15	3.34	50.27	10:28

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
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	K1907654-002.07	12.0194 ppm	0.0222 ppm	0.1800%	2019/09/06 02:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.0037	120.0374	90.25	93.70	3.45	50.32	10:29
2	TOC	12.0351	120.3512	90.46	93.99	3.53	50.34	10:27

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
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	K1907654-004.07	11.9394 ppm	0.0419 ppm	0.3500%	2019/09/06 02:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.9690	119.6898	90.01	93.50	3.49	50.34	10:28
2	TOC	11.9098	119.0975	89.61	92.98	3.37	50.33	10:25

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
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	K1907654-005.07	13.8081 ppm	0.0254 ppm	0.1800%	2019/09/06 03:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.8261	138.2609	102.62	105.99	3.37	50.34	10:27
2	TOC	13.7901	137.9015	102.37	105.87	3.50	50.37	10:30

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
71	TOC	K1907654-006.07	13.7156 ppm	0.0813 ppm	0.5900%	2019/09/06 03:42

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

1	TOC	13.6581	136.5815	101.48	104.86	3.38	50.37	10:27
2	TOC	13.7731	137.7306	102.26	105.48	3.22	50.37	10:28

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
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	K1907654-007.07	8.9452 ppm	0.0051 ppm	0.0600%	2019/09/06 04:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.9415	89.4155	69.46	73.03	3.57	50.38	10:28
2	TOC	8.9488	89.4877	69.51	72.81	3.30	50.39	10:26

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
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	K1907654-008.07	8.7912 ppm	0.0718 ppm	0.8200%	2019/09/06 04:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.8420	88.4196	68.78	72.20	3.41	50.38	10:28
2	TOC	8.7405	87.4046	68.10	71.58	3.48	50.41	10:30

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
74	TOC	K1907654-008.07 ms	34.1848 ppm	0.0000 ppm	0.0000%	2019/09/06 05:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	34.1848	341.8484	240.81	244.28	3.47	50.40	10:29

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
75	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/06 05:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.23	9.57	3.34	50.41	10:29
2	TOC	0.0000	0.0000	5.74	9.20	3.46	50.40	10:27

Dilution 1:10
Blank Contribution (TC) 8.7653 (IC) (v1291)
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)	23.6317 ppm (PASS)	0.0000 ppm	0%	2019/09/06 05:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6317	236.3169	169.87	173.22	3.35	50.41	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%	2019/09/06 06:04

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	4.95	8.40	3.45	50.41	10:32

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
--	-------------------------------------	---------------------------------------	---	-----------------------------------

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1290	1.5247	1.2200	0.0000	0.0000	0.0000	2019/08/31 16:00	Fusion1 (Fusion1)
v1291	1.2453	1.0830	0.0000	0.0000	0.0000	2019/09/04 16:15	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	2019/09/06 06:19



Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1924077; 1924078; 1925000

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2287 (247020)

General Set Information: There were three 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: NA

Method QC data: The method blank (LMB 671758) was less than 1/2 the CRDL. The recovery for the LCS (671759) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on sample 1924077001 (Client ID: LH18/24-SP650_082019_AIX). 4.0 μ l of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.0 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 – 671756) is reported from the analysis of the Laboratory Control Sample (LCS – 671759) at a level of 4.0 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: 19MARI03) along with datafiles 04SEPD05-09.

Thomas Bosch September 4, 2019
Analyst Date



ANALYTICAL REPORT

Report Date: September 05, 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: **34-1925000**

Project ID: HS19081495

Purchase Order: HS19081495

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_082719_AIX	1925000001	08/27/19	08/30/19	



ANALYTICAL REPORT

Workorder: 34-1925000

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: LH18/24-SP650_082719_AIX	Sampling Site: NA	Collected: 08/27/2019				
Lab ID: 1925000001	Media: 125 mL Nalgene	Received: 08/30/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2287 (HBN: 247020) Analyzed: 09/04/2019 11:32	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 09/04/2019 13:14	/S/ Stephen Brose 09/05/2019 09:49

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: 34-1925000

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

00951896

Analysis Information

Workorder: 1925000

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2287 (HBN: 247020)
Analyzed By: Thomas Bosch

Blank

LMB: 671758 Analyzed: 09/04/2019 10:21 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 671759 Analyzed: 09/04/2019 09:53 Dilution: 1 Units: ug/L					
Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.20	4.00	105	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1924077001 Analyzed: 09/04/2019 10:35 Dilution: 1 Units: ug/L			MS: 671760 Analyzed: 09/04/2019 10:49 Dilution: 1 Units: ug/L				MSD: 671761 Analyzed: 09/04/2019 11:04 Dilution: 1 Units: ug/L				
Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.36	4	109	78.8	123.8	4.14	103	5.09	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 09/04/2019 13:17	/S/ Stephen Brose 09/05/2019 09:48

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

ALS Environmental CHAIN-OF-CUSTODY



Project / Job / Task: HS19081495		Split:		Workorder ID: 1925000		Level: ENV_LVL4		Requested Analysis			
Client: ALS Environmental (Houston)		Account: 8101									
Comments:											
Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Count	Containers			
1	08/27/2019 14:00	LH18/24-SP650_082719_AIX	1925000001		Water	A	1	EPA 8950, DDD QSM			
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)	ALS Sample Receiving	Reason for Transfer / Storage Location	Sample Login	Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Lab Notebook No.:	Date / Time:	Reason for Transfer / Storage Location
<i>Julie Warrall</i>	08/30/2019 09:15										
<i>Julie Warrall</i>	08/29/19 1400		603	Storage							
R.33.1	08/04/19/08:30	T. Bush		not analyzed							



1925000

18698/2

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: 12074

SUBCONTRACT TO:

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

1925000

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: HS19081495
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19081495-02	LH18/24-SP650_082719_AIX	Groundwater	27 Aug 2019 14:00
	SUB_Perch-6850		12 Sep 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: 8/29/19 1800

Received By: _____

Date/Time: 8/30/19 09:15

Cooler ID(s): _____

Temperature(s): _____

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston Project/Task/Site: 1925000
 Date/Time of Receipt: 8/30/19 09:15 Number of Coolers Received: 1

Condition of Coolers: Acceptable/Unacceptable Temperature Control: Present/Not Included
 Cooler Custody Seals: Present/Absent/NA
 Container Custody Seals: Intact/Broken/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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19-9870	2°C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: JayLynn Johnson Signature Printed Name Date: 8/30/19

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 Sensitive!



Part # 159489-434 RT2 EXP 05/20

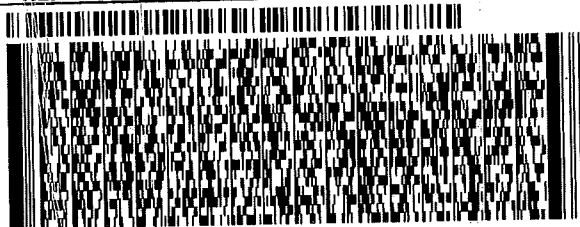
ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 29AUG19
ACTWGT: 9.55 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN
BILL THIRD PARTY

TO **SAMPLE RECEIVING**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123

(001) 288-7700
REF: HS19081495 - RJ



FedEx
Express



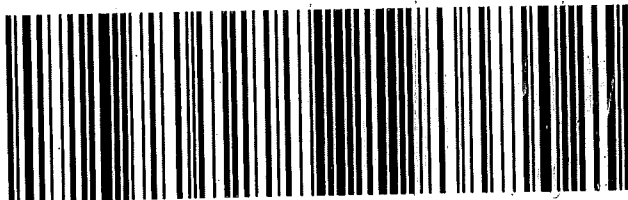
JT811806050101

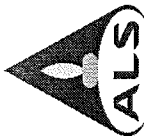
TRK# 4809 7837 3585
0201

FRI - 30 AUG 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC





Batch Worklist

Batch: ELMS/ 2287

Created: 9/4/2019 08:20

Instrument:

Rule: EPA 6850, DoD QSM Water

Analyst: T. Bosch

Status: WP

Workorder: 1924077 [ENV_LVL4]
 Workorder: 1924078 [ENV_LVL4]
 Workorder: 1925000 [ENV_LVL4]



HBN: 247020

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	671755	CCV for HBN 247020 [ELMS/2287]				CCV	3		E685041C3Q	5311		9/5/2019	
2	671756	RLVS for HBN 247020 [ELMS/2287]				RLVS	3		E685041C3Q	5311		9/5/2019	
3	671757	ICS for HBN 247020 [ELMS/2287]				ICS	3		E6850.D3Q	5311		9/5/2019	
4	671758	LMB for HBN 247020 [ELMS/2287]				LMB	3		E6850Q413Q	5311		9/5/2019	
5	671759	LCS for HBN 247020 [ELMS/2287]				LCS	3		E6850Q413Q	5311		9/5/2019	
6	1924077001	LH18/24-SP650_082019_AIX				SAMPLE	3	1924077001-A	E6850Q41.3	5480	9/17/2019	9/5/2019	
7	671760	LH18/24-SP650...(1924077001MS)				MS	3		E6850Q413Q	5311		9/5/2019	
8	671761	LH18/24-SP65...(1924077001MSD)				MSD	3		E6850Q413Q	5311		9/5/2019	
9	1924078001	LH18/24-SP650_082019_BIX				SAMPLE	3	1924078001-A	E6850Q41.3	5480	9/17/2019	9/5/2019	
10	1925000001	LH18/24-SP650_082719_AIX				SAMPLE	3	1925000001-A	E6850Q41.3	5480	9/24/2019	9/13/2019	
11	671762	CCV for HBN 247020 [ELMS/2287]				CCV	3		E685041C3Q	5311		9/5/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-upALS Work Order #'s & Sample #()'s: 1924077 (001); 1924078 (001) 1925000 (001)ELMS Batch/HBN ID: 2287 (247020)Prep Date: 09/04/2019 Analysis Date: 09/04/2019 Analyst: T. BoschAnalyte: **Perchlorate** Matrix: **Water** Method: **6850**Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\SEP\04SEP19D.sReported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**SAMPLE PREPARATION/ANALYSIS:

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

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

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

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.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: 10 Injection Volume: 50µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

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: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 671759; Target = 4.0µg/L. ASTM type II water was used for LMB 671758.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1924077001 (Client ID: LH18/24-SP650_082019_AIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

- 1) Results reported in µg/L.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALS\TWS013\LCMS\LCMS04\2019\SEP\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\als\TWS013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\247020-DoD-ALS-Hstn LCMS4 or through \\ALS\TWS013\DATA\REVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 671756) is reported from the analysis of the Laboratory Control Sample (LCS – 671759) at a level of 4.0µg/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: 19MARI03) along with datafiles 04SEP05-09.

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.

<u>Chromatography (GC, HPLC, LC/MS) Technical Review Criteria</u>	<u>Analyst Initials</u>	<u>Reviewer Initials</u>
<u>Batch(es)/SDG: ELMS: 2287 HBN: 247020</u>		
<u>Sample Set IDs if Applicable: 1924077/1924078/1925000</u>		
<u>Calibration standards analyzed and meets criteria</u>	TB	SB
<u>Standards traceability checked and meets criteria</u>	TB	SB
<u>Standard curve coefficients evaluated and meet criteria</u>	TB	SB
<u>ICVs analyzed and meet acceptance criteria</u>	TB	SB
<u>CCVs analyzed and meet acceptance criteria</u>	TB	SB
<u>Method Blanks analyzed and meet acceptance criteria</u>	TB	SB
<u>Retention Time Windows checked</u>	TB	SB
<u>For method 8081A, Endrin/DDT Breakdown is checked for compliance</u>	—	—
<u>Surrogate recoveries checked and appropriately addressed</u>	—	—
<u>Method Preparation Blanks analyzed and meet acceptance criteria</u>	TB	SB
<u>MSSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed</u>	TB	SB
<u>RLVS analyzed</u>	TB	SB
<u>Preparation and analysis hold times met</u>	TB	SB
<u>Preparation deviations and re-preparations noted when performed</u>	TB	SB
<u>Analysis deviations and re-analyses noted when performed</u>	TB	SB
<u>Sample dilution factors noted on reports</u>	TB	SB
<u>Electronic records in HBN transcription accuracy and completeness checked</u>	TB	SB
<u>Preparation and analysis calculations checked</u>	TB	SB
<u>NCRs are completed as necessary NC/CAR# _____</u>	—	—
<u>Report forms are complete and accurate</u>	TB	SB
<u>Manual integrations checked</u>	TB	SB



STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK			Description - 6850.WKG Std:100.ug/L		
Standard: 43702		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/18/2018 02:09PM		Expires: 09/18/2019	
MFG Lot: TNB: 09/18/2018				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 WRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019



STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL	
Standard: 43659	Created By: Thomas Bosch	Amount: 100 mL	
MFG: AccuStandard	Create Date: 09/17/2018 09:09AM	Expires: 07/25/2020	
MFG Lot: 218065075		Usable: No	
Part ID: IC-PER-10X-1		Lab Lot: CLO4 STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL



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: 43701		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/18/2018 02:09PM		Expires: 09/18/2019	
MFG Lot: TNB: 09/18/2018				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 INT	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020



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



STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK			Description - Perchlorate ISTD Wrk 1,000ug/L		
Standard: 43730	Created By: Thomas Bosch	Amount: 25 mL			
MFG: ALS/SLC	Create Date: 09/20/2018 09:09AM	Expires: 09/20/2019			
MFG Lot: TNB: 05/09/2018	Verified By: Thomas Bosch	Usable: Yes			
Pipette ID: Not Provided	Verify Date:	Lab Lot: CLO4ISTDWRK			
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026



STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock	
Standard: 43729		Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope		Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A		Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S		Verify Date:	Lab Lot: CLO4ISTDSTK
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL



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.





Certificate of Analysis



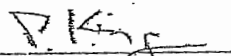
ISO Guide 34 Reference Material

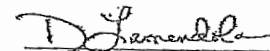
Product Number: ICC-013
Lot Number: CP-0860

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 QAVRA



125 Market Street
New Haven, CT 06513
USA



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

CERTIFICATE OF ANALYSIS



S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (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

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

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



23118

Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDDG-013

Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

Labeled CAS Number: NA

Unlabeled CAS Number: 7601-89-0

MW*: 130.4

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.

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

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

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

Approved by: T. J. Eckerley

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

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 $\mu\text{g/mL}$
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 \pm 2.8 $\mu\text{g/mL}$ (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP2.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	
*	671755	CCV@25	Vial 71	1	Control	1	2.50134e6	7.746	26.60067
*	671759	QC@4.0	Vial 72	1	Control	2	4.25137e5	7.705	4.19744
*	671757	ICS@4.0	Vial 73	1	Control	3	4.00928e5	7.551	4.86408
*	671758	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1924077001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	671760	240771S	Vial 76	1	Sample	6	2.51039e5	7.489	4.35557
*	671761	240771D	Vial 77	1	Sample	7	2.33940e5	7.470	4.13952
*	1924078001		Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1925000001		Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	671762	CCV@25	Vial 71	1	Control	10	2.46708e6	7.642	26.04469

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
*	671755	CCV@25	Vial 71	1	Control	1	7.43865e5	7.772	26.65922
*	671759	QC@4.0	Vial 72	1	Control	2	1.37190e5	7.730	4.41015
*	671757	ICS@4.0	Vial 73	1	Control	3	1.32103e5	7.568	5.24525
*	671758	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1924077001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	671760	240771S	Vial 76	1	Sample	6	8.31783e4	7.512	4.70443
*	671761	240771D	Vial 77	1	Sample	7	7.89548e4	7.485	4.54456
*	1924078001		Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1925000001		Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	671762	CCV@25	Vial 71	1	Control	10	7.35698e5	7.663	26.16643

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
*	671755	CCV@25	Vial 71	1	Control	1	2.85000e5	7.774	5.00000
*	671759	QC@4.0	Vial 72	1	Control	2	3.32955e5	7.737	5.00000
*	671757	ICS@4.0	Vial 73	1	Control	3	2.69122e5	7.569	5.00000
*	671758	LMB	Vial 74	1	Control	4	3.11424e5	7.861	5.00000
*	1924077001		Vial 75	1	Sample	5	2.01971e5	7.497	5.00000
*	671760	240771S	Vial 76	1	Sample	6	1.89135e5	7.510	5.00000
*	671761	240771D	Vial 77	1	Sample	7	1.85904e5	7.500	5.00000
*	1924078001		Vial 78	1	Sample	8	1.85766e5	7.472	5.00000
*	1925000001		Vial 79	1	Sample	9	1.92863e5	7.486	5.00000
*	671762	CCV@25	Vial 71	1	Control	10	2.87475e5	7.670	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

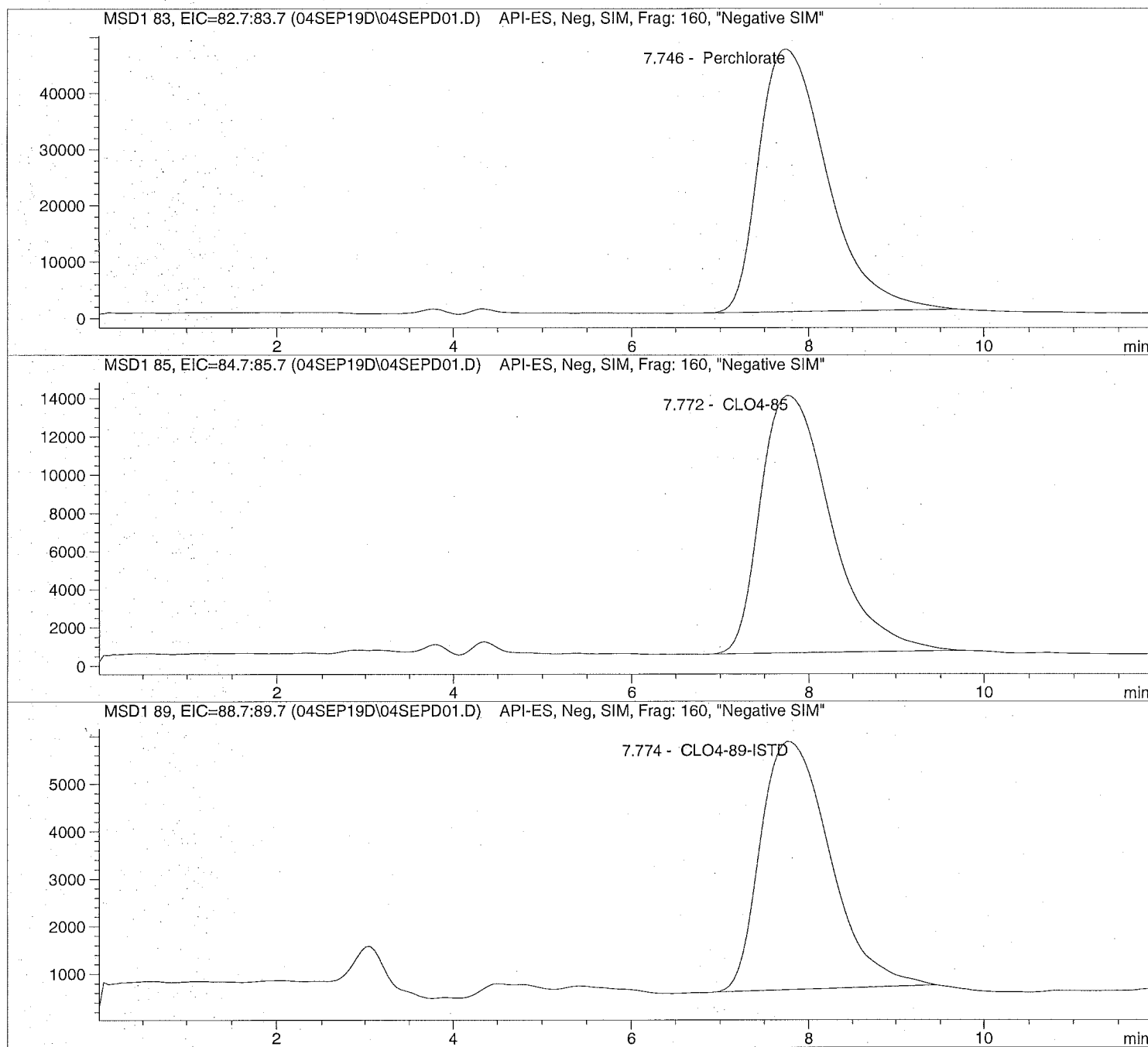
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	671755	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	671759	QC@4.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	671757	ICS@4.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	671758	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1924077001		CLO4-AQN	1	Sample	
6	Vial 76	671760	240771S	CLO4-AQN	1	Sample	
7	Vial 77	671761	240771D	CLO4-AQN	1	Sample	
8	Vial 78	1924078001		CLO4-AQN	1	Sample	
9	Vial 79	1925000001		CLO4-AQN	1	Sample	
10	Vial 71	671762	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD01.D Sample Name: 671755 CCV@25

```
=====
Injection Date: 9/04/2019 09:28:08      Seq Line: 1
Sample Name:    671755 CCV@25           Location: Vial 71
Acq Operator:  TNB                      Inj. No.: 1
                                           Inj. Vol.: 50 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/4/2019 12:03:36
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD01.D Sample Name: 671755 CCV@25

```

=====
Injection Date: 9/04/2019 09:28:08      Seq Line: 1
Sample Name:    671755 CCV@25           Location:  Vial 71
Acq Operator:  TNB                      Inj. No.: 1
                                           Inj. Vol.: 50 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/4/2019 12:03:36
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.746	PBA	2501336.5	26.6007	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.772	PBA	743865.2	26.6592	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.774	PBA	285000.0	5.0000	CLO4-89-ISTD

```

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

```


Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD02.D

Sample Name: 671759 QC@4.0

Injection Date: 9/04/2019 09:53:07

Seq Line: 2

Sample Name: 671759 QC@4.0

Location: Vial 72

Acq Operator: TNB

Inj. No.: 1

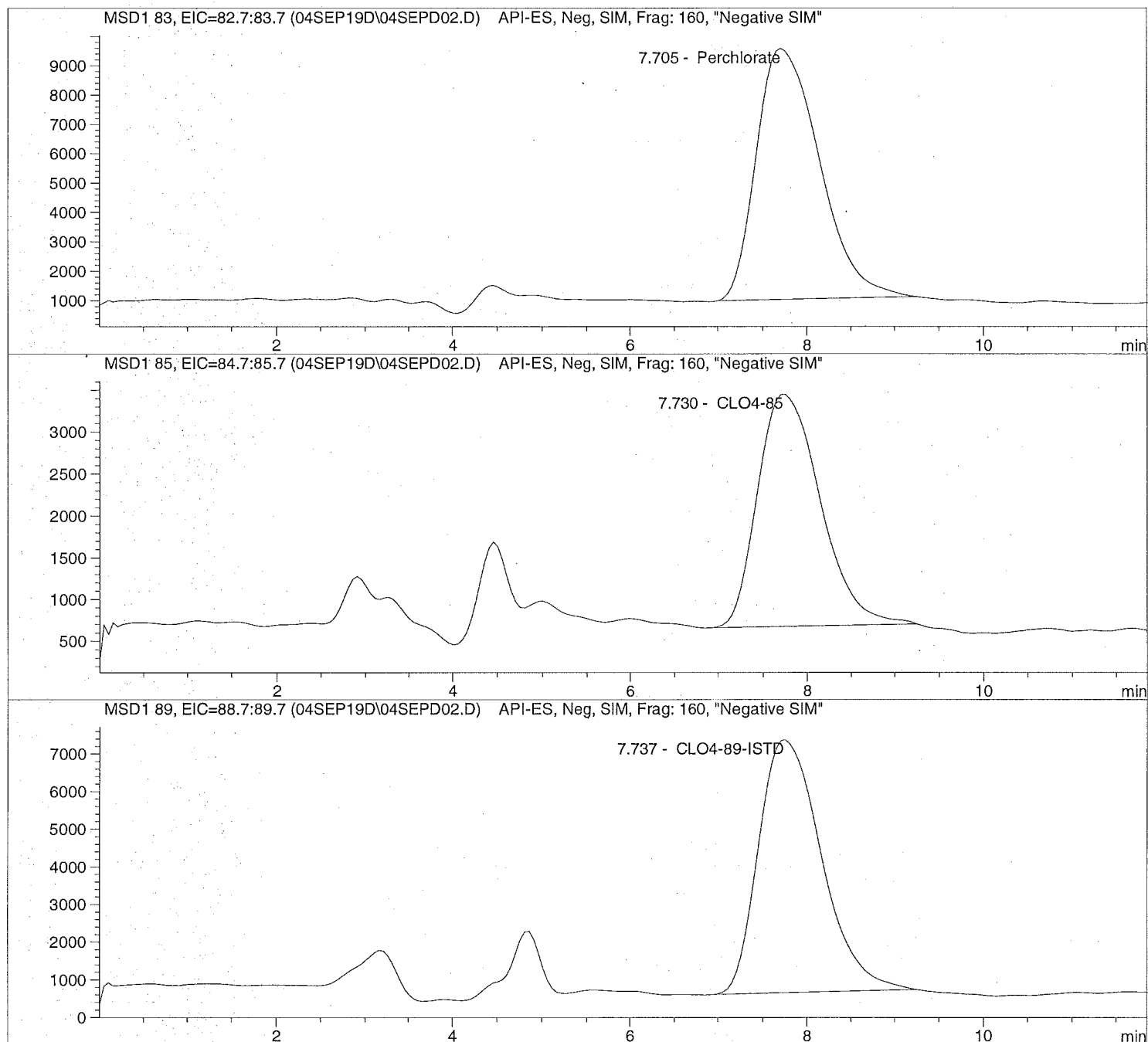
Inj. Vol.: 50 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/4/2019 12:03:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD02.D Sample Name: 671759 QC@4.0

```

=====
Injection Date:  9/04/2019  09:53:07                    Seq Line:                    2
Sample Name:     671759    QC@4.0                      Location:                    Vial 72
Acq Operator:    TNB                                    Inj. No.:                    1
                                                          Inj. Vol.:                   50 µl
  
```

```

Acq. Method:     CLO4-AQN.M
Analysis Method:  C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:    9/4/2019  12:03:36
  
```

Perchlorate analysis

=====
 Sample Information
 =====

```

Sorted By:                    Signal
Calib. Data Modified:        Tue, 20. Aug. 2019,10:15:00 am
Multiplier:                  1.000000
Dilution:                    1.000000
Sample Amount:                4.000
  
```

=====
 LCMS Results
 =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.705	PBA	425136.7	4.1974	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.730	PBA	137190.2	4.4102	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.737	PBA	332955.3	5.0000	CLO4-89-ISTD

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

Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD03.D

Sample Name: 671757 ICS@4.0

Injection Date: 9/04/2019 10:07:21

Seq Line: 3

Sample Name: 671757 ICS@4.0

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

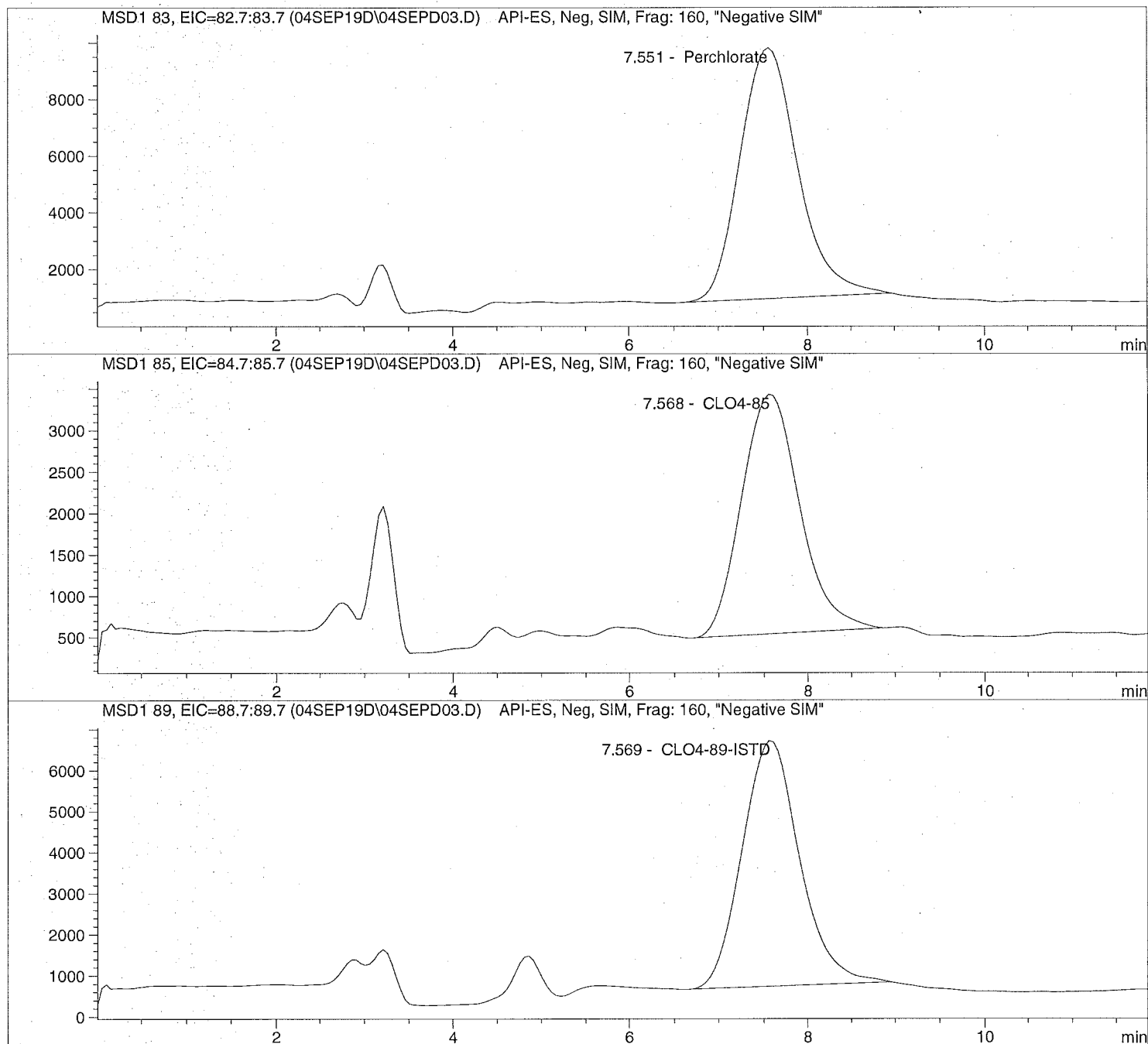
Inj. Vol.: 50 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/4/2019 12:03:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD03.D Sample Name: 671757 ICS@4.0

```

=====
Injection Date: 9/04/2019 10:07:21      Seq Line: 3
Sample Name: 671757 ICS@4.0           Location: Vial 73
Acq Operator: TNB                      Inj. No.: 1
                                         Inj. Vol.: 50 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/4/2019 12:03:36
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 4.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.551	PBA	400927.9	4.8641	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.568	PBA	132102.7	5.2452	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.569	PBA	269121.9	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD04.D

Sample Name: 671758 LMB

Injection Date: 9/04/2019 10:21:37

Seq Line: 4

Sample Name: 671758 LMB

Location: Vial 74

Acq Operator: TNB

Inj. No.: 1

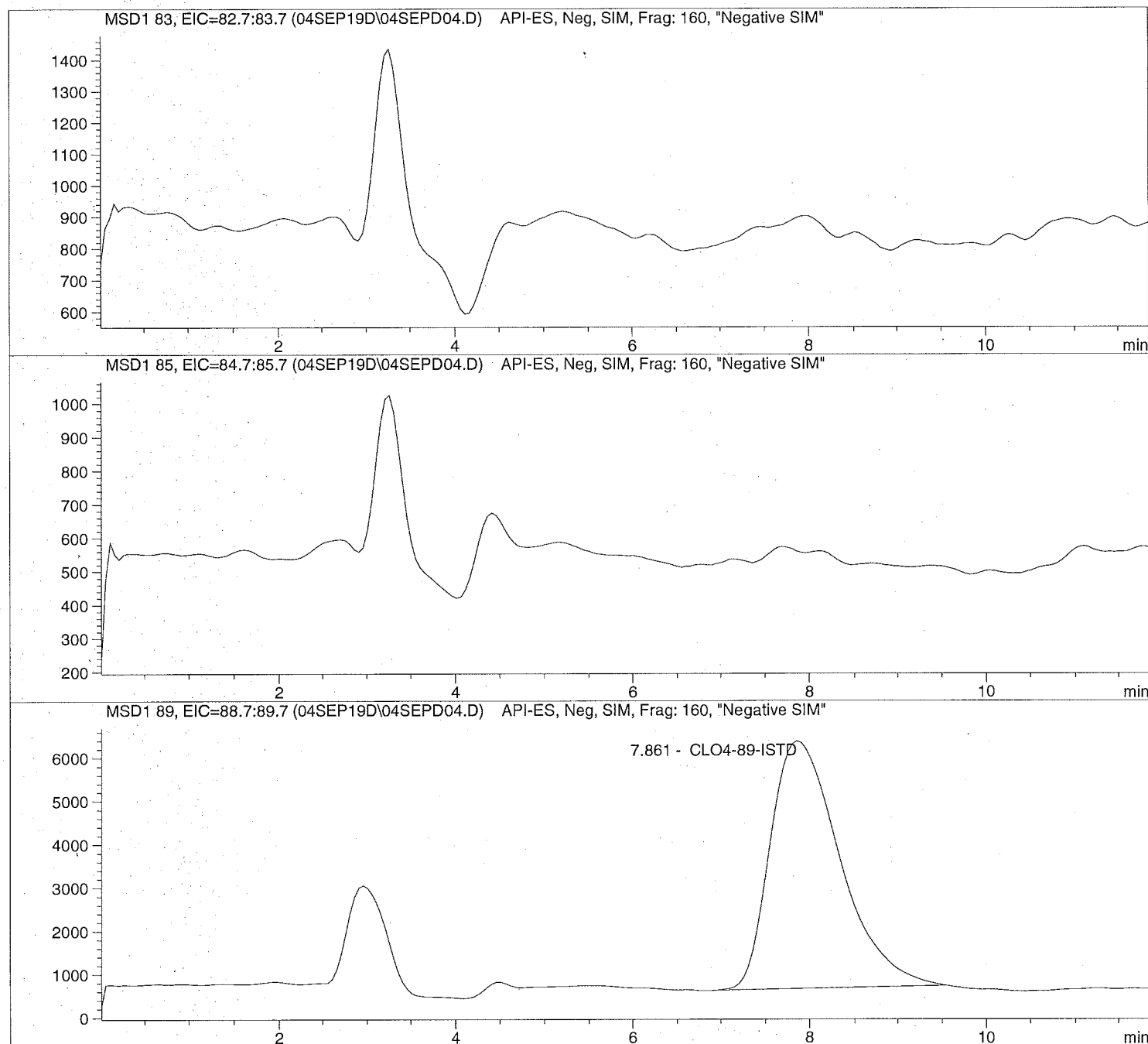
Inj. Vol.: 50 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/4/2019 12:03:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD04.D Sample Name: 671758 LMB

```

=====
Injection Date: 9/04/2019 10:21:37      Seq Line: 4
Sample Name: 671758 LMB                Location: Vial 74
Acq Operator: TNB                      Inj. No.: 1
                                         Inj. Vol.: 50 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/4/2019 12:03:36
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.861	PBA	311424.2	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD05.D

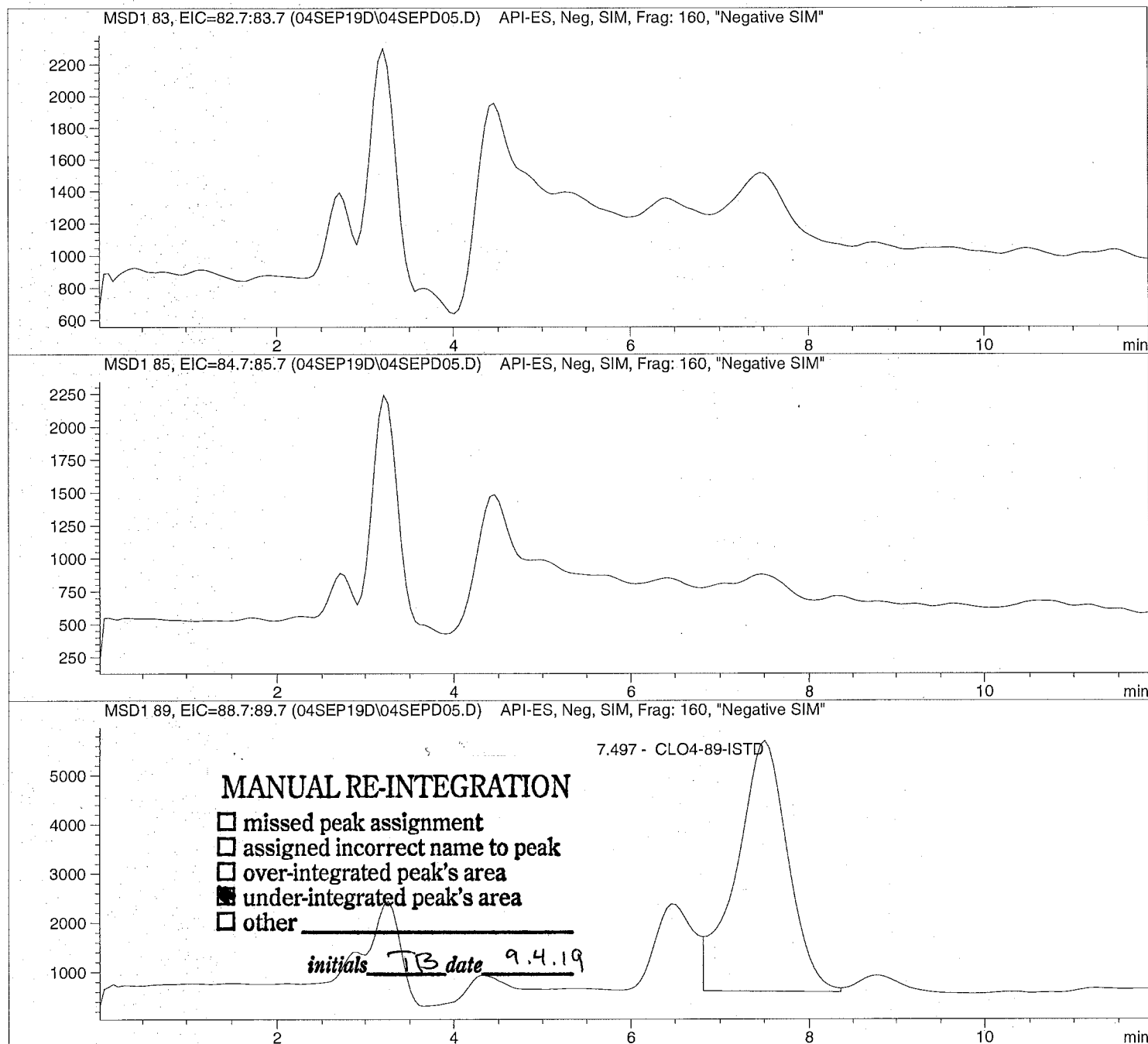
Sample Name: 1924077001

Injection Date: 9/04/2019 10:35:47
Sample Name: 1924077001
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/4/2019 12:03:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD05.D

Sample Name: 1924077001

```

=====
Injection Date:  9/04/2019  10:35:47      Seq Line:      5
Sample Name:    1924077001                Location:      Vial 75
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    50 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/4/2019  12:03:36
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.497	MF	201970.8	5.0000	CLO4-89-ISTD

```

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

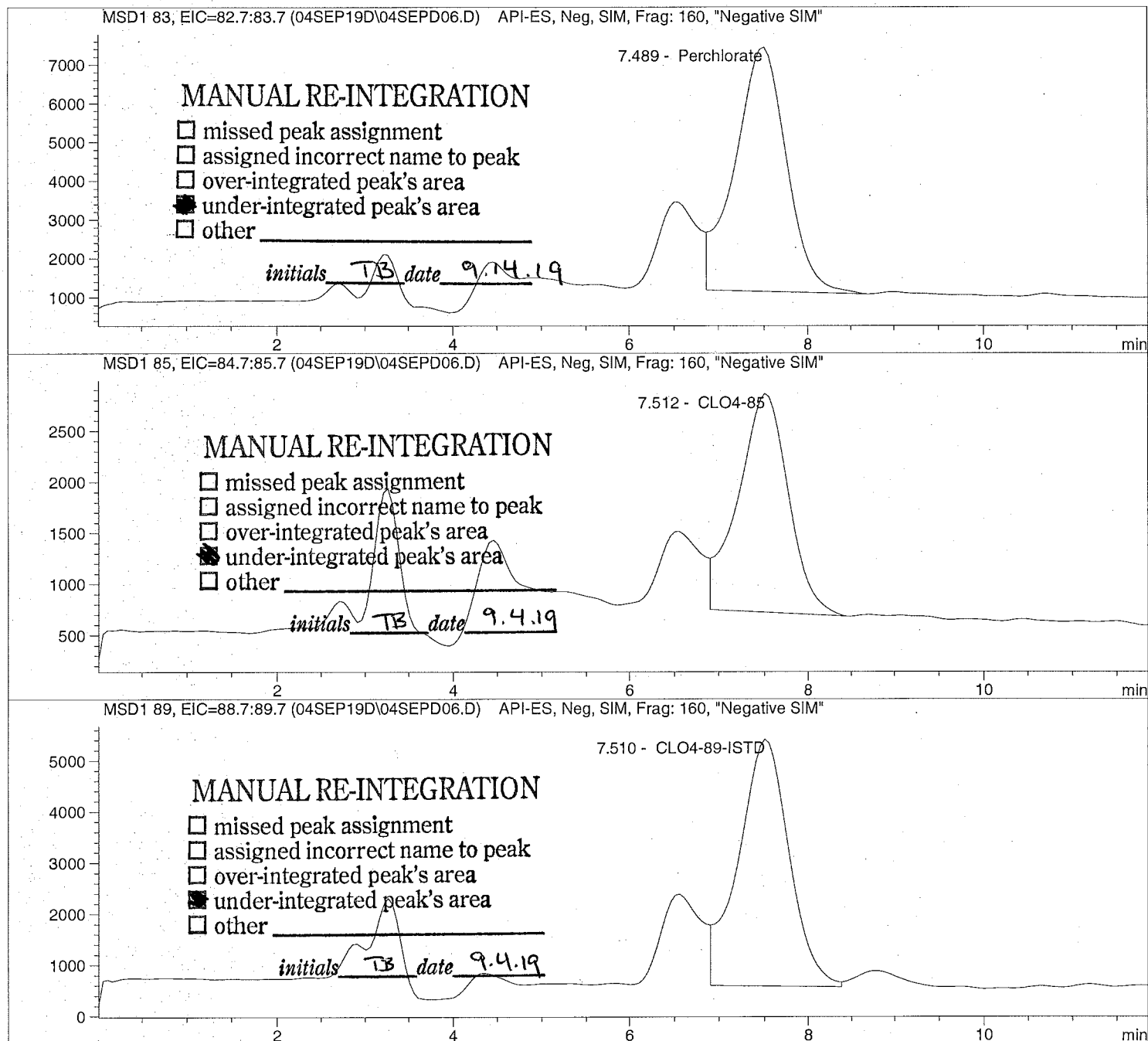
```


Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD06.D Sample Name: 671760 240771S

Injection Date: 9/04/2019 10:49:59 Seq Line: 6
 Sample Name: 671760 240771S Location: Vial 76
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 50 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
 Last Changed: 9/4/2019 12:03:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD06.D Sample Name: 671760 240771S

```

=====
Injection Date: 9/04/2019 10:49:59 Seq Line: 6
Sample Name: 671760 240771S Location: Vial 76
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 50 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/4/2019 12:03:36
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019, 10:15:00 am
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
7.489	FM	251038.9	4.3556	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.512	FM	83178.3	4.7044	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.510	MF	189134.7	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD07.D

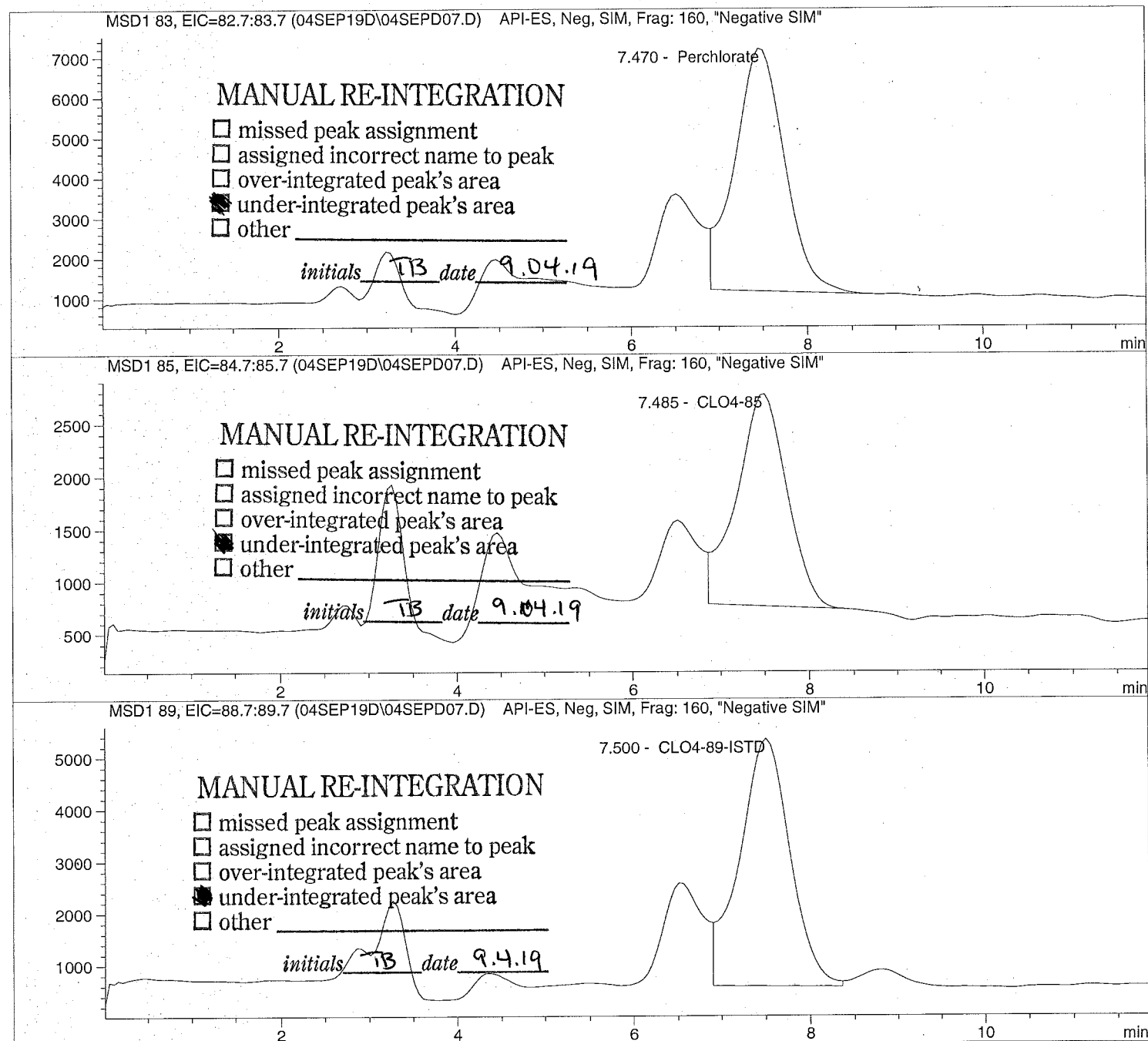
Sample Name: 671761 240771D

Injection Date: 9/04/2019 11:04:10
Sample Name: 671761 240771D
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/4/2019 12:03:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD07.D Sample Name: 671761 240771D

```
=====
Injection Date: 9/04/2019 11:04:10 Seq Line: 7
Sample Name: 671761 240771D Location: Vial 77
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 50 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/4/2019 12:03:36
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019, 10:15:00 am
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
7.470	FM	233940.2	4.1395	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.485	FM	78954.8	4.5446	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.500	MF	185904.5	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD08.D

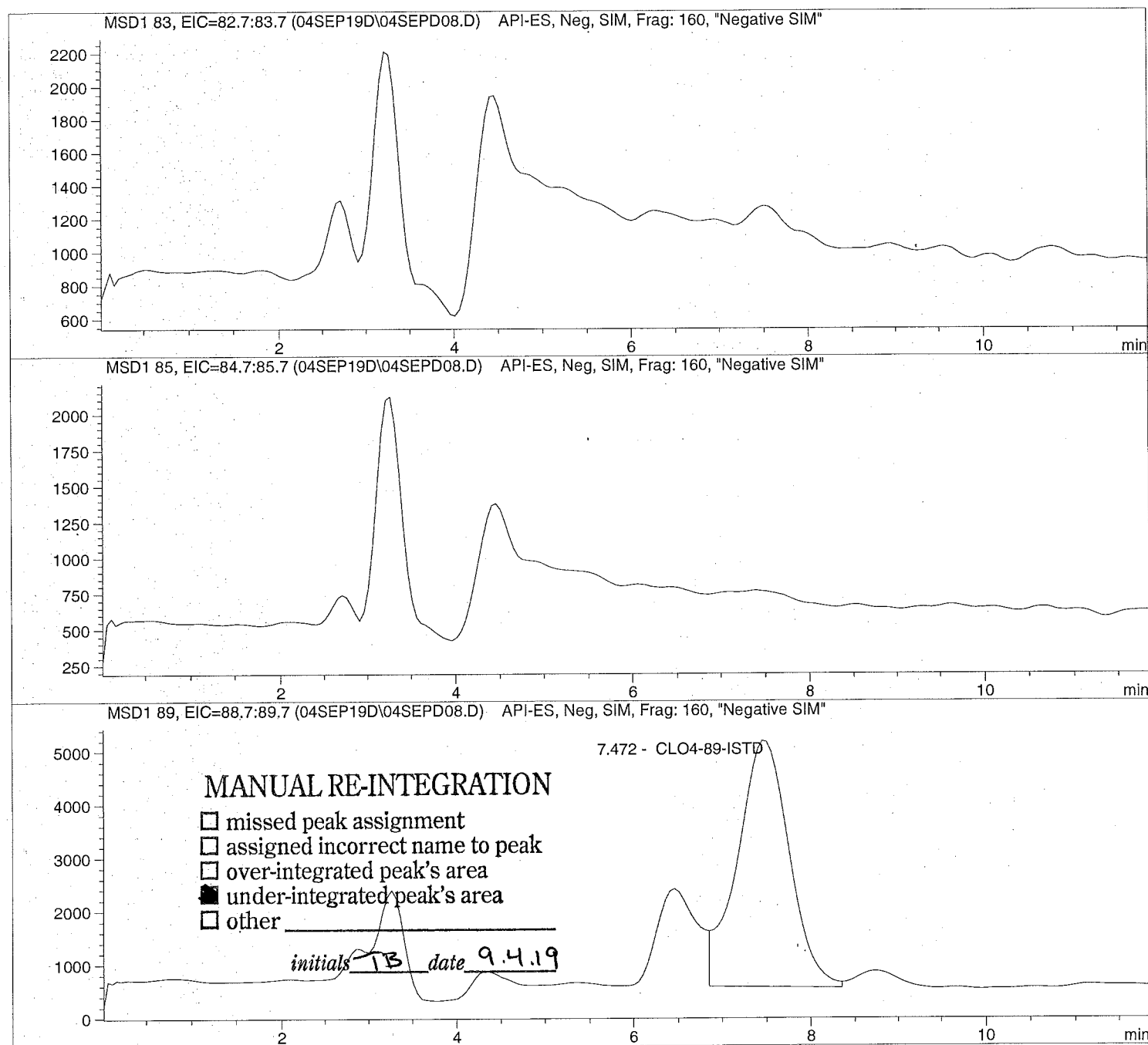
Sample Name: 1924078001

Injection Date: 9/04/2019 11:18:22
 Sample Name: 1924078001
 Acq Operator: TNB

Seq Line: 8
 Location: Vial 78
 Inj. No.: 1
 Inj. Vol.: 50 μ l

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
 Last Changed: 9/4/2019 12:03:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD08.D Sample Name: 1924078001

```

=====
Injection Date: 9/04/2019 11:18:22      Seq Line:      8
Sample Name:   1924078001                Location:      Vial 78
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    50 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:  9/4/2019 12:03:36
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.472	MF	185766.2	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD09.D

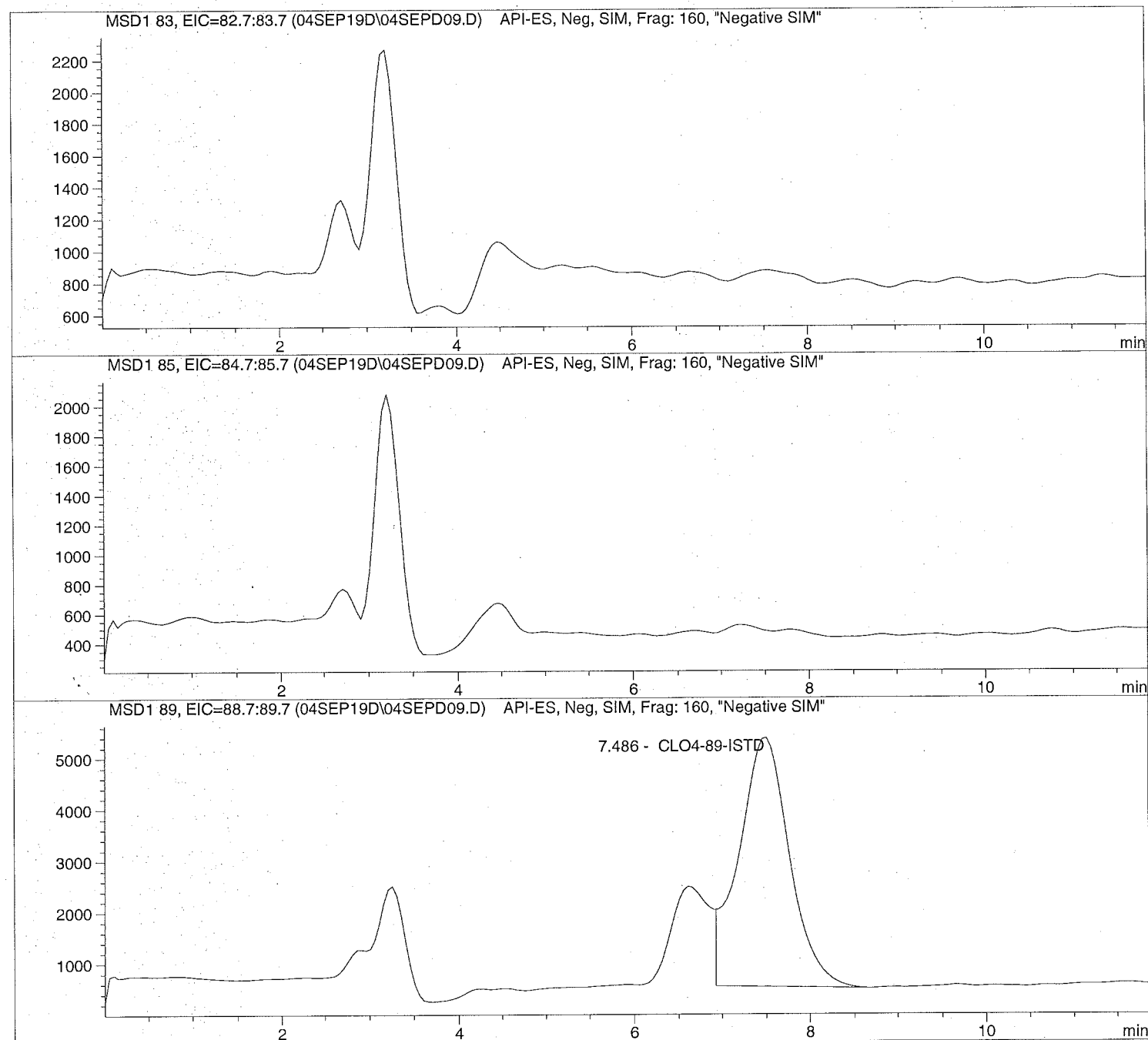
Sample Name: 1925000001

=====
Injection Date: 9/04/2019 11:32:35
Sample Name: 1925000001
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 50 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/4/2019 12:03:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEP09.D Sample Name: 1925000001

```

=====
Injection Date: 9/04/2019 11:32:35 Seq Line: 9
Sample Name: 1925000001 Location: Vial 79
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 50 µl

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/4/2019 12:03:36

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.486	FM	192863.5	5.0000	CLO4-89-ISTD

```

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

```


Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD10.D

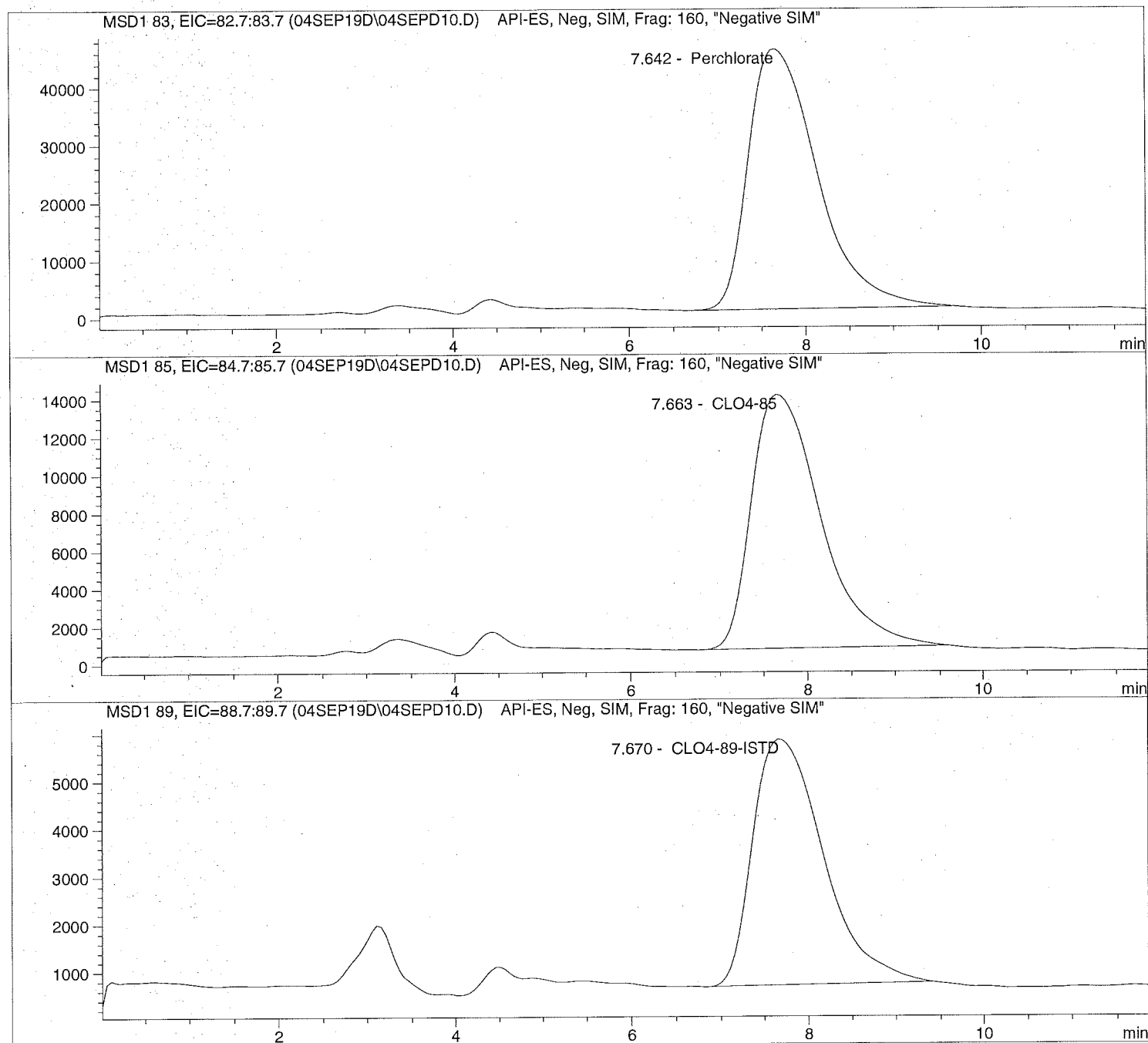
Sample Name: 671762 CCV@25

Injection Date: 9/04/2019 11:46:49
Sample Name: 671762 CCV@25
Acq Operator: TNB

Seq Line: 10
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 50 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/4/2019 12:03:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD10.D Sample Name: 671762 CCV@25

```

=====
Injection Date: 9/04/2019 11:46:49 Seq Line: 10
Sample Name: 671762 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 50 µl

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/4/2019 12:03:36

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019, 10:15:00 am
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
7.642	PBA	2467083.8	26.0447	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.663	PBA	735697.6	26.1664	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.670	PBA	287475.3	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 : 3/19/2019 2:35:19 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
8.744	1 1	1.00000	7.76074e4	1.28854e-5	1	Perchlorate
	2	2.00000	1.35273e5	1.47849e-5		
	3	5.00000	3.37764e5	1.48033e-5		
	4	10.00000	6.83454e5	1.46316e-5		
	5	25.00000	2.08433e6	1.19943e-5		
	6	50.00000	4.13334e6	1.20968e-5		
	7	75.00000	5.99313e6	1.25143e-5		
8.755	2 1	1.00000	2.36780e4	4.22333e-5	1	CLO4-85
	2	2.00000	4.69486e4	4.25998e-5		
	3	5.00000	1.06124e5	4.71147e-5		
	4	10.00000	2.13523e5	4.68335e-5		
	5	25.00000	6.14295e5	4.06971e-5		
	6	50.00000	1.19814e6	4.17315e-5		
	7	75.00000	1.78355e6	4.20509e-5		
8.766	3 1	5.00000	2.73208e5	1.83011e-5	+I1	CLO4-89-ISTD
	2	5.00000	2.24886e5	2.22335e-5		
	3	5.00000	2.33196e5	2.14412e-5		
	4	5.00000	2.34454e5	2.13262e-5		
	5	5.00000	2.50568e5	1.99547e-5		
	6	5.00000	2.30977e5	2.16472e-5		

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp Name
7		5.00000	2.21504e5	2.25729e-5	

More compound-specific settings:

Compound: Perchlorate

Time Window : From 6.654 min To 12.544 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333

Compound: CLO4-85

Time Window : From 6.650 min To 12.505 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333

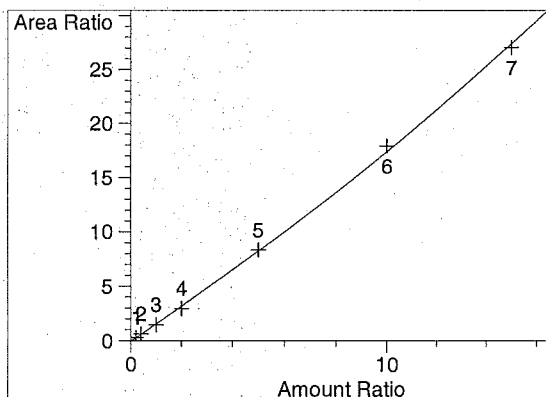
Compound: CLO4-89-ISTD

Time Window : From 6.659 min To 12.466 min
 Curve Type : Linear
 Origin : Included
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 1
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1

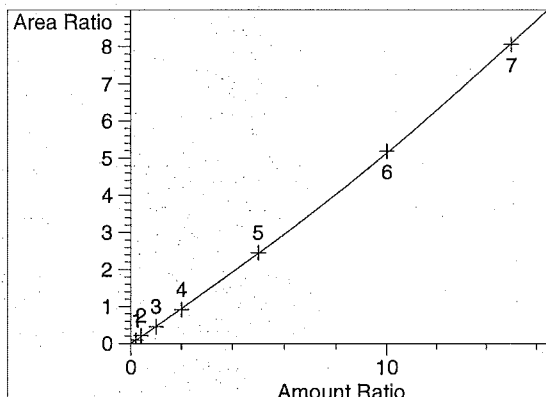
=====
 Peak Sum Table
 =====

No Entries in table

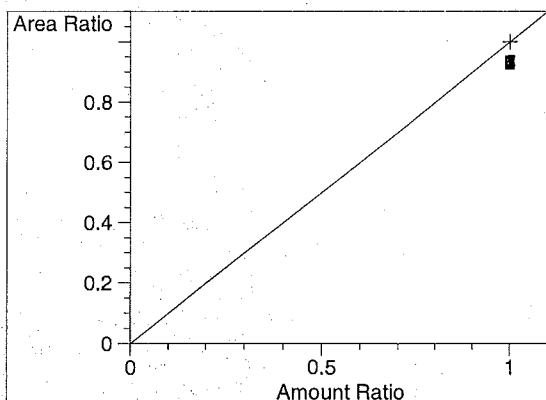
=====
 Calibration Curves
 =====



Perchlorate at exp. RT: 8.744
 MSD1 83, EIC=82.7:83.7
 Correlation: 0.99957
 Residual Std. Dev.: 0.30744
 Formula: $y = ax^2 + bx + c$
 a: 1.76988e-2
 b: 1.56480
 c: -4.92430e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
 MSD1 85, EIC=84.7:85.7
 Correlation: 0.99983
 Residual Std. Dev.: 0.03473
 Formula: $y = ax^2 + bx + c$
 a: 5.13396e-3
 b: 4.62055e-1
 c: 4.97209e-4
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
 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 1 : 1
 Level 2 : 1
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP2.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	7.76074e4	8.744	1.06245
##	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
##	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
##	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
##	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
##	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
##	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
##	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

##	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
##	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
##	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
##	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
##	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
##	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
##	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
##	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
##	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

##	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	2.73208e5	8.766	5.00000
##	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
##	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
##	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
##	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
##	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
##	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
##	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** 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 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 3/19/2019 09:39:40

Seq Line: 3

Sample Name: CLO4@ 1.0ug/L

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

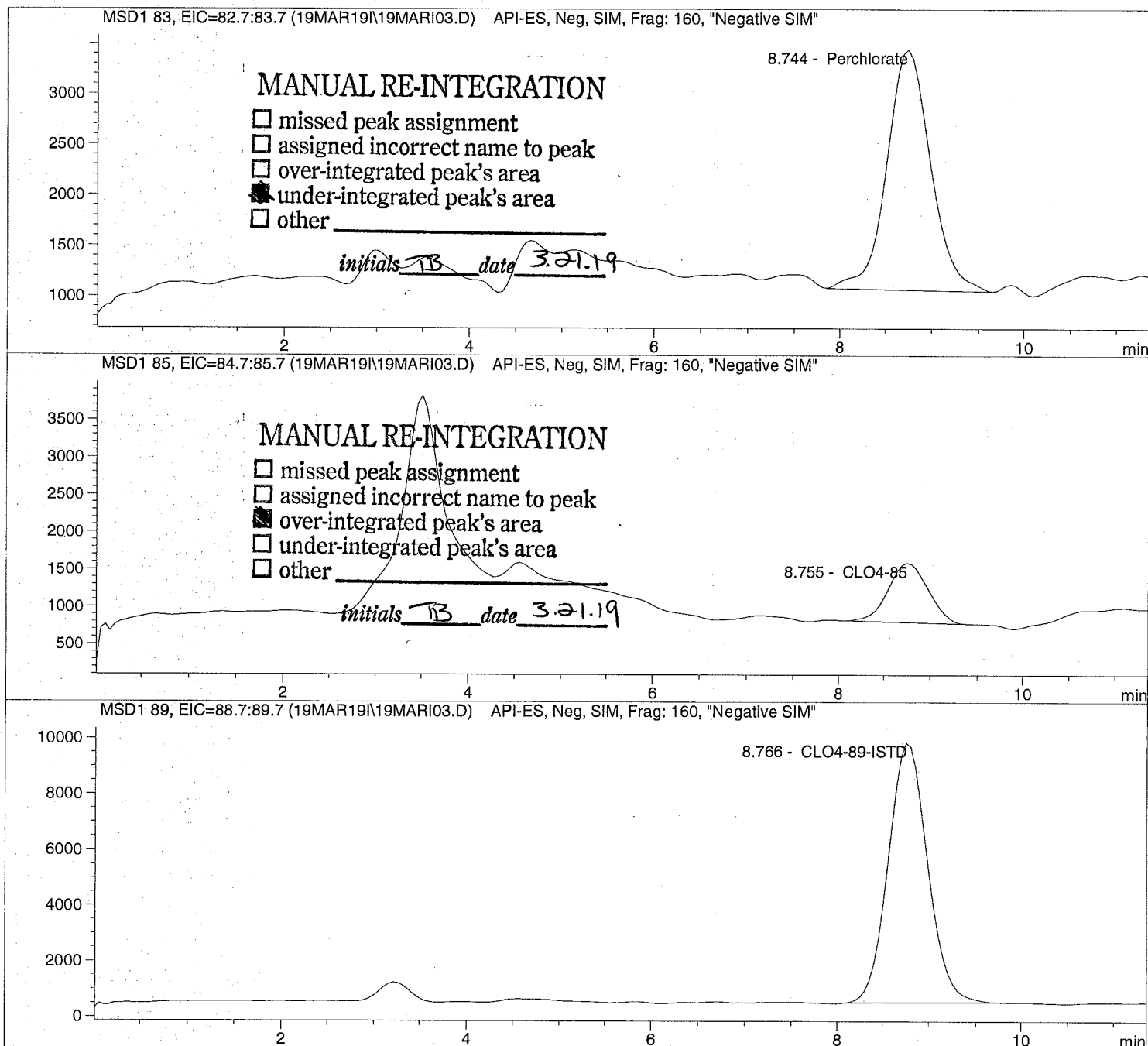
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 3/19/2019 09:39:40      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D

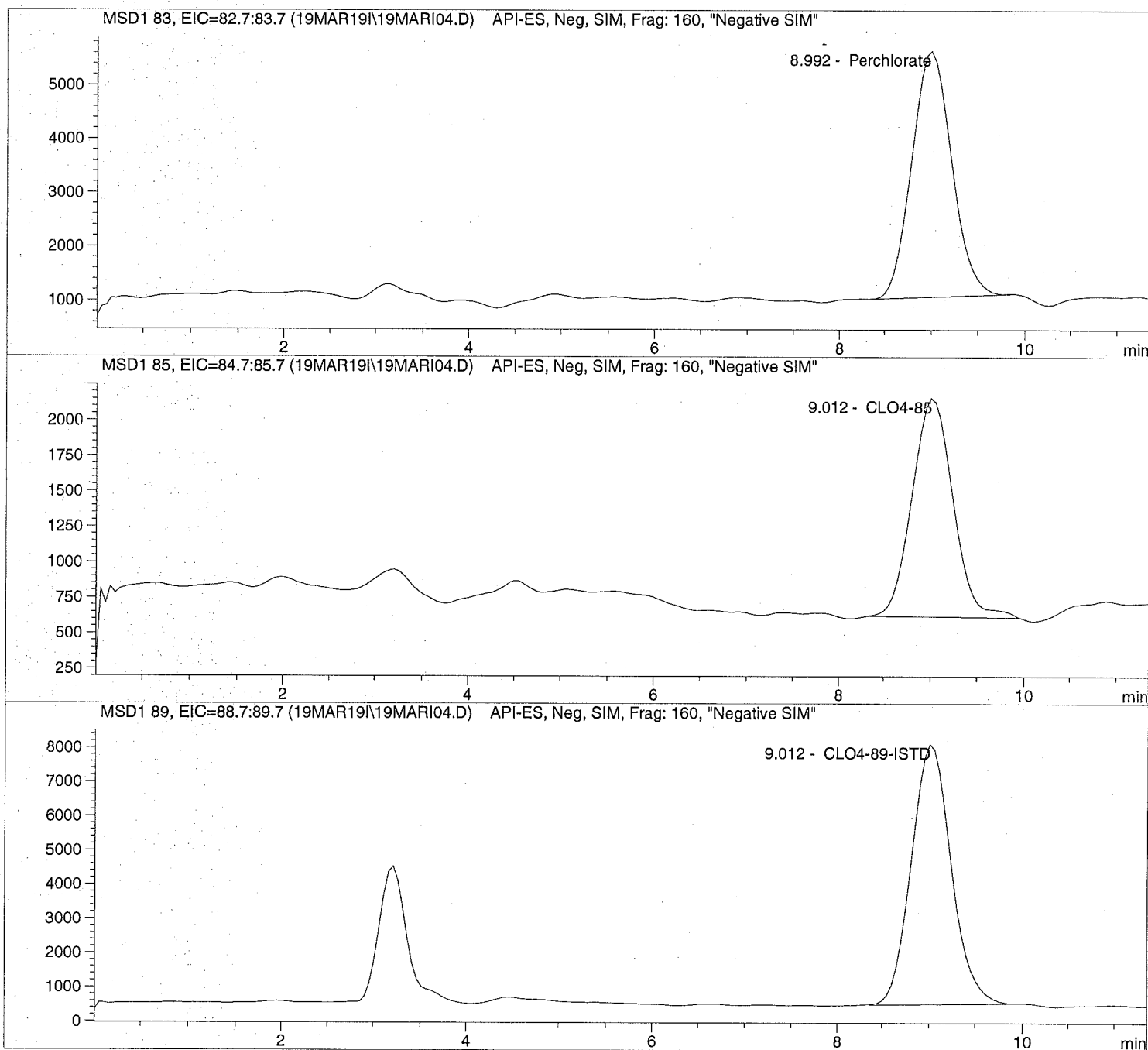
Sample Name: CLO4@ 2.0ug/L

Injection Date: 3/19/2019 09:53:00
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

```
=====
Injection Date: 3/19/2019 09:53:00      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-DP2.M
Last Changed: 3/19/2019 14:35:22
```

Perchlorate analysis

```
=====
Sample Information
=====
```

```
Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019, 02:35:19 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
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

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

Data file: C:\HPCHEM\1\DATA\19MAR19\19MARI05.D

Sample Name: CLO4@ 5.0ug/L

Injection Date: 3/19/2019 10:06:16

Seq Line: 5

Sample Name: CLO4@ 5.0ug/L

Location: Vial 75

Acq Operator: TNB

Inj. No.: 1

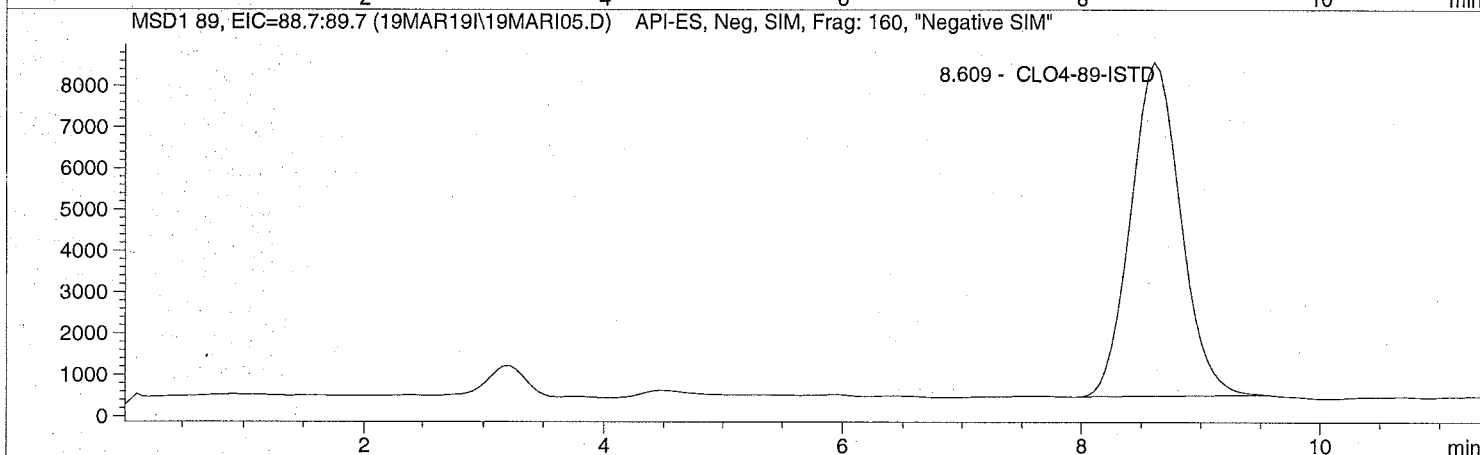
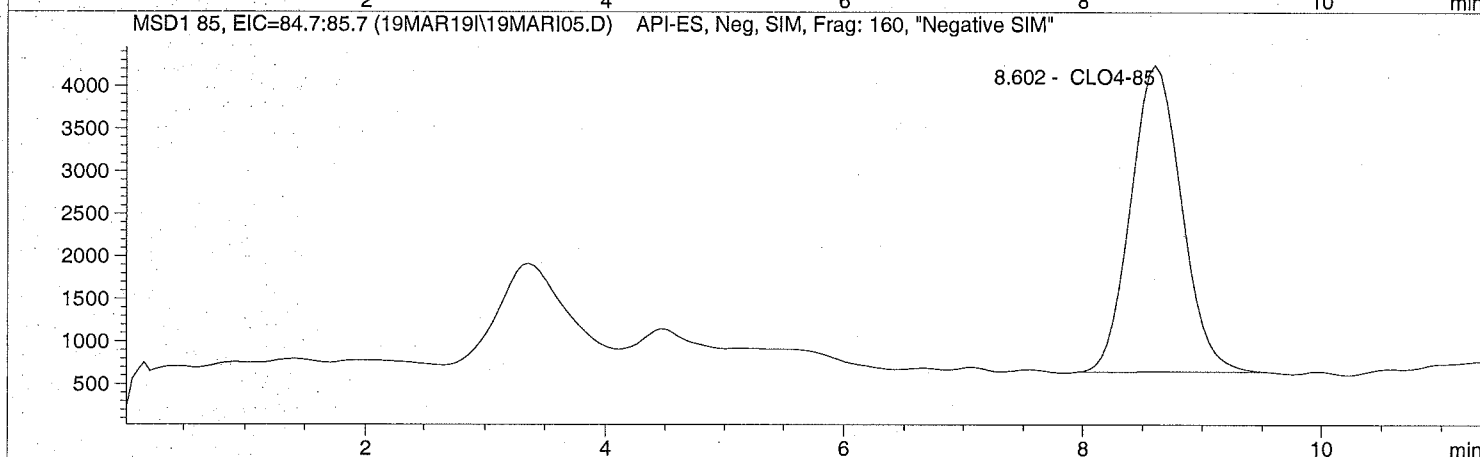
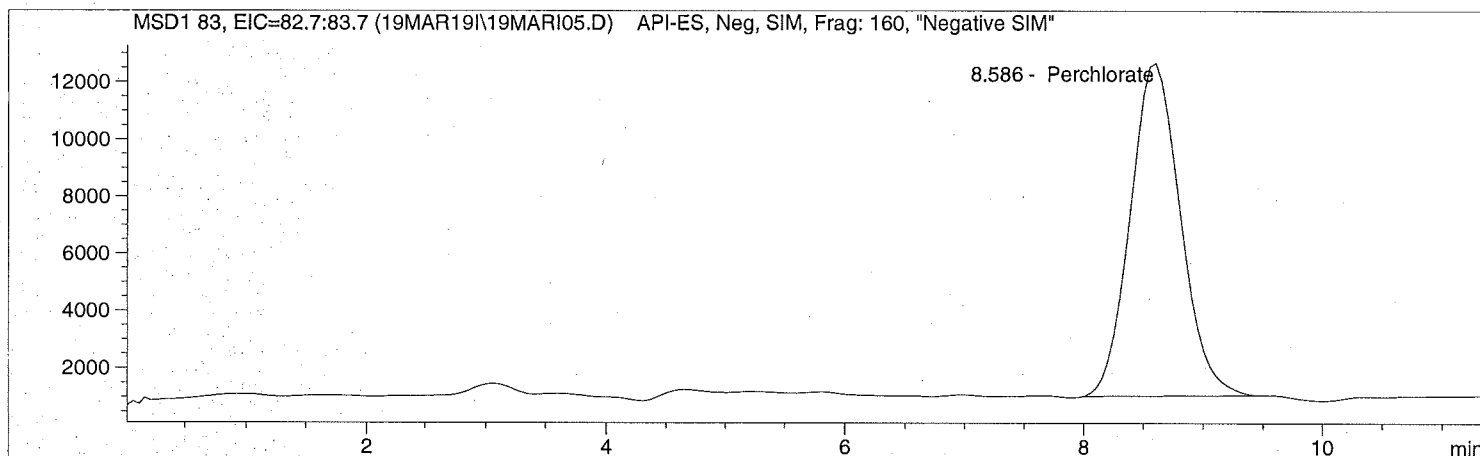
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

```

=====
Injection Date: 3/19/2019 10:06:16      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-DP2.M
Last Changed:   3/19/2019 14:35:22

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D

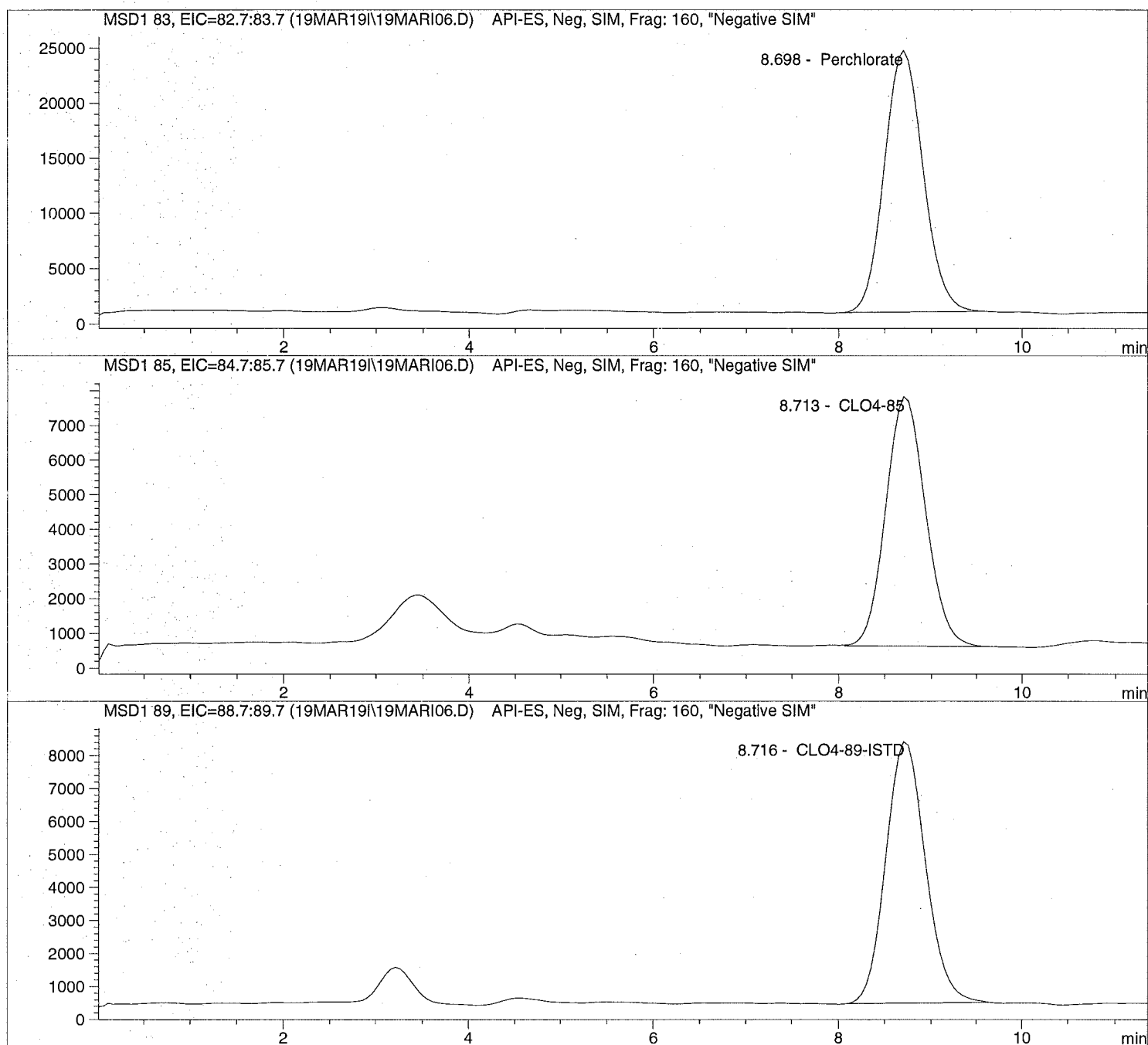
Sample Name: CLO4@ 10.ug/L

Injection Date: 3/19/2019 10:19:32
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

```

=====
Injection Date: 3/19/2019 10:19:32      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

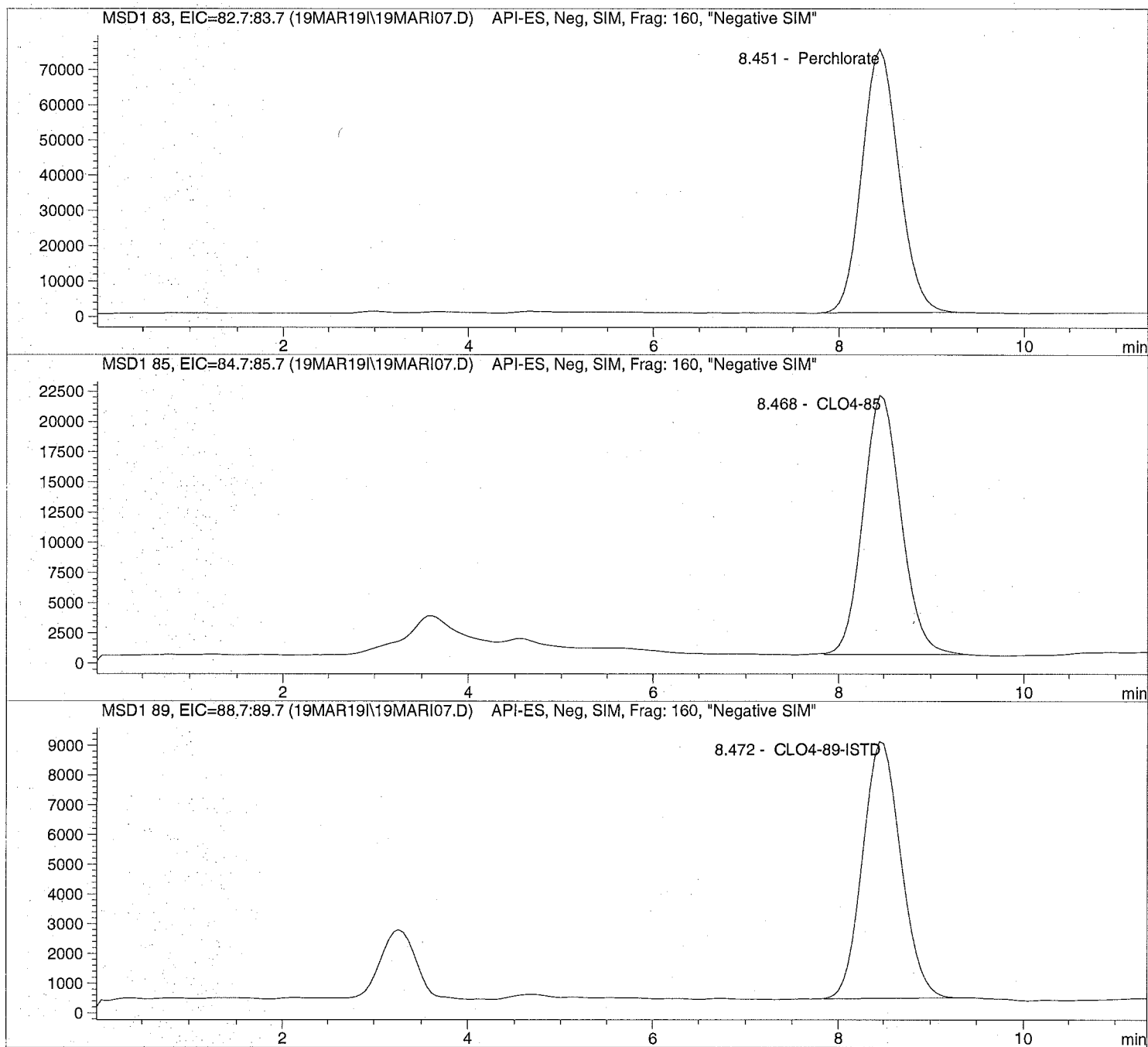
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

=====
Injection Date: 3/19/2019 10:32:49 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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

```

=====
Injection Date: 3/19/2019 10:32:49      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-DP2.M
Last Changed: 3/19/2019 14:35:22
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019, 02:35:19 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
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19\19MARI08.D

Sample Name: CLO4@ 50.ug/L

Injection Date: 3/19/2019 10:46:05

Seq Line: 8

Sample Name: CLO4@ 50.ug/L

Location: Vial 78

Acq Operator: TNB

Inj. No.: 1

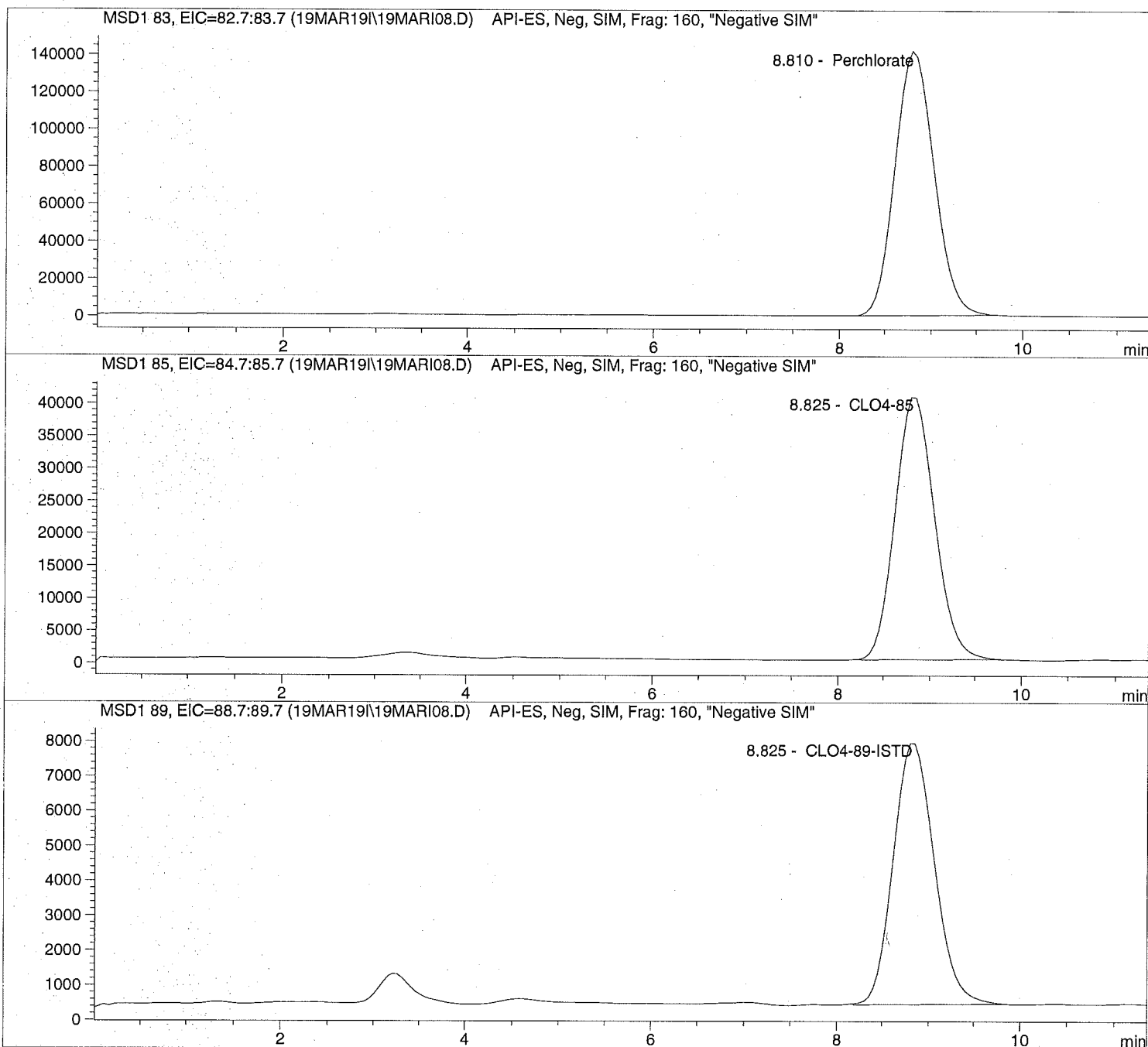
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

```

=====
Injection Date: 3/19/2019 10:46:05 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-DP2.M
Last Changed: 3/19/2019 14:35:22
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D

Sample Name: CLO4@ 75.ug/L

Injection Date: 3/19/2019 10:59:22

Seq Line: 9

Sample Name: CLO4@ 75.ug/L

Location: Vial 79

Acq Operator: TNB

Inj. No.: 1

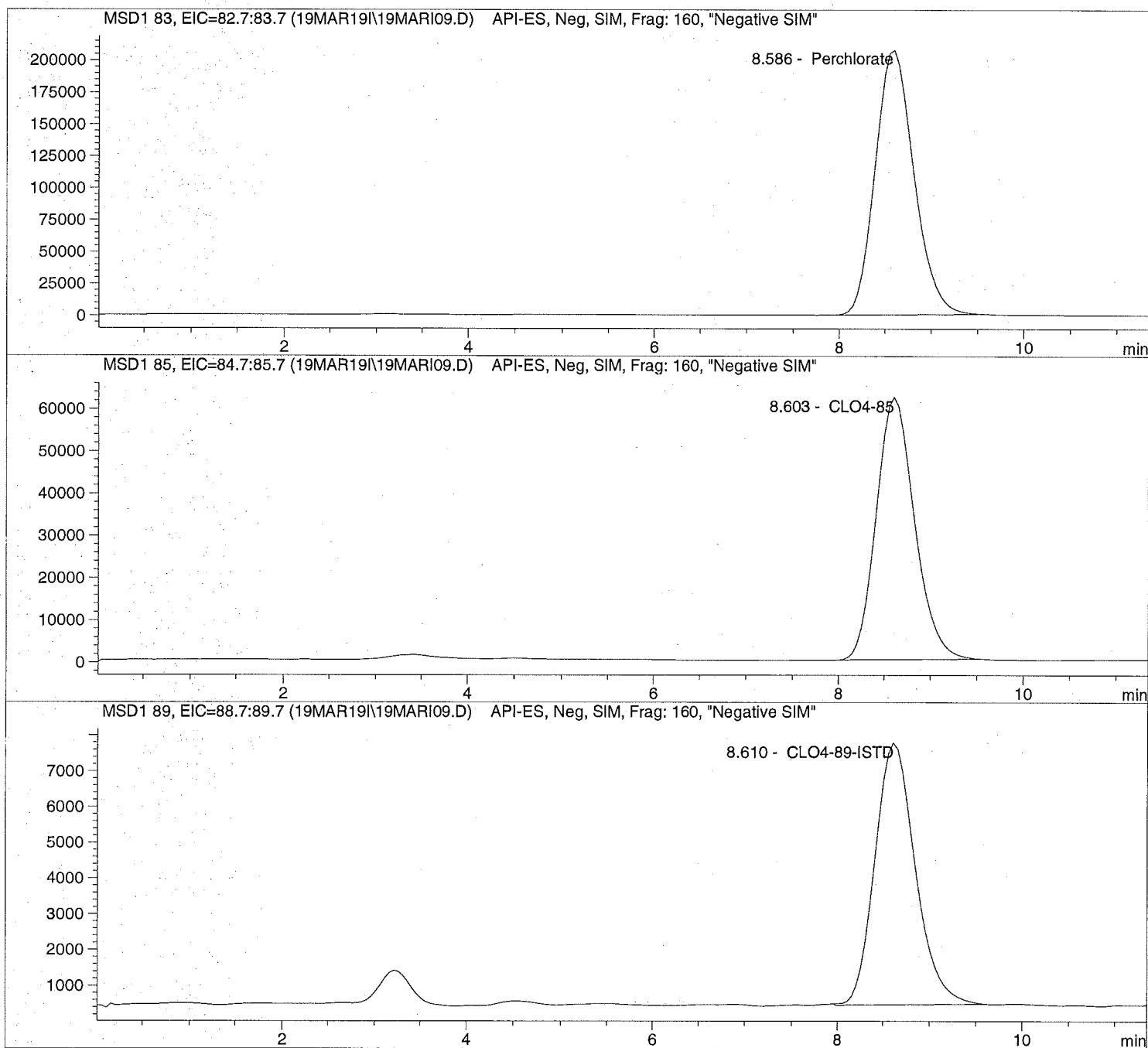
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

```

=====
Injection Date: 3/19/2019 10:59:22      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D

Sample Name: ICAL Verf@10ug/L

Injection Date: 3/19/2019 11:12:42

Seq Line: 10

Sample Name: ICAL Verf@10ug/L

Location: Vial 80

Acq Operator: TNB

Inj. No.: 1

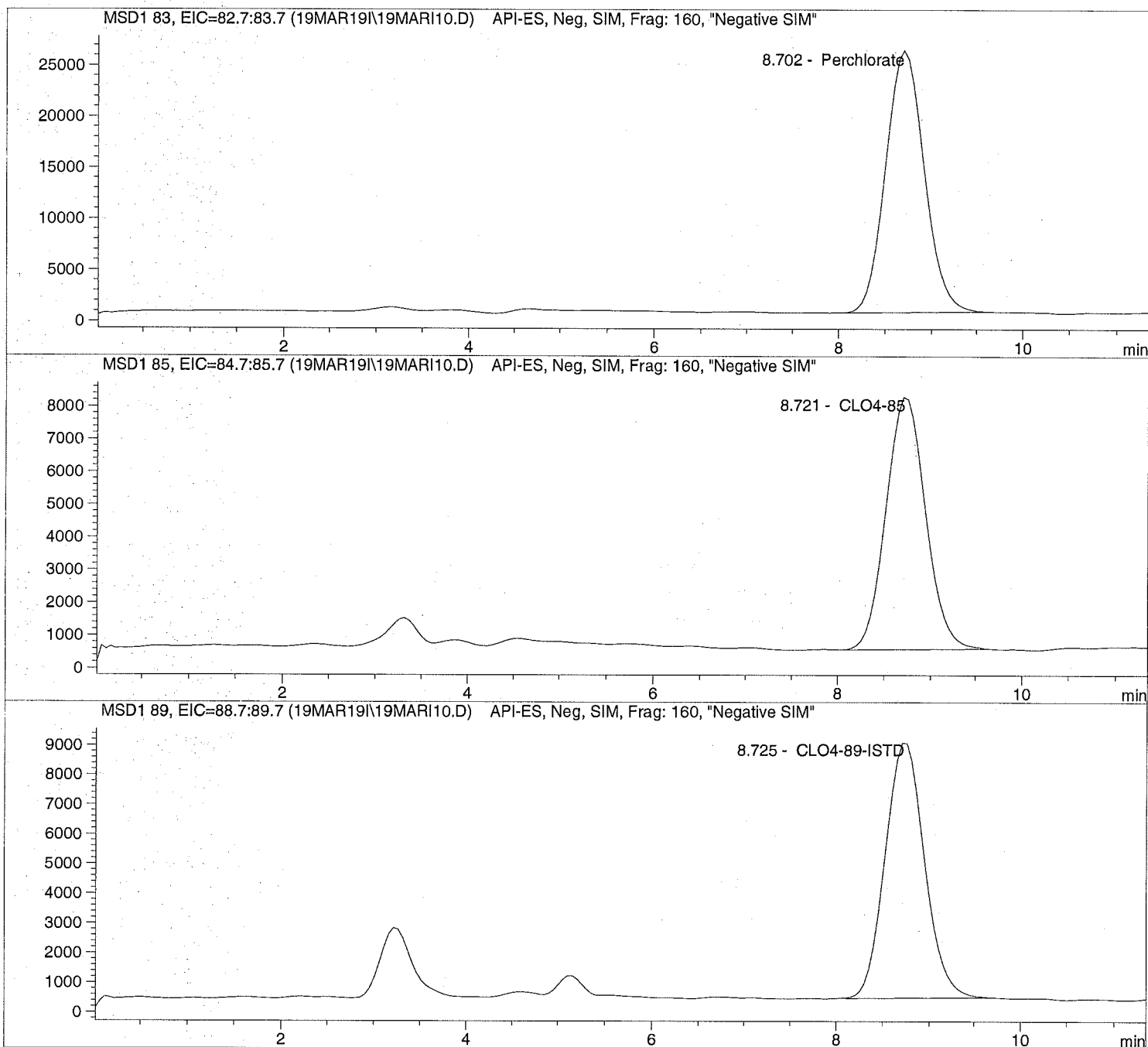
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

```

=====
Injection Date: 3/19/2019 11:12:42      Seq Line:      10
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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	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\19MAR19I\19MARI03.D

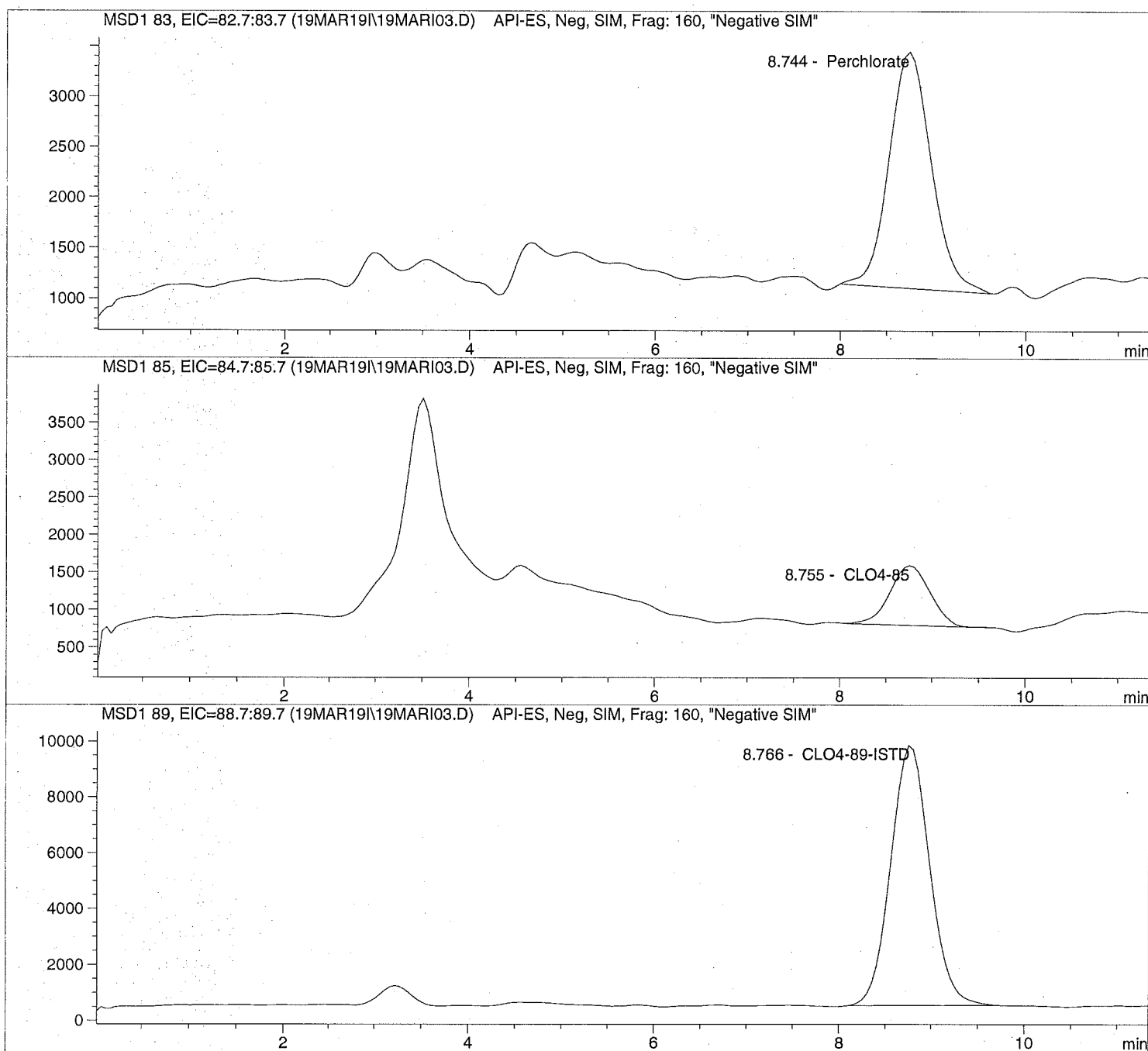
Sample Name: CLO4@ 1.0ug/L

Injection Date: 3/19/2019 09:39:40
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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 3/19/2019 09:39:40      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-DP2.M
Last Changed:   3/19/2019 14:38:25
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD05.D

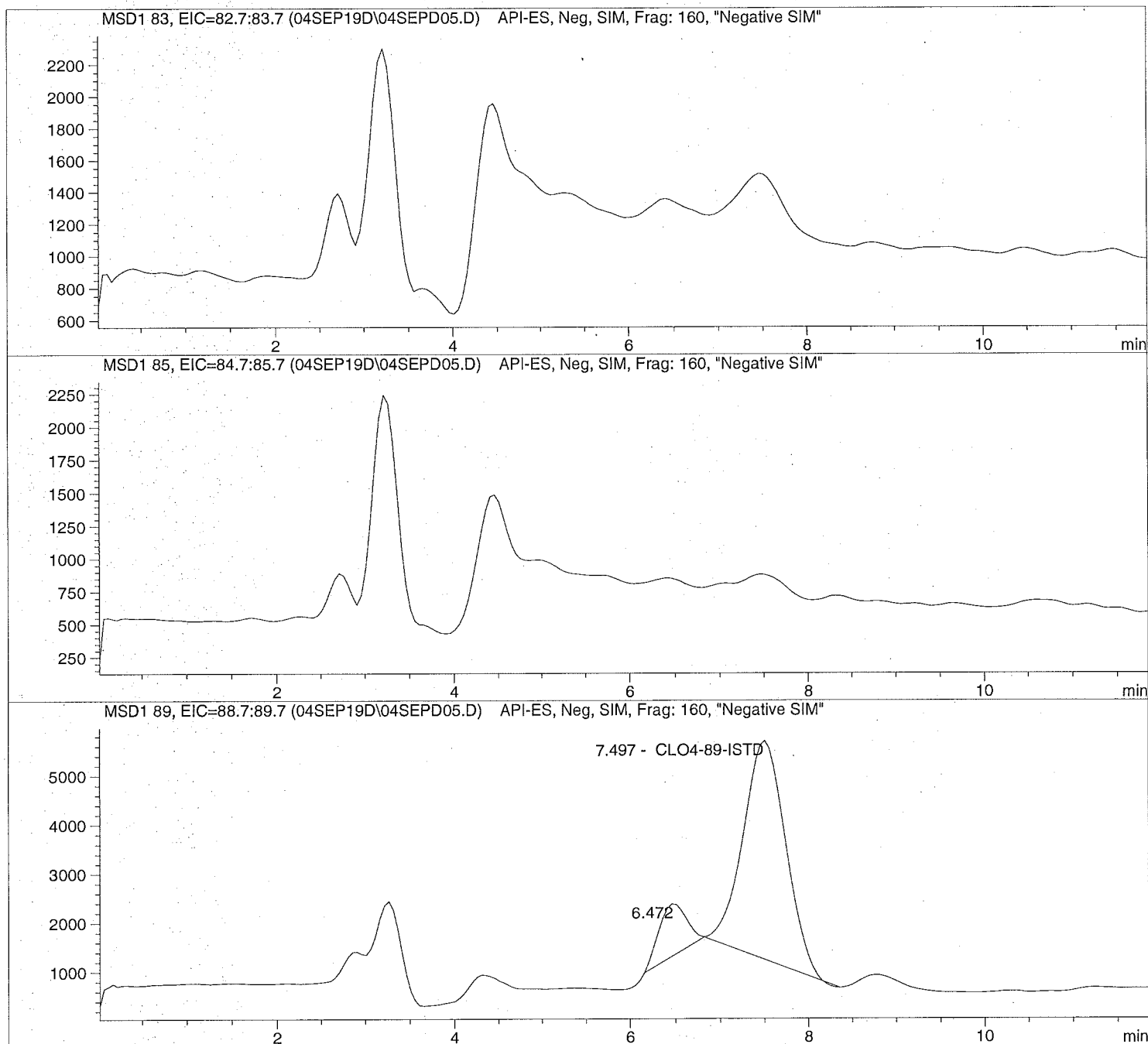
Sample Name: 1924077001

Injection Date: 9/04/2019 10:35:47
Sample Name: 1924077001
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 50 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/4/2019 12:03:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD05.D Sample Name: 1924077001

```

=====
Injection Date: 9/04/2019 10:35:47      Seq Line: 5
Sample Name: 1924077001                  Location: Vial 75
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 50 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/4/2019 12:03:36
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.472	PB	22484.4	0.0000	
7.497	VBA	149227.0	5.0000	CLO4-89-ISTD

```

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

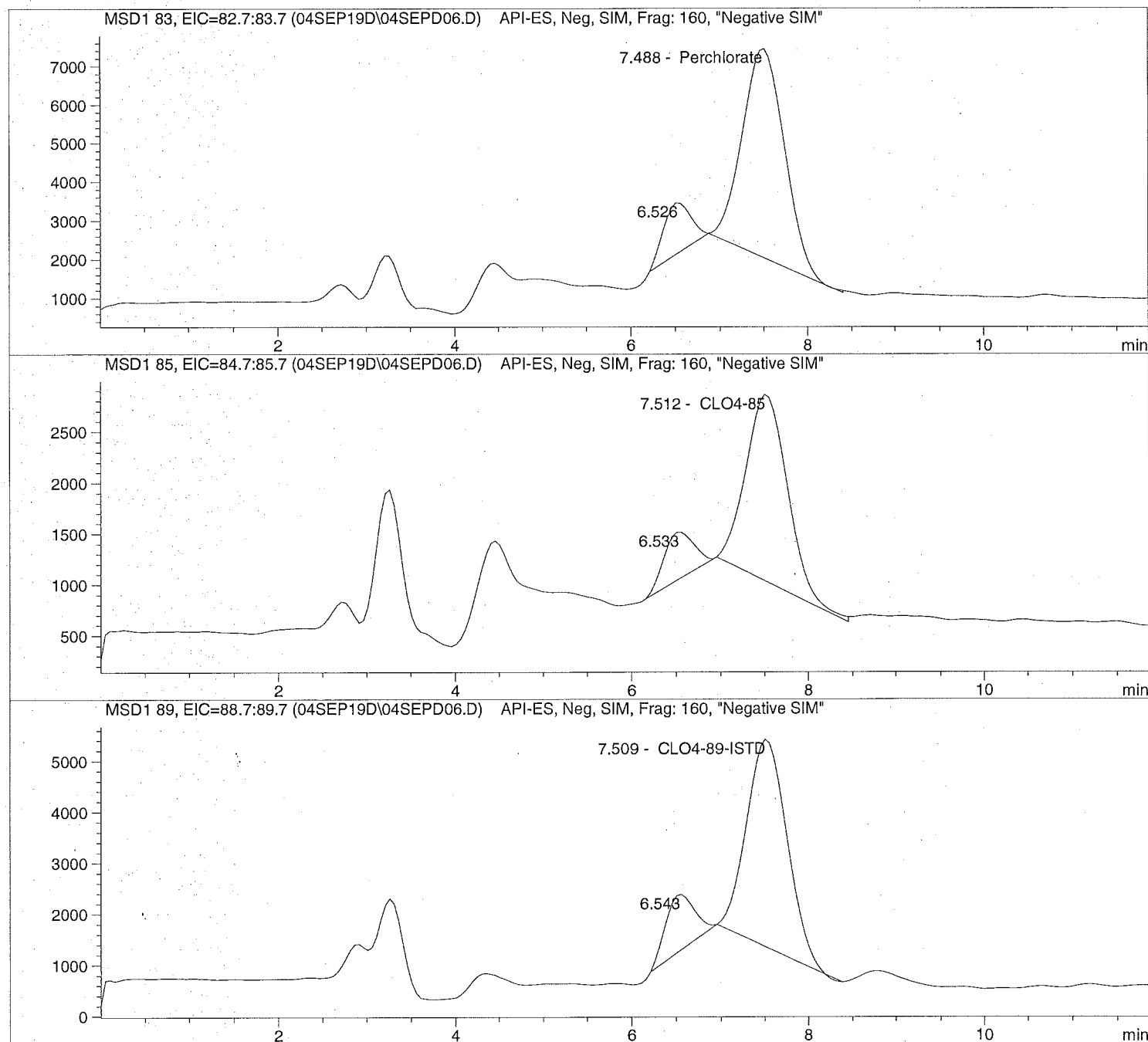
```

Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD06.D Sample Name: 671760 240771S

```
=====
Injection Date: 9/04/2019 10:49:59      Seq Line: 6
Sample Name: 671760 240771S           Location: Vial 76
Acq Operator: TNB                      Inj. No.: 1
                                         Inj. Vol.: 50 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/4/2019 12:03:36
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD06.D Sample Name: 671760 240771S

```

=====
Injection Date: 9/04/2019 10:49:59      Seq Line: 6
Sample Name:    671760 240771S          Location:  Vial 76
Acq Operator:  TNB                      Inj. No.: 1
                                           Inj. Vol.: 50 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/4/2019 12:03:36
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
6.526	PB	28324.4	0.0000	
7.488	VBA	181668.4	4.5246	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.533	PB	11043.3	0.0000	
7.512	VBA	61081.2	4.9653	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.543	PB	25427.6	0.0000	
7.509	VBA	131523.7	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD07.D

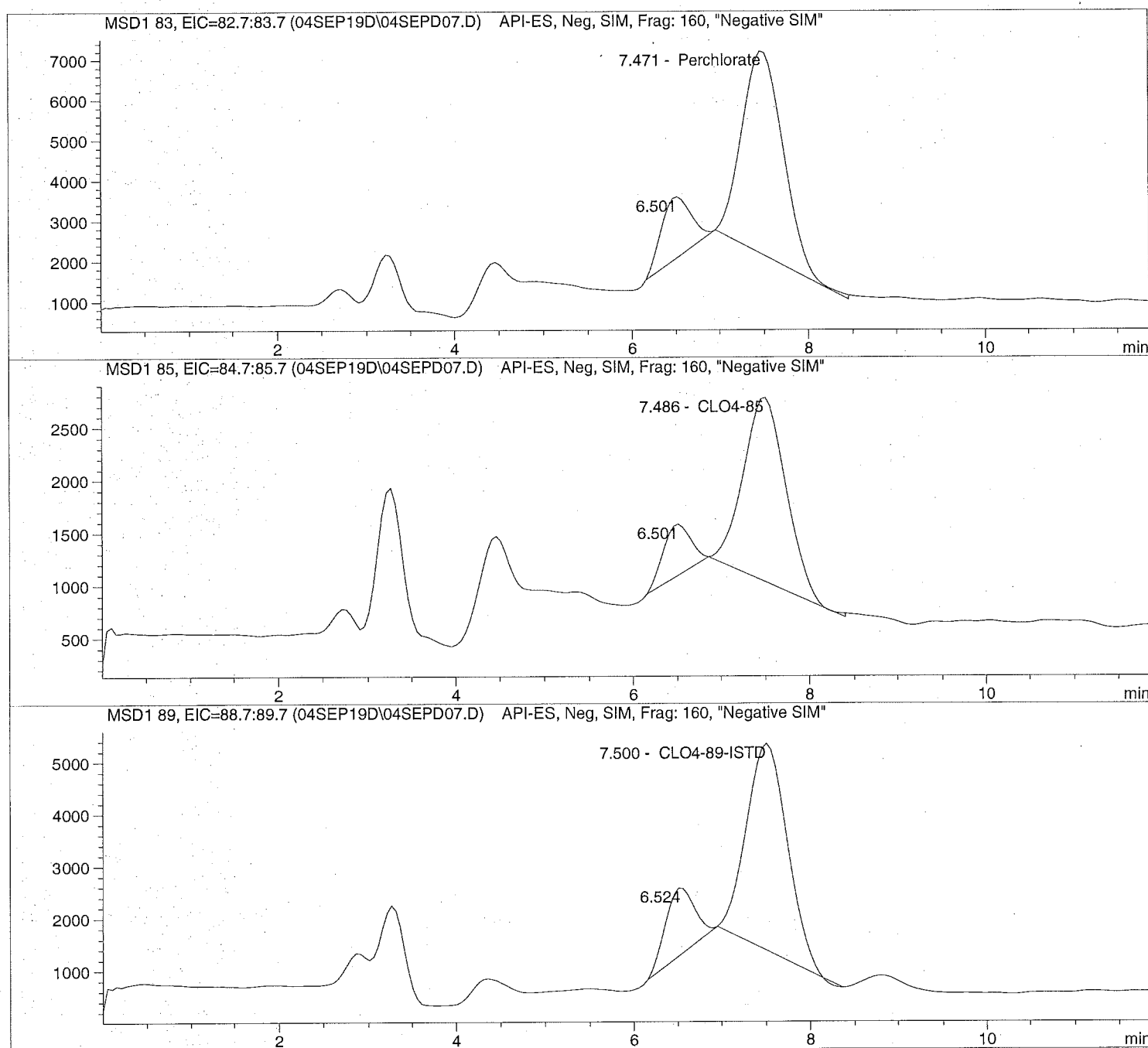
Sample Name: 671761 240771D

Injection Date: 9/04/2019 11:04:10
Sample Name: 671761 240771D
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/4/2019 12:03:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD07.D Sample Name: 671761 240771D

```

=====
Injection Date: 9/04/2019 11:04:10 Seq Line: 7
Sample Name: 671761 240771D Location: Vial 77
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 50 µl

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/4/2019 12:03:36

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019, 10:15:00 am
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
6.501	PB	36136.0	0.0000	
7.471	VBA	163374.0	4.2267	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.501	PB	10843.8	0.0000	
7.486	VBA	58416.5	4.9175	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.524	PB	30077.9	0.0000	
7.500	VBA	127021.3	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD08.D

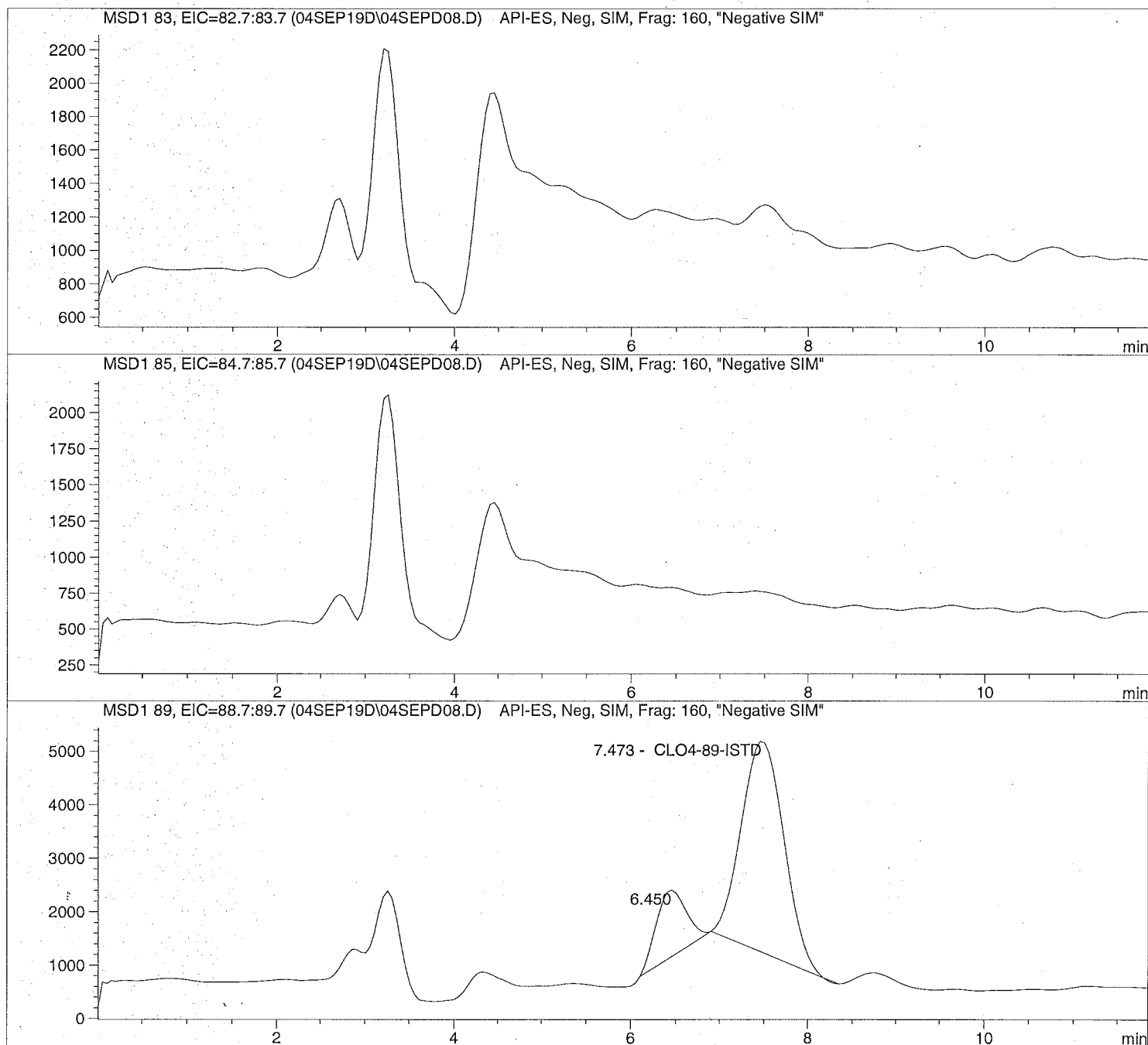
Sample Name: 1924078001

Injection Date: 9/04/2019 11:18:22
Sample Name: 1924078001
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/4/2019 12:03:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEP08.D Sample Name: 1924078001

```

=====
Injection Date: 9/04/2019 11:18:22      Seq Line:      8
Sample Name:   1924078001                Location:      Vial 78
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    50 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:  9/4/2019 12:03:36
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.450	PB	29359.0	0.0000	
7.473	VBA	133454.4	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD09.D

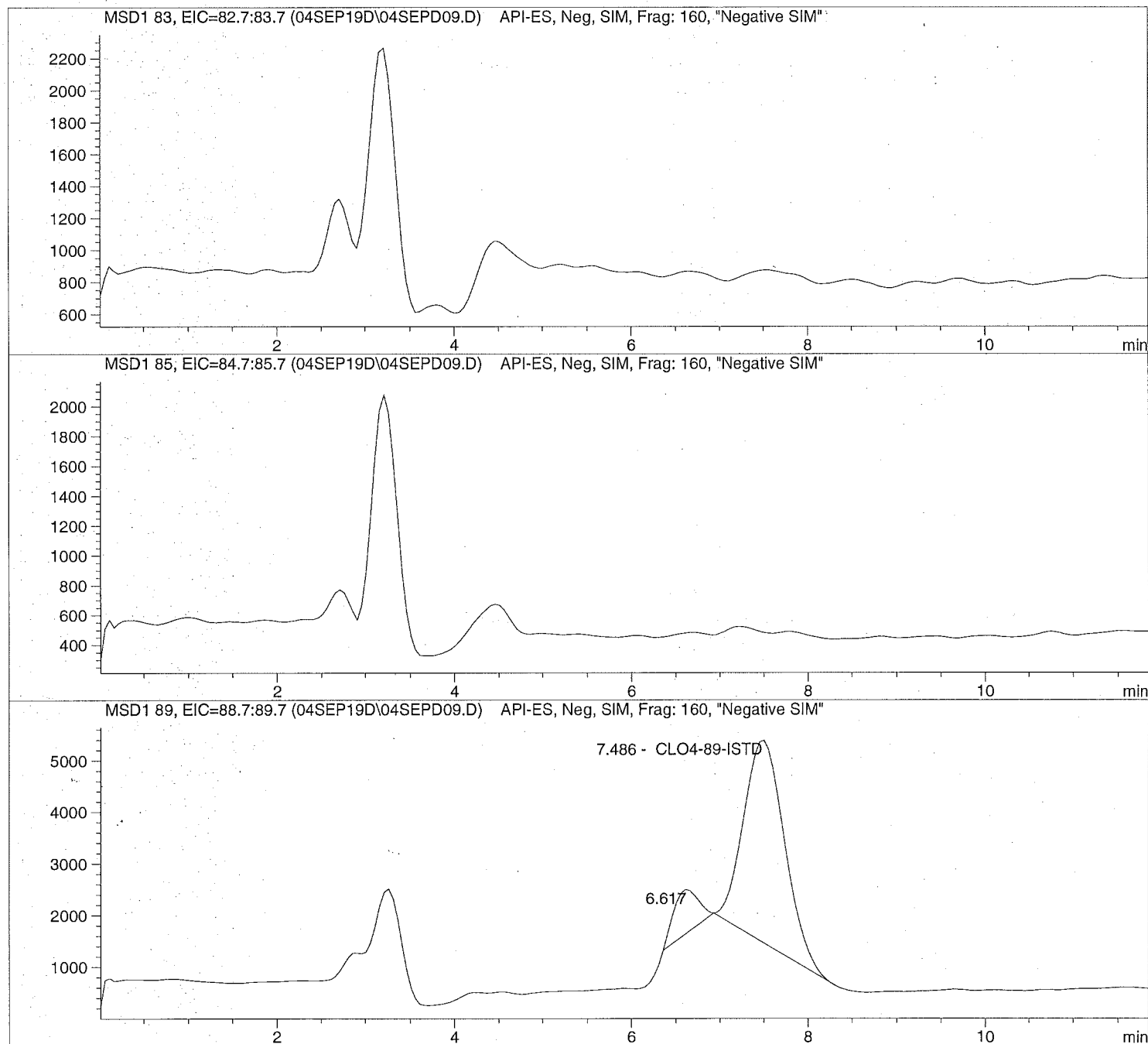
Sample Name: 1925000001

Injection Date: 9/04/2019 11:32:35
Sample Name: 1925000001
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 50 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/4/2019 12:03:36

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\04SEP19D\04SEPD09.D Sample Name: 1925000001

```

=====
Injection Date: 9/04/2019 11:32:35      Seq Line:          9
Sample Name:    1925000001              Location:          Vial 79
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:        50 µl

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/4/2019 12:03:36

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.617	BB	16665.3	0.0000	
7.486	VBA	127478.8	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

September 19, 2019

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

Work Order: **HS19090166**

Laboratory Results for: **Longhorn GW Treatment Plant - GWTP Weekly Effluent**

Dear Marcia,

ALS Environmental received 2 sample(s) on Sep 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 simple oval scribble.

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US

Date: 19-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
Work Order: HS19090166

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19090166-01	LH18/24-SP650_090419	Groundwater		04-Sep-2019 14:00	05-Sep-2019 08:50	<input type="checkbox"/>
HS19090166-02	LH18/24-SP650_090419_AIX	Groundwater		04-Sep-2019 14:00	05-Sep-2019 08:50	<input type="checkbox"/>

ALS Houston, US

Date: 19-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
Work Order: HS19090166

CASE NARRATIVE**Work Order Comments**

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

WetChemistry by Method E365.3**Batch ID: R346078**

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

WetChemistry by Method E350.3**Batch ID: R346062**

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

ALS Houston, US

Date: 19-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
 Sample ID: LH18/24-SP650_090419
 Collection Date: 04-Sep-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19090166
 Lab ID:HS19090166-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)								Analyst: KVL
Nitrogen, Ammonia (As N)	7.9		0.20	0.20	0.20	mg/L	1	10-Sep-2019 10:45
ORTHO PHOSPHATE (PO4) AS P BY E365.3								Analyst: KVL
Phosphorus, Total Orthophosphate (As P)	3.03		0.100	0.250	0.250	mg/L	10	05-Sep-2019 17:46
SUBCONTRACT ANALYSIS - TOC ANALYSIS								Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	17-Sep-2019 15:28

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

ALS Houston, US

Date: 19-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
 Sample ID: LH18/24-SP650_090419_AIX
 Collection Date: 04-Sep-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19090166
 Lab ID:HS19090166-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA		Analyst: SUB				
Subcontract Analysis	See Attached		0	0		NA	1	19-Sep-2019 16:33

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

ALS Houston, US

Date: 19-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: HS19090166

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R346062 (0)		Test Name : AMMONIA AS N BY E350.3(ISE)			Matrix: Groundwater	
HS19090166-01	LH18/24-SP650_090419	04 Sep 2019 14:00			10 Sep 2019 10:45	1
Batch ID: R346078 (0)		Test Name : ORTHO PHOSPHATE (PO4) AS P BY E365.3			Matrix: Groundwater	
HS19090166-01	LH18/24-SP650_090419	04 Sep 2019 14:00			05 Sep 2019 17:46	10
Batch ID: R346394 (0)		Test Name : SUBCONTRACT ANALYSIS - TOC ANALYSIS			Matrix: Groundwater	
HS19090166-01	LH18/24-SP650_090419	04 Sep 2019 14:00			17 Sep 2019 15:28	1
Batch ID: R346576 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Groundwater	
HS19090166-02	LH18/24-SP650_090419_AIX	04 Sep 2019 14:00			19 Sep 2019 16:33	1

ALS Houston, US

Date: 19-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: HS19090166

QC BATCH REPORT

Batch ID:	R346062 (0)	Instrument:	WetChem_HS	Method:	AMMONIA AS N BY E350.3(ISE)					
MBLK	Sample ID: MBLK-R346062	Units:	mg/L	Analysis Date:	10-Sep-2019 10:45					
Client ID:	Run ID: WetChem_HS_346062	SeqNo:	5248518	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)	0.20	0.20								U
LCS	Sample ID: LCS-R346062	Units:	mg/L	Analysis Date:	10-Sep-2019 10:45					
Client ID:	Run ID: WetChem_HS_346062	SeqNo:	5248517	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)	9.282	0.20	10	0	92.8	80 - 120				
MS	Sample ID: HS19081495-01MS	Units:	mg/L	Analysis Date:	10-Sep-2019 10:45					
Client ID:	Run ID: WetChem_HS_346062	SeqNo:	5248520	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)	9.879	0.20	10	1.03	88.5	80 - 120				
MSD	Sample ID: HS19081495-01MSD	Units:	mg/L	Analysis Date:	10-Sep-2019 10:45					
Client ID:	Run ID: WetChem_HS_346062	SeqNo:	5248519	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)	9.981	0.20	10	1.03	89.5	80 - 120	9.879	1.03	20	

The following samples were analyzed in this batch: HS19090166-01

ALS Houston, US

Date: 19-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: HS19090166

QC BATCH REPORT

Batch ID:	R346078 (0)	Instrument:	UV-2450	Method:	ORTHO PHOSPHATE (PO4) AS P BY E365.3					
MBLK	Sample ID: MBLK-R346078	Units:	mg/L	Analysis Date:	05-Sep-2019 17:46					
Client ID:	Run ID: UV-2450_346078	SeqNo:	5248793	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-R346078	Units:	mg/L	Analysis Date:	05-Sep-2019 17:46					
Client ID:	Run ID: UV-2450_346078	SeqNo:	5248792	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)	0.246	0.0250	0.25	0	98.4	85 - 115				
LCSD	Sample ID: LCSD-R346078	Units:	mg/L	Analysis Date:	05-Sep-2019 17:46					
Client ID:	Run ID: UV-2450_346078	SeqNo:	5248791	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)	0.245	0.0250	0.25	0	98.0	85 - 115	0.246	0.407	20	
MS	Sample ID: HS19090166-01MS	Units:	mg/L	Analysis Date:	05-Sep-2019 17:46					
Client ID: LH18/24-SP650_090419	Run ID: UV-2450_346078	SeqNo:	5248795	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)	5.4	0.250	2.5	3.03	94.8	80 - 120				
MSD	Sample ID: HS19090166-01MSD	Units:	mg/L	Analysis Date:	05-Sep-2019 17:46					
Client ID: LH18/24-SP650_090419	Run ID: UV-2450_346078	SeqNo:	5248794	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)	5.42	0.250	2.5	3.03	95.6	80 - 120	5.4	0.37	20	

The following samples were analyzed in this batch: HS19090166-01

ALS Houston, US

Date: 19-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: HS19090166

**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	2019-141	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19090166

Date/Time Received: **05-Sep-2019 08:50**
 Received by: **AC**

Checklist completed by: Paresh M. Giga 5-Sep-2019
 eSignature Date

Reviewed by: Corey Grandits 5-Sep-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): 1.9c U/c IR25
 Cooler(s)/Kit(s): 44516
 Date/Time sample(s) sent to storage: 9/5/19 13:20

- 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:



1608 13th Avenue South, Suite 300
 Birmingham Alabama 35205
 Tel: 205-918-4000
 Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: _____

Facility/Base I.D.: <u>LHAAP</u>								Sample Analysis Requested ⁽¹⁾										Quality Assurance Samples ⁽²⁾						
Project/Site Name: <u>LHAAP / GWTP weekly Effluent</u>								Number of containers	TOC	Ammonia-N	Orthophosphate	Phosphate									Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Coiler ID
Client Name:																								
Collected by: <u>Scott Beesing</u>																								
Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mm-YYYY)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (3)	Sample Number (4)	Sample Matrix (4)																	
<u>LH1824-SW60-090419</u>		<u>04 Sep 2019</u>	<u>1400</u>		<u>N</u>	<u>WG</u>	<u>4</u>	<u>X</u>	<u>X</u>	<u>X</u>														
<u>LH1824-SW60-090419-ATX</u>		<u>04 Sep 2019</u>	<u>1400</u>		<u>N</u>	<u>WG</u>	<u>1</u>				<u>X</u>													

HS19090166
 Bhate Environmental Associates, Inc.
 Ighorn GW Treatment Plant - GWTP Weekly Effluent

COMMENTS:

STANDARD TAT

Relinquished By (Signed)				Received by (signed)				Sample Delivery Details / Laboratory Receipt			
<u>Scott Beesing</u>	<u>9/4/19</u>	<u>1430</u>		<u>AC</u>	<u>9-5-19</u>	<u>08:50</u>		Delivered Directly to Lab: _____	Shipped _____	No.:	
								Method of Shipment: _____			
								Fed _____ Ex _____ Airbill _____ Number: _____			
								Analytical Lab: <u>ALS 10450 Stancliff Rd, Suite 210 Houston, TX 77099 (281) 530-6656</u>			
								Lab Recipient: <u>ATIN, SONIA WEST</u> Delivery Date/Time: _____			

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)
 2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)
 3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)
 4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks
 5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.
 6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

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

CUSTODY SEAL		Seal Broken By:
PK#:	914/19	Time: 1430
Name:	Scott Beeson Gen	
Company:	B.H.A.T.C.	
		Date:

FedEx
 TRK# 4380 9529 3556
 0221

SEP 10 10:30A
PRIORITY OVERNIGHT

AB SGRA

7709
 TX-US



475872 09/04 55711/9204/0582



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

September 17, 2019

Analytical Report for Service Request No: K1908161

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

RE: HS19090166

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory September 06, 2019. For your reference, these analyses have been assigned our service request number **K1908161**.

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.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)636-1 068
www.alsglobal.com



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

Service Request: K1908161
Date Received: 09/06/2019

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 ground water sample was received for analysis at ALS Environmental on 09/06/2019. 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 09/17/2019



Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com



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

101908161

Subcontract Chain of Custody

SAMPLING STATE: Dept of Defense

COC ID: 12124

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: HS19090166
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19090166-01	LH18/24-SP650_090419	Groundwater	04 Sep 2019 14:00
TOC Analysis for DOD Level IV			19 Sep 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: Nederber
Cooler ID(s): _____

Date/Time: 9/5/19 1800.
Date/Time: 9-6-19 1030
Temperature(s): _____



PC Kelley

Cooler Receipt and Preservation Form

Client ALS Houston Service Request K19 08161

Received: 9.6.19 Opened: 9.6.19 By: NP Unloaded: 9.6.19 By: NP

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

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-0.3	-0.1	0.0	0.2	0.2	396	12224	4809 7837 5886	

- 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: _____



General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

Analytical Report

Client: ALS Environmental - US
Project: HS19090166
Sample Matrix: Ground Water
Analysis Method: SM 5310 C
Prep Method: None

Service Request: K1908161
Date Collected: 09/4/19
Date Received: 09/6/19
Units: mg/L
Basis: NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_090419	K1908161-001	0.81	0.50	0.20	0.07	1	09/11/19 07:47	
Method Blank	K1908161-MB	ND U	0.50	0.20	0.07	1	09/11/19 08:44	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19090166
Sample Matrix: Ground Water

Service Request: K1908161
Date Collected: 09/04/19
Date Received: 09/06/19
Date Analyzed: 09/11/19

Replicate Sample Summary
General Chemistry Parameters

Sample Name: LH18/24-SP650_090419
Lab Code: K1908161-001

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 K1908161-001DUP Result</u>	<u>Average</u>	<u>RPD</u>	<u>RPD Limit</u>
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	0.81	0.84	0.824	4	10

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

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

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

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19090166
Sample Matrix: Ground Water

Service Request: K1908161
Date Analyzed: 09/11/19
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: 650766

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1908161-LCS	24.3	25.0	97	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project:

Service Request: K1908161

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	650766	KQ1912836-22	09/11/19 00:47	25.0	24.1	97	90-110
CCV2	650766	KQ1912836-23	09/11/19 08:15	25.0	23.7	95	90-110
CCV3	650766	KQ1912836-24	09/11/19 12:59	25.0	24.0	96	90-110
CCV4	650766	KQ1912836-25	09/11/19 18:09	25.0	23.7	95	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US

Service Request:K1908161

Project:

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	650766	KQ1912836-26	09/11/19 01:01	0.50	0.20	0.07	ND	U
CCB2	650766	KQ1912836-27	09/11/19 08:30	0.50	0.20	0.07	ND	U
CCB3	650766	KQ1912836-28	09/11/19 13:13	0.50	0.20	0.07	ND	U
CCB4	650766	KQ1912836-29	09/11/19 18:23	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)636-1 068
www.alsglobal.com

Work Request # ^{Original} () K1908065, 8071, 8075, 8099, 8092, 8139, 8145, 8150, 8161, 8169, 8164, 8184, 8139, 8231
 Tier: IV IV IV II II II IV II IV II IV IV II II
 Date Analyzed: 9/10/19 TOC: 650765,
650766,
650769
 Analyst: BOD Run # DOC: 650772
 Analysis: TOC/POC

**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/ 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: K1908071-4/4d/4+4g, 8075-3/3d/3t/3g, 8184-2/2d, and 8092-1/1d report a high %RSD. However, these samples are less than 5x the MRL.
K1908092-6/6d, 8092-8/8d report a high %RSD due to non-homogenous sample.

Final Approved by: *Freemeyer* Date: 09/13/19 DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 650765 Method/Testcode: 9060/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
K1908065-001	Carbon, Total Organic	N/A		Ground Water	2.37 mg/L	10 mL	118 mg/L	50	4	25			9/10/19 19:12:00	Y	IV
K1908065-002	Carbon, Total Organic	N/A		Ground Water	0.89 mg/L	10 mL	89 mg/L	100	7	50			9/10/19 21:32:00	N	IV
K1908071-001	Carbon, Total Organic	N/A		Ground Water	0.36 mg/L	10 mL	0.36 mg/L	J 1	0.07	0.50			9/10/19 22:55:00	N	IV
K1908071-002	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/10/19 23:51:00	N	IV
K1908071-003	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/11/19 01:16:00	N	IV
K1908071-004	Carbon, Total Organic	N/A		Ground Water	0.11 mg/L	10 mL	0.11 mg/L	J 1	0.07	0.50			9/11/19 02:12:00	N	IV
K1908075-001	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/11/19 03:08:00	N	IV
K1908075-002	Carbon, Total Organic	N/A		Ground Water	1.57 mg/L	10 mL	1.57 mg/L	1	0.07	0.50			9/11/19 04:03:00	N	IV
K1908075-003	Carbon, Total Organic	N/A		Ground Water	0.12 mg/L	10 mL	0.12 mg/L	J 1	0.07	0.50			9/11/19 04:59:00	N	IV
K1908075-004	Carbon, Total Organic	N/A		Ground Water	0.76 mg/L	10 mL	0.76 mg/L	1	0.07	0.50			9/11/19 05:54:00	N	IV
KQ1912835-01	Carbon, Total Organic	CCV		Ground Water	24.96 mg/L	10 mL	25.0 mg/L	1					9/10/19 16:37:00	N	IV
KQ1912835-02	Carbon, Total Organic	CCV		Ground Water	24.14 mg/L	10 mL	24.1 mg/L	1					9/11/19 00:47:00	N	IV
KQ1912835-03	Carbon, Total Organic	CCV		Ground Water	23.70 mg/L	10 mL	23.7 mg/L	1					9/11/19 08:15:00	N	IV
KQ1912835-04	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/10/19 16:51:00	N	IV
KQ1912835-05	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/11/19 01:01:00	N	IV
KQ1912835-06	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/11/19 08:30:00	N	IV
KQ1912835-07	Carbon, Total Organic	MS	K1908065-001	Ground Water	26.60 mg/L	10 mL	2660 mg/L	100	7	50	102		9/10/19 20:08:00	N	IV
KQ1912835-18	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/10/19 17:06:00	N	IV
KQ1912835-19	Carbon, Total Organic	LCS		Ground Water	24.49 mg/L	10 mL	24.5 mg/L	1	0.07	0.50	98		9/10/19 18:02:00	N	IV
KQ1912835-20	Carbon, Total Organic	MS	K1908065-001	Ground Water	26.24 mg/L	10 mL	2620 mg/L	100	7	50	100		9/10/19 20:08:00	N	IV
KQ1912835-21	Carbon, Total Organic	MS	K1908065-001	Ground Water	26.28 mg/L	10 mL	2630 mg/L	100	7	50	100		9/10/19 20:08:00	N	IV
KQ1912835-22	Carbon, Total Organic	MS	K1908065-001	Ground Water	26.14 mg/L	10 mL	2610 mg/L	100	7	50	100		9/10/19 20:08:00	N	IV
KQ1912835-23	Carbon, Total Organic	DUP	K1908065-001	Ground Water	2.29 mg/L	10 mL	114 mg/L	50	4	25		4	9/10/19 19:12:00	N	IV

83 of 152

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

09/13/19
Frederick

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 650765 Method/Testcode: 9060/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
KQ1912835-24	Carbon, Total Organic	TRP	K1908065-001	Ground Water	2.26 mg/L	10 mL	113 mg/L	50	4	25		3	9/10/19 19:12:00	N	IV
KQ1912835-25	Carbon, Total Organic	QUAD	K1908065-001	Ground Water	2.16 mg/L	10 mL	108 mg/L	50	4	25		4	9/10/19 19:12:00	N	IV
KQ1912835-26	Carbon, Total Organic	DUP	K1908065-002	Ground Water	0.91 mg/L	10 mL	91 mg/L	100	7	50		1	9/10/19 21:32:00	N	IV
KQ1912835-27	Carbon, Total Organic	TRP	K1908065-002	Ground Water	0.90 mg/L	10 mL	90 mg/L	100	7	50		<1	9/10/19 21:32:00	N	IV
KQ1912835-28	Carbon, Total Organic	QUAD	K1908065-002	Ground Water	0.88 mg/L	10 mL	88 mg/L	100	7	50		1	9/10/19 21:32:00	N	IV
KQ1912835-29	Carbon, Total Organic	DUP	K1908071-001	Ground Water	0.43 mg/L	10 mL	0.43 mg/L	J 1	0.07	0.50		19	9/10/19 22:55:00	N	IV
KQ1912835-30	Carbon, Total Organic	TRP	K1908071-001	Ground Water	0.34 mg/L	10 mL	0.34 mg/L	J 1	0.07	0.50		13	9/10/19 22:55:00	N	IV
KQ1912835-31	Carbon, Total Organic	QUAD	K1908071-001	Ground Water	0.34 mg/L	10 mL	0.34 mg/L	J 1	0.07	0.50		11	9/10/19 22:55:00	N	IV
KQ1912835-32	Carbon, Total Organic	DUP	K1908071-002	Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	9/10/19 23:51:00	N	IV
KQ1912835-33	Carbon, Total Organic	TRP	K1908071-002	Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	9/10/19 23:51:00	N	IV
KQ1912835-34	Carbon, Total Organic	QUAD	K1908071-002	Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	9/10/19 23:51:00	N	IV
KQ1912835-35	Carbon, Total Organic	DUP	K1908071-003	Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	9/11/19 01:16:00	N	IV
KQ1912835-36	Carbon, Total Organic	TRP	K1908071-003	Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	9/11/19 01:16:00	N	IV
KQ1912835-37	Carbon, Total Organic	QUAD	K1908071-003	Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	9/11/19 01:16:00	N	IV
KQ1912835-38	Carbon, Total Organic	DUP	K1908071-004	Ground Water	0.20 mg/L	10 mL	0.20 mg/L	J 1	0.07	0.50		58*	9/11/19 02:12:00	N	IV
KQ1912835-39	Carbon, Total Organic	TRP	K1908071-004	Ground Water	0.13 mg/L	10 mL	0.13 mg/L	J 1	0.07	0.50		31*	9/11/19 02:12:00	N	IV
KQ1912835-40	Carbon, Total Organic	QUAD	K1908071-004	Ground Water	0.13 mg/L	10 mL	0.13 mg/L	J 1	0.07	0.50		27*	9/11/19 02:12:00	N	IV
KQ1912835-41	Carbon, Total Organic	DUP	K1908075-001	Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	9/11/19 03:08:00	N	IV
KQ1912835-42	Carbon, Total Organic	TRP	K1908075-001	Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	9/11/19 03:08:00	N	IV
KQ1912835-43	Carbon, Total Organic	QUAD	K1908075-001	Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	9/11/19 03:08:00	N	IV
KQ1912835-44	Carbon, Total Organic	DUP	K1908075-002	Ground Water	1.59 mg/L	10 mL	1.59 mg/L	1	0.07	0.50		2	9/11/19 04:03:00	N	IV
KQ1912835-45	Carbon, Total Organic	TRP	K1908075-002	Ground Water	1.57 mg/L	10 mL	1.57 mg/L	1	0.07	0.50		<1	9/11/19 04:03:00	N	IV
KQ1912835-46	Carbon, Total Organic	QUAD	K1908075-002	Ground Water	1.59 mg/L	10 mL	1.59 mg/L	1	0.07	0.50		<1	9/11/19 04:03:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 650765 Method/Testcode: 9060/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
KQ1912835-47	Carbon, Total Organic	DUP	K1908075-003	Ground Water	0.16 mg/L	10 mL	0.16 mg/L	J 1	0.07	0.50		23*	9/11/19 04:59:00	N	IV
KQ1912835-48	Carbon, Total Organic	TRP	K1908075-003	Ground Water	0.09 mg/L	10 mL	0.09 mg/L	J 1	0.07	0.50		25*	9/11/19 04:59:00	N	IV
KQ1912835-49	Carbon, Total Organic	QUAD	K1908075-003	Ground Water	0.10 mg/L	10 mL	0.1 mg/L	J 1	0.07	0.50		25*	9/11/19 04:59:00	N	IV
KQ1912835-50	Carbon, Total Organic	DUP	K1908075-004	Ground Water	0.83 mg/L	10 mL	0.83 mg/L	1	0.07	0.50		9	9/11/19 05:54:00	N	IV
KQ1912835-51	Carbon, Total Organic	TRP	K1908075-004	Ground Water	0.81 mg/L	10 mL	0.81 mg/L	1	0.07	0.50		4	9/11/19 05:54:00	N	IV
KQ1912835-52	Carbon, Total Organic	QUAD	K1908075-004	Ground Water	0.88 mg/L	10 mL	0.88 mg/L	1	0.07	0.50		6	9/11/19 05:54:00	N	IV
KQ1912835-53	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/10/19 17:06:00	N	IV
KQ1912835-54	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/10/19 17:06:00	N	IV
KQ1912835-55	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/10/19 17:06:00	N	IV
KQ1912835-56	Carbon, Total Organic	LCS		Ground Water	24.45 mg/L	10 mL	24.5 mg/L	1	0.07	0.50	98		9/10/19 18:02:00	N	IV
KQ1912835-57	Carbon, Total Organic	LCS		Ground Water	24.62 mg/L	10 mL	24.6 mg/L	1	0.07	0.50	98		9/10/19 18:02:00	N	IV
KQ1912835-58	Carbon, Total Organic	LCS		Ground Water	24.46 mg/L	10 mL	24.5 mg/L	1	0.07	0.50	98		9/10/19 18:02:00	N	IV

35 of 152

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: 650766 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
K1908059-003	Carbon, Total Organic	N/A		Water	6.05 mg/L	10 mL	605 mg/L	100	7	50			9/11/19 09:14:00	N	II
K1908092-001	Carbon, Total Organic	N/A		Ground Water	0.90 mg/L	10 mL	0.90 mg/L	1	0.07	0.50			9/11/19 11:06:00	N	II
K1908092-002	Carbon, Total Organic	N/A		Ground Water	1.83 mg/L	10 mL	1.83 mg/L	1	0.07	0.50			9/11/19 11:34:00	N	II
K1908092-003	Carbon, Total Organic	N/A		Ground Water	1.08 mg/L	10 mL	1.08 mg/L	1	0.07	0.50			9/11/19 12:03:00	N	II
K1908092-004	Carbon, Total Organic	N/A		Ground Water	4.85 mg/L	10 mL	4.85 mg/L	1	0.07	0.50			9/11/19 12:31:00	N	II
K1908092-005	Carbon, Total Organic	N/A		Ground Water	21.80 mg/L	10 mL	21.8 mg/L	1	0.07	0.50			9/11/19 13:28:00	N	II
K1908092-006	Carbon, Total Organic	N/A		Ground Water	3.65 mg/L	10 mL	3.65 mg/L	1	0.07	0.50			9/11/19 13:56:00	N	II
K1908092-007	Carbon, Total Organic	N/A		Ground Water	1.26 mg/L	10 mL	1.26 mg/L	1	0.07	0.50			9/11/19 14:24:00	N	II
K1908092-008	Carbon, Total Organic	N/A		Ground Water	5.14 mg/L	10 mL	5.14 mg/L	1	0.07	0.50			9/11/19 14:52:00	N	II
K1908139-001	Carbon, Total Organic	N/A		Water	3.23 mg/L	10 mL	3.23 mg/L	1	0.07	0.50			9/11/19 09:42:00	N	II
K1908139-003	Carbon, Total Organic	N/A		Water	2.11 mg/L	10 mL	2.11 mg/L	1	0.07	0.50			9/11/19 10:10:00	N	II
K1908145-001	Carbon, Total Organic	N/A		Surface Water	2.90 mg/L	10 mL	2.90 mg/L	1	0.07	0.50			9/11/19 15:20:00	N	IV
K1908145-002	Carbon, Total Organic	N/A		Surface Water	2.65 mg/L	10 mL	2.65 mg/L	1	0.07	0.50			9/11/19 15:49:00	N	IV
K1908145-003	Carbon, Total Organic	N/A		Surface Water	2.21 mg/L	10 mL	2.21 mg/L	1	0.07	0.50			9/11/19 16:17:00	N	IV
K1908145-004	Carbon, Total Organic	N/A		Surface Water	0.78 mg/L	10 mL	0.78 mg/L	1	0.07	0.50			9/11/19 16:45:00	N	IV
K1908145-005	Carbon, Total Organic	N/A		Surface Water	20.96 mg/L	10 mL	21.0 mg/L	1	0.07	0.50			9/11/19 17:13:00	N	IV
K1908145-006	Carbon, Total Organic	N/A		Surface Water	0.13 mg/L	10 mL	0.13 mg/L	J	0.07	0.50			9/11/19 17:41:00	N	IV
K1908150-001	Carbon, Total Organic	N/A		Water	1.27 mg/L	10 mL	1.27 mg/L	1	0.07	0.50			9/11/19 06:50:00	N	II
K1908161-001	Carbon, Total Organic	N/A		Ground Water	0.81 mg/L	10 mL	0.81 mg/L	1	0.07	0.50			9/11/19 07:47:00	N	IV
K1908169-001	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L	U	0.07	0.50			9/11/19 10:38:00	N	II
KQ1912836-01	Carbon, Total Organic	MS	K1908150-001	Water	26.44 mg/L	10 mL	26.4 mg/L	1	0.07	0.50	101		9/11/19 07:18:00	N	II
KQ1912836-02	Carbon, Total Organic	DUP	K1908150-001	Water	1.30 mg/L	10 mL	1.30 mg/L	1	0.07	0.50		2	9/11/19 06:50:00	N	II
KQ1912836-03	Carbon, Total Organic	DUP	K1908161-001	Ground Water	0.84 mg/L	10 mL	0.84 mg/L	1	0.07	0.50		4	9/11/19 07:47:00	N	IV
KQ1912836-04	Carbon, Total Organic	DUP	K1908059-003	Water	6.02 mg/L	10 mL	602 mg/L	100	7	50		<1	9/11/19 09:14:00	N	II
KQ1912836-05	Carbon, Total Organic	DUP	K1908139-001	Water	3.17 mg/L	10 mL	3.17 mg/L	1	0.07	0.50		2	9/11/19 09:42:00	N	II
KQ1912836-06	Carbon, Total Organic	DUP	K1908139-003	Water	2.12 mg/L	10 mL	2.12 mg/L	1	0.07	0.50		<1	9/11/19 10:10:00	N	II
KQ1912836-07	Carbon, Total Organic	DUP	K1908169-001	Water	0.00 mg/L	10 mL	0.50 mg/L	U	0.07	0.50		NC	9/11/19 10:38:00	N	II

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

09/13/19
Freeze

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 650766 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
KQ1912836-08	Carbon, Total Organic	DUP	K1908092-001	Ground Water	0.75 mg/L	10 mL	0.75 mg/L	1	0.07	0.50		17*	9/11/19 11:06:00	N	II
KQ1912836-09	Carbon, Total Organic	DUP	K1908092-002	Ground Water	1.85 mg/L	10 mL	1.85 mg/L	1	0.07	0.50		1	9/11/19 11:34:00	N	II
KQ1912836-10	Carbon, Total Organic	DUP	K1908092-003	Ground Water	1.13 mg/L	10 mL	1.13 mg/L	1	0.07	0.50		4	9/11/19 12:03:00	N	II
KQ1912836-11	Carbon, Total Organic	DUP	K1908092-004	Ground Water	4.85 mg/L	10 mL	4.85 mg/L	1	0.07	0.50		<1	9/11/19 12:31:00	N	II
KQ1912836-12	Carbon, Total Organic	DUP	K1908092-005	Ground Water	22.26 mg/L	10 mL	22.3 mg/L	1	0.07	0.50		2	9/11/19 13:28:00	N	II
KQ1912836-13	Carbon, Total Organic	DUP	K1908092-006	Ground Water	2.83 mg/L	10 mL	2.83 mg/L	1	0.07	0.50		25*	9/11/19 13:56:00	N	II
KQ1912836-14	Carbon, Total Organic	DUP	K1908092-007	Ground Water	1.22 mg/L	10 mL	1.22 mg/L	1	0.07	0.50		3	9/11/19 14:24:00	N	II
KQ1912836-15	Carbon, Total Organic	DUP	K1908092-008	Ground Water	5.74 mg/L	10 mL	5.74 mg/L	1	0.07	0.50		11*	9/11/19 14:52:00	N	II
KQ1912836-16	Carbon, Total Organic	DUP	K1908145-001	Surface Water	2.74 mg/L	10 mL	2.74 mg/L	1	0.07	0.50		5	9/11/19 15:20:00	N	IV
KQ1912836-17	Carbon, Total Organic	DUP	K1908145-002	Surface Water	2.68 mg/L	10 mL	2.68 mg/L	1	0.07	0.50		1	9/11/19 15:49:00	N	IV
KQ1912836-18	Carbon, Total Organic	DUP	K1908145-003	Surface Water	2.20 mg/L	10 mL	2.20 mg/L	1	0.07	0.50		<1	9/11/19 16:17:00	N	IV
KQ1912836-19	Carbon, Total Organic	DUP	K1908145-004	Surface Water	0.81 mg/L	10 mL	0.81 mg/L	1	0.07	0.50		3	9/11/19 16:45:00	N	IV
KQ1912836-20	Carbon, Total Organic	DUP	K1908145-005	Surface Water	20.94 mg/L	10 mL	20.9 mg/L	1	0.07	0.50		<1	9/11/19 17:13:00	N	IV
KQ1912836-21	Carbon, Total Organic	DUP	K1908145-006	Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/11/19 17:41:00	N	IV
KQ1912836-22	Carbon, Total Organic	CCV		Water	24.14 mg/L	10 mL	24.1 mg/L	1					9/11/19 00:47:00	N	II
KQ1912836-23	Carbon, Total Organic	CCV		Water	23.70 mg/L	10 mL	23.7 mg/L	1					9/11/19 08:15:00	N	II
KQ1912836-24	Carbon, Total Organic	CCV		Water	24.00 mg/L	10 mL	24.0 mg/L	1					9/11/19 12:59:00	N	II
KQ1912836-25	Carbon, Total Organic	CCV		Water	23.69 mg/L	10 mL	23.7 mg/L	1					9/11/19 18:09:00	N	II
KQ1912836-26	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/11/19 01:01:00	N	II
KQ1912836-27	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/11/19 08:30:00	N	II
KQ1912836-28	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/11/19 13:13:00	N	II
KQ1912836-29	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/11/19 18:23:00	N	II
KQ1912836-30	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/11/19 08:44:00	N	II
KQ1912836-31	Carbon, Total Organic	LCS		Water	24.26 mg/L	10 mL	24.3 mg/L	1	0.07	0.50	97		9/11/19 08:59:00	N	II

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

Analytical Results Summary

00952014

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 650769 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
K1908164-001	Carbon, Total Organic	N/A		Water	8.01 mg/L	10 mL	8.01 mg/L	1	0.07	0.50			9/11/19 19:08:00	N	IV
K1908164-002	Carbon, Total Organic	N/A		Water	7.86 mg/L	10 mL	7.86 mg/L	1	0.07	0.50			9/11/19 19:36:00	N	IV
K1908164-003	Carbon, Total Organic	N/A		Water	7.73 mg/L	10 mL	7.73 mg/L	1	0.07	0.50			9/11/19 20:04:00	N	IV
K1908164-004	Carbon, Total Organic	N/A		Water	10.04 mg/L	10 mL	10.0 mg/L	1	0.07	0.50			9/11/19 20:32:00	N	IV
K1908164-005	Carbon, Total Organic	N/A		Water	6.17 mg/L	10 mL	6.17 mg/L	1	0.07	0.50			9/11/19 21:00:00	N	IV
K1908164-006	Carbon, Total Organic	N/A		Water	2.97 mg/L	10 mL	2.97 mg/L	1	0.07	0.50			9/11/19 21:28:00	N	IV
K1908164-007	Carbon, Total Organic	N/A		Water	7.86 mg/L	10 mL	7.86 mg/L	1	0.07	0.50			9/11/19 21:56:00	N	IV
K1908184-001	Carbon, Total Organic	N/A		Surface Water	0.54 mg/L	10 mL	0.54 mg/L	1	0.07	0.50			9/11/19 22:24:00	N	IV
K1908184-002	Carbon, Total Organic	N/A		Surface Water	0.16 mg/L	10 mL	0.16 mg/L	J 1	0.07	0.50			9/11/19 23:51:00	N	IV
K1908184-003	Carbon, Total Organic	N/A		Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/12/19 00:19:00	N	IV
K1908184-004	Carbon, Total Organic	N/A		Surface Water	7.53 mg/L	10 mL	7.53 mg/L	1	0.07	0.50			9/12/19 00:47:00	N	IV
K1908184-005	Carbon, Total Organic	N/A		Surface Water	7.45 mg/L	10 mL	7.45 mg/L	1	0.07	0.50			9/12/19 01:15:00	N	IV
K1908184-006	Carbon, Total Organic	N/A		Surface Water	3.12 mg/L	10 mL	312 mg/L	100	7	50			9/12/19 01:43:00	N	IV
KQ1912837-01	Carbon, Total Organic	CCV		Water	23.69 mg/L	10 mL	23.7 mg/L	1					9/11/19 18:09:00	N	IV
KQ1912837-02	Carbon, Total Organic	CCV		Water	23.55 mg/L	10 mL	23.6 mg/L	1					9/11/19 22:52:00	N	IV
KQ1912837-03	Carbon, Total Organic	CCV		Water	23.69 mg/L	10 mL	23.7 mg/L	1					9/12/19 03:22:00	N	IV
KQ1912837-04	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/11/19 18:23:00	N	IV
KQ1912837-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/11/19 23:07:00	N	IV
KQ1912837-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/12/19 03:37:00	N	IV
KQ1912837-07	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/11/19 18:38:00	N	IV
KQ1912837-08	Carbon, Total Organic	LCS		Water	24.43 mg/L	10 mL	24.4 mg/L	1	0.07	0.50	98		9/11/19 18:53:00	N	IV
KQ1912837-09	Carbon, Total Organic	MS	K1908184-001	Surface Water	27.33 mg/L	10 mL	27.3 mg/L	1	0.07	0.50	107		9/11/19 23:22:00	N	IV
KQ1912837-10	Carbon, Total Organic	DUP	K1908164-001	Water	8.00 mg/L	10 mL	8.00 mg/L	1	0.07	0.50		<1	9/11/19 19:08:00	N	IV
KQ1912837-11	Carbon, Total Organic	DUP	K1908164-002	Water	7.81 mg/L	10 mL	7.81 mg/L	1	0.07	0.50		<1	9/11/19 19:36:00	N	IV
KQ1912837-12	Carbon, Total Organic	DUP	K1908164-003	Water	7.68 mg/L	10 mL	7.68 mg/L	1	0.07	0.50		<1	9/11/19 20:04:00	N	IV
KQ1912837-13	Carbon, Total Organic	DUP	K1908164-004	Water	9.79 mg/L	10 mL	9.79 mg/L	1	0.07	0.50		3	9/11/19 20:32:00	N	IV
KQ1912837-14	Carbon, Total Organic	DUP	K1908164-005	Water	6.15 mg/L	10 mL	6.15 mg/L	1	0.07	0.50		<1	9/11/19 21:00:00	N	IV
KQ1912837-15	Carbon, Total Organic	DUP	K1908164-006	Water	2.94 mg/L	10 mL	2.94 mg/L	1	0.07	0.50		1	9/11/19 21:28:00	N	IV
KQ1912837-16	Carbon, Total Organic	DUP	K1908164-007	Water	7.92 mg/L	10 mL	7.92 mg/L	1	0.07	0.50		<1	9/11/19 21:56:00	N	IV
KQ1912837-17	Carbon, Total Organic	DUP	K1908184-001	Surface Water	0.50 mg/L	10 mL	0.50 mg/L	1	0.07	0.50		7	9/11/19 22:24:00	N	IV
KQ1912837-18	Carbon, Total Organic	DUP	K1908184-002	Surface Water	0.19 mg/L	10 mL	0.19 mg/L	J 1	0.07	0.50		18*	9/11/19 23:51:00	N	IV

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

09/13/19
[Handwritten Signature]

Analytical Results Summary

00952015

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 650769 **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>
KQ1912837-19	Carbon, Total Organic	DUP	K1908184-003	Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/12/19 00:19:00	N	IV
KQ1912837-20	Carbon, Total Organic	DUP	K1908184-004	Surface Water	7.60 mg/L	10 mL	7.60 mg/L	1	0.07	0.50		<1	9/12/19 00:47:00	N	IV
KQ1912837-21	Carbon, Total Organic	DUP	K1908184-005	Surface Water	7.46 mg/L	10 mL	7.46 mg/L	1	0.07	0.50		<1	9/12/19 01:15:00	N	IV
KQ1912837-22	Carbon, Total Organic	DUP	K1908184-006	Surface Water	3.10 mg/L	10 mL	310 mg/L	100	7	50		<1	9/12/19 01:43:00	N	IV

39 of 152

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: 650772 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
K1908139-002	Carbon, Dissolved Organic (DOC)	N/A		Water	3.04 mg/L	10 mL	3.04 mg/L	1	0.07	0.50			9/12/19 02:40:00	N	II
K1908139-004	Carbon, Dissolved Organic (DOC)	N/A		Water	2.04 mg/L	10 mL	2.04 mg/L	1	0.07	0.50			9/12/19 04:21:00	N	II
K1908231-001	Carbon, Dissolved Organic (DOC)	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/12/19 05:04:00	N	II
K1908231-002	Carbon, Dissolved Organic (DOC)	N/A		Water	0.31 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/12/19 05:32:00	N	II
K1908231-003	Carbon, Dissolved Organic (DOC)	N/A		Water	0.08 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/12/19 06:00:00	N	II
K1908231-004	Carbon, Dissolved Organic (DOC)	N/A		Water	0.08 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/12/19 06:28:00	N	II
K1908231-005	Carbon, Dissolved Organic (DOC)	N/A		Water	0.26 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/12/19 06:56:00	N	II
K1908231-006	Carbon, Dissolved Organic (DOC)	N/A		Water	0.07 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/12/19 07:24:00	N	II
KQ1912838-01	Carbon, Dissolved Organic (DOC)	CCV		Water	23.55 mg/L	10 mL	23.6 mg/L	1					9/11/19 22:52:00	N	II
KQ1912838-02	Carbon, Dissolved Organic (DOC)	CCV		Water	23.69 mg/L	10 mL	23.7 mg/L	1					9/12/19 03:22:00	N	II
KQ1912838-03	Carbon, Dissolved Organic (DOC)	CCV		Water	23.49 mg/L	10 mL	23.5 mg/L	1					9/12/19 07:53:00	N	II
KQ1912838-04	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/11/19 23:07:00	N	II
KQ1912838-05	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/12/19 03:37:00	N	II
KQ1912838-06	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/12/19 08:07:00	N	II
KQ1912838-07	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/12/19 03:52:00	N	II
KQ1912838-08	Carbon, Dissolved Organic (DOC)	LCS		Water	24.24 mg/L	10 mL	24.2 mg/L	1	0.07	0.50	97		9/12/19 04:06:00	N	II
KQ1912838-09	Carbon, Dissolved Organic (DOC)	MS	K1908139-002	Water	28.61 mg/L	10 mL	28.6 mg/L	1	0.07	0.50	102		9/12/19 03:08:00	N	II
KQ1912838-10	Carbon, Dissolved Organic (DOC)	DUP	K1908139-002	Water	2.97 mg/L	10 mL	2.97 mg/L	1	0.07	0.50		2	9/12/19 02:40:00	N	II
KQ1912838-11	Carbon, Dissolved Organic (DOC)	DUP	K1908139-004	Water	1.98 mg/L	10 mL	1.98 mg/L	1	0.07	0.50		3	9/12/19 04:21:00	N	II
KQ1912838-12	Carbon, Dissolved Organic (DOC)	DUP	K1908231-001	Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	9/12/19 05:04:00	N	II
KQ1912838-13	Carbon, Dissolved Organic (DOC)	DUP	K1908231-002	Water	0.20 mg/L	10 mL	0.20 mg/L	J 1	0.07	0.50		NC	9/12/19 05:32:00	N	II
KQ1912838-14	Carbon, Dissolved Organic (DOC)	DUP	K1908231-003	Water	0.12 mg/L	10 mL	0.12 mg/L	J 1	0.07	0.50		NC	9/12/19 06:00:00	N	II
KQ1912838-15	Carbon, Dissolved Organic (DOC)	DUP	K1908231-004	Water	0.09 mg/L	10 mL	0.09 mg/L	J 1	0.07	0.50		NC	9/12/19 06:28:00	N	II

40 of 152

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

Printed 9/12/19 15:08

Results Summary

09/13/19
B. Ditzler

Page 1 of 2

Analytical Results Summary

00952017

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 650772 **Method/Testcode:** SM 5310 C/TOC D

<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>
KQ1912838-16	Carbon, Dissolved Organic (DOC)	DUP	K1908231-005	Water	0.28 mg/L	10 mL	0.28 mg/L J	1	0.07	0.50		NC	9/12/19 06:56:00	N	II
KQ1912838-17	Carbon, Dissolved Organic (DOC)	DUP	K1908231-006	Water	0.06 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/12/19 07:24:00	N	II

41 of 152

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

TOC: 650765,
650766,
650769
DOC: 650772

Schedule: 09102019

Version: 6

Instrument: Fusion1

Last Saved by: Fusion1 (Fusion1)

Last Saved on: 2019/09/10 16:17 - Tuesday

09/13/19
[Signature]

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1908065-001.03 50x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
4	Sample	K1908065-001.03 ms 100x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
5	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
6	Sample	K1908065-002.03 100x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
7	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K1908071-001.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
9	Sample	K1908071-002.03	CAS_salt_010711 (CAS_salt_010711)	4	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	K1908071-003.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
11	Sample	K1908071-004.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
12	Sample	K1908075-001.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
13	Sample	K1908075-002.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
14	Sample	K1908075-003.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
15	Sample	K1908075-004.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
16	Sample	K1908150-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1908150-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
18	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
19	Sample	K1908161-001.01	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	K1908059-003.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1908139-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1908139-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1908169-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1908092-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1908092-002.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1908092-003.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1908092-004.03	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	K1908092-005.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1908092-006.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K1908092-007.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	K1908092-008.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K1908145-001.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K1908145-002.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K1908145-003.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1908145-004.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1908145-005.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K1908145-006.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

Printed on: September 12, 2019 08:59:58

Schedule: 09102019

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	K1908164-001.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K1908164-002.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K1908164-003.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	K1908164-004.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	K1908164-005.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K1908164-006.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K1908164-007.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	K1908184-001.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
48	Sample	K1908184-001.08 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
49	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
50	Sample	K1908184-002.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
51	Sample	K1908184-003.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	K1908184-004.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	K1908184-005.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
54	Sample	K1908184-006.08 <u>100x</u>	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	K1908139-002.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
57	Sample	K1908139-002.01 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
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	K1908139-004.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
60	Sample	FB 9/10/19	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
61	Sample	K1908231-001.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
62	Sample	K1908231-002.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
63	Sample	K1908231-003.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
64	Sample	K1908231-004.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
65	Sample	K1908231-005.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
66	Sample	K1908231-006.01 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
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

Fusion Report - 09102019

Tuesday, September 10, 2019 02:40 PM

(View - Repts, Unused Repts, Meta-Data, Signature, History)
Printed on 2019/09/12 09:00 - Thursday

Report Summary Information

Company Location: Gen Chem Lab
 Schedule Name: 09102019
 Instrument Name: Fusion1
 Report Version: 1 of 1
 Report Creation by Operators (schedule version): Fusion1 (Fusion1) (v2)
 Fusion1 (Fusion1) (v3)
 Fusion1 (Fusion1) (v4)
 Fusion1 (Fusion1) (v5)
 Fusion1 (Fusion1) (v6)

Engine 1.1.5.1
 Version:
 Firmware 1.2.0696
 Version:
 Connection: RS232 COM1

Comment:

Report Results

09/13/19
Fusion

Sample Type: Clean From Schedule Version 2

Pos	Analysis Type	Sample ID	Start Time
◆ (clean)		Clean	2019/09/10 14:40

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	14.80	18.22	3.42	49.73	05:24
2	TC Clean	13.08	16.45	3.37	50.08	04:00
3	TC Clean	3.41	6.96	3.54	50.05	03:46
4	TC Clean	2.34	5.75	3.41	50.07	03:48

Sample Type: Clean From Schedule Version 3

Pos	Analysis Type	Sample ID	Start Time
◆ (clean)		Clean	2019/09/10 15:02

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.18	16.62	3.44	49.78	05:11
2	TC Clean	5.79	9.23	3.43	50.07	04:02
3	TC Clean	2.19	5.74	3.55	50.04	03:47

4	TC Clean	1.67	5.34	3.66	50.07	03:56
---	----------	------	------	------	-------	-------

Sample Type: Clean From Schedule Version 4

Pos	Analysis Type	Sample ID	Start Time
♦ (clean)		Clean	2019/09/10 15:26

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.00	16.36	3.36	49.70	05:20
2	TC Clean	5.46	8.87	3.41	50.05	04:04
3	TC Clean	2.42	5.83	3.41	50.07	03:45
4	TC Clean	1.71	5.25	3.54	50.07	03:49

Sample Type: Blank (Creating v1293) From Schedule Version 5

Pos	Analysis Type	Sample ID	Start Time
♦ (blank)		Reagent/Acid Blank	2019/09/10 15:48

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.95	16.41	3.46	49.82	05:24
2	TC Clean	4.26	7.76	3.50	50.06	04:04
3	TC Clean	2.37	5.91	3.54	50.06	03:56
4	TC Clean	1.77	5.29	3.52	50.04	03:54
5	Reagent Blank	3.16	6.68	3.52	50.07	05:05
6	Acid Blank	1.18	4.66	3.48	49.78	05:29

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ D	TOC	RB	0.3396 ppm	0.0000 ppm	0.0000%	2019/09/10 16:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3396	3.3956	11.03	14.70	3.67	50.16	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7271 (IC) (v1293)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.9554 ppm (PASS)	0.0000 ppm	0%	2019/09/10 16:37

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9554	249.5536	178.86	182.39	3.53	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 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/10 16:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.62	11.08	3.46	50.18	10:34

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

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/10 17:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.64	9.29	3.65	50.15	10:30
2	TOC	0.0000	0.0000	5.85	9.19	3.34	50.14	10:28
3	TOC	0.0000	0.0000	6.33	9.63	3.30	50.15	10:28
4	TOC	0.0000	0.0000	5.49	8.96	3.47	50.16	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7271 (IC) (v1293)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 6

Concentration	Min / Max

Pos	BAT	(ppm)	Dil	Sample ID	(% dev)	Result	Std. Dev.	RSD	Start Time
♦ C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.5060 ppm (PASS)	0.0809 ppm	0.33%	2019/09/10 18:02

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.4889	244.8895	175.69	179.20	3.50	50.18	10:26
C	TOC	25.0 ppm	2	24.4505	244.5050	175.43	178.90	3.47	50.16	10:24
C	TOC	25.0 ppm	3	24.6249	246.2492	176.62	180.17	3.55	50.15	10:28
C	TOC	25.0 ppm	4	24.4598	244.5978	175.49	179.18	3.69	50.15	10:28

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 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 2	TOC	ICS	2.5270 ppm	0.0000 ppm	0.0000%	2019/09/10 18:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5270	25.2697	25.88	29.38	3.50	50.16	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7271 (IC) (v1293)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 3	TOC	K1908065-001.03 50x	2.2695 ppm	0.0855 ppm	3.7700%	2019/09/10 19:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3699	23.6992	24.81	28.39	3.57	50.20	10:27
2	TOC	2.2883	22.8831	24.26	27.73	3.47	50.20	10:27
3	TOC	2.2569	22.5693	24.05	27.56	3.51	50.23	10:25
4	TOC	2.1629	21.6294	23.41	26.69	3.28	50.25	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7271 (IC) (v1293)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 4	TOC	K1908065-001.03 ms 100x	26.3150 ppm	0.2004 ppm	0.7600%	2019/09/10 20:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.1434	261.4341	186.19	189.67	3.49	50.32	10:27
2	TOC	26.2756	262.7555	187.08	190.41	3.33	50.32	10:24
3	TOC	26.2371	262.3710	186.82	190.19	3.36	50.33	10:26

4	TOC	26.6038	266.0378	189.31	192.63	3.32	50.37	10:28
---	-----	---------	----------	--------	--------	------	-------	-------

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
5	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/10 21:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.20	9.78	3.58	50.39	10:29
2	TOC	0.0000	0.0000	5.77	9.37	3.60	50.40	10:28

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **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	K1908065-002.03 100x	0.8954 ppm	0.0092 ppm	1.0300%	2019/09/10 21:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8942	8.9422	14.80	18.39	3.59	50.39	10:29
2	TOC	0.9073	9.0733	14.89	18.27	3.38	50.39	10:29
3	TOC	0.8951	8.9510	14.80	18.14	3.33	50.46	10:30
4	TOC	0.8849	8.8494	14.73	18.24	3.50	50.43	10:28

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **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	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/10 22:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.98	8.44	3.45	50.43	10:31
2	TOC	0.0000	0.0000	5.12	8.52	3.39	50.46	10:26

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **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	K1908071-001.03	0.3689 ppm	0.0422 ppm	11.4300%	2019/09/10 22:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3571	3.5709	11.15	14.62	3.46	50.34	10:26
2	TOC	0.4315	4.3148	11.66	14.99	3.33	50.33	10:29
3	TOC	0.3425	3.4250	11.05	14.65	3.59	50.28	10:25
4	TOC	0.3447	3.4471	11.07	14.52	3.46	50.34	10:28

<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>		<u>Calibration</u>	
1:10		(TC) 8.7271 (IC) (v1293)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)	

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
9	TOC	K1908071-002.03	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/10 23:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.00	10.40	3.40	50.32	10:25
2	TOC	0.0000	0.0000	6.97	10.25	3.28	50.25	10:29
3	TOC	0.0000	0.0000	7.16	10.51	3.36	50.32	10:28
4	TOC	0.0000	0.0000	6.47	9.86	3.39	50.37	10:29

<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>		<u>Calibration</u>	
1:10		(TC) 8.7271 (IC) (v1293)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)	

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.1389 ppm (PASS)	0.0000 ppm	0%	2019/09/11 00:47

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1389	241.3891	173.32	176.69	3.38	50.42	10:34

<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 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/11 01:01

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.04	8.60	3.56	50.45	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 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
10	TOC	K1908071-003.03	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/11 01:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.23	11.69	3.46	50.50	10:29
2	TOC	0.0000	0.0000	8.06	11.44	3.38	50.51	10:27
3	TOC	0.0000	0.0000	7.76	11.15	3.39	50.52	10:25
4	TOC	0.0000	0.0000	8.20	11.41	3.21	50.53	10:29

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **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	K1908071-004.03	0.1420 ppm	0.0378 ppm	26.6100%	2019/09/11 02:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1072	1.0723	9.46	12.94	3.49	50.53	10:26
2	TOC	0.1958	1.9577	10.06	13.35	3.29	50.51	10:27
3	TOC	0.1333	1.3331	9.63	12.88	3.25	50.53	10:28
4	TOC	0.1317	1.3169	9.62	12.99	3.37	50.56	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **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	K1908075-001.03	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/11 03:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.40	10.74	3.34	50.54	10:31
2	TOC	0.0000	0.0000	7.26	10.68	3.42	50.55	10:23
3	TOC	0.0000	0.0000	7.11	10.58	3.47	50.56	10:23
4	TOC	0.0000	0.0000	6.95	10.22	3.27	50.56	10:28

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **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	K1908075-002.03	1.5780 ppm	0.0135 ppm	0.8600%	2019/09/11 04:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5678	15.6776	19.37	22.87	3.50	50.53	10:27
2	TOC	1.5922	15.9222	19.54	23.04	3.51	50.53	10:26
3	TOC	1.5653	15.6526	19.35	22.82	3.47	50.55	10:26
4	TOC	1.5868	15.8677	19.50	22.91	3.42	50.50	10:28

Dilution **Blank Contribution** **Method** **Calibration**

1:10 (TC) 8.7271 (IC) CAS_salt_010711 CAS_salt_010711
(v1293) (v4) (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
14	TOC	K1908075-003.03	0.1175 ppm	0.0293 ppm	24.9100%	2019/09/11 04:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1237	1.2373	9.57	13.04	3.47	50.54	10:27
2	TOC	0.1563	1.5629	9.79	13.21	3.42	50.54	10:24
3	TOC	0.0932	0.9324	9.36	12.83	3.47	50.53	10:26
4	TOC	0.0966	0.9663	9.38	12.70	3.32	50.56	10:30

Dilution 1:10 Blank Contribution (TC) 8.7271 (IC) (v1293) 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	K1908075-004.03	0.8221 ppm	0.0478 ppm	5.8200%	2019/09/11 05:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7647	7.6472	13.92	17.41	3.50	50.52	10:27
2	TOC	0.8334	8.3337	14.38	17.76	3.38	50.53	10:31
3	TOC	0.8107	8.1069	14.23	17.70	3.47	50.53	10:28
4	TOC	0.8796	8.7963	14.70	18.17	3.48	50.55	10:27

Dilution 1:10 Blank Contribution (TC) 8.7271 (IC) (v1293) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
16	TOC	K1908150-001.01	1.2861 ppm	0.0204 ppm	1.5900%	2019/09/11 06:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2717	12.7165	17.36	20.72	3.36	50.58	10:29
2	TOC	1.3005	13.0053	17.56	20.86	3.30	50.55	10:24

Dilution 1:10 Blank Contribution (TC) 8.7271 (IC) (v1293) 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	K1908150-001.01 ms	26.4397 ppm	0.0000 ppm	0.0000%	2019/09/11 07:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.4397	264.3967	188.20	191.40	3.21	50.55	10:33

Dilution 1:10 Blank Contribution (TC) 8.7271 (IC) (v1293) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Analysis	Std. Dev.

Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
18	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/11 07:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.48	9.06	3.58	50.53	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7271 (IC) (v1293)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
19	TOC	K1908161-001.01	0.8237 ppm	0.0216 ppm	2.6200%	2019/09/11 07:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8085	8.0848	14.22	17.88	3.67	50.55	10:27
2	TOC	0.8390	8.3897	14.42	17.79	3.37	50.51	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7271 (IC) (v1293)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.6975 ppm (PASS)	0.0000 ppm	0%	2019/09/11 08:15

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6975	236.9754	170.32	173.75	3.43	50.55	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 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/11 08:30

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.12	8.40	3.29	50.58	10:28

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

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/11 08:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.56	8.09	3.53	50.55	10:30

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7271 (IC) (v1293)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.2630 ppm (PASS)	0.0000 ppm	0%	2019/09/11 08:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.2630	242.6296	174.16	177.52	3.36	50.57	10:28

<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 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
21	TOC	K1908059-003.01 100x	6.0345 ppm	0.0238 ppm	0.3900%	2019/09/11 09:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.0513	60.5130	49.80	53.30	3.49	50.55	10:30
2	TOC	6.0177	60.1772	49.58	53.00	3.43	50.57	10:24

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7271 (IC) (v1293)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
22	TOC	K1908139-001.01	3.1996 ppm	0.0390 ppm	1.2200%	2019/09/11 09:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2272	32.2718	30.63	34.16	3.53	50.55	10:30
2	TOC	3.1721	31.7208	30.26	33.74	3.48	50.55	10:28

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
-----------------	---------------------------	---------------	--------------------

1:10 (TC) 8.7271 (IC) CAS_salt_010711 CAS_salt_010711
(v1293) (v4) (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
23	TOC	K1908139-003.01	2.1149 ppm	0.0025 ppm	0.1200%	2019/09/11 10:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1131	21.1314	23.07	26.48	3.41	50.62	10:28
2	TOC	2.1167	21.1668	23.10	26.41	3.32	50.53	10:27

Dilution 1:10 Blank Contribution (TC) 8.7271 (IC) (v1293) 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	K1908169-001.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/11 10:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.03	8.63	3.60	50.48	10:30
2	TOC	0.0000	0.0000	5.70	9.15	3.45	50.47	10:24

Dilution 1:10 Blank Contribution (TC) 8.7271 (IC) (v1293) Method CAS_salt_010711 (v4) Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
25	TOC	K1908092-001.03	0.8261 ppm	0.1009 ppm	12.2200%	2019/09/11 11:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8975	8.9746	14.82	18.22	3.40	50.46	10:26
2	TOC	0.7547	7.5471	13.85	17.32	3.47	50.45	10:28

Dilution 1:10 Blank Contribution (TC) 8.7271 (IC) (v1293) 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	K1908092-002.03	1.8387 ppm	0.0148 ppm	0.8000%	2019/09/11 11:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8282	18.2823	21.14	24.52	3.39	50.46	10:31
2	TOC	1.8491	18.4915	21.28	24.83	3.55	50.45	10:28

Dilution 1:10 Blank Contribution (TC) 8.7271 (IC) (v1293) 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	K1908092-003.03	1.1022 ppm	0.0326 ppm	2.9600%	2019/09/11 12:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0791	10.7910	16.05	19.64	3.59	50.43	10:30
2	TOC	1.1252	11.2522	16.36	19.78	3.42	50.41	10:25
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7271 (IC) (v1293)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
28	TOC	K1908092-004.03	4.8482 ppm	0.0009 ppm	0.0200%	2019/09/11 12:31		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.8476	48.4755	41.63	45.01	3.38	50.45	10:27
2	TOC	4.8489	48.4888	41.64	45.01	3.36	50.37	10:27
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7271 (IC) (v1293)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.0028 ppm (PASS)	0.0000 ppm	0%	2019/09/11 12:59	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.0028	240.0279	172.39	176.01	3.62	50.34	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 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/11 13:13	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.63	8.92	3.29	50.31	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 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
29	TOC	K1908092-005.03	22.0282 ppm	0.3256 ppm	1.4800%	2019/09/11 13:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	21.7979	217.9791	156.69	160.16	3.47	50.28	10:28
2	TOC	22.2584	222.5843	159.82	163.53	3.71	50.25	10:29

Dilution 1:10
Blank Contribution (TC) 8.7271 (IC) (v1293)
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	K1908092-006.03	3.2396 ppm	0.5734 ppm	17.7000%	2019/09/11 13:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.6450	36.4498	33.47	36.91	3.44	50.21	10:27
2	TOC	2.8341	28.3413	27.96	31.44	3.48	50.19	10:26

Dilution 1:10
Blank Contribution (TC) 8.7271 (IC) (v1293)
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	K1908092-007.03	1.2395 ppm	0.0224 ppm	1.8100%	2019/09/11 14:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2553	12.5530	17.25	20.49	3.25	50.17	10:27
2	TOC	1.2236	12.2362	17.03	20.40	3.37	50.14	10:31

Dilution 1:10
Blank Contribution (TC) 8.7271 (IC) (v1293)
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	K1908092-008.03	5.4409 ppm	0.4280 ppm	7.8700%	2019/09/11 14:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1382	51.3821	43.60	46.88	3.28	50.15	10:28
2	TOC	5.7436	57.4355	47.71	51.24	3.52	50.11	10:28

Dilution 1:10
Blank Contribution (TC) 8.7271 (IC) (v1293)
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	K1908145-001.08	2.8190 ppm	0.1080 ppm	3.8300%	2019/09/11 15:20

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

1	TOC	2.8954	28.9541	28.38	31.76	3.38	50.09	10:27
2	TOC	2.7426	27.4264	27.34	30.74	3.40	50.07	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **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	K1908145-002.08	2.6662 ppm	0.0260 ppm	0.9800%	2019/09/11 15:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6478	26.4777	26.70	29.98	3.28	50.07	10:28
2	TOC	2.6846	26.8460	26.95	30.25	3.30	50.06	10:26

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **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	K1908145-003.08	2.2054 ppm	0.0048 ppm	0.2200%	2019/09/11 16:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2088	22.0875	23.72	27.15	3.43	50.08	10:30
2	TOC	2.2020	22.0198	23.67	27.09	3.42	50.04	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **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	K1908145-004.08	0.7941 ppm	0.0174 ppm	2.1900%	2019/09/11 16:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7818	7.8181	14.03	17.53	3.49	50.07	10:30
2	TOC	0.8064	8.0641	14.20	17.60	3.39	50.03	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
37	TOC	K1908145-005.08	20.9472 ppm	0.0147 ppm	0.0700%	2019/09/11 17:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	20.9576	209.5759	150.99	154.50	3.52	50.05	10:28
2	TOC	20.9368	209.3682	150.84	154.41	3.57	50.00	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
38	TOC	K1908145-006.08	0.0644 ppm	0.0911 ppm	141.4200%	2019/09/11 17:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1289	1.2889	9.60	13.05	3.45	50.04	10:28
2	TOC	0.0000	0.0000	8.46	12.08	3.62	50.08	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7271 (IC) (v1293)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.6872 ppm (PASS)	0.0000 ppm	0%	2019/09/11 18:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6872	236.8723	170.25	173.77	3.52	50.05	10:35

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

Sample Type: Check Standard --> CCB From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/11 18:23

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.51	8.87	3.36	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 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/11 18:38

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

1	TOC	0.0000	0.0000	4.81	8.23	3.42	50.00	10:31
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 8.7271 (IC) (v1293)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		

Sample Type: Check Standard --> LCS From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.4334 ppm (PASS)	0.0000 ppm	0%	2019/09/11 18:53

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.4334	244.3341	175.32	178.83	3.52	50.09	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 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 40	TOC	K1908164-001.04	8.0058 ppm	0.0121 ppm	0.1500%	2019/09/11 19:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.0143	80.1434	63.13	66.48	3.35	50.07	10:28
2	TOC	7.9973	79.9726	63.01	66.26	3.25	50.08	10:26

Dilution		Blank Contribution		Method		Calibration	
1:10		(TC) 8.7271 (IC) (v1293)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)	

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 41	TOC	K1908164-002.04	7.8365 ppm	0.0354 ppm	0.4500%	2019/09/11 19:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.8616	78.6157	62.09	65.52	3.43	50.08	10:31
2	TOC	7.8115	78.1148	61.75	65.24	3.49	50.10	10:28

Dilution		Blank Contribution		Method		Calibration	
1:10		(TC) 8.7271 (IC) (v1293)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)	

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 42	TOC	K1908164-003.04	7.7064 ppm	0.0366 ppm	0.4700%	2019/09/11 20:04

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

1	TOC	7.7322	77.3223	61.21	64.73	3.51	50.12	10:25
2	TOC	7.6805	76.8052	60.86	64.34	3.48	50.14	10:27

Dilution 1:10
Blank Contribution (TC) 8.7271 (IC) (v1293)
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	K1908164-004.04	9.9148 ppm	0.1800 ppm	1.8200%	2019/09/11 20:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.0421	100.4206	76.89	80.15	3.26	50.16	10:28
2	TOC	9.7875	97.8749	75.16	78.70	3.53	50.19	10:25

Dilution 1:10
Blank Contribution (TC) 8.7271 (IC) (v1293)
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	K1908164-005.04	6.1644 ppm	0.0145 ppm	0.2300%	2019/09/11 21:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.1746	61.7461	50.64	54.03	3.39	50.19	10:27
2	TOC	6.1541	61.5413	50.50	53.85	3.35	50.23	10:26

Dilution 1:10
Blank Contribution (TC) 8.7271 (IC) (v1293)
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	K1908164-006.04	2.9511 ppm	0.0215 ppm	0.7300%	2019/09/11 21:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9663	29.6627	28.86	32.39	3.53	50.26	10:28
2	TOC	2.9359	29.3593	28.66	32.07	3.41	50.26	10:27

Dilution 1:10
Blank Contribution (TC) 8.7271 (IC) (v1293)
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	K1908164-007.04	7.8912 ppm	0.0400 ppm	0.5100%	2019/09/11 21:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.8629	78.6290	62.10	65.41	3.31	50.30	10:28
2	TOC	7.9195	79.1947	62.48	65.94	3.45	50.31	10:28

Dilution 1:10
Blank Contribution (TC) 8.7271 (IC) (v1293)
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	K1908184-001.08	0.5196 ppm	0.0267 ppm	5.1300%	2019/09/11 22:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5384	5.3844	12.38	15.85	3.47	50.35	10:24
2	TOC	0.5007	5.0073	12.13	15.58	3.45	50.37	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7271 (IC) (v1293)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.5546 ppm (PASS)	0.0000 ppm	0%	2019/09/11 22:52

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.5546	235.5464	169.35	172.71	3.36	50.38	10:30

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

Sample Type: Check Standard --> CCB From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/11 23:07

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	4.64	8.28	3.65	50.40	10:32

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

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
48	TOC	K1908184-001.08 ms	27.3346 ppm	0.0000 ppm	0.0000%	2019/09/11 23:22

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

1	TOC	27.3346	273.3464	194.27	197.49	3.21	50.39	10:28
---	-----	---------	----------	--------	--------	------	-------	-------

Dilution 1:10
Blank Contribution (TC) 8.7271 (IC) (v1293)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
49	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/11 23:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.14	8.61	3.47	50.41	10:30

Dilution 1:10
Blank Contribution (TC) 8.7271 (IC) (v1293)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
50	TOC	K1908184-002.08	0.1726 ppm	0.0218 ppm	12.6200%	2019/09/11 23:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1572	1.5717	9.79	13.26	3.47	50.46	10:27
2	TOC	0.1880	1.8796	10.00	13.40	3.40	50.40	10:25

Dilution 1:10
Blank Contribution (TC) 8.7271 (IC) (v1293)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
51	TOC	K1908184-003.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/12 00:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.75	10.37	3.62	50.34	10:26
2	TOC	0.0000	0.0000	7.14	10.42	3.27	50.35	10:28

Dilution 1:10
Blank Contribution (TC) 8.7271 (IC) (v1293)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
52	TOC	K1908184-004.08	7.5667 ppm	0.0524 ppm	0.6900%	2019/09/12 00:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.5297	75.2966	59.84	63.15	3.31	50.32	10:27
2	TOC	7.6038	76.0376	60.34	63.84	3.50	50.26	10:27

Dilution 1:10
Blank Contribution (TC) 8.7271 (IC) (v1293)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
53	TOC	K1908184-005.08	7.4537 ppm	0.0111 ppm	0.1500%	2019/09/12 01:15

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
54	TOC	K1908184-006.08 100x	3.1077 ppm	0.0125 ppm	0.4000%	2019/09/12 01:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1165	31.1654	29.88	33.22	3.33	50.16	10:29
2	TOC	3.0989	30.9886	29.76	33.09	3.33	50.20	10:29

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
55	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/12 02:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.95	8.46	3.51	50.22	10:27
2	TOC	0.0000	0.0000	5.41	8.65	3.24	50.28	10:26

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
56	TOC	K1908139-002.01 doc	3.0037 ppm	0.0523 ppm	1.7400%	2019/09/12 02:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.0407	30.4067	29.37	32.84	3.47	50.20	10:26
2	TOC	2.9667	29.6672	28.86	32.38	3.51	50.28	10:22

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **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	K1908139-002.01 ms doc	28.6050 ppm	0.0000 ppm	0.0000%	2019/09/12 03:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.6050	286.0498	202.90	206.37	3.48	50.33	10:33

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
* B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.6905 ppm (PASS)	0.0000 ppm	0%	2019/09/12 03:22

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6905	236.9047	170.27	173.77	3.50	50.33	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 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
* D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/12 03:37

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.11	8.63	3.52	50.36	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 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
* 58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/12 03:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.47	7.99	3.52	50.38	10:34

Dilution 1:10
Blank Contribution (TC) 8.7271 (IC) (v1293)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
* C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.2367 ppm (PASS)	0.0000 ppm	0%	2019/09/12 04:06

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.2367	242.3673	173.98	177.36	3.38	50.33	10:32
Completion State		Success Action		Method		Calibration		STD Conc - Pos C		
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		25 ppmC		

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
59	TOC	K1908139-004.01 doc	2.0103 ppm	0.0363 ppm	1.8000%	2019/09/12 04:21		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0359	20.3595	22.55	25.88	3.33	50.31	10:27
2	TOC	1.9847	19.8468	22.20	25.57	3.37	50.32	10:25
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 8.7271 (IC) (v1293)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
60	TOC	FB 9/10/19	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/12 04:49		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.68	8.04	3.36	50.32	10:34
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 8.7271 (IC) (v1293)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
61	TOC	K1908231-001.01 doc	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/12 05:04		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.33	10.82	3.49	50.30	10:31
2	TOC	0.0000	0.0000	7.33	10.93	3.61	50.28	10:27
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 8.7271 (IC) (v1293)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
62	TOC	K1908231-002.01 doc	0.2540 ppm	0.0761 ppm	29.9800%	2019/09/12 05:32		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3079	3.0788	10.82	14.15	3.34	50.28	10:25
2	TOC	0.2002	2.0019	10.09	13.53	3.44	50.27	10:28

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **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	K1908231-003.01 doc	0.1004 ppm	0.0332 ppm	33.1000%	2019/09/12 06:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0769	0.7689	9.25	12.66	3.41	50.27	10:26
2	TOC	0.1239	1.2388	9.57	13.00	3.43	50.27	10:26

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **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	K1908231-004.01 doc	0.0831 ppm	0.0051 ppm	6.1400%	2019/09/12 06:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0795	0.7954	9.27	12.73	3.47	50.27	10:28
2	TOC	0.0868	0.8676	9.32	12.78	3.47	50.33	10:28

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **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	K1908231-005.01 doc	0.2676 ppm	0.0111 ppm	4.1700%	2019/09/12 06:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2597	2.5971	10.49	13.93	3.44	50.37	10:28
2	TOC	0.2755	2.7547	10.60	14.07	3.47	50.39	10:28

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **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	K1908231-006.01 doc	0.0625 ppm	0.0089 ppm	14.1600%	2019/09/12 07:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0688	0.6878	9.19	12.69	3.50	50.39	10:27
2	TOC	0.0563	0.5626	9.11	12.78	3.68	50.40	10:30

Dilution 1:10 **Blank Contribution** (TC) 8.7271 (IC) (v1293) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.4922 ppm (PASS)	0.0000 ppm	0%	2019/09/12 07:53

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.4922	234.9218	168.93	172.31	3.38	50.38	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 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/12 08:07

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	4.68	8.11	3.43	50.35	10:30

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

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1292	1.8533	1.6950	0.0000	0.0000	0.0000	2019/09/06 19:26	Fusion1 (Fusion1)
v1293	1.0543	1.1800	0.0000	0.0000	0.0000	2019/09/10 16:22	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 TOC
Type

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	2019/09/12 08:23

ALS Environmental

StarLIMS Run: 650765, 650766, 650769, 650772
 Analysis: DOC/TOC
 Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-79K 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-77J 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-80F

21 % H3PO4: 11-GEN-05-80E

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By: <i>bed</i>	Date Analyzed: <i>9/10/19</i>
Reviewed By: <i>Freeze</i>	Date Reviewed: <i>09/13/19</i>



Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1925603; 1926281; 1926282;
1926283

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2292 (247901)

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 1926282001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 673905) was less than 1/2 the CRDL. The recovery for the LCS (673906) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on sample 1925603001 (Client ID: LH18/24-SP650_090419_AIX). 3.0 μ l of Working Standard Solution Horizon ID 43701 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 – 673903) is reported from the analysis of the Laboratory Control Sample (LCS – 673906) 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: 19MARI03) along with datafiles 17SEPD11. Sample 1926282001 failed the 50-150% method requirement for ISTD recovery. This sample was re-prepped, re-analyzed and reported.

Thomas Bosch September 18, 2019

Analyst

Date



ANALYTICAL REPORT

Report Date: September 19, 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: **34-1925603**

Project ID: HS19090166

Purchase Order: HS19090166

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650-090419-AIX	1925603001	09/04/19	09/06/19	

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

73 of 152



ANALYTICAL REPORT

Workorder: **34-1925603**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: LH18/24-SP650-090419-AIX	Sampling Site: NA	Collected: 09/04/2019				
Lab ID: 1925603001	Media: 125 mL Nalgene	Received: 09/06/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2292 (HBN: 247901) Analyzed: 09/17/2019 09:55	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: 247901)

Field sample 1926282001 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 09/17/2019 14:12	/S/ Stephen Brose 09/19/2019 09:58

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: 34-1925603

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

00952052

Analysis Information

Workorder: 1925603

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2292 (HBN: 247901)
Analyzed By: Thomas Bosch

Blank

LMB: 673905 Analyzed: 09/17/2019 09:41 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 673906 Analyzed: 09/17/2019 08:57 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	2.72	3.00	90.5	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1925603001 Analyzed: 09/17/2019 09:55 Dilution: 1 Units: ug/L		MS: 673907 Analyzed: 09/17/2019 10:09 Dilution: 1 Units: ug/L				MSD: 673908 Analyzed: 09/17/2019 10:23 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	2.47	3	82.5	78.8 123.8	2.5	83.2	0.861	0.0 20.0

Comments

Field sample 1926282001 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 09/18/2019 11:11	/S/ Stephen Brose 09/19/2019 09:58

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



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: 12125

1925603

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: HS19090166
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19090166-02	LH18/24-SP650_090419_AIX	Groundwater	04 Sep 2019 14:00
SUB_Perch-6850			19 Sep 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____

Date/Time: 9/5/19 1800.

Received By: _____

Date/Time: 9/6/19 10:01

Cooler ID(s): _____

Temperature(s): _____

RIGHT SOLUTIONS | RIGHT PARTNER

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston Project/Task/Site: 1925603
 Date/Time of Receipt: 9/6/19 10:01 Number of Coolers Received: 1

Condition of Coolers: Acceptable/Unacceptable Temperature Control: Present/Not Included
 Cooler Custody Seals: Present/Absent/NA
 Container Custody Seals: Intact/Broken/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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 <u>9879</u>	5 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Jay Lynn Johnson Signature Printed Name Date: 9/6/19

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



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

SHIP DATE: 05SEP
ACTWGT: 5.30 LB
CAD: 300130/0
DIMS: 14x11x
BILL THIRD PARTY

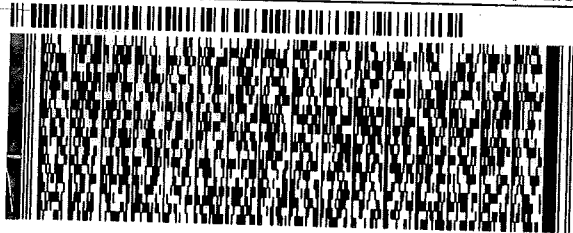
RT 907
ST 21

5 15:00 A
5897
09.06

TO **SAMPLE RECEIVING**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123

(801) 286-7700
REF: HS19090166 - RJ



FedEx
Express

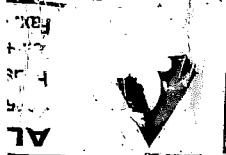


TRK# 4809 7837 5897
0201

FRI - 06 SEP 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC

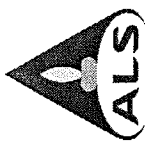




ALS Environmental
CHAIN-OF-CUSTODY

Project / Job / Task: HS19090166		Split:		Workorder ID: 1925603		Level: ENV_LVL4		Requested Analysis			
Client: ALS Environmental (Houston)				Account: 8101				Type: 125Poly			
Comments:											
Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Count	Containers			
1	09/04/2019 14:00	LH18/24-SP650-090419-AIX	1925603001		Water	A	1	EPA 6850, D+D GSM			
2											
3											
4											
5											
6											
7											
8											
9											
10											

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY						SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY					
Relinquished By: (Signature)			Received By: (Signature)			Relinquished By: (Signature)			Received By: (Signature)		
W. Kelly, Julie			ALS Sample Receiving			Date / Time			Reason for Transfer / Storage Location		
Julie Warrington			14B			Date / Time			Reason for Transfer / Storage Location		
R.33.1			T. Bush			Date / Time			Reason for Transfer / Storage Location		
09/06/2019 10:01			12:45			Date / Time			Reason for Transfer / Storage Location		
10/19/2019						Date / Time			Reason for Transfer / Storage Location		
						Date / Time			Reason for Transfer / Storage Location		
						Date / Time			Reason for Transfer / Storage Location		
						Date / Time			Reason for Transfer / Storage Location		
						Date / Time			Reason for Transfer / Storage Location		
						Date / Time			Reason for Transfer / Storage Location		
						Date / Time			Reason for Transfer / Storage Location		
						Date / Time			Reason for Transfer / Storage Location		
						Date / Time			Reason for Transfer / Storage Location		



Batch Worklist

HBN: 247901

Instrument: WP
Status: WP

Created: 9/17/2019 07:46
Analyst: T. Bosch

Batch: ELMS/ 2292
Rule: EPA 6850, DoD QSM Water

- Workorder: 1925603 [ENV_LVL4]
- Workorder: 1926281 [ENV_LVL4]
- Workorder: 1926282 [ENV_LVL4]
- Workorder: 1926283 [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	673902	CCV for HBN 247901 [ELMS/2292]				CCV	3		E685041C3Q	5311		9/19/2019	
2	673903	RLYS for HBN 247901 [ELMS/2292]				RLYS	3		E685041C3Q	5311		9/19/2019	
3	673904	ICS for HBN 247901 [ELMS/2292]				ICS	3		E6850.D3Q	5311		9/19/2019	
4	673905	LMB for HBN 247901 [ELMS/2292]				LMB	3		E6850Q413Q	5311		9/19/2019	
5	673906	LCS for HBN 247901 [ELMS/2292]				LCS	3		E6850Q413Q	5311		9/19/2019	
6	1925603001	LH18/24-SP650-090419-AIX				SAMPLE	3	1925603001-A	E6850Q41.3	5480	10/2/2019	9/19/2019	
7	673907	LH18/24-SP650...(1925603001MS)				MS	3		E6850Q413Q	5311		9/19/2019	
8	673908	LH18/24-SP65...(1925603001MSD)				MSD	3		E6850Q413Q	5311		9/19/2019	
9	1926281001	LH18/24-SP650_091019_AIX				SAMPLE	3	1926281001-A	E6850Q41.3	5480	10/8/2019	9/25/2019	
10	1926282001	LH18/24-SP140_091019				SAMPLE	3	1926282001-A	E6850Q41.3	5480	10/8/2019	9/25/2019	
11	1926283001	LH18/24-SP650_091019_AIX				SAMPLE	3	1926283001-A	E6850Q41.3	5480	10/8/2019	9/25/2019	
12	673909	CCV for HBN 247901 [ELMS/2292]				CCV	3		E685041C3Q	5311		9/19/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-upALS Work Order #'s & Sample #()'s: 1925603 (001); 1926281 (001) 1926282 (001); 1926283 (001)ELMS Batch/HBN ID: 2292 (247901)Prep Date: 09/16/2019 Analysis Date: 09/17/2019 Analyst: T. BoschAnalyte: **Perchlorate** Matrix: **Water** Method: **6850**Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\SEP\17SEP19D.sReported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**SAMPLE PREPARATION/ANALYSIS:

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

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

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

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.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: 40µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

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 673906; Target = 3.0µg/L. ASTM type II water was used for LMB 673905.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1925603001 (Client ID: LH18/24-SP650_090419_AIX). 3.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters. Field sample 1926282001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly. Sample 1926282001 failed the 50-150% method requirement for ISTD recovery. This sample was re-prepped, re-analyzed and reported.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\SEP\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\247901-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 673903) is reported from the analysis of the Laboratory Control Sample (LCS – 673906) 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: 19MARI03) along with datafiles 17SEPD11.

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: 2292 HBN: 247901</u> <u>1926283</u>		
Sample Set IDs if Applicable: <u>1925603/1926281/1926282</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	—	— SB
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 - CLO4 WRK

CLO4 WRK			Description - 6850.WKG Std:100.ug/L		
Standard: 43702		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/18/2018 02:09PM		Expires: 09/18/2019	
MFG Lot: TNB: 09/18/2018				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 WRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019



STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK			Description - 6850: Stock AccStd 1,000ug/mL
Standard: 43659		Created By: Thomas Bosch	
MFG: AccuStandard		Create Date: 09/17/2018 09:09AM	
MFG Lot: 218065075		Amount: 100 mL	
Part ID: IC-PER-10X-1		Expires: 07/25/2020	
		Usable: No	
		Lab Lot: CLO4 STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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: 43701		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/18/2018 02:09PM		Expires: 09/18/2019	
MFG Lot: TNB: 09/18/2018				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 INT	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020



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



STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK			Description - Perchlorate ISTD Wrk 1,000ug/L		
Standard: 43730		Created By: Thomas Bosch		Amount: 25 mL	
MFG: ALS/SLC		Create Date: 09/20/2018 09:09AM		Expires: 09/20/2019	
MFG Lot: TNB: 05/09/2018		Verified By: Thomas Bosch		Usable: Yes	
Pipette ID: Not Provided		Verify Date:		Lab Lot: CLO4ISTDWRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026



STANDARD REPORT

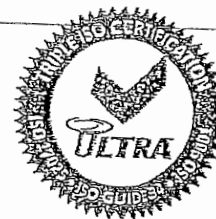
Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock	
Standard: 43729		Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope		Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFP-012A		Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S		Verify Date:	Lab Lot: CLO4ISTDSTK
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL



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.

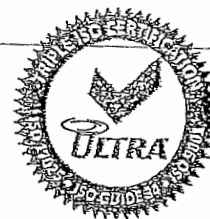
Expiration of Certification:

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.





Certificate of Analysis



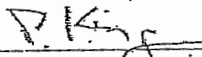
ISO Guide 34 Reference Material

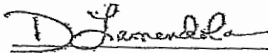
Product Number: ICC-013
Lot Number: CP-0860

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/QA



125 Market Street
New Haven, CT 06513
USA



AccuStandard®

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

CERTIFICATE OF ANALYSIS



S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (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



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

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



23118

Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDDG-013

Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

Labeled CAS Number: NA

Unlabeled CAS Number: 7601-89-0

MW*: 130.4

Chemical Formula: $\text{NaCl}^+\text{O}_4^-$

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.

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

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

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

Approved by: T. J. Eckersley

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

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 $\mu\text{g/mL}$
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 \pm 2.8 $\mu\text{g/mL}$ (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP2.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	
*	673902	CCV@25	Vial 71	1	Control	1	2.11095e6	7.718	26.01274
*	673906	QC@3.0	Vial 72	1	Control	2	2.38232e5	7.546	2.71615
*	673904	ICS@3.0	Vial 73	1	Control	3	1.94502e5	7.427	3.19438
*	673905	LMB	Vial 74	1	Control	5	0.00000	0.000	0.00000
*	1925603001		Vial 75	1	Sample	6	0.00000	0.000	0.00000
*	673907	256031S	Vial 76	1	Sample	7	1.44508e5	7.417	2.47376
*	673908	256031D	Vial 77	1	Sample	8	1.50348e5	7.390	2.49518
*	1926281001		Vial 78	1	Sample	9	0.00000	0.000	0.00000
*	1926282001	1K	Vial 79	1	Sample	10	7.57421e5	7.740	4926.17796 <i>-NR REP</i>
*	1926283001		Vial 80	1	Sample	11	5.00363e4	7.319	9.83188e-1 <i>< RL</i>
*	1926282001	1K	Vial 79	1	Sample	12	4.98891e5	7.765	4904.43754
*	673909	CCV@25	Vial 71	1	Control	13	2.04203e6	7.785	26.00821

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
*	673902	CCV@25	Vial 71	1	Control	1	6.35094e5	7.742	26.35431
*	673906	QC@3.0	Vial 72	1	Control	2	7.43744e4	7.563	2.70140
*	673904	ICS@3.0	Vial 73	1	Control	3	6.33519e4	7.450	3.34525
*	673905	LMB	Vial 74	1	Control	5	0.00000	0.000	0.00000
*	1925603001		Vial 75	1	Sample	6	0.00000	0.000	0.00000
*	673907	256031S	Vial 76	1	Sample	7	5.21915e4	7.445	2.82706
*	673908	256031D	Vial 77	1	Sample	8	5.26531e4	7.420	2.76701
*	1926281001		Vial 78	1	Sample	9	0.00000	0.000	0.00000
*	1926282001	1K	Vial 79	1	Sample	10	2.36316e5	7.779	5035.13054
*	1926283001		Vial 80	1	Sample	11	1.87749e4	7.329	1.04440
*	1926282001	1K	Vial 79	1	Sample	12	1.57327e5	7.787	5065.48124
*	673909	CCV@25	Vial 71	1	Control	13	6.17795e5	7.802	26.48941

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-ISTD RT	CLO4-89-ISTD Amount	
*	673902	CCV@25	Vial 71	1	Control	1	2.46298e5	7.734	5.00000
*	673906	QC@3.0	Vial 72	1	Control	2	2.95565e5	7.573	5.00000
*	673904	ICS@3.0	Vial 73	1	Control	3	2.03094e5	7.453	5.00000
*	673905	LMB	Vial 74	1	Control	5	2.63662e5	7.809	5.00000
*	1925603001		Vial 75	1	Sample	6	2.04752e5	7.431	5.00000
*	673907	256031S	Vial 76	1	Sample	7	1.98153e5	7.432	5.00000
*	673908	256031D	Vial 77	1	Sample	8	2.04262e5	7.411	5.00000
*	1926281001		Vial 78	1	Sample	9	1.87883e5	7.386	5.00000
*	1926282001	1K	Vial 79	1	Sample	10	5.01727e5	7.772	5000.00000 <i>ISTD</i>
*	1926283001		Vial 80	1	Sample	11	1.93087e5	7.333	5.00000 <i>HIGH</i>
*	1926282001	1K	Vial 79	1	Sample	12	3.32002e5	7.798	5000.00000 <i>REP</i>
*	673909	CCV@25	Vial 71	1	Control	13	2.38300e5	7.815	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

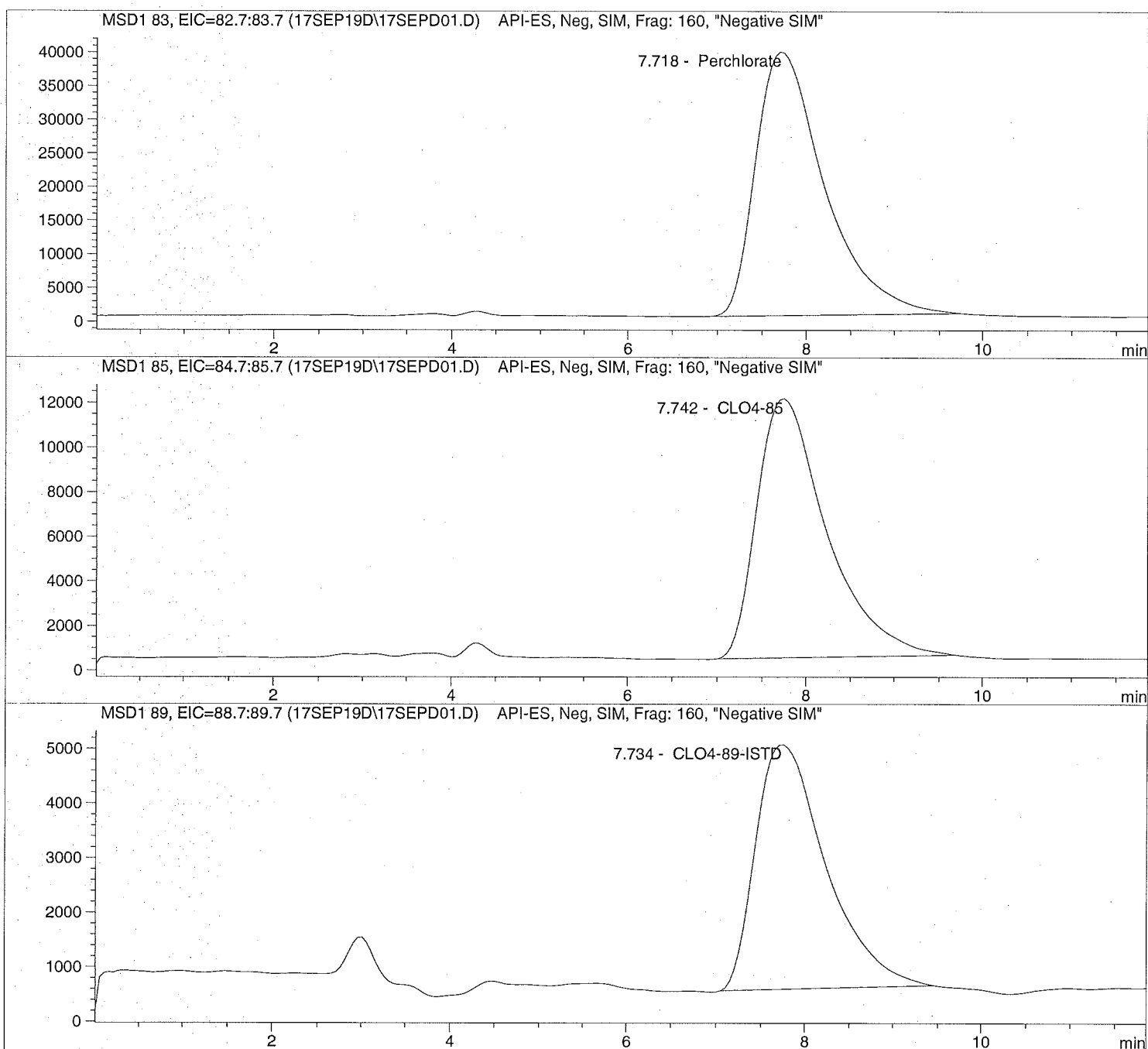
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	673902	CCV@25	CLO4-AQN	1		Ctrl Samp
2	Vial 72	673906	QC@3.0	CLO4-AQN	1		Ctrl Samp
3	Vial 73	673904	ICS@3.0	CLO4-AQN	1		Ctrl Samp
4	Vial 74	673905	LMB	CLO4-AQN	1		Ctrl Samp
5	Vial 74	673905	LMB	CLO4-AQN	1		Ctrl Samp
6	Vial 75	1925603001		CLO4-AQN	1		Sample
7	Vial 76	673907	256031S	CLO4-AQN	1		Sample
8	Vial 77	673908	256031D	CLO4-AQN	1		Sample
9	Vial 78	1926281001		CLO4-AQN	1		Sample
10	Vial 79	1926282001	1K	CLO4-AQN	1		Sample
11	Vial 80	1926283001		CLO4-AQN	1		Sample
12	Vial 79	1926282001	1K	CLO4-AQN	1		Sample
13	Vial 71	673909	CCV@25	CLO4-AQN	1		Ctrl Samp

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD01.D Sample Name: 673902 CCV@25

=====
Injection Date: 9/17/2019 08:40:19 Seq Line: 1
Sample Name: 673902 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD01.D Sample Name: 673902 CCV@25

```

=====
Injection Date: 9/17/2019 08:40:19      Seq Line: 1
Sample Name: 673902 CCV@25              Location: Vial 71
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.718	PBA	2110953.5	26.0127	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.742	PBA	635093.8	26.3543	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.734	PBA	246298.2	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD02.D

Sample Name: 673906 QC@3.0

Injection Date: 9/17/2019 08:57:27

Seq Line: 2

Sample Name: 673906 QC@3.0

Location: Vial 72

Acq Operator: TNB

Inj. No.: 1

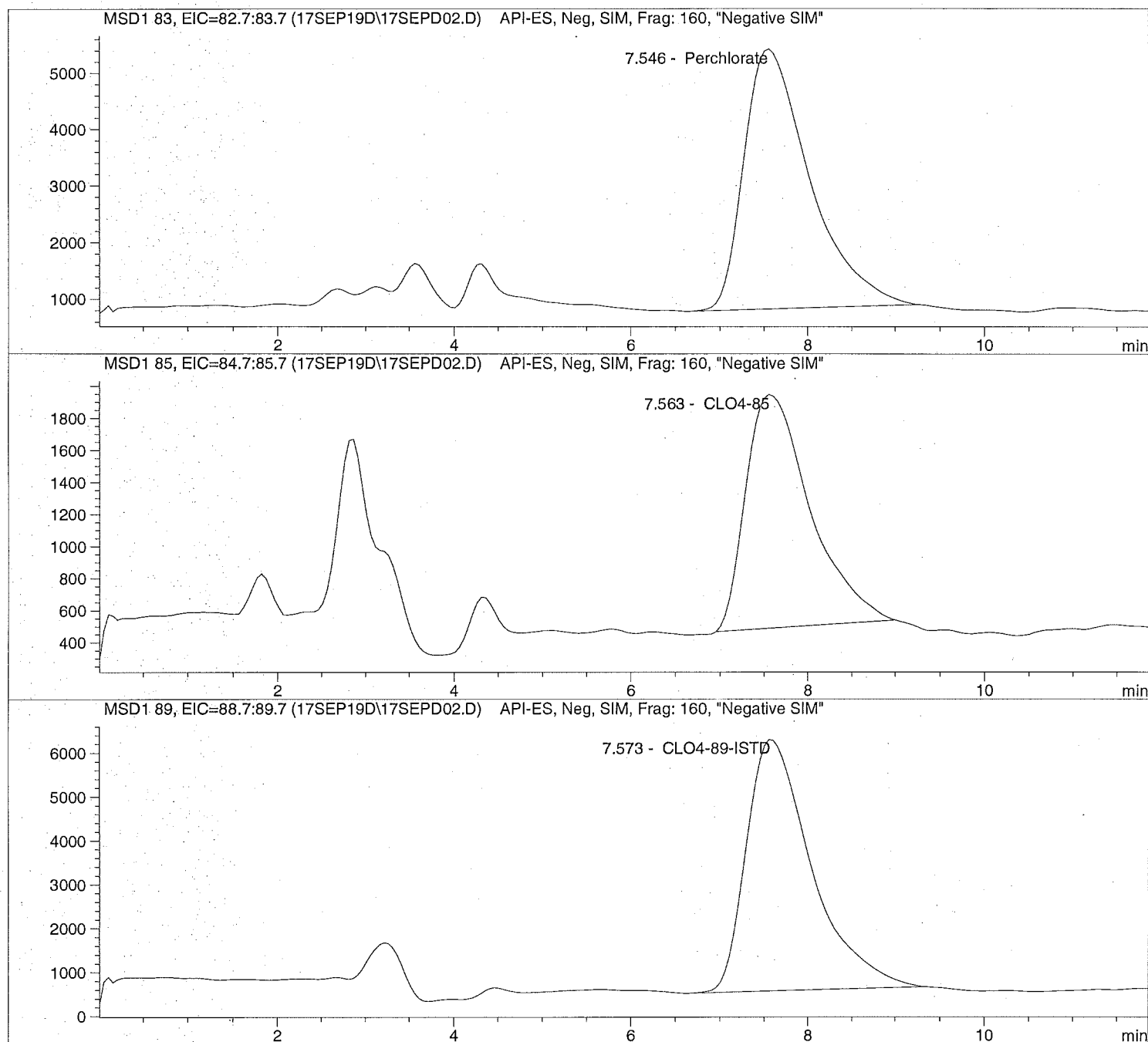
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD02.D Sample Name: 673906 QC@3.0

Injection Date: 9/17/2019 08:57:27 Seq Line: 2
 Sample Name: 673906 QC@3.0 Location: Vial 72
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
 Last Changed: 9/17/2019 12:34:41

Perchlorate analysis

Sample Information

Sorted By: Signal
 Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
 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
7.546	PBA	238232.5	2.7161	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.563	PBA	74374.4	2.7014	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.573	PBA	295565.3	5.0000	CLO4-89-ISTD

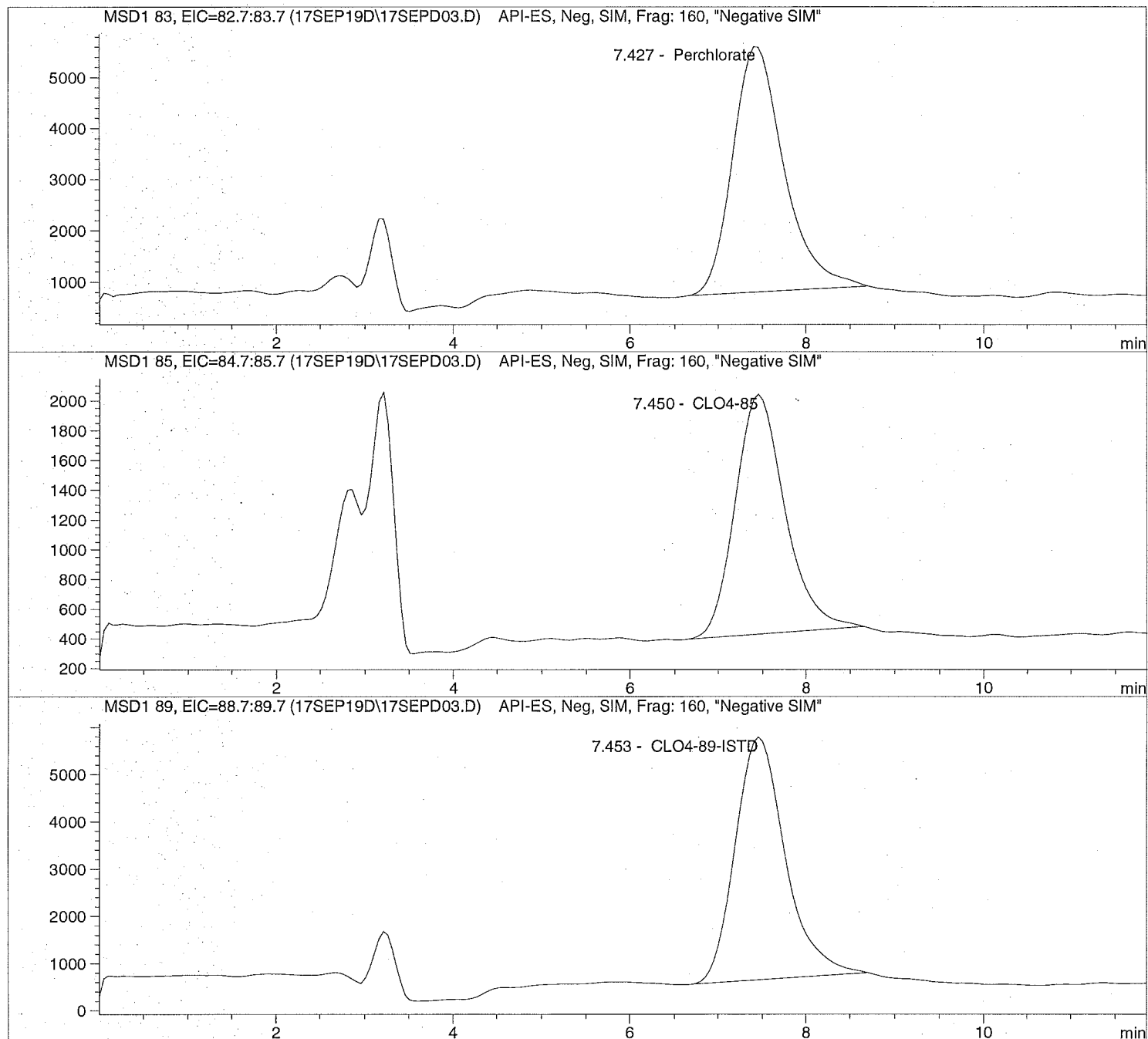
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD03.D Sample Name: 673904 ICS@3.0

Injection Date: 9/17/2019 09:11:28 Seq Line: 3
Sample Name: 673904 ICS@3.0 Location: Vial 73
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD03.D Sample Name: 673904 ICS@3.0

```

=====
Injection Date: 9/17/2019 09:11:28      Seq Line: 3
Sample Name: 673904 ICS@3.0            Location: Vial 73
Acq Operator: TNB                      Inj. No.: 1
                                           Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.427	PBA	194501.8	3.1944	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.450	PBA	63351.9	3.3452	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.453	PBA	203094.5	5.0000	CLO4-89-ISTD

```

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

```


Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD05.D

Sample Name: 673905 LMB

Injection Date: 9/17/2019 09:41:11

Seq Line: 5

Sample Name: 673905 LMB

Location: Vial 74

Acq Operator: TNB

Inj. No.: 1

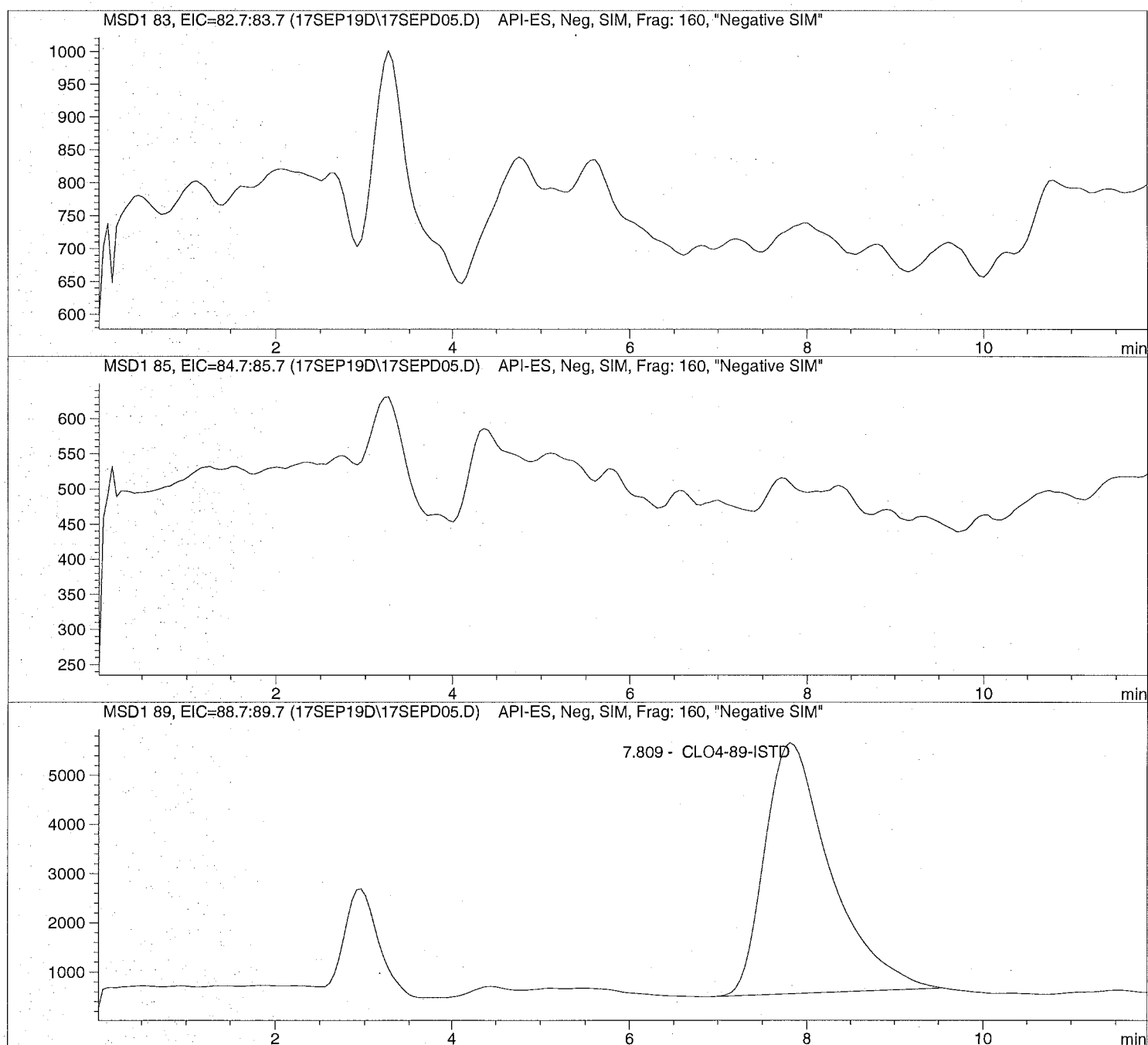
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD05.D Sample Name: 673905 LMB

```

=====
Injection Date: 9/17/2019 09:41:11      Seq Line: 5
Sample Name: 673905 LMB                 Location: Vial 74
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019, 10:15:00 am
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
7.809	PBA	263661.9	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD06.D

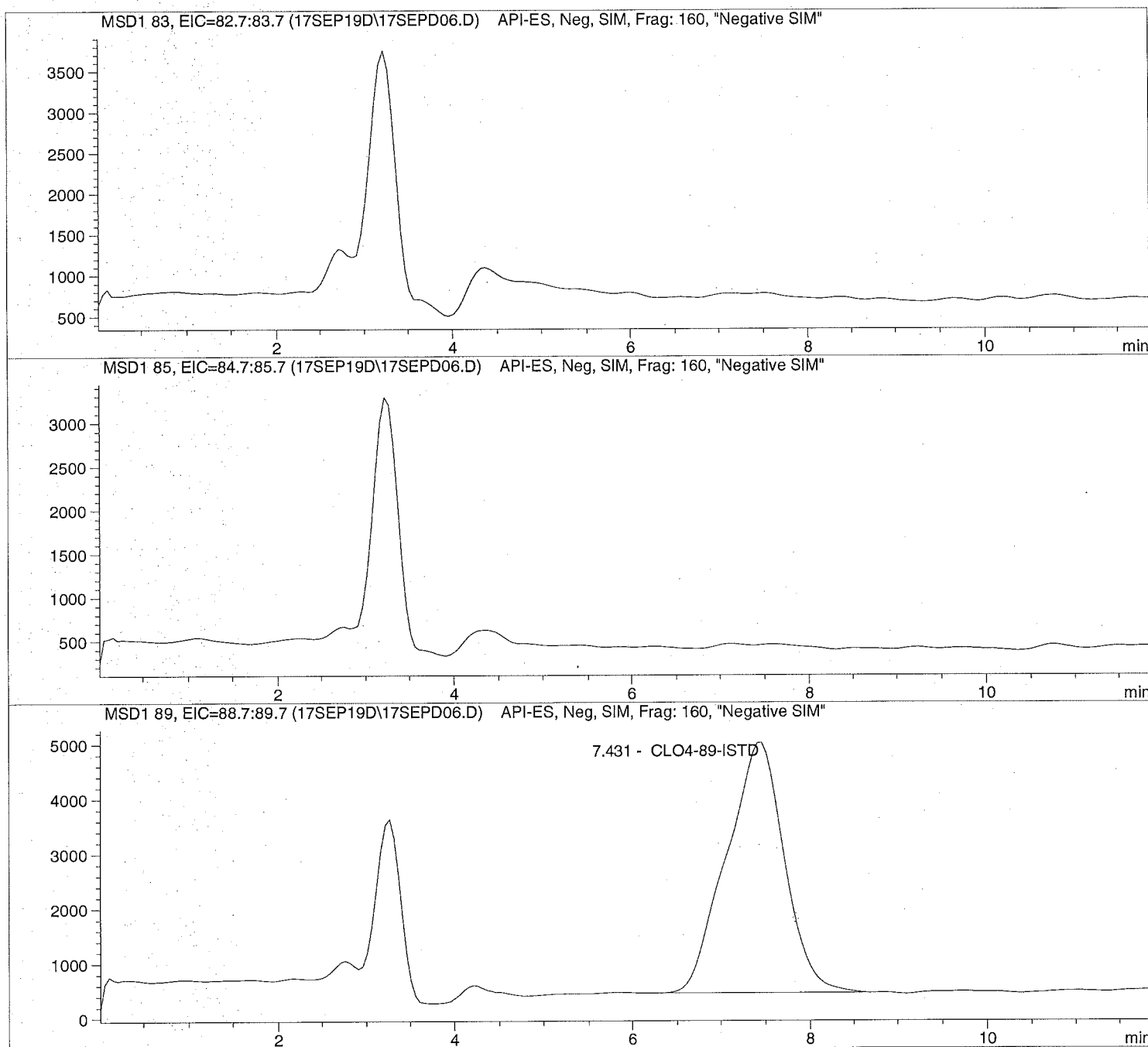
Sample Name: 1925603001

Injection Date: 9/17/2019 09:55:10
Sample Name: 1925603001
Acq Operator: TNB

Seq Line: 6
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD06.D

Sample Name: 1925603001

```

=====
Injection Date: 9/17/2019 09:55:10      Seq Line: 6
Sample Name: 1925603001                Location: Vial 75
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019, 10:15:00 am
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
7.431	BBA	204752.5	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD07.D

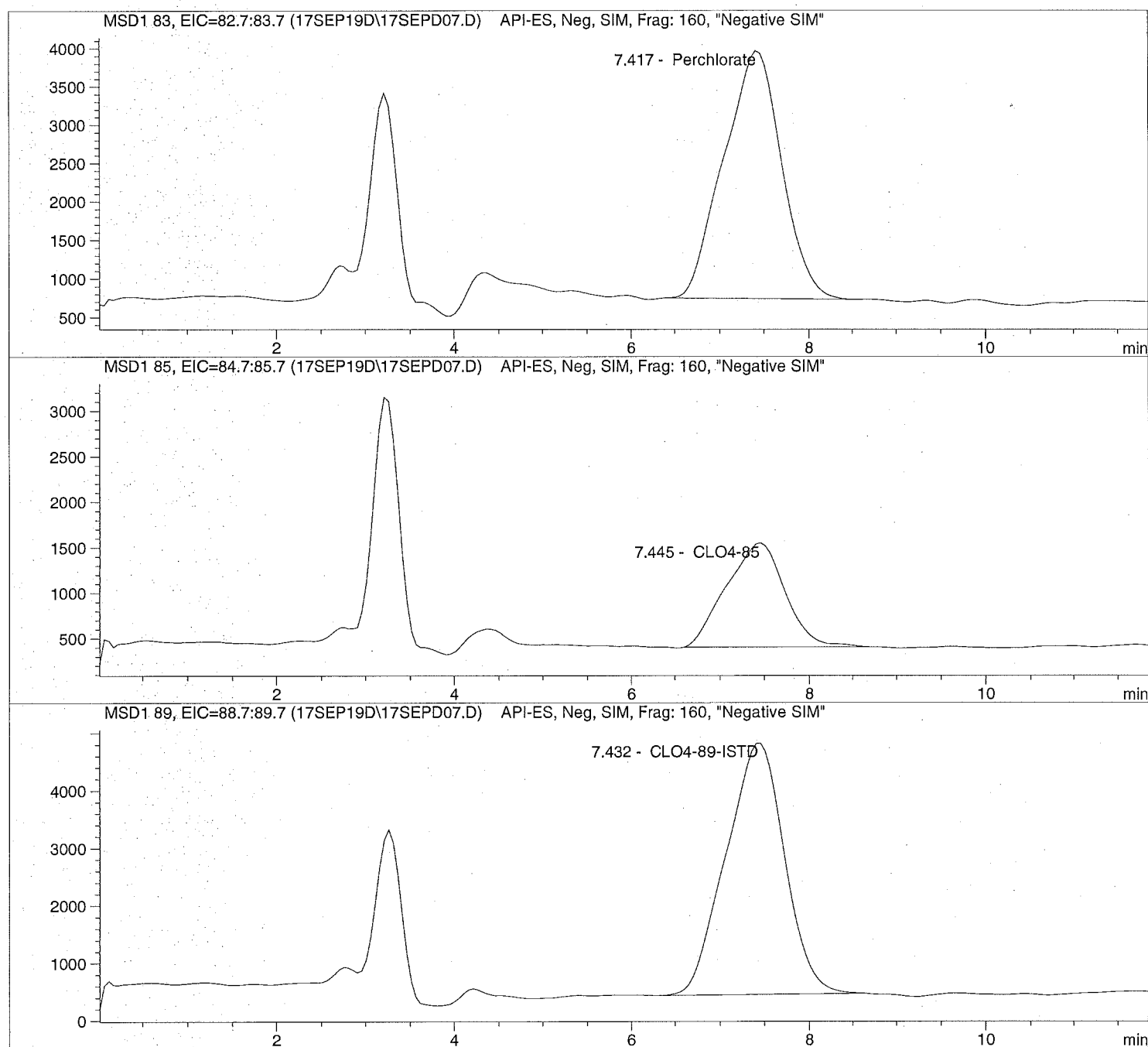
Sample Name: 673907 256031S

Injection Date: 9/17/2019 10:09:10
Sample Name: 673907 256031S
Acq Operator: TNB

Seq Line: 7
Location: Vial 76
Inj. No.: 1
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD07.D Sample Name: 673907 256031S

```

=====
Injection Date: 9/17/2019 10:09:10      Seq Line: 7
Sample Name: 673907 256031S           Location: Vial 76
Acq Operator: TNB                      Inj. No.: 1
                                         Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.417	PBA	144507.9	2.4738	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.445	PBA	52191.5	2.8271	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.432	PBA	198152.6	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD08.D

Sample Name: 673908 256031D

Injection Date: 9/17/2019 10:23:18

Seq Line: 8

Sample Name: 673908 256031D

Location: Vial 77

Acq Operator: TNB

Inj. No.: 1

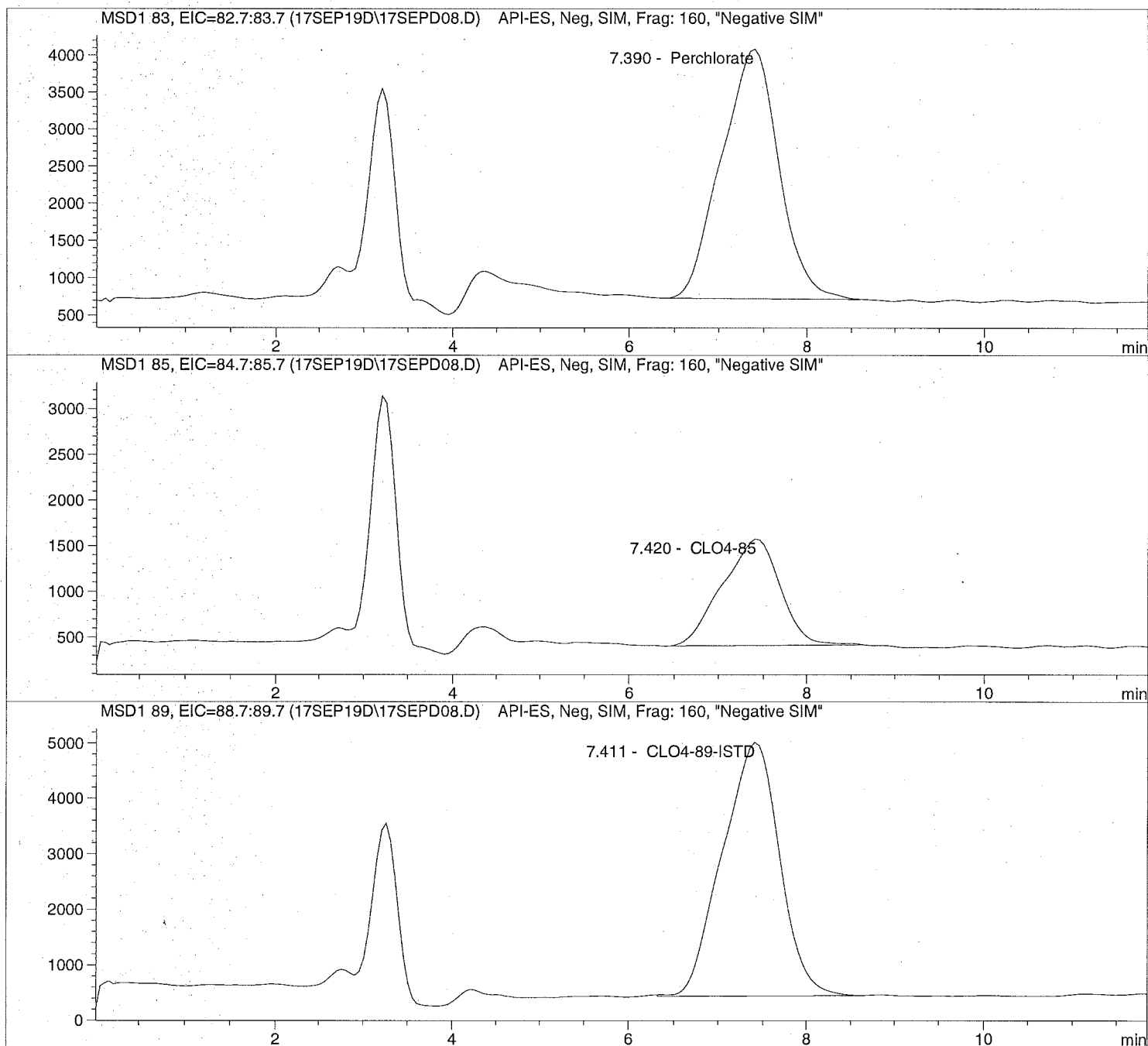
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD08.D Sample Name: 673908 256031D

```

=====
Injection Date: 9/17/2019 10:23:18      Seq Line:      8
Sample Name:   673908 256031D          Location:     Vial 77
Acq Operator:  TNB                      Inj. No.:    1
                                           Inj. Vol.:   40 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:  9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.390	PBA	150348.3	2.4952	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.420	PBA	52653.1	2.7670	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.411	BBA	204262.4	5.0000	CLO4-89-ISTD

```

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

```


Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD09.D

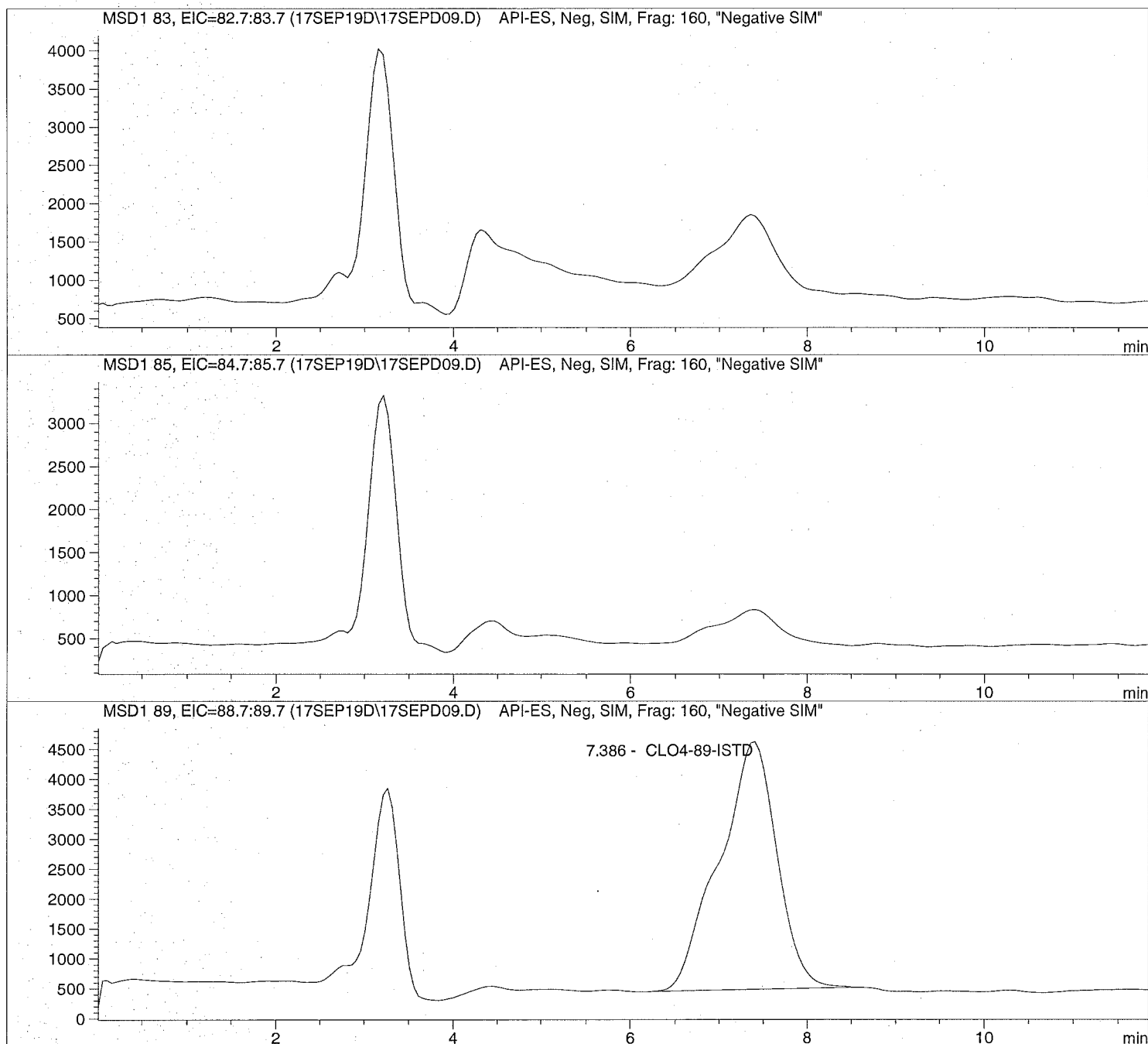
Sample Name: 1926281001

Injection Date: 9/17/2019 10:37:19
Sample Name: 1926281001
Acq Operator: TNB

Seq Line: 9
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD09.D Sample Name: 1926281001

```

=====
Injection Date: 9/17/2019 10:37:19      Seq Line: 9
Sample Name: 1926281001                 Location: Vial 78
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 40 µl
  
```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
  
```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019, 10:15:00 am
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
7.386	PBA	187882.8	5.0000	CLO4-89-ISTD

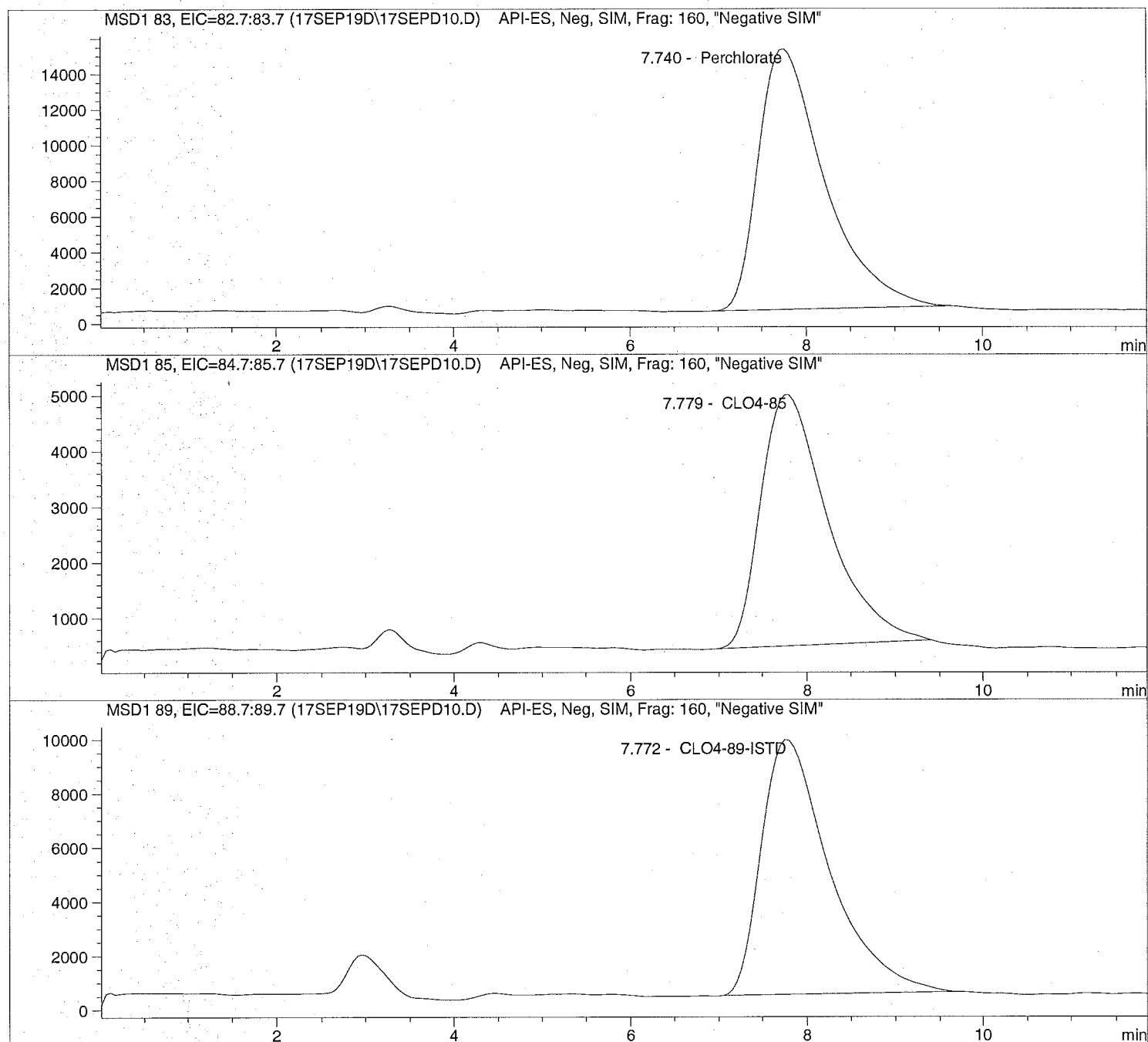
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD10.D Sample Name: 1926282001 1K

=====
Injection Date: 9/17/2019 10:51:21 Seq Line: 10
Sample Name: 1926282001 1K Location: Vial 79
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD10.D Sample Name: 1926282001 1K

```

=====
Injection Date: 9/17/2019 10:51:21      Seq Line: 10
Sample Name: 1926282001 1K             Location: Vial 79
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019, 10:15:00 am
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
7.740	PBA	757420.9	4926.1780	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.779	PBA	236315.7	5035.1305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.772	PBA	501726.5	5000.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD11.D

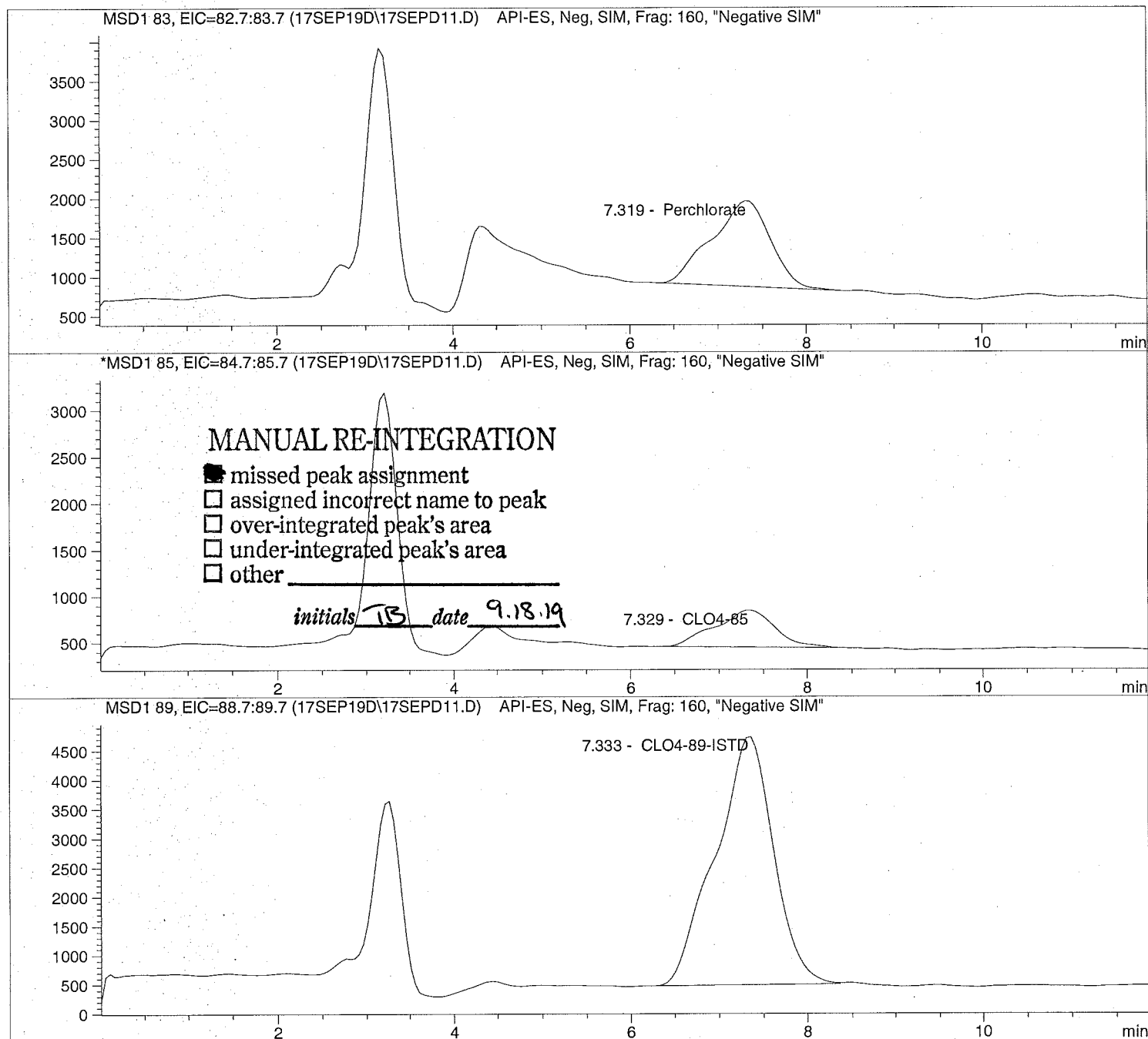
Sample Name: 1926283001

Injection Date: 9/17/2019 11:05:22
 Sample Name: 1926283001
 Acq Operator: TNB

Seq Line: 11
 Location: Vial 80
 Inj. No.: 1
 Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
 Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD11.D Sample Name: 1926283001

```

=====
Injection Date: 9/17/2019 11:05:22 Seq Line: 11
Sample Name: 1926283001 Location: Vial 80
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 40 µl

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.319	PBA	50036.3	0.9832	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.329	MM	18774.9	1.0444	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.333	PBA	193086.8	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD12.D

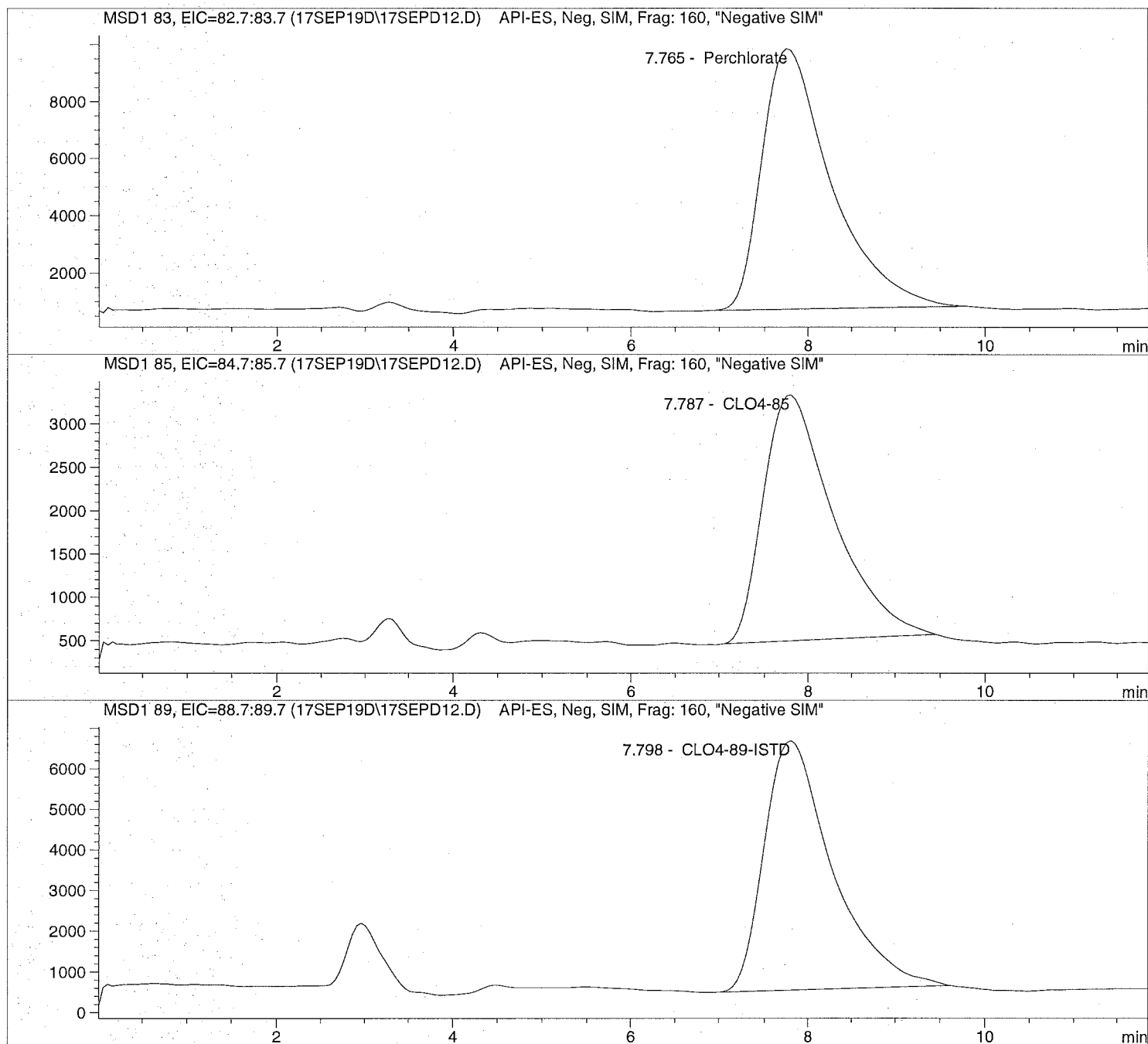
Sample Name: 1926282001 1K

Injection Date: 9/17/2019 11:22:08
Sample Name: 1926282001 1K
Acq Operator: TNB

Seq Line: 12
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD12.D Sample Name: 1926282001 1K

```

=====
Injection Date: 9/17/2019 11:22:08      Seq Line:      12
Sample Name:   1926282001 1K           Location:     Vial 79
Acq Operator:  TNB                    Inj. No.:    1
                                           Inj. Vol.:   40 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:  9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.765	PBA	498890.6	4904.4375	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.787	PBA	157326.7	5065.4812	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.798	PBA	332001.9	5000.0000	CLO4-89-ISTD

```

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

```


Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD13.D

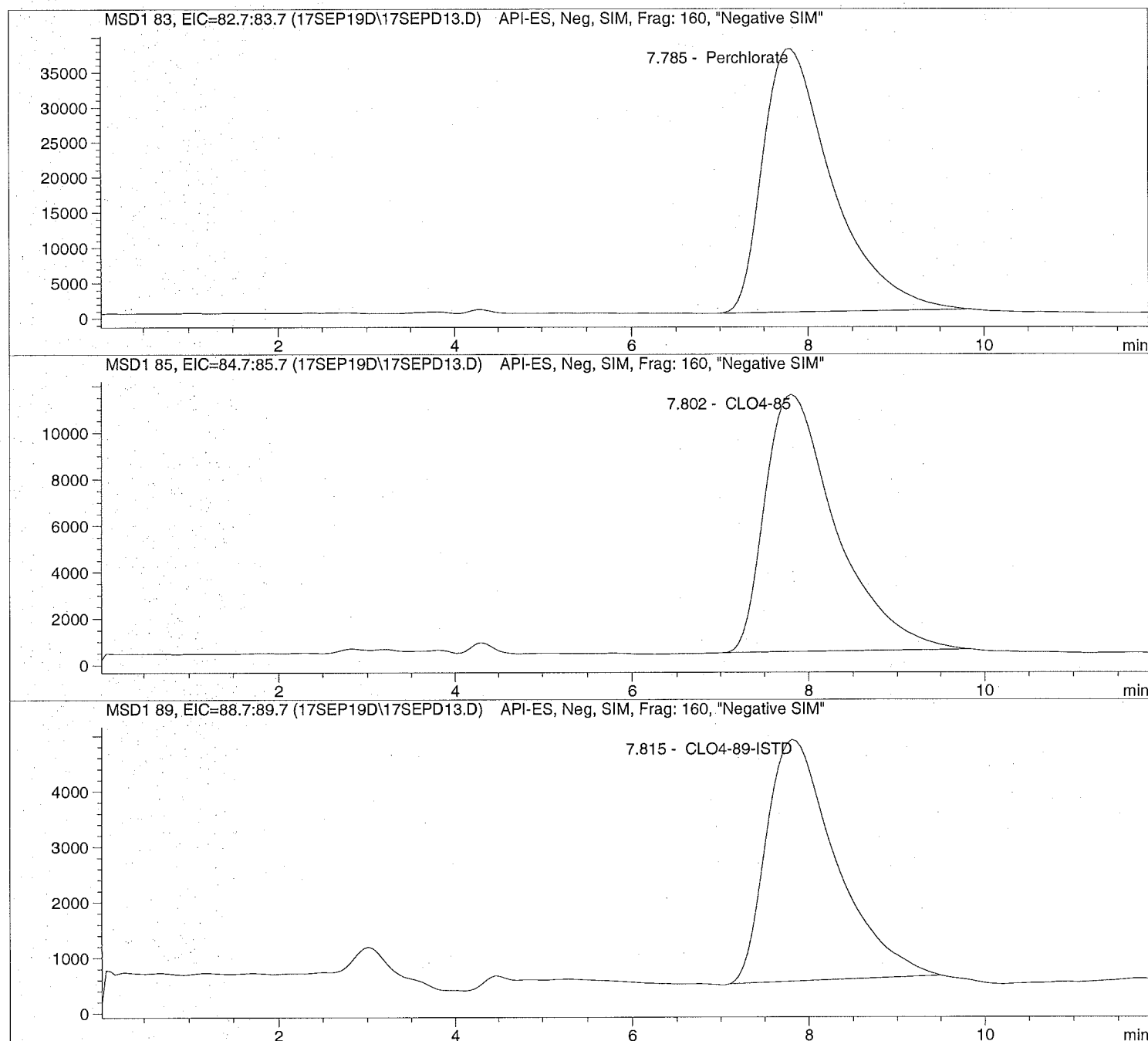
Sample Name: 673909 CCV@25

Injection Date: 9/17/2019 11:37:02
Sample Name: 673909 CCV@25
Acq Operator: TNB

Seq Line: 13
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD13.D Sample Name: 673909 CCV@25

```

=====
Injection Date: 9/17/2019 11:37:02      Seq Line: 13
Sample Name: 673909 CCV@25             Location: Vial 71
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.785	PBA	2042028.8	26.0082	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.802	PBA	617795.5	26.4894	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.815	PBA	238300.4	5.0000	CLO4-89-ISTD

```

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

```



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

=====
 Calibration Table
 =====

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 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
8.744	1	1	1.00000	7.76074e4	1.28854e-5	1 Perchlorate
		2	2.00000	1.35273e5	1.47849e-5	
		3	5.00000	3.37764e5	1.48033e-5	
		4	10.00000	6.83454e5	1.46316e-5	
		5	25.00000	2.08433e6	1.19943e-5	
		6	50.00000	4.13334e6	1.20968e-5	
		7	75.00000	5.99313e6	1.25143e-5	
8.755	2	1	1.00000	2.36780e4	4.22333e-5	1 CLO4-85
		2	2.00000	4.69486e4	4.25998e-5	
		3	5.00000	1.06124e5	4.71147e-5	
		4	10.00000	2.13523e5	4.68335e-5	
		5	25.00000	6.14295e5	4.06971e-5	
		6	50.00000	1.19814e6	4.17315e-5	
		7	75.00000	1.78355e6	4.20509e-5	
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1 CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5	
		3	5.00000	2.33196e5	2.14412e-5	
		4	5.00000	2.34454e5	2.13262e-5	
		5	5.00000	2.50568e5	1.99547e-5	
		6	5.00000	2.30977e5	2.16472e-5	

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp Name
7		5.00000	2.21504e5	2.25729e-5	

More compound-specific settings:

Compound: Perchlorate

Time Window : From 6.654 min To 12.544 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333

Compound: CLO4-85

Time Window : From 6.650 min To 12.505 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333

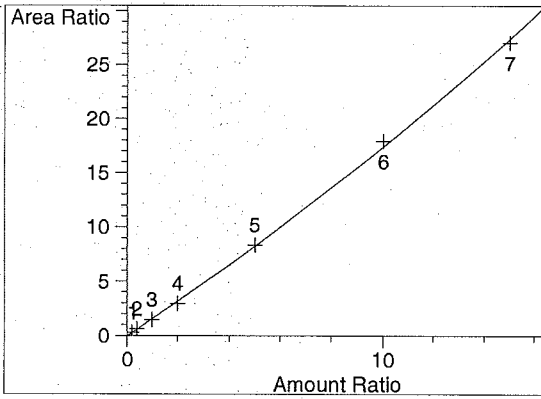
Compound: CLO4-89-ISTD

Time Window : From 6.659 min To 12.466 min
 Curve Type : Linear
 Origin : Included
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 1
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1

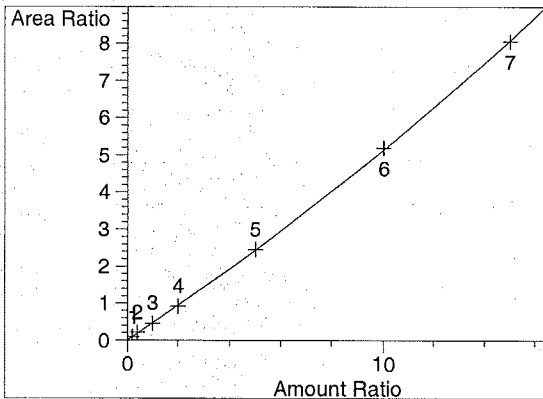
=====
 Peak Sum Table
 =====

No Entries in table
 =====

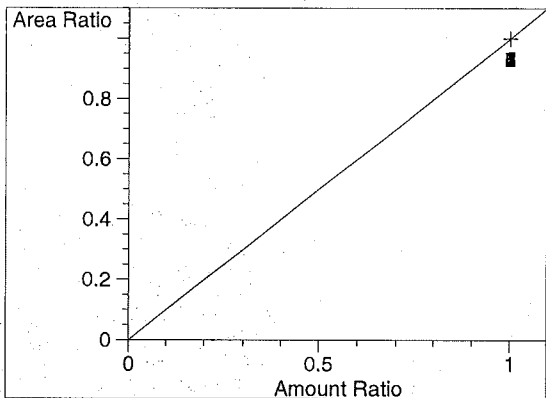
=====
 Calibration Curves
 =====



Perchlorate at exp. RT: 8.744
 MSD1 83, EIC=82.7:83.7
 Correlation: 0.99957
 Residual Std. Dev.: 0.30744
 Formula: $y = ax^2 + bx + c$
 a: 1.76988e-2
 b: 1.56480
 c: -4.92430e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
 MSD1 85, EIC=84.7:85.7
 Correlation: 0.99983
 Residual Std. Dev.: 0.03473
 Formula: $y = ax^2 + bx + c$
 a: 5.13396e-3
 b: 4.62055e-1
 c: 4.97209e-4
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
 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 1 : 1
 Level 2 : 1
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP2.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	7.76074e4	8.744	1.06245
##	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
##	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
##	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
##	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
##	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
##	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
##	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

##	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
##	---	---	---	---	---	---	---	---
##	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
##	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
##	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
##	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
##	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
##	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
##	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
##	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

##	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	2.73208e5	8.766	5.00000
##	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
##	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
##	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
##	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
##	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
##	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
##	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** 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 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 3/19/2019 09:39:40

Seq Line: 3

Sample Name: CLO4@ 1.0ug/L

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

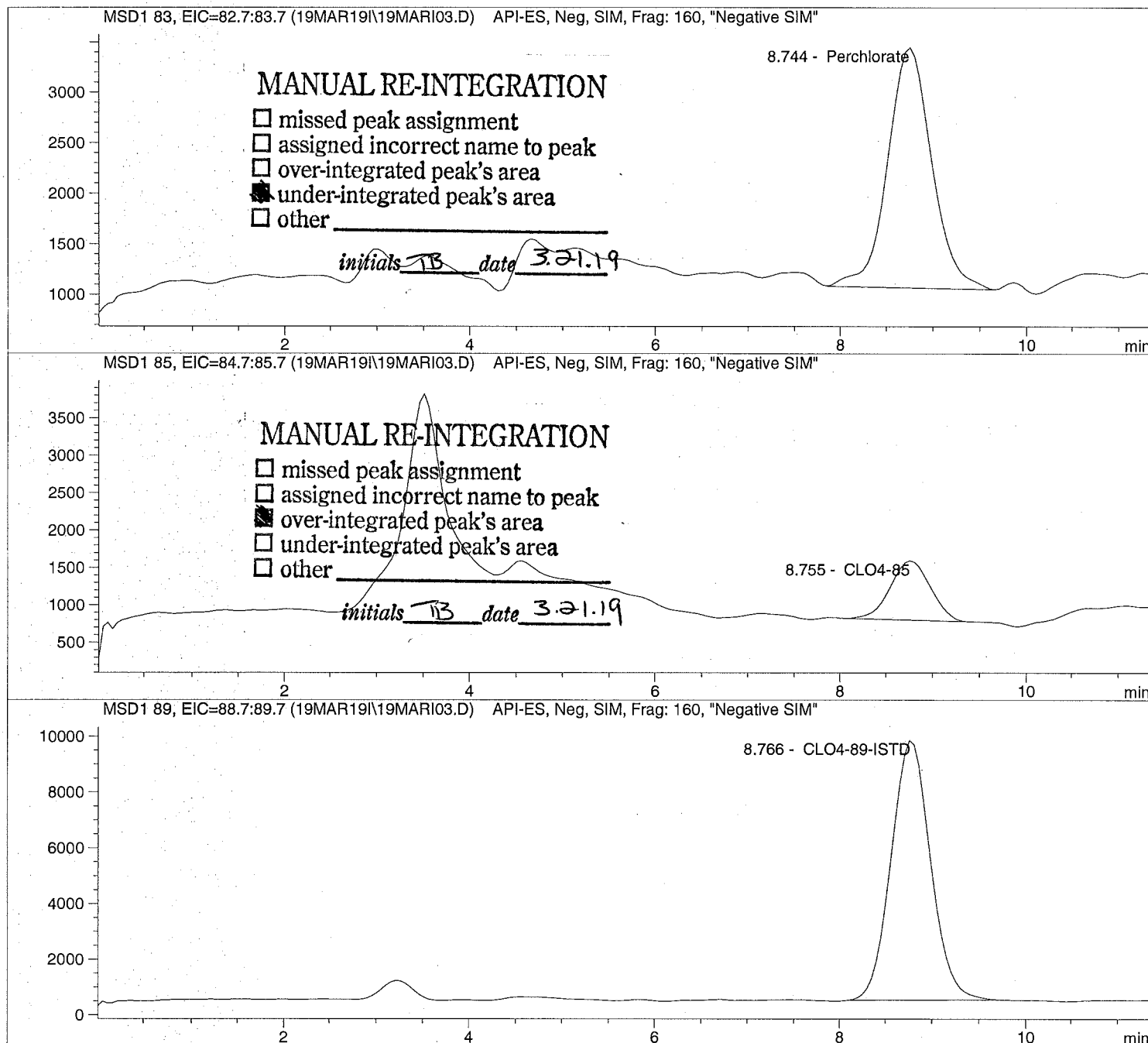
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 3/19/2019 09:39:40      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

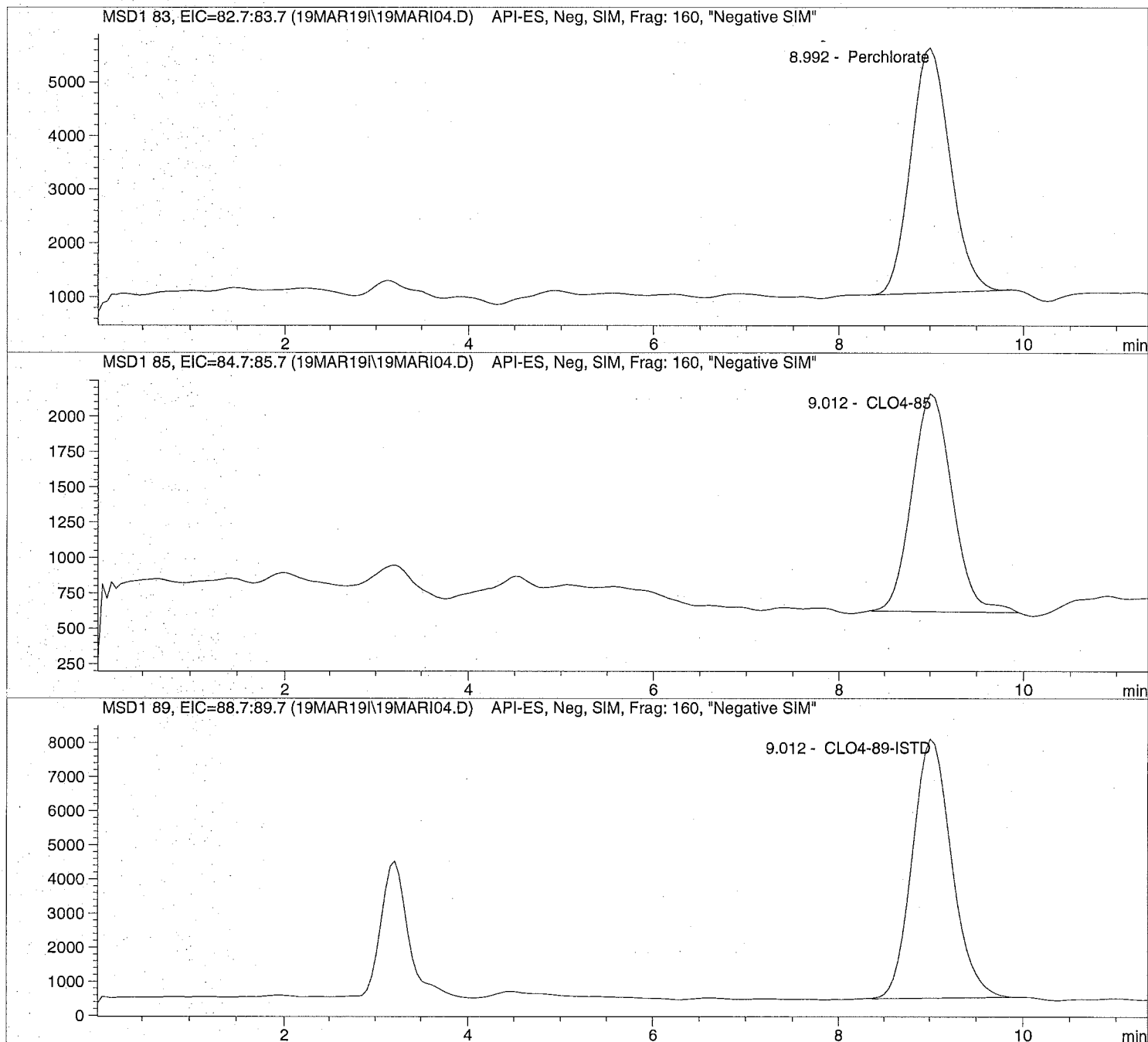
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

```
=====
Injection Date: 3/19/2019 09:53:00      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19\19MARI04.D

Sample Name: CLO4@ 2.0ug/L

```

=====
Injection Date: 3/19/2019 09:53:00      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D

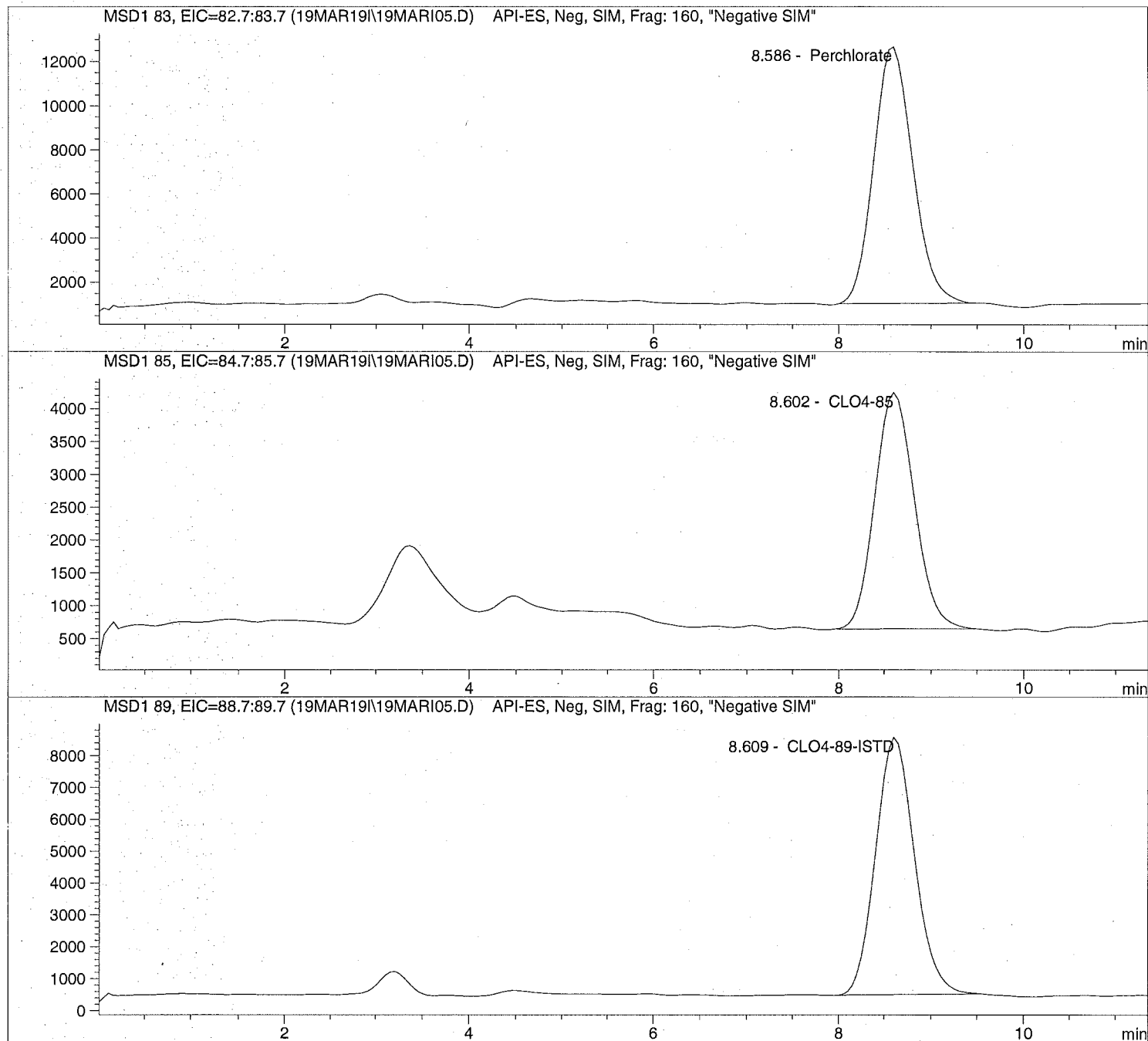
Sample Name: CLO4@ 5.0ug/L

Injection Date: 3/19/2019 10:06:16
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

```

=====
Injection Date: 3/19/2019 10:06:16      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

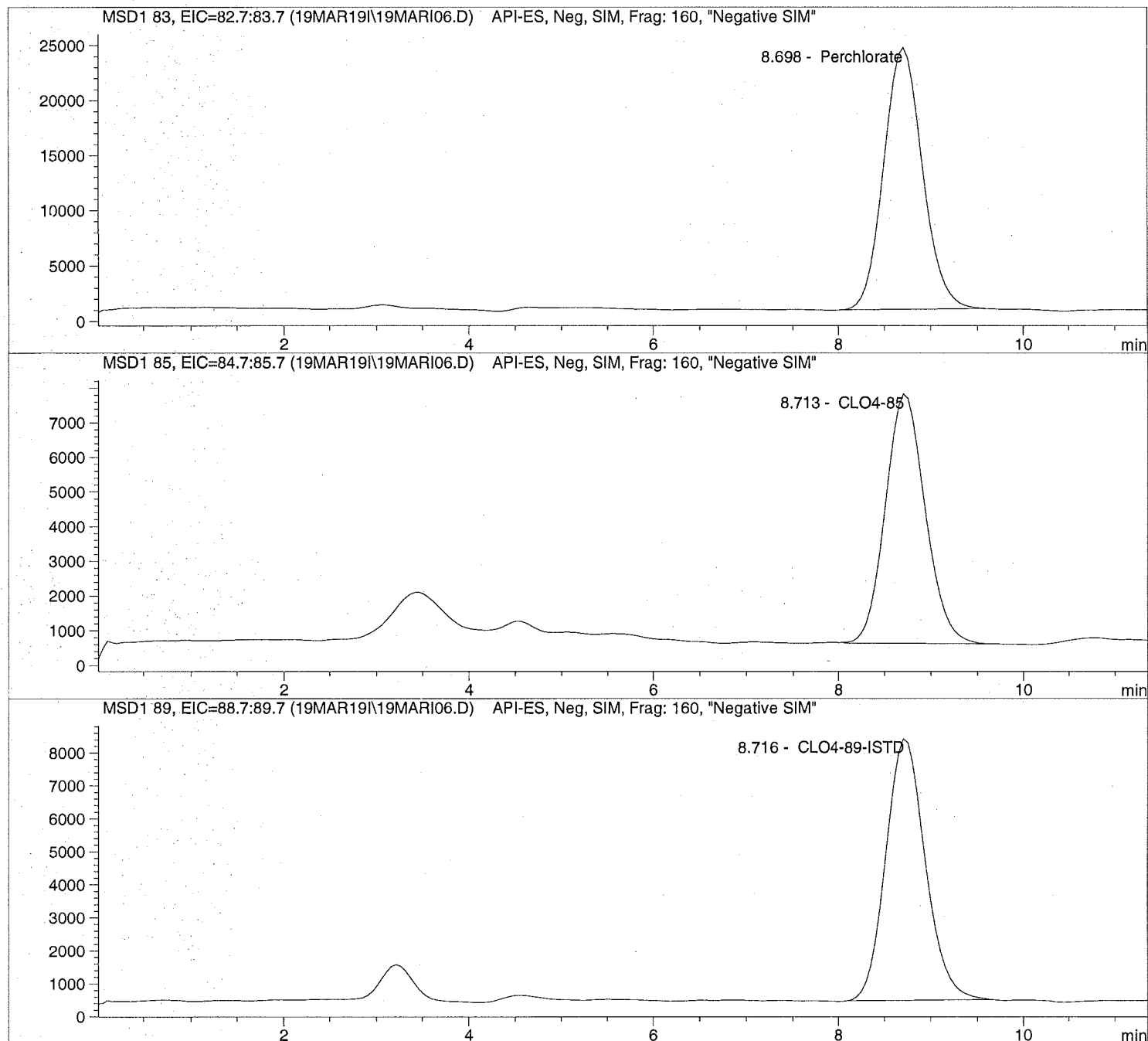
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

```
=====
Injection Date: 3/19/2019 10:19:32      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-DP2.M
Last Changed: 3/19/2019 14:35:22
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

```

=====
Injection Date: 3/19/2019 10:19:32      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

```

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

```


Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D

Sample Name: CLO4@ 25.ug/L

Injection Date: 3/19/2019 10:32:49

Seq Line: 7

Sample Name: CLO4@ 25.ug/L

Location: Vial 77

Acq Operator: TNB

Inj. No.: 1

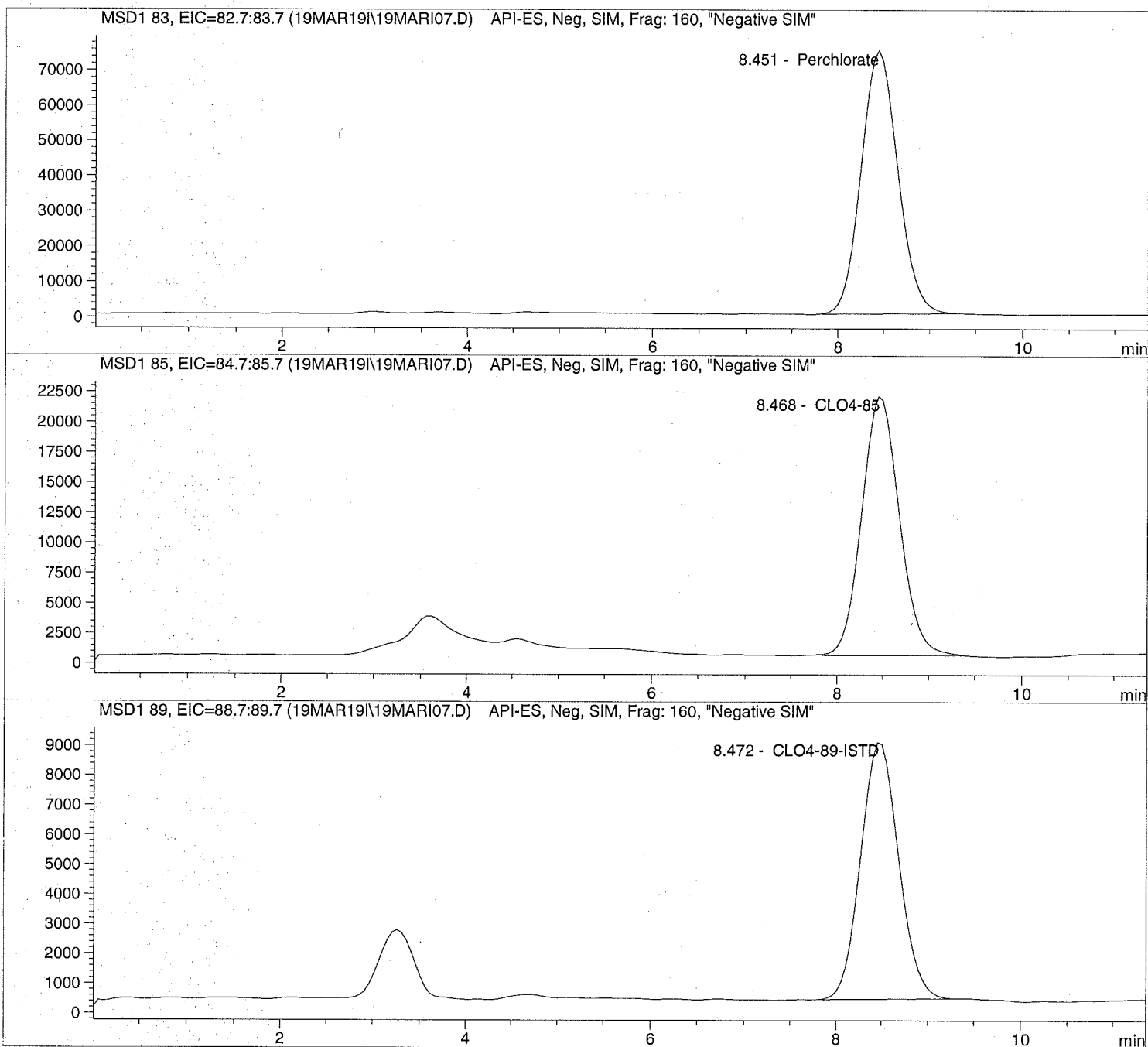
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

```

=====
Injection Date: 3/19/2019 10:32:49 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-DP2.M
Last Changed: 3/19/2019 14:35:22

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019, 02:35:19 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
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D

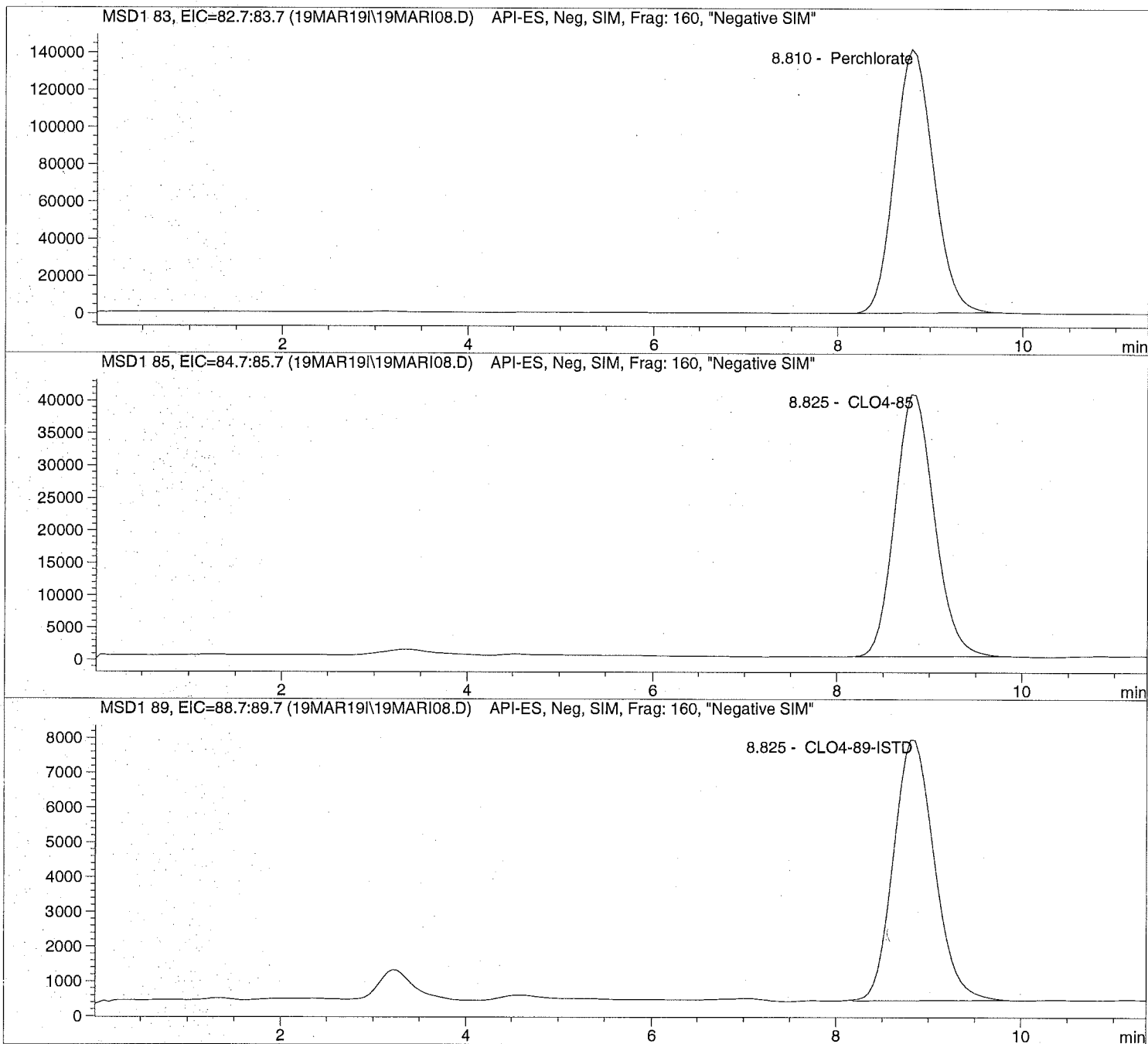
Sample Name: CLO4@ 50.ug/L

Injection Date: 3/19/2019 10:46:05
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

```

=====
Injection Date: 3/19/2019 10:46:05      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-DP2.M
Last Changed:   3/19/2019 14:35:22
  
```

Perchlorate analysis

Sample Information

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D

Sample Name: CLO4@ 75.ug/L

Injection Date: 3/19/2019 10:59:22

Seq Line: 9

Sample Name: CLO4@ 75.ug/L

Location: Vial 79

Acq Operator: TNB

Inj. No.: 1

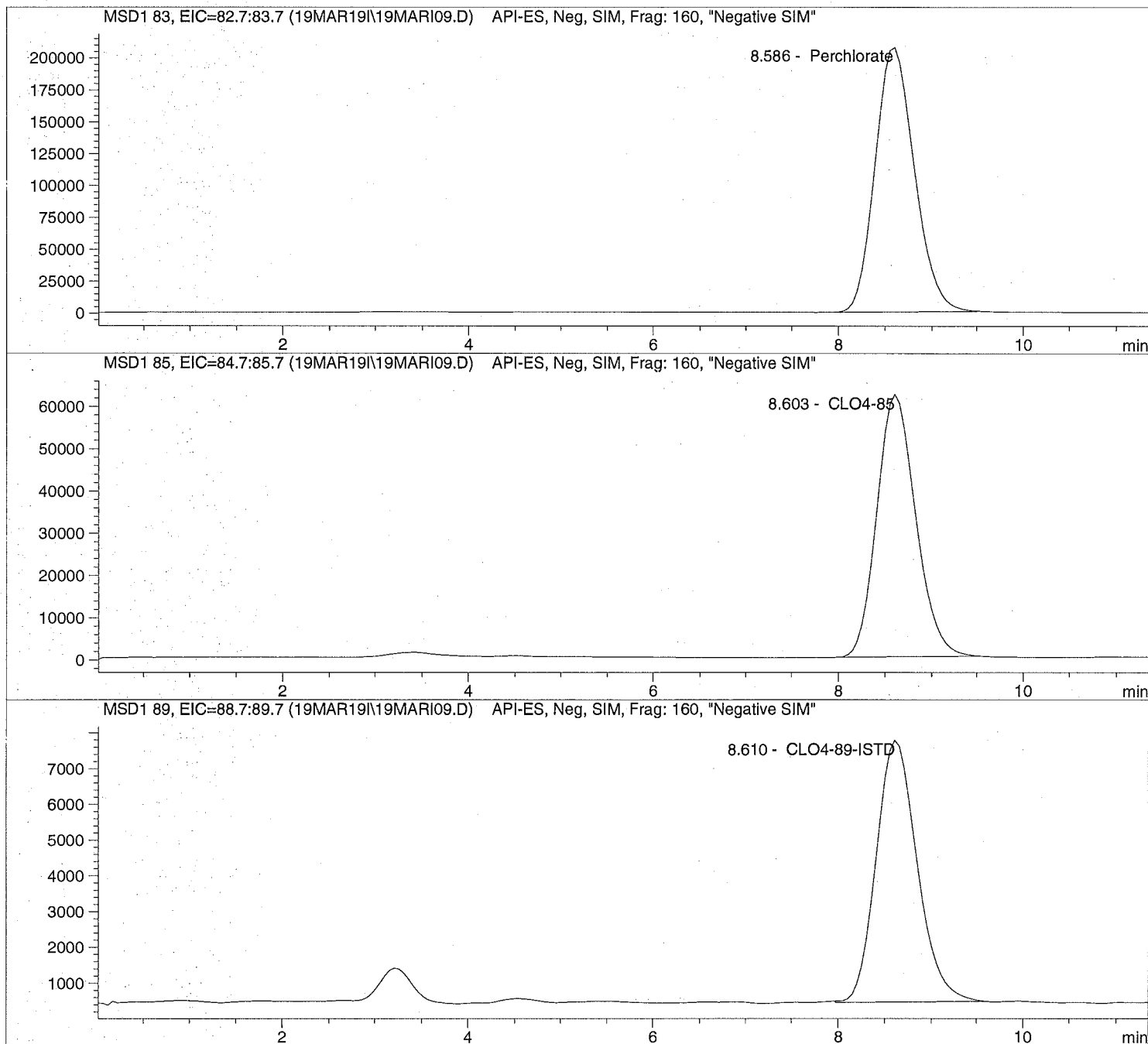
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

```

=====
Injection Date: 3/19/2019 10:59:22      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-DP2.M
Last Changed:   3/19/2019 14:35:22
  
```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

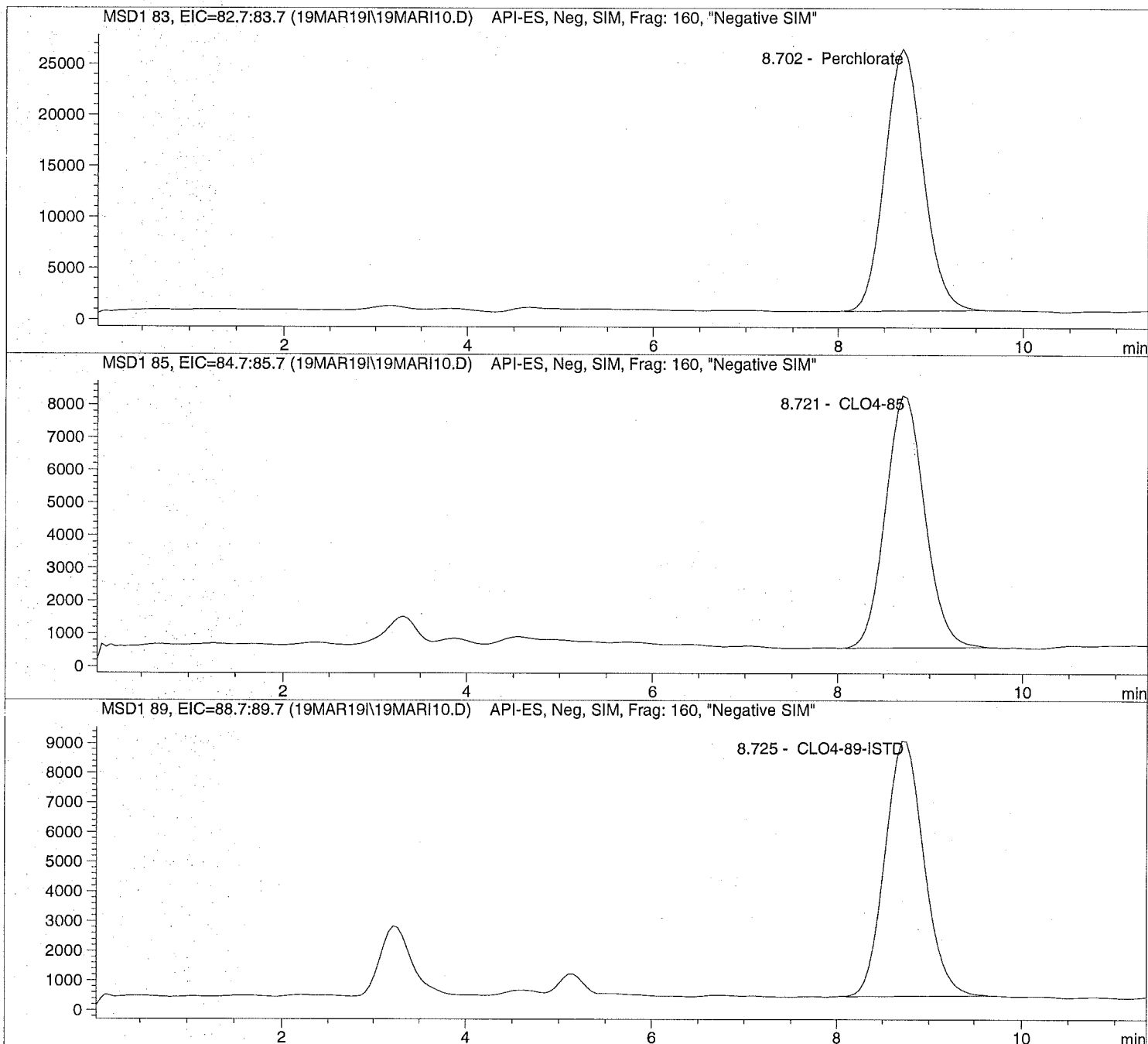
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

```
=====
Injection Date: 3/19/2019 11:12:42      Seq Line:      10
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-DP2.M
Last Changed:   3/19/2019 14:35:22
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

```

=====
Injection Date: 3/19/2019 11:12:42      Seq Line:            10
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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:            Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	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\19MAR19I\19MARI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 3/19/2019 09:39:40

Seq Line: 3

Sample Name: CLO4@ 1.0ug/L

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

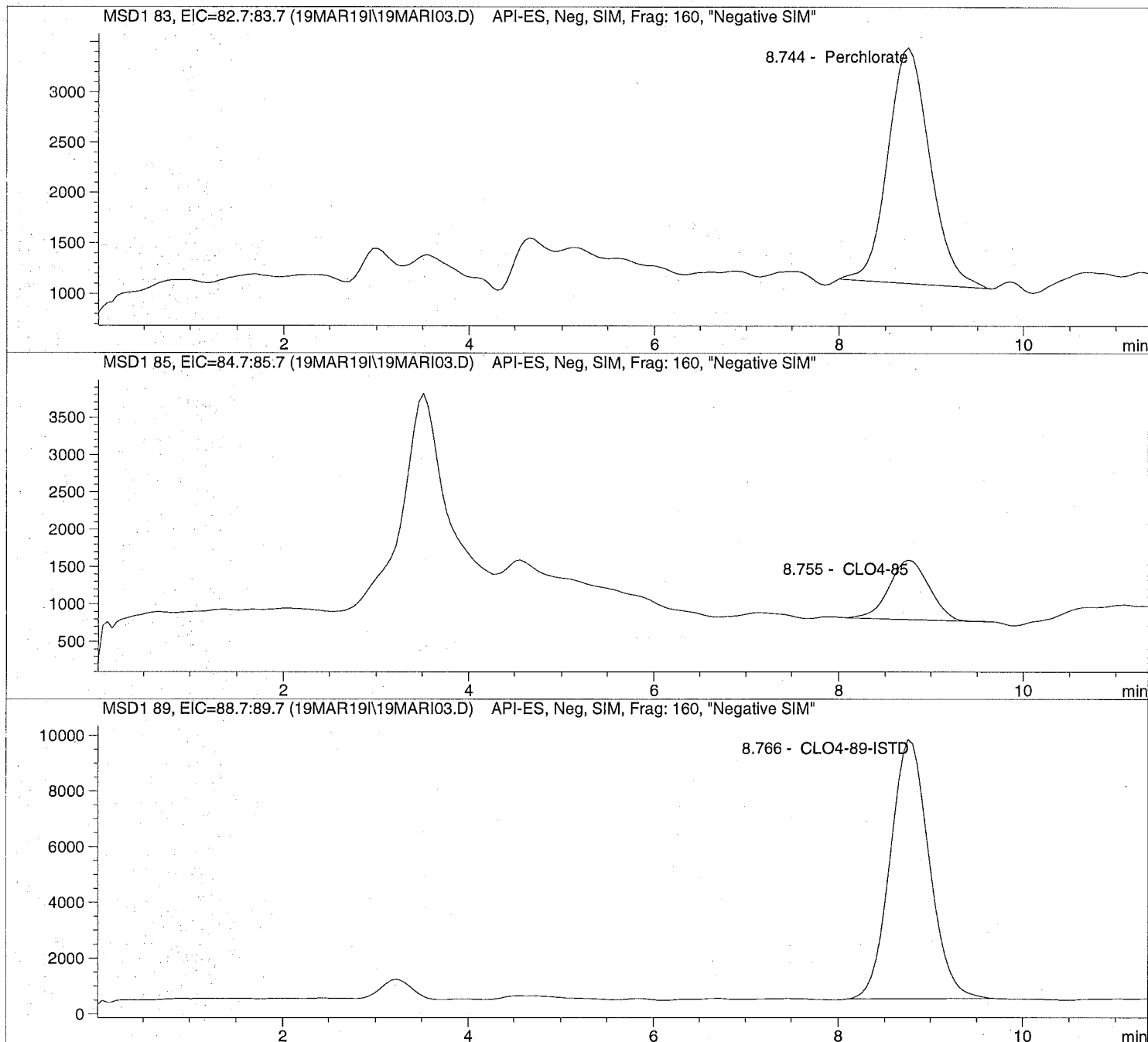
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 3/19/2019 09:39:40      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-DP2.M
Last Changed:   3/19/2019 14:38:25
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD11.D

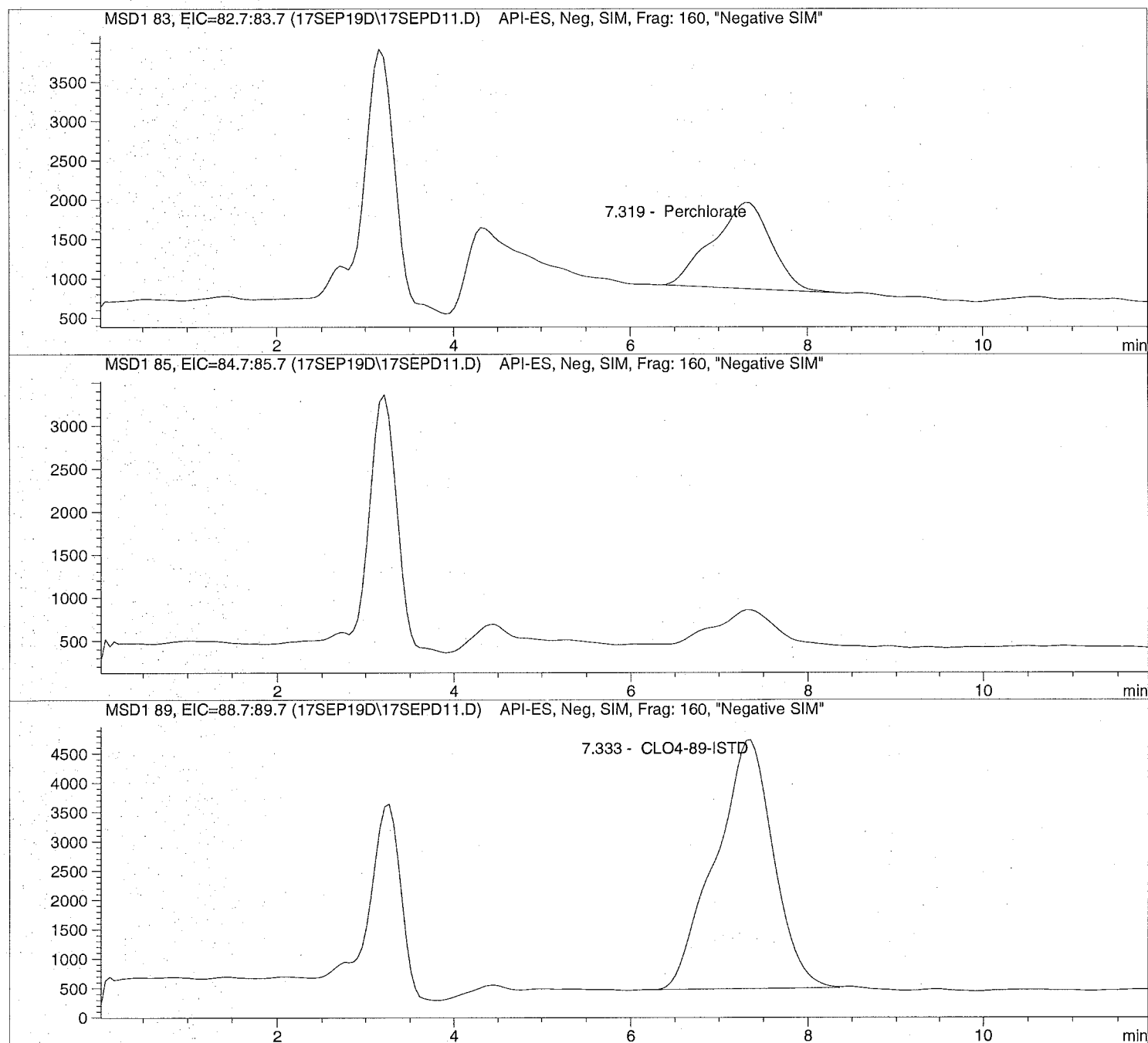
Sample Name: 1926283001

Injection Date: 9/17/2019 11:05:22
Sample Name: 1926283001
Acq Operator: TNB

Seq Line: 11
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD11.D Sample Name: 1926283001

```

=====
Injection Date: 9/17/2019 11:05:22      Seq Line: 11
Sample Name: 1926283001                 Location: Vial 80
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.319	PBA	50036.3	0.9832	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
7.333	PBA	193086.8	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

September 20, 2019

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

Work Order: **HS19090191**

Laboratory Results for: **Groundwater Treatment Plant Bi-Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Sep 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 simple oval scribble.

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

ALS Houston, US

Date: 20-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
Work Order: HS19090191

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19090191-01	LH18/24-SP650_090419	Water		04-Sep-2019 14:00	05-Sep-2019 08:50	<input type="checkbox"/>
HS19090191-02	Trip Blank	Water	C&G- 050119-176	04-Sep-2019 14:00	05-Sep-2019 08:50	<input type="checkbox"/>

ALS Houston, US

Date: 20-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
Work Order: HS19090191

CASE NARRATIVE**Work Order Comments**

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

GCMS Volatiles by Method SW8260**Batch ID: R346125****Sample ID: HS19090151-02MS**

- MS and MSD are for an unrelated sample
-

WetChemistry by Method SW9056**Batch ID: R346569****Sample ID: HS19090579-01MS**

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

Sample ID: HS19090624-01MS

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

ALS Houston, US

Date: 20-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Bi-Weekly Samples
 Sample ID: LH18/24-SP650_090419
 Collection Date: 04-Sep-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19090191
 Lab ID:HS19090191-01
 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	11-Sep-2019 20:43
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 20:43
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 20:43
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 20:43
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 20:43
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 20:43
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 20:43
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 20:43
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 20:43
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 20:43
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 20:43
1,2-Dichloroethane	0.51	J	0.20	0.50	1.0	UG/L	1	11-Sep-2019 20:43
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 20:43
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 20:43
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 20:43
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 20:43
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	11-Sep-2019 20:43
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	11-Sep-2019 20:43
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 20:43
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	11-Sep-2019 20:43
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	11-Sep-2019 20:43
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 20:43
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 20:43
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 20:43
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 20:43
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 20:43
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 20:43
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	11-Sep-2019 20:43
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 20:43
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 20:43

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

ALS Houston, US

Date: 20-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Bi-Weekly Samples
 Sample ID: LH18/24-SP650_090419
 Collection Date: 04-Sep-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19090191
 Lab ID:HS19090191-01
 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	11-Sep-2019 20:43	
cis-1,2-Dichloroethene	2.4		0.20	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	11-Sep-2019 20:43	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	11-Sep-2019 20:43	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	11-Sep-2019 20:43	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
Trichloroethene	1.2		0.20	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 20:43	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>89.9</i>			0	<i>81-118</i>	%REC	1	11-Sep-2019 20:43	
<i>Surr: 4-Bromofluorobenzene</i>	<i>102</i>			0	<i>85-114</i>	%REC	1	11-Sep-2019 20:43	
<i>Surr: Dibromofluoromethane</i>	<i>93.9</i>			0	<i>80-119</i>	%REC	1	11-Sep-2019 20:43	
<i>Surr: Toluene-d8</i>	<i>96.7</i>			0	<i>89-112</i>	%REC	1	11-Sep-2019 20:43	
ANIONS BY SW9056A		Method:SW9056							Analyst: KMU
Chloride	557		2.00	5.00	5.00	mg/L	10	19-Sep-2019 12:00	
Sulfate	113		2.00	5.00	5.00	mg/L	10	19-Sep-2019 12:00	

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

ALS Houston, US

Date: 20-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Bi-Weekly Samples
 Sample ID: Trip Blank
 Collection Date: 04-Sep-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19090191
 Lab ID:HS19090191-02
 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	11-Sep-2019 19:31
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:31
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 19:31
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:31
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:31
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 19:31
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 19:31
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 19:31
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:31
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:31
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 19:31
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:31
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 19:31
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 19:31
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 19:31
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:31
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	11-Sep-2019 19:31
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	11-Sep-2019 19:31
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 19:31
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	11-Sep-2019 19:31
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	11-Sep-2019 19:31
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	11-Sep-2019 19:31
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:31

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

ALS Houston, US

Date: 20-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Bi-Weekly Samples
 Sample ID: Trip Blank
 Collection Date: 04-Sep-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19090191
 Lab ID:HS19090191-02
 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	11-Sep-2019 19:31
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:31
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	11-Sep-2019 19:31
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	11-Sep-2019 19:31
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	11-Sep-2019 19:31
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 19:31
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:31
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:31
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:31
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:31
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.4</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>11-Sep-2019 19:31</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>104</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>11-Sep-2019 19:31</i>
<i>Surr: Dibromofluoromethane</i>	<i>94.0</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>11-Sep-2019 19:31</i>
<i>Surr: Toluene-d8</i>	<i>96.8</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>11-Sep-2019 19:31</i>

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

ALS Houston, US

Date: 20-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090191

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R346125 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19090191-01	LH18/24-SP650_090419	04 Sep 2019 14:00			11 Sep 2019 20:43	1
HS19090191-02	Trip Blank	04 Sep 2019 14:00			11 Sep 2019 19:31	1
Batch ID: R346569 (0)		Test Name : ANIONS BY SW9056A			Matrix: Water	
HS19090191-01	LH18/24-SP650_090419	04 Sep 2019 14:00			19 Sep 2019 12:00	10

ALS Houston, US

Date: 20-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090191

QC BATCH REPORT

Batch ID: R346125 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-190911	Units: UG/L			Analysis Date: 11-Sep-2019 18:43					
Client ID:	Run ID: VOA6_346125	SeqNo: 5249737	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	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	44.71	1.0	50	0	89.4	81 - 118				
Surr: 4-Bromofluorobenzene	50.16	1.0	50	0	100	85 - 114				
Surr: Dibromofluoromethane	46.37	1.0	50	0	92.7	80 - 119				
Surr: Toluene-d8	48.08	1.0	50	0	96.2	89 - 112				

ALS Houston, US

Date: 20-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090191

QC BATCH REPORT

Batch ID: R346125 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-190911	Units: UG/L			Analysis Date: 11-Sep-2019 17:55					
Client ID:	Run ID: VOA6_346125	SeqNo: 5249736	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	18.61	1.0	20	0	93.1	78 - 124				
1,1,1-Trichloroethane	17.96	1.0	20	0	89.8	74 - 131				
1,1,2,2-Tetrachloroethane	19.65	1.0	20	0	98.3	71 - 121				
1,1,2-Trichloroethane	18.71	1.0	20	0	93.5	80 - 119				
1,1-Dichloroethane	17.61	1.0	20	0	88.0	77 - 125				
1,1-Dichloroethene	17.42	1.0	20	0	87.1	71 - 131				
1,1-Dichloropropene	17.37	1.0	20	0	86.9	78 - 125				
1,2,3-Trichlorobenzene	17.77	1.0	20	0	88.8	69 - 129				
1,2,3-Trichloropropane	18.79	1.0	20	0	93.9	73 - 122				
1,2,4-Trichlorobenzene	18	1.0	20	0	90.0	69 - 130				
1,2,4-Trimethylbenzene	17.17	1.0	20	0	85.9	76 - 124				
1,2-Dibromo-3-chloropropane	20.2	1.0	20	0	101	62 - 128				
1,2-Dibromoethane	19.26	1.0	20	0	96.3	77 - 121				
1,2-Dichlorobenzene	17.45	1.0	20	0	87.3	80 - 119				
1,2-Dichloroethane	18.66	1.0	20	0	93.3	73 - 128				
1,2-Dichloropropane	17.98	1.0	20	0	89.9	78 - 122				
1,3,5-Trimethylbenzene	16.92	1.0	20	0	84.6	75 - 124				
1,3-Dichlorobenzene	17.82	1.0	20	0	89.1	80 - 119				
1,3-Dichloropropane	18.15	1.0	20	0	90.7	80 - 119				
1,4-Dichlorobenzene	17.52	1.0	20	0	87.6	79 - 118				
2,2-Dichloropropane	17.99	1.0	20	0	89.9	60 - 139				
2-Butanone	40.56	2.0	40	0	101	56 - 143				
2-Chlorotoluene	18.35	1.0	20	0	91.7	79 - 122				
2-Hexanone	39.38	2.0	40	0	98.4	57 - 139				
4-Chlorotoluene	16.66	1.0	20	0	83.3	78 - 122				
4-Isopropyltoluene	16.65	1.0	20	0	83.3	77 - 127				
4-Methyl-2-pentanone	37.81	2.0	40	0	94.5	67 - 130				
Acetone	42.22	2.0	40	0	106	39 - 160				
Benzene	17.88	1.0	20	0	89.4	79 - 120				
Bromobenzene	17.86	1.0	20	0	89.3	80 - 120				
Bromochloromethane	18.51	1.0	20	0	92.6	78 - 123				
Bromodichloromethane	18.18	1.0	20	0	90.9	79 - 125				
Bromoform	19.52	1.0	20	0	97.6	66 - 130				
Bromomethane	20.71	1.0	20	0	104	53 - 141				

ALS Houston, US

Date: 20-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090191

QC BATCH REPORT

Batch ID: R346125 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-190911	Units: UG/L			Analysis Date: 11-Sep-2019 17:55					
Client ID:	Run ID: VOA6_346125	SeqNo: 5249736	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.01	2.0	40	0	87.5	64 - 133				
Carbon tetrachloride	17.27	1.0	20	0	86.4	72 - 136				
Chlorobenzene	17.55	1.0	20	0	87.8	82 - 118				
Chloroethane	18.52	1.0	20	0	92.6	60 - 138				
Chloroform	18.49	1.0	20	0	92.5	79 - 124				
Chloromethane	18.64	1.0	20	0	93.2	50 - 139				
cis-1,2-Dichloroethene	18.67	1.0	20	0	93.3	78 - 123				
cis-1,3-Dichloropropene	18.89	1.0	20	0	94.5	75 - 124				
Dibromochloromethane	18.74	1.0	20	0	93.7	74 - 126				
Dibromomethane	18.52	1.0	20	0	92.6	79 - 123				
Dichlorodifluoromethane	16.62	1.0	20	0	83.1	32 - 152				
Ethylbenzene	17.52	1.0	20	0	87.6	79 - 121				
Hexachlorobutadiene	16.3	1.0	20	0	81.5	66 - 134				
Isopropylbenzene	17.22	1.0	20	0	86.1	72 - 131				
m,p-Xylene	34.98	2.0	40	0	87.4	80 - 121				
Methylene chloride	19.52	2.0	20	0	97.6	74 - 124				
Naphthalene	18.75	1.0	20	0	93.7	61 - 128				
n-Butylbenzene	16.52	1.0	20	0	82.6	75 - 128				
n-Propylbenzene	16.56	1.0	20	0	82.8	76 - 126				
o-Xylene	17.88	1.0	20	0	89.4	78 - 122				
sec-Butylbenzene	15.79	1.0	20	0	78.9	77 - 126				
Styrene	18.33	1.0	20	0	91.6	78 - 123				
tert-Butylbenzene	16.47	1.0	20	0	82.4	78 - 124				
Tetrachloroethene	17.57	1.0	20	0	87.8	74 - 129				
Toluene	17.42	1.0	20	0	87.1	80 - 121				
trans-1,2-Dichloroethene	17.97	1.0	20	0	89.9	75 - 124				
trans-1,3-Dichloropropene	19.14	1.0	20	0	95.7	73 - 127				
Trichloroethene	18	1.0	20	0	90.0	79 - 123				
Trichlorofluoromethane	17.22	1.0	20	0	86.1	65 - 141				
Vinyl chloride	16.36	1.0	20	0	81.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	53.96	1.0	50	0	108	81 - 118				
Surr: 4-Bromofluorobenzene	52.2	1.0	50	0	104	85 - 114				
Surr: Dibromofluoromethane	53.62	1.0	50	0	107	80 - 119				
Surr: Toluene-d8	46.45	1.0	50	0	92.9	89 - 112				

ALS Houston, US

Date: 20-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090191

QC BATCH REPORT

Batch ID: R346125 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19090151-02MS	Units: UG/L			Analysis Date: 11-Sep-2019 21:31					
Client ID:	Run ID: VOA6_346125	SeqNo: 5249744	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	18.7	1.0	20	0	93.5	78 - 124				
1,1,1-Trichloroethane	16.89	1.0	20	0	84.4	74 - 131				
1,1,2,2-Tetrachloroethane	18.69	1.0	20	0	93.5	71 - 121				
1,1,2-Trichloroethane	18.15	1.0	20	0	90.7	80 - 119				
1,1-Dichloroethane	15.96	1.0	20	0	79.8	77 - 125				
1,1-Dichloroethene	18.29	1.0	20	0	91.4	71 - 131				
1,1-Dichloropropene	17.7	1.0	20	0	88.5	78 - 125				
1,2,3-Trichlorobenzene	15.21	1.0	20	0	76.1	69 - 129				
1,2,3-Trichloropropane	17.66	1.0	20	0	88.3	73 - 122				
1,2,4-Trichlorobenzene	16.44	1.0	20	0	82.2	69 - 130				
1,2,4-Trimethylbenzene	18.63	1.0	20	0	93.1	76 - 124				
1,2-Dibromo-3-chloropropane	16.89	1.0	20	0	84.5	62 - 128				
1,2-Dibromoethane	17.89	1.0	20	0	89.5	77 - 121				
1,2-Dichlorobenzene	17.82	1.0	20	0	89.1	80 - 119				
1,2-Dichloroethane	16.6	1.0	20	0	83.0	73 - 128				
1,2-Dichloropropane	16.98	1.0	20	0	84.9	78 - 122				
1,3,5-Trimethylbenzene	18.77	1.0	20	0	93.9	75 - 124				
1,3-Dichlorobenzene	18.82	1.0	20	0	94.1	80 - 119				
1,3-Dichloropropane	17.65	1.0	20	0	88.2	80 - 119				
1,4-Dichlorobenzene	18.12	1.0	20	0	90.6	79 - 118				
2,2-Dichloropropane	15.9	1.0	20	0	79.5	60 - 139				
2-Butanone	28.82	2.0	40	0	72.1	56 - 143				
2-Chlorotoluene	19.79	1.0	20	0	98.9	79 - 122				
2-Hexanone	36.77	2.0	40	0	91.9	57 - 139				
4-Chlorotoluene	18.26	1.0	20	0	91.3	78 - 122				
4-Isopropyltoluene	19.09	1.0	20	0	95.4	77 - 127				
4-Methyl-2-pentanone	35.97	2.0	40	0	89.9	67 - 130				
Acetone	28.75	2.0	40	0	71.9	39 - 160				
Benzene	17.15	1.0	20	0	85.8	79 - 120				
Bromobenzene	18.75	1.0	20	0	93.8	80 - 120				
Bromochloromethane	15.85	1.0	20	0	79.2	78 - 123				
Bromodichloromethane	16.69	1.0	20	0	83.4	79 - 125				
Bromoform	18	1.0	20	0	90.0	66 - 130				
Bromomethane	21.5	1.0	20	0	107	53 - 141				

ALS Houston, US

Date: 20-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090191

QC BATCH REPORT

Batch ID: R346125 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19090151-02MS	Units: UG/L			Analysis Date: 11-Sep-2019 21:31					
Client ID:	Run ID: VOA6_346125	SeqNo: 5249744	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	30.64	2.0	40	0	76.6	64 - 133				
Carbon tetrachloride	17.82	1.0	20	0	89.1	72 - 136				
Chlorobenzene	17.82	1.0	20	0	89.1	82 - 118				
Chloroethane	19.4	1.0	20	0	97.0	60 - 138				
Chloroform	16.47	1.0	20	0	82.4	79 - 124				
Chloromethane	14.85	1.0	20	0	74.2	50 - 139				
cis-1,2-Dichloroethene	17	1.0	20	0	85.0	78 - 123				
cis-1,3-Dichloropropene	16.93	1.0	20	0	84.7	75 - 124				
Dibromochloromethane	18.26	1.0	20	0	91.3	74 - 126				
Dibromomethane	16.55	1.0	20	0	82.7	79 - 123				
Dichlorodifluoromethane	9.542	1.0	20	0	47.7	32 - 152				
Ethylbenzene	18.53	1.0	20	0	92.7	79 - 121				
Hexachlorobutadiene	17.86	1.0	20	0	89.3	66 - 134				
Isopropylbenzene	18.54	1.0	20	0	92.7	72 - 131				
m,p-Xylene	36.79	2.0	40	0	92.0	80 - 121				
Methylene chloride	15.9	2.0	20	0	79.5	74 - 124				
Naphthalene	15.91	1.0	20	0	79.6	61 - 128				
n-Butylbenzene	19.4	1.0	20	0	97.0	75 - 128				
n-Propylbenzene	19.06	1.0	20	0	95.3	76 - 126				
o-Xylene	18.32	1.0	20	0	91.6	78 - 122				
sec-Butylbenzene	19.02	1.0	20	0	95.1	77 - 126				
Styrene	18.46	1.0	20	0	92.3	78 - 123				
tert-Butylbenzene	19.06	1.0	20	0	95.3	78 - 124				
Tetrachloroethene	18.93	1.0	20	0	94.7	74 - 129				
Toluene	18.39	1.0	20	0	91.9	80 - 121				
trans-1,2-Dichloroethene	16.62	1.0	20	0	83.1	75 - 124				
trans-1,3-Dichloropropene	16.51	1.0	20	0	82.5	73 - 127				
Trichloroethene	17.9	1.0	20	0	89.5	79 - 123				
Trichlorofluoromethane	18.55	1.0	20	0	92.7	65 - 141				
Vinyl chloride	16.83	1.0	20	0	84.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	45.76	1.0	50	0	91.5	81 - 118				
Surr: 4-Bromofluorobenzene	49.61	1.0	50	0	99.2	85 - 114				
Surr: Dibromofluoromethane	46.87	1.0	50	0	93.7	80 - 119				
Surr: Toluene-d8	49.24	1.0	50	0	98.5	89 - 112				

ALS Houston, US

Date: 20-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090191

QC BATCH REPORT

Batch ID: R346125 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19090151-02MSD	Units: UG/L			Analysis Date: 11-Sep-2019 21:55					
Client ID:	Run ID: VOA6_346125	SeqNo: 5249745	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	17.83	1.0	20	0	89.1	78 - 124	18.7	4.78	20	
1,1,1-Trichloroethane	16.2	1.0	20	0	81.0	74 - 131	16.89	4.14	20	
1,1,2,2-Tetrachloroethane	18.64	1.0	20	0	93.2	71 - 121	18.69	0.28	20	
1,1,2-Trichloroethane	18.05	1.0	20	0	90.3	80 - 119	18.15	0.535	20	
1,1-Dichloroethane	15.22	1.0	20	0	76.1	77 - 125	15.96	4.75	20	S
1,1-Dichloroethene	17.37	1.0	20	0	86.8	71 - 131	18.29	5.17	20	
1,1-Dichloropropene	16.68	1.0	20	0	83.4	78 - 125	17.7	5.96	20	
1,2,3-Trichlorobenzene	15.8	1.0	20	0	79.0	69 - 129	15.21	3.8	20	
1,2,3-Trichloropropane	17.28	1.0	20	0	86.4	73 - 122	17.66	2.14	20	
1,2,4-Trichlorobenzene	16.61	1.0	20	0	83.0	69 - 130	16.44	0.992	20	
1,2,4-Trimethylbenzene	17.97	1.0	20	0	89.9	76 - 124	18.63	3.59	20	
1,2-Dibromo-3-chloropropane	16.84	1.0	20	0	84.2	62 - 128	16.89	0.309	20	
1,2-Dibromoethane	17.91	1.0	20	0	89.5	77 - 121	17.89	0.098	20	
1,2-Dichlorobenzene	17.56	1.0	20	0	87.8	80 - 119	17.82	1.44	20	
1,2-Dichloroethane	16.73	1.0	20	0	83.7	73 - 128	16.6	0.815	20	
1,2-Dichloropropane	16.38	1.0	20	0	81.9	78 - 122	16.98	3.63	20	
1,3,5-Trimethylbenzene	17.88	1.0	20	0	89.4	75 - 124	18.77	4.87	20	
1,3-Dichlorobenzene	18.23	1.0	20	0	91.2	80 - 119	18.82	3.17	20	
1,3-Dichloropropane	17.27	1.0	20	0	86.3	80 - 119	17.65	2.17	20	
1,4-Dichlorobenzene	17.54	1.0	20	0	87.7	79 - 118	18.12	3.27	20	
2,2-Dichloropropane	14.69	1.0	20	0	73.5	60 - 139	15.9	7.9	20	
2-Butanone	29.18	2.0	40	0	73.0	56 - 143	28.82	1.24	20	
2-Chlorotoluene	19.19	1.0	20	0	95.9	79 - 122	19.79	3.07	20	
2-Hexanone	36.52	2.0	40	0	91.3	57 - 139	36.77	0.699	20	
4-Chlorotoluene	17.71	1.0	20	0	88.5	78 - 122	18.26	3.08	20	
4-Isopropyltoluene	18.23	1.0	20	0	91.1	77 - 127	19.09	4.6	20	
4-Methyl-2-pentanone	36.19	2.0	40	0	90.5	67 - 130	35.97	0.611	20	
Acetone	30.06	2.0	40	0	75.1	39 - 160	28.75	4.45	20	
Benzene	16.39	1.0	20	0	81.9	79 - 120	17.15	4.56	20	
Bromobenzene	18.49	1.0	20	0	92.4	80 - 120	18.75	1.42	20	
Bromochloromethane	15.42	1.0	20	0	77.1	78 - 123	15.85	2.77	20	S
Bromodichloromethane	16.49	1.0	20	0	82.5	79 - 125	16.69	1.19	20	
Bromoform	18.14	1.0	20	0	90.7	66 - 130	18	0.788	20	
Bromomethane	19.12	1.0	20	0	95.6	53 - 141	21.5	11.7	20	

ALS Houston, US

Date: 20-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090191

QC BATCH REPORT

Batch ID: R346125 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19090151-02MSD	Units: UG/L			Analysis Date: 11-Sep-2019 21:55					
Client ID:	Run ID: VOA6_346125	SeqNo: 5249745	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	28.33	2.0	40	0	70.8	64 - 133	30.64	7.83	20	
Carbon tetrachloride	17.07	1.0	20	0	85.4	72 - 136	17.82	4.3	20	
Chlorobenzene	17.52	1.0	20	0	87.6	82 - 118	17.82	1.69	20	
Chloroethane	19.75	1.0	20	0	98.7	60 - 138	19.4	1.76	20	
Chloroform	15.85	1.0	20	0	79.2	79 - 124	16.47	3.89	20	
Chloromethane	13.28	1.0	20	0	66.4	50 - 139	14.85	11.2	20	
cis-1,2-Dichloroethene	16.15	1.0	20	0	80.7	78 - 123	17	5.13	20	
cis-1,3-Dichloropropene	16.56	1.0	20	0	82.8	75 - 124	16.93	2.25	20	
Dibromochloromethane	17.74	1.0	20	0	88.7	74 - 126	18.26	2.87	20	
Dibromomethane	16.61	1.0	20	0	83.1	79 - 123	16.55	0.38	20	
Dichlorodifluoromethane	8.387	1.0	20	0	41.9	32 - 152	9.542	12.9	20	
Ethylbenzene	17.8	1.0	20	0	89.0	79 - 121	18.53	4.03	20	
Hexachlorobutadiene	18.05	1.0	20	0	90.3	66 - 134	17.86	1.08	20	
Isopropylbenzene	18.06	1.0	20	0	90.3	72 - 131	18.54	2.63	20	
m,p-Xylene	35.84	2.0	40	0	89.6	80 - 121	36.79	2.62	20	
Methylene chloride	15.33	2.0	20	0	76.7	74 - 124	15.9	3.64	20	
Naphthalene	16.08	1.0	20	0	80.4	61 - 128	15.91	1.05	20	
n-Butylbenzene	18.58	1.0	20	0	92.9	75 - 128	19.4	4.32	20	
n-Propylbenzene	18.02	1.0	20	0	90.1	76 - 126	19.06	5.63	20	
o-Xylene	18	1.0	20	0	90.0	78 - 122	18.32	1.8	20	
sec-Butylbenzene	17.96	1.0	20	0	89.8	77 - 126	19.02	5.73	20	
Styrene	18.05	1.0	20	0	90.2	78 - 123	18.46	2.24	20	
tert-Butylbenzene	18.25	1.0	20	0	91.3	78 - 124	19.06	4.32	20	
Tetrachloroethene	18.22	1.0	20	0	91.1	74 - 129	18.93	3.83	20	
Toluene	17.59	1.0	20	0	87.9	80 - 121	18.39	4.45	20	
trans-1,2-Dichloroethene	15.36	1.0	20	0	76.8	75 - 124	16.62	7.91	20	
trans-1,3-Dichloropropene	16.68	1.0	20	0	83.4	73 - 127	16.51	1.04	20	
Trichloroethene	16.99	1.0	20	0	85.0	79 - 123	17.9	5.2	20	
Trichlorofluoromethane	17.12	1.0	20	0	85.6	65 - 141	18.55	8.04	20	
Vinyl chloride	14.2	1.0	20	0	71.0	58 - 137	16.83	16.9	20	
Surr: 1,2-Dichloroethane-d4	45.36	1.0	50	0	90.7	81 - 118	45.76	0.884	20	
Surr: 4-Bromofluorobenzene	50.28	1.0	50	0	101	85 - 114	49.61	1.34	20	
Surr: Dibromofluoromethane	46.52	1.0	50	0	93.0	80 - 119	46.87	0.735	20	
Surr: Toluene-d8	48.97	1.0	50	0	97.9	89 - 112	49.24	0.542	20	

ALS Houston, US

Date: 20-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090191

QC BATCH REPORT**Batch ID:** R346125 (0)**Instrument:** VOA6**Method:** VOLATILES ORGANICS BY METHOD
8260C

The following samples were analyzed in this batch:

HS19090191-01	HS19090191-02
---------------	---------------

ALS Houston, US

Date: 20-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090191

QC BATCH REPORT

Batch ID: R346569 (0)		Instrument: ICS-Integrion		Method: ANIONS BY SW9056A						
MBLK	Sample ID: WBLKW2-091819	Units: mg/L			Analysis Date: 19-Sep-2019 02:23					
Client ID:	Run ID: ICS-Integrion_346569	SeqNo: 5259831		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: WLCSW2-091819	Units: mg/L			Analysis Date: 19-Sep-2019 02:40					
Client ID:	Run ID: ICS-Integrion_346569	SeqNo: 5259832		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	20.02	0.500	20	0	100	80 - 120				
Sulfate	20	0.500	20	0	100	80 - 120				
LCSD	Sample ID: WLCSDW2-091819	Units: mg/L			Analysis Date: 19-Sep-2019 02:56					
Client ID:	Run ID: ICS-Integrion_346569	SeqNo: 5259833		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	20.05	0.500	20	0	100	80 - 120	20.02	0.165	20	
Sulfate	20.23	0.500	20	0	101	80 - 120	20	1.12	20	
MS	Sample ID: HS19090624-01MS	Units: mg/L			Analysis Date: 19-Sep-2019 03:30					
Client ID:	Run ID: ICS-Integrion_346569	SeqNo: 5259835		PrepDate:			DF: 50			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	7447	25.0	500	7079	73.6	80 - 120			SEO	
Sulfate	499.9	25.0	500	12.68	97.4	80 - 120				
MS	Sample ID: HS19090624-01MS	Units: mg/L			Analysis Date: 19-Sep-2019 10:53					
Client ID:	Run ID: ICS-Integrion_346569	SeqNo: 5259842		PrepDate:			DF: 500			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	11860	250	5000	7126	94.7	80 - 120				
Sulfate	4910	250	5000	62.95	96.9	80 - 120				

ALS Houston, US

Date: 20-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090191

QC BATCH REPORT

Batch ID: R346569 (0)		Instrument: ICS-Integrion		Method: ANIONS BY SW9056A						
MS	Sample ID: HS19090579-01MS	Units: mg/L			Analysis Date: 19-Sep-2019 15:53					
Client ID:	Run ID: ICS-Integrion_346569	SeqNo: 5259976		PrepDate:			DF: 20			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	301.1	10.0	200	111.3	94.9	80 - 120				
Sulfate	1783	10.0	200	1649	67.3	80 - 120				SO
MSD	Sample ID: HS19090624-01MSD	Units: mg/L			Analysis Date: 19-Sep-2019 03:46					
Client ID:	Run ID: ICS-Integrion_346569	SeqNo: 5259836		PrepDate:			DF: 50			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	7416	25.0	500	7079	67.4	80 - 120	7447	0.418	20	SEO
Sulfate	497.6	25.0	500	12.68	97.0	80 - 120	499.9	0.46	20	
MSD	Sample ID: HS19090624-01MSD	Units: mg/L			Analysis Date: 19-Sep-2019 11:10					
Client ID:	Run ID: ICS-Integrion_346569	SeqNo: 5259843		PrepDate:			DF: 500			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	11800	250	5000	7126	93.5	80 - 120	11860	0.516	20	
Sulfate	4914	250	5000	62.95	97.0	80 - 120	4910	0.0814	20	
MSD	Sample ID: HS19090579-01MSD	Units: mg/L			Analysis Date: 19-Sep-2019 16:09					
Client ID:	Run ID: ICS-Integrion_346569	SeqNo: 5259977		PrepDate:			DF: 20			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	299.7	10.0	200	111.3	94.2	80 - 120	301.1	0.439	20	
Sulfate	1768	10.0	200	1649	59.5	80 - 120	1783	0.878	20	SO

The following samples were analyzed in this batch:

ALS Houston, US

Date: 20-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090191

**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	2019-141	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US

Date: 20-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
Work Order: HS19090191

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19090191-01	LH18/24-SP650_090419	Login	9/5/2019 4:34:49 PM	AC	Disposed
HS19090191-01	LH18/24-SP650_090419	Login	9/5/2019 4:34:49 PM	AC	VOA083
HS19090191-02	Trip Blank	Login	9/5/2019 4:34:49 PM	AC	VOA083

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19090191

Date/Time Received: **05-Sep-2019 08:50**
 Received by: **AC**

Checklist completed by: Asad Chaudhry 5-Sep-2019
 eSignature Date

Reviewed by: Corey Grandits 6-Sep-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 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): 1.9c C/UC IR 25
 Cooler(s)/Kit(s): 44516
 Date/Time sample(s) sent to storage: 09/05/2019 16:50

- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH acceptable upon receipt? Yes No N/A
- pH adjusted? Yes No N/A

pH adjusted by:

Login Notes:

Client Contacted: Date Contacted: Person Contacted:
 Contacted By: Regarding:

Comments:

Corrective Action:



1608 13th Avenue South, Suite 300
 Birmingham Alabama 35205
 Tel: 205-918-4000
 Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____

Project/Phase No: NW01312.0150

HS19090191

Bhate Environmental Associates, Inc.
 Groundwater Treatment Plant Bi-Weekly Samples

Facility/Base I.D.: LHAAP
 Project/Site Name: LHAAP / GWTP Bi-weekly Effluent
 Client Name:
 Collected by: Scott Beesinger

Sample Analysis Re



Field Sample ID (30 Characters Max)	ERFMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (1)	Sample Number (1)	Sample Matrix ⁽⁴⁾	Number of containers	Analysis	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
LHAAP-SQ650-090419		04SEP 2019	1400	-	N		WG	4	X				
TRP Blank		04SEP 2019	1400	-	TB		W	2	X				

COMMENTS:

STANDARD TAT

Relinquished By (Signed) <u>Scott Beesinger</u> Date <u>9/4/19</u> Time <u>1430</u>				Received by (signed) <u>AC</u> Date <u>9-5-19</u> Time <u>08:50</u>				Sample Delivery Details / Laboratory Receipt			
1. _____				2. _____				Delivered Directly to Lab: _____ Shipped _____ No.:			
3. _____				3. _____				Method of Shipment: _____			
								Fed _____ Ex _____ Airbill _____ Number: _____			
								Analytical Lab: <u>ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656</u>			
								Lab Recipient: <u>ATTN: SONIA WEST</u> Delivery Date/Time: _____			

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)
 2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)
 3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)
 4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks
 5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.
 6.) Quality assurance samples are assigned by date (ddmmmy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

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

44716

CUSTODY SEAL		Seal Broken By:
Date: 9/14/19	Time: 1430	A
To: Scott Bessinger		Date:
From: BHTA		15/19

FedEx
 TRK# 4380 9529 3556
 0221

THU 05 SEP 10:30A
 PRIORITY OVERNIGHT

AB SGRA

77091
 TX-US



*475872 09/04 55711/9304/0582



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

September 25, 2019

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

Work Order: **HS19090454**

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

Dear Marcia,

ALS Environmental received 3 sample(s) on Sep 11, 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 simple oval scribble.

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS19090454

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19090454-01	LH18/24-SP650_091019	Water		10-Sep-2019 14:00	11-Sep-2019 08:59	<input type="checkbox"/>
HS19090454-02	LH18/24-SP650_091019_AIX	Water		10-Sep-2019 14:00	11-Sep-2019 08:59	<input type="checkbox"/>
HS19090454-03	Trip Blank	Water	C&G- 101618-288	10-Sep-2019 00:00	11-Sep-2019 08:59	<input type="checkbox"/>

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS19090454

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: 145158**

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

Sample ID: LH18/24-SP650_091019 (HS19090454-01)

- The surrogate recoveries could not be determined due to dilution below the calibration range.
-

GCMS Volatiles by Method SW8260**Batch ID: R346125****Sample ID: HS19090151-02MSD**

- MSD is for an unrelated sample
-

Metals by Method SW6020**Batch ID: 145210**

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

WetChemistry by Method SW7196**Batch ID: R346144**

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

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Monthly Effluent Samples
 Sample ID: LH18/24-SP650_091019
 Collection Date: 10-Sep-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19090454
 Lab ID:HS19090454-01
 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	11-Sep-2019 21:07	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	11-Sep-2019 21:07	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	11-Sep-2019 21:07	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	11-Sep-2019 21:07	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	11-Sep-2019 21:07	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	11-Sep-2019 21:07	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 21:07	

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

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Monthly Effluent Samples
 Sample ID: LH18/24-SP650_091019
 Collection Date: 10-Sep-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19090454
 Lab ID:HS19090454-01
 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	11-Sep-2019 21:07		
cis-1,2-Dichloroethene	2.2		0.20	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	11-Sep-2019 21:07		
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	11-Sep-2019 21:07		
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	11-Sep-2019 21:07		
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
Trichloroethene	1.1		0.20	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 21:07		
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>90.6</i>			0	<i>81-118</i>	%REC	<i>1</i>	<i>11-Sep-2019 21:07</i>		
<i>Surr: 4-Bromofluorobenzene</i>	<i>101</i>			0	<i>85-114</i>	%REC	<i>1</i>	<i>11-Sep-2019 21:07</i>		
<i>Surr: Dibromofluoromethane</i>	<i>95.6</i>			0	<i>80-119</i>	%REC	<i>1</i>	<i>11-Sep-2019 21:07</i>		
<i>Surr: Toluene-d8</i>	<i>97.7</i>			0	<i>89-112</i>	%REC	<i>1</i>	<i>11-Sep-2019 21:07</i>		
SEMIVOLATILES SIM		Method:SW8270SIM							Prep:SW3510 / 12-Sep-2019	Analyst: LG
1,4-Dioxane	13		1.0	1.0	1.0	ug/L	100	19-Sep-2019 11:29		
<i>Surr: 2-Fluorobiphenyl</i>	<i>0</i>	S		0	<i>40-140</i>	%REC	<i>100</i>	<i>19-Sep-2019 11:29</i>		
<i>Surr: 4-Terphenyl-d14</i>	<i>0</i>	S		0	<i>40-140</i>	%REC	<i>100</i>	<i>19-Sep-2019 11:29</i>		
<i>Surr: Nitrobenzene-d5</i>	<i>0</i>	S		0	<i>40-140</i>	%REC	<i>100</i>	<i>19-Sep-2019 11:29</i>		
METALS BY ICPMS BY SW6020A		Method:SW6020							Prep:SW3010A / 13-Sep-2019	Analyst: JHD
Barium	0.155		0.00190	0.00250	0.00500	mg/L	1	24-Sep-2019 18:50		
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	24-Sep-2019 18:50		
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	24-Sep-2019 18:50		
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	24-Sep-2019 18:50		

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

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Monthly Effluent Samples
 Sample ID: LH18/24-SP650_091019
 Collection Date: 10-Sep-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19090454
 Lab ID:HS19090454-01
 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	11-Sep-2019 13:34	

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Monthly Effluent Samples
 Sample ID: LH18/24-SP650_091019_AIX
 Collection Date: 10-Sep-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19090454
 Lab ID:HS19090454-02
 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	19-Sep-2019 16:33

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Monthly Effluent Samples
 Sample ID: Trip Blank
 Collection Date: 10-Sep-2019 00:00

ANALYTICAL REPORT

WorkOrder:HS19090454
 Lab ID:HS19090454-03
 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	11-Sep-2019 19:55	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	11-Sep-2019 19:55	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	11-Sep-2019 19:55	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	11-Sep-2019 19:55	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	11-Sep-2019 19:55	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	11-Sep-2019 19:55	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:55	

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

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Monthly Effluent Samples
 Sample ID: Trip Blank
 Collection Date: 10-Sep-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19090454
 Lab ID:HS19090454-03
 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	11-Sep-2019 19:55	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	11-Sep-2019 19:55	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	11-Sep-2019 19:55	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	11-Sep-2019 19:55	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	11-Sep-2019 19:55	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.6</i>			0	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>11-Sep-2019 19:55</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>99.8</i>			0	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>11-Sep-2019 19:55</i>	
<i>Surr: Dibromofluoromethane</i>	<i>95.7</i>			0	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>11-Sep-2019 19:55</i>	
<i>Surr: Toluene-d8</i>	<i>98.0</i>			0	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>11-Sep-2019 19:55</i>	

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

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19090454

Batch ID: 145158 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampleID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19090454-01	1	1000	1 (mL)	0.001

Batch ID: 145210 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampleID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19090454-01	1	10	10 (mL)	1

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19090454

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 145158 (1)		Test Name : SEMIVOLATILES SIM			Matrix: Water	
HS19090454-01	LH18/24-SP650_091019	10 Sep 2019 14:00		12 Sep 2019 13:20	19 Sep 2019 11:29	100
Batch ID: 145210 (0)		Test Name : METALS BY ICPMS BY SW6020A			Matrix: Water	
HS19090454-01	LH18/24-SP650_091019	10 Sep 2019 14:00		13 Sep 2019 12:30	24 Sep 2019 18:50	1
Batch ID: R346125 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19090454-01	LH18/24-SP650_091019	10 Sep 2019 14:00			11 Sep 2019 21:07	1
HS19090454-03	Trip Blank	10 Sep 2019 00:00			11 Sep 2019 19:55	1
Batch ID: R346144 (0)		Test Name : HEXAVALENT CHROMIUM BY SW7196A			Matrix: Water	
HS19090454-01	LH18/24-SP650_091019	10 Sep 2019 14:00			11 Sep 2019 13:34	1
Batch ID: R346576 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Water	
HS19090454-02	LH18/24-SP650_091019_AIX	10 Sep 2019 14:00			19 Sep 2019 16:33	1

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19090454

QC BATCH REPORT

Batch ID: 145210 (0)		Instrument: ICPMS04		Method: METALS BY ICPMS BY SW6020A						
MBLK	Sample ID: MBLK-145210	Units: mg/L			Analysis Date: 24-Sep-2019 18:45					
Client ID:	Run ID: ICPMS04_346816	SeqNo: 5266437	PrepDate: 13-Sep-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-145210	Units: mg/L			Analysis Date: 24-Sep-2019 18:48					
Client ID:	Run ID: ICPMS04_346816	SeqNo: 5266438	PrepDate: 13-Sep-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Barium	0.04458	0.00500	0.05	0	89.2	86 - 114				
Lead	0.04574	0.00500	0.05	0	91.5	88 - 115				
Selenium	0.04081	0.00500	0.05	0	81.6	80 - 120				
Silver	0.04786	0.00500	0.05	0	95.7	85 - 116				
MS	Sample ID: HS19090454-01MS	Units: mg/L			Analysis Date: 24-Sep-2019 18:54					
Client ID: LH18/24-SP650_091019	Run ID: ICPMS04_346816	SeqNo: 5266441	PrepDate: 13-Sep-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Barium	0.2114	0.00500	0.05	0.1551	113	86 - 114				
Lead	0.04615	0.00500	0.05	0.000369	91.6	88 - 115				
Selenium	0.04304	0.00500	0.05	0.000755	84.6	80 - 120				
Silver	0.04597	0.00500	0.05	0.000007	91.9	85 - 116				
MSD	Sample ID: HS19090454-01MSD	Units: mg/L			Analysis Date: 24-Sep-2019 18:57					
Client ID: LH18/24-SP650_091019	Run ID: ICPMS04_346816	SeqNo: 5266442	PrepDate: 13-Sep-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Barium	0.2014	0.00500	0.05	0.1551	92.8	86 - 114	0.2114	4.83	20	
Lead	0.04498	0.00500	0.05	0.000369	89.2	88 - 115	0.04615	2.57	20	
Selenium	0.04142	0.00500	0.05	0.000755	81.3	80 - 120	0.04304	3.83	20	
Silver	0.04473	0.00500	0.05	0.000007	89.5	85 - 116	0.04597	2.74	20	

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19090454

QC BATCH REPORT

Batch ID: 145210 (0)		Instrument: ICPMS04		Method: METALS BY ICPMS BY SW6020A						
PDS		Sample ID: HS19090454-01PDS		Units: mg/L		Analysis Date: 24-Sep-2019 18:59				
Client ID: LH18/24-SP650_091019		Run ID: ICPMS04_346816		SeqNo: 5266443		PrepDate: 13-Sep-2019		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Barium	0.2603	0.00500	0.1	0.1551	105	80 - 120				
Lead	0.1003	0.00500	0.1	0.000369	99.9	80 - 120				
Selenium	0.09874	0.00500	0.1	0.000755	98.0	80 - 120				
Silver	0.08726	0.00500	0.1	0.000007	87.3	80 - 120				
SD		Sample ID: HS19090454-01SD		Units: mg/L		Analysis Date: 24-Sep-2019 18:52				
Client ID: LH18/24-SP650_091019		Run ID: ICPMS04_346816		SeqNo: 5266440		PrepDate: 13-Sep-2019		DF: 5		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	RPD Limit Qual	
Barium	0.1541	0.0250					0.1551	0.642	10	
Lead	0.00500	0.0250					0.000369	0	10 U	
Selenium	0.0125	0.0250					0.000755	0	10 U	
Silver	0.00250	0.0250					0.000007	0	10 U	
The following samples were analyzed in this batch: HS19090454-01										

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19090454

QC BATCH REPORT

Batch ID: 145158 (1)		Instrument: SV-6		Method: SEMIVOLATILES SIM						
MBLK	Sample ID: MBLK-145158	Units: ug/L			Analysis Date: 19-Sep-2019 09:52					
Client ID:	Run ID: SV-6_346560	SeqNo: 5259584		PrepDate: 12-Sep-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	
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.06623</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>82.8</i>	<i>40 - 140</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>0.05903</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>73.8</i>	<i>40 - 140</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>0.0691</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>86.4</i>	<i>40 - 140</i>				
LCS	Sample ID: LCS1-145158	Units: ug/L			Analysis Date: 19-Sep-2019 10:11					
Client ID:	Run ID: SV-6_346560	SeqNo: 5259585		PrepDate: 12-Sep-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.08146	0.010	0.08	0	102	40 - 140				
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.07378</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>92.2</i>	<i>40 - 140</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>0.07691</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>96.1</i>	<i>40 - 140</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>0.07253</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>90.7</i>	<i>40 - 140</i>				
LCSD	Sample ID: LCSD1-145158	Units: ug/L			Analysis Date: 19-Sep-2019 10:31					
Client ID:	Run ID: SV-6_346560	SeqNo: 5259586		PrepDate: 12-Sep-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.07347	0.010	0.08	0	91.8	40 - 140	0.08146	10.3	20	
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.07278</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>91.0</i>	<i>40 - 140</i>	<i>0.07378</i>	<i>1.36</i>	<i>20</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>0.07689</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>96.1</i>	<i>40 - 140</i>	<i>0.07691</i>	<i>0.0312</i>	<i>20</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>0.07316</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>91.5</i>	<i>40 - 140</i>	<i>0.07253</i>	<i>0.876</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19090454-01

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19090454

QC BATCH REPORT

Batch ID: R346125 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-190911	Units: UG/L			Analysis Date: 11-Sep-2019 18:43					
Client ID:	Run ID: VOA6_346125	SeqNo: 5249737	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	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	44.71	1.0	50	0	89.4	81 - 118				
Surr: 4-Bromofluorobenzene	50.16	1.0	50	0	100	85 - 114				
Surr: Dibromofluoromethane	46.37	1.0	50	0	92.7	80 - 119				
Surr: Toluene-d8	48.08	1.0	50	0	96.2	89 - 112				

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19090454

QC BATCH REPORT

Batch ID: R346125 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-190911	Units: UG/L			Analysis Date: 11-Sep-2019 17:55					
Client ID:	Run ID: VOA6_346125	SeqNo: 5249736	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	18.61	1.0	20	0	93.1	78 - 124				
1,1,1-Trichloroethane	17.96	1.0	20	0	89.8	74 - 131				
1,1,2,2-Tetrachloroethane	19.65	1.0	20	0	98.3	71 - 121				
1,1,2-Trichloroethane	18.71	1.0	20	0	93.5	80 - 119				
1,1-Dichloroethane	17.61	1.0	20	0	88.0	77 - 125				
1,1-Dichloroethene	17.42	1.0	20	0	87.1	71 - 131				
1,1-Dichloropropene	17.37	1.0	20	0	86.9	78 - 125				
1,2,3-Trichlorobenzene	17.77	1.0	20	0	88.8	69 - 129				
1,2,3-Trichloropropane	18.79	1.0	20	0	93.9	73 - 122				
1,2,4-Trichlorobenzene	18	1.0	20	0	90.0	69 - 130				
1,2,4-Trimethylbenzene	17.17	1.0	20	0	85.9	76 - 124				
1,2-Dibromo-3-chloropropane	20.2	1.0	20	0	101	62 - 128				
1,2-Dibromoethane	19.26	1.0	20	0	96.3	77 - 121				
1,2-Dichlorobenzene	17.45	1.0	20	0	87.3	80 - 119				
1,2-Dichloroethane	18.66	1.0	20	0	93.3	73 - 128				
1,2-Dichloropropane	17.98	1.0	20	0	89.9	78 - 122				
1,3,5-Trimethylbenzene	16.92	1.0	20	0	84.6	75 - 124				
1,3-Dichlorobenzene	17.82	1.0	20	0	89.1	80 - 119				
1,3-Dichloropropane	18.15	1.0	20	0	90.7	80 - 119				
1,4-Dichlorobenzene	17.52	1.0	20	0	87.6	79 - 118				
2,2-Dichloropropane	17.99	1.0	20	0	89.9	60 - 139				
2-Butanone	40.56	2.0	40	0	101	56 - 143				
2-Chlorotoluene	18.35	1.0	20	0	91.7	79 - 122				
2-Hexanone	39.38	2.0	40	0	98.4	57 - 139				
4-Chlorotoluene	16.66	1.0	20	0	83.3	78 - 122				
4-Isopropyltoluene	16.65	1.0	20	0	83.3	77 - 127				
4-Methyl-2-pentanone	37.81	2.0	40	0	94.5	67 - 130				
Acetone	42.22	2.0	40	0	106	39 - 160				
Benzene	17.88	1.0	20	0	89.4	79 - 120				
Bromobenzene	17.86	1.0	20	0	89.3	80 - 120				
Bromochloromethane	18.51	1.0	20	0	92.6	78 - 123				
Bromodichloromethane	18.18	1.0	20	0	90.9	79 - 125				
Bromoform	19.52	1.0	20	0	97.6	66 - 130				
Bromomethane	20.71	1.0	20	0	104	53 - 141				

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19090454

QC BATCH REPORT

Batch ID: R346125 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-190911	Units: UG/L			Analysis Date: 11-Sep-2019 17:55					
Client ID:	Run ID: VOA6_346125	SeqNo: 5249736	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.01	2.0	40	0	87.5	64 - 133				
Carbon tetrachloride	17.27	1.0	20	0	86.4	72 - 136				
Chlorobenzene	17.55	1.0	20	0	87.8	82 - 118				
Chloroethane	18.52	1.0	20	0	92.6	60 - 138				
Chloroform	18.49	1.0	20	0	92.5	79 - 124				
Chloromethane	18.64	1.0	20	0	93.2	50 - 139				
cis-1,2-Dichloroethene	18.67	1.0	20	0	93.3	78 - 123				
cis-1,3-Dichloropropene	18.89	1.0	20	0	94.5	75 - 124				
Dibromochloromethane	18.74	1.0	20	0	93.7	74 - 126				
Dibromomethane	18.52	1.0	20	0	92.6	79 - 123				
Dichlorodifluoromethane	16.62	1.0	20	0	83.1	32 - 152				
Ethylbenzene	17.52	1.0	20	0	87.6	79 - 121				
Hexachlorobutadiene	16.3	1.0	20	0	81.5	66 - 134				
Isopropylbenzene	17.22	1.0	20	0	86.1	72 - 131				
m,p-Xylene	34.98	2.0	40	0	87.4	80 - 121				
Methylene chloride	19.52	2.0	20	0	97.6	74 - 124				
Naphthalene	18.75	1.0	20	0	93.7	61 - 128				
n-Butylbenzene	16.52	1.0	20	0	82.6	75 - 128				
n-Propylbenzene	16.56	1.0	20	0	82.8	76 - 126				
o-Xylene	17.88	1.0	20	0	89.4	78 - 122				
sec-Butylbenzene	15.79	1.0	20	0	78.9	77 - 126				
Styrene	18.33	1.0	20	0	91.6	78 - 123				
tert-Butylbenzene	16.47	1.0	20	0	82.4	78 - 124				
Tetrachloroethene	17.57	1.0	20	0	87.8	74 - 129				
Toluene	17.42	1.0	20	0	87.1	80 - 121				
trans-1,2-Dichloroethene	17.97	1.0	20	0	89.9	75 - 124				
trans-1,3-Dichloropropene	19.14	1.0	20	0	95.7	73 - 127				
Trichloroethene	18	1.0	20	0	90.0	79 - 123				
Trichlorofluoromethane	17.22	1.0	20	0	86.1	65 - 141				
Vinyl chloride	16.36	1.0	20	0	81.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	53.96	1.0	50	0	108	81 - 118				
Surr: 4-Bromofluorobenzene	52.2	1.0	50	0	104	85 - 114				
Surr: Dibromofluoromethane	53.62	1.0	50	0	107	80 - 119				
Surr: Toluene-d8	46.45	1.0	50	0	92.9	89 - 112				

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19090454

QC BATCH REPORT

Batch ID: R346125 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19090151-02MS	Units: UG/L			Analysis Date: 11-Sep-2019 21:31					
Client ID:	Run ID: VOA6_346125	SeqNo: 5249744	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	18.7	1.0	20	0	93.5	78 - 124				
1,1,1-Trichloroethane	16.89	1.0	20	0	84.4	74 - 131				
1,1,2,2-Tetrachloroethane	18.69	1.0	20	0	93.5	71 - 121				
1,1,2-Trichloroethane	18.15	1.0	20	0	90.7	80 - 119				
1,1-Dichloroethane	15.96	1.0	20	0	79.8	77 - 125				
1,1-Dichloroethene	18.29	1.0	20	0	91.4	71 - 131				
1,1-Dichloropropene	17.7	1.0	20	0	88.5	78 - 125				
1,2,3-Trichlorobenzene	15.21	1.0	20	0	76.1	69 - 129				
1,2,3-Trichloropropane	17.66	1.0	20	0	88.3	73 - 122				
1,2,4-Trichlorobenzene	16.44	1.0	20	0	82.2	69 - 130				
1,2,4-Trimethylbenzene	18.63	1.0	20	0	93.1	76 - 124				
1,2-Dibromo-3-chloropropane	16.89	1.0	20	0	84.5	62 - 128				
1,2-Dibromoethane	17.89	1.0	20	0	89.5	77 - 121				
1,2-Dichlorobenzene	17.82	1.0	20	0	89.1	80 - 119				
1,2-Dichloroethane	16.6	1.0	20	0	83.0	73 - 128				
1,2-Dichloropropane	16.98	1.0	20	0	84.9	78 - 122				
1,3,5-Trimethylbenzene	18.77	1.0	20	0	93.9	75 - 124				
1,3-Dichlorobenzene	18.82	1.0	20	0	94.1	80 - 119				
1,3-Dichloropropane	17.65	1.0	20	0	88.2	80 - 119				
1,4-Dichlorobenzene	18.12	1.0	20	0	90.6	79 - 118				
2,2-Dichloropropane	15.9	1.0	20	0	79.5	60 - 139				
2-Butanone	28.82	2.0	40	0	72.1	56 - 143				
2-Chlorotoluene	19.79	1.0	20	0	98.9	79 - 122				
2-Hexanone	36.77	2.0	40	0	91.9	57 - 139				
4-Chlorotoluene	18.26	1.0	20	0	91.3	78 - 122				
4-Isopropyltoluene	19.09	1.0	20	0	95.4	77 - 127				
4-Methyl-2-pentanone	35.97	2.0	40	0	89.9	67 - 130				
Acetone	28.75	2.0	40	0	71.9	39 - 160				
Benzene	17.15	1.0	20	0	85.8	79 - 120				
Bromobenzene	18.75	1.0	20	0	93.8	80 - 120				
Bromochloromethane	15.85	1.0	20	0	79.2	78 - 123				
Bromodichloromethane	16.69	1.0	20	0	83.4	79 - 125				
Bromoform	18	1.0	20	0	90.0	66 - 130				
Bromomethane	21.5	1.0	20	0	107	53 - 141				

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19090454

QC BATCH REPORT

Batch ID: R346125 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19090151-02MS	Units: UG/L			Analysis Date: 11-Sep-2019 21:31					
Client ID:	Run ID: VOA6_346125	SeqNo: 5249744	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	30.64	2.0	40	0	76.6	64 - 133				
Carbon tetrachloride	17.82	1.0	20	0	89.1	72 - 136				
Chlorobenzene	17.82	1.0	20	0	89.1	82 - 118				
Chloroethane	19.4	1.0	20	0	97.0	60 - 138				
Chloroform	16.47	1.0	20	0	82.4	79 - 124				
Chloromethane	14.85	1.0	20	0	74.2	50 - 139				
cis-1,2-Dichloroethene	17	1.0	20	0	85.0	78 - 123				
cis-1,3-Dichloropropene	16.93	1.0	20	0	84.7	75 - 124				
Dibromochloromethane	18.26	1.0	20	0	91.3	74 - 126				
Dibromomethane	16.55	1.0	20	0	82.7	79 - 123				
Dichlorodifluoromethane	9.542	1.0	20	0	47.7	32 - 152				
Ethylbenzene	18.53	1.0	20	0	92.7	79 - 121				
Hexachlorobutadiene	17.86	1.0	20	0	89.3	66 - 134				
Isopropylbenzene	18.54	1.0	20	0	92.7	72 - 131				
m,p-Xylene	36.79	2.0	40	0	92.0	80 - 121				
Methylene chloride	15.9	2.0	20	0	79.5	74 - 124				
Naphthalene	15.91	1.0	20	0	79.6	61 - 128				
n-Butylbenzene	19.4	1.0	20	0	97.0	75 - 128				
n-Propylbenzene	19.06	1.0	20	0	95.3	76 - 126				
o-Xylene	18.32	1.0	20	0	91.6	78 - 122				
sec-Butylbenzene	19.02	1.0	20	0	95.1	77 - 126				
Styrene	18.46	1.0	20	0	92.3	78 - 123				
tert-Butylbenzene	19.06	1.0	20	0	95.3	78 - 124				
Tetrachloroethene	18.93	1.0	20	0	94.7	74 - 129				
Toluene	18.39	1.0	20	0	91.9	80 - 121				
trans-1,2-Dichloroethene	16.62	1.0	20	0	83.1	75 - 124				
trans-1,3-Dichloropropene	16.51	1.0	20	0	82.5	73 - 127				
Trichloroethene	17.9	1.0	20	0	89.5	79 - 123				
Trichlorofluoromethane	18.55	1.0	20	0	92.7	65 - 141				
Vinyl chloride	16.83	1.0	20	0	84.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	45.76	1.0	50	0	91.5	81 - 118				
Surr: 4-Bromofluorobenzene	49.61	1.0	50	0	99.2	85 - 114				
Surr: Dibromofluoromethane	46.87	1.0	50	0	93.7	80 - 119				
Surr: Toluene-d8	49.24	1.0	50	0	98.5	89 - 112				

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19090454

QC BATCH REPORT

Batch ID: R346125 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19090151-02MSD	Units: UG/L			Analysis Date: 11-Sep-2019 21:55					
Client ID:	Run ID: VOA6_346125	SeqNo: 5249745	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	17.83	1.0	20	0	89.1	78 - 124	18.7	4.78	20	
1,1,1-Trichloroethane	16.2	1.0	20	0	81.0	74 - 131	16.89	4.14	20	
1,1,2,2-Tetrachloroethane	18.64	1.0	20	0	93.2	71 - 121	18.69	0.28	20	
1,1,2-Trichloroethane	18.05	1.0	20	0	90.3	80 - 119	18.15	0.535	20	
1,1-Dichloroethane	15.22	1.0	20	0	76.1	77 - 125	15.96	4.75	20	S
1,1-Dichloroethene	17.37	1.0	20	0	86.8	71 - 131	18.29	5.17	20	
1,1-Dichloropropene	16.68	1.0	20	0	83.4	78 - 125	17.7	5.96	20	
1,2,3-Trichlorobenzene	15.8	1.0	20	0	79.0	69 - 129	15.21	3.8	20	
1,2,3-Trichloropropane	17.28	1.0	20	0	86.4	73 - 122	17.66	2.14	20	
1,2,4-Trichlorobenzene	16.61	1.0	20	0	83.0	69 - 130	16.44	0.992	20	
1,2,4-Trimethylbenzene	17.97	1.0	20	0	89.9	76 - 124	18.63	3.59	20	
1,2-Dibromo-3-chloropropane	16.84	1.0	20	0	84.2	62 - 128	16.89	0.309	20	
1,2-Dibromoethane	17.91	1.0	20	0	89.5	77 - 121	17.89	0.098	20	
1,2-Dichlorobenzene	17.56	1.0	20	0	87.8	80 - 119	17.82	1.44	20	
1,2-Dichloroethane	16.73	1.0	20	0	83.7	73 - 128	16.6	0.815	20	
1,2-Dichloropropane	16.38	1.0	20	0	81.9	78 - 122	16.98	3.63	20	
1,3,5-Trimethylbenzene	17.88	1.0	20	0	89.4	75 - 124	18.77	4.87	20	
1,3-Dichlorobenzene	18.23	1.0	20	0	91.2	80 - 119	18.82	3.17	20	
1,3-Dichloropropane	17.27	1.0	20	0	86.3	80 - 119	17.65	2.17	20	
1,4-Dichlorobenzene	17.54	1.0	20	0	87.7	79 - 118	18.12	3.27	20	
2,2-Dichloropropane	14.69	1.0	20	0	73.5	60 - 139	15.9	7.9	20	
2-Butanone	29.18	2.0	40	0	73.0	56 - 143	28.82	1.24	20	
2-Chlorotoluene	19.19	1.0	20	0	95.9	79 - 122	19.79	3.07	20	
2-Hexanone	36.52	2.0	40	0	91.3	57 - 139	36.77	0.699	20	
4-Chlorotoluene	17.71	1.0	20	0	88.5	78 - 122	18.26	3.08	20	
4-Isopropyltoluene	18.23	1.0	20	0	91.1	77 - 127	19.09	4.6	20	
4-Methyl-2-pentanone	36.19	2.0	40	0	90.5	67 - 130	35.97	0.611	20	
Acetone	30.06	2.0	40	0	75.1	39 - 160	28.75	4.45	20	
Benzene	16.39	1.0	20	0	81.9	79 - 120	17.15	4.56	20	
Bromobenzene	18.49	1.0	20	0	92.4	80 - 120	18.75	1.42	20	
Bromochloromethane	15.42	1.0	20	0	77.1	78 - 123	15.85	2.77	20	S
Bromodichloromethane	16.49	1.0	20	0	82.5	79 - 125	16.69	1.19	20	
Bromoform	18.14	1.0	20	0	90.7	66 - 130	18	0.788	20	
Bromomethane	19.12	1.0	20	0	95.6	53 - 141	21.5	11.7	20	

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19090454

QC BATCH REPORT

Batch ID: R346125 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19090151-02MSD	Units: UG/L			Analysis Date: 11-Sep-2019 21:55					
Client ID:	Run ID: VOA6_346125	SeqNo: 5249745		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	28.33	2.0	40	0	70.8	64 - 133	30.64	7.83	20	
Carbon tetrachloride	17.07	1.0	20	0	85.4	72 - 136	17.82	4.3	20	
Chlorobenzene	17.52	1.0	20	0	87.6	82 - 118	17.82	1.69	20	
Chloroethane	19.75	1.0	20	0	98.7	60 - 138	19.4	1.76	20	
Chloroform	15.85	1.0	20	0	79.2	79 - 124	16.47	3.89	20	
Chloromethane	13.28	1.0	20	0	66.4	50 - 139	14.85	11.2	20	
cis-1,2-Dichloroethene	16.15	1.0	20	0	80.7	78 - 123	17	5.13	20	
cis-1,3-Dichloropropene	16.56	1.0	20	0	82.8	75 - 124	16.93	2.25	20	
Dibromochloromethane	17.74	1.0	20	0	88.7	74 - 126	18.26	2.87	20	
Dibromomethane	16.61	1.0	20	0	83.1	79 - 123	16.55	0.38	20	
Dichlorodifluoromethane	8.387	1.0	20	0	41.9	32 - 152	9.542	12.9	20	
Ethylbenzene	17.8	1.0	20	0	89.0	79 - 121	18.53	4.03	20	
Hexachlorobutadiene	18.05	1.0	20	0	90.3	66 - 134	17.86	1.08	20	
Isopropylbenzene	18.06	1.0	20	0	90.3	72 - 131	18.54	2.63	20	
m,p-Xylene	35.84	2.0	40	0	89.6	80 - 121	36.79	2.62	20	
Methylene chloride	15.33	2.0	20	0	76.7	74 - 124	15.9	3.64	20	
Naphthalene	16.08	1.0	20	0	80.4	61 - 128	15.91	1.05	20	
n-Butylbenzene	18.58	1.0	20	0	92.9	75 - 128	19.4	4.32	20	
n-Propylbenzene	18.02	1.0	20	0	90.1	76 - 126	19.06	5.63	20	
o-Xylene	18	1.0	20	0	90.0	78 - 122	18.32	1.8	20	
sec-Butylbenzene	17.96	1.0	20	0	89.8	77 - 126	19.02	5.73	20	
Styrene	18.05	1.0	20	0	90.2	78 - 123	18.46	2.24	20	
tert-Butylbenzene	18.25	1.0	20	0	91.3	78 - 124	19.06	4.32	20	
Tetrachloroethene	18.22	1.0	20	0	91.1	74 - 129	18.93	3.83	20	
Toluene	17.59	1.0	20	0	87.9	80 - 121	18.39	4.45	20	
trans-1,2-Dichloroethene	15.36	1.0	20	0	76.8	75 - 124	16.62	7.91	20	
trans-1,3-Dichloropropene	16.68	1.0	20	0	83.4	73 - 127	16.51	1.04	20	
Trichloroethene	16.99	1.0	20	0	85.0	79 - 123	17.9	5.2	20	
Trichlorofluoromethane	17.12	1.0	20	0	85.6	65 - 141	18.55	8.04	20	
Vinyl chloride	14.2	1.0	20	0	71.0	58 - 137	16.83	16.9	20	
Surr: 1,2-Dichloroethane-d4	45.36	1.0	50	0	90.7	81 - 118	45.76	0.884	20	
Surr: 4-Bromofluorobenzene	50.28	1.0	50	0	101	85 - 114	49.61	1.34	20	
Surr: Dibromofluoromethane	46.52	1.0	50	0	93.0	80 - 119	46.87	0.735	20	
Surr: Toluene-d8	48.97	1.0	50	0	97.9	89 - 112	49.24	0.542	20	

ALS Houston, US

Date: 25-Sep-19

Client: Bhatte Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19090454

QC BATCH REPORT**Batch ID:** R346125 (0)**Instrument:** VOA6**Method:** VOLATILES ORGANICS BY METHOD
8260C

The following samples were analyzed in this batch:

HS19090454-01	HS19090454-03
---------------	---------------

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19090454

QC BATCH REPORT

Batch ID: R346144 (0)		Instrument: UV-2450		Method: HEXAVALENT CHROMIUM BY SW7196A					
MBLK	Sample ID: MBLK-346144	Units: mg/L		Analysis Date: 11-Sep-2019 13:34					
Client ID:	Run ID: UV-2450_346144	SeqNo: 5250372		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual	
Chromium, Hexavalent	0.0100	0.0100						U	
LCS	Sample ID: LCS-346144	Units: mg/L		Analysis Date: 11-Sep-2019 13:34					
Client ID:	Run ID: UV-2450_346144	SeqNo: 5250373		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual	
Chromium, Hexavalent	0.261	0.0100	0.25	0	104	90 - 111			
MS	Sample ID: HS19090447-02MS	Units: mg/L		Analysis Date: 11-Sep-2019 13:34					
Client ID:	Run ID: UV-2450_346144	SeqNo: 5250375		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual	
Chromium, Hexavalent	0.252	0.0100	0.25	0.005	98.8	90 - 111			
MSD	Sample ID: HS19090447-02MSD	Units: mg/L		Analysis Date: 11-Sep-2019 13:34					
Client ID:	Run ID: UV-2450_346144	SeqNo: 5250376		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual	
Chromium, Hexavalent	0.25	0.0100	0.25	0.005	98.0	90 - 111	0.252	0.797 20	

The following samples were analyzed in this batch: HS19090454-01

ALS Houston, US

Date: 25-Sep-19

Client:	Bhate Environmental Associates, Inc.	QUALIFIERS, ACRONYMS, UNITS
Project:	Longhorn GW Treatment Plant Monthly Effluent Samples	
WorkOrder:	HS19090454	

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	2019-141	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS19090454

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19090454-01	LH18/24-SP650_091019	Login	9/11/2019 11:22:55 AM	PMG	EXT092
HS19090454-01	LH18/24-SP650_091019	Login	9/11/2019 11:22:55 AM	PMG	WET336
HS19090454-01	LH18/24-SP650_091019	Login	9/11/2019 11:22:55 AM	PMG	MET090
HS19090454-01	LH18/24-SP650_091019	Login	9/11/2019 11:22:55 AM	PMG	VOA235
HS19090454-02	LH18/24-SP650_091019_AIX	Login	9/11/2019 11:22:55 AM	PMG	Sub
HS19090454-03	Trip Blank	Login	9/11/2019 11:22:55 AM	PMG	VOA235

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19090454

Date/Time Received: **11-Sep-2019 08:59**
 Received by: **AC**

Checklist completed by: Paresh M. Giga 11-Sep-2019
 eSignature Date

Reviewed by: RJ Modashia 11-Sep-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): 2.7c U/c IR25
 Cooler(s)/Kit(s): 45038
 Date/Time sample(s) sent to storage: 9/11/19 11:35

- 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:



1608 13th Avenue South, Suite 300
 Birmingham Alabama 35205
 Tel: 205-918-4000
 Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____

Project/Phase No: NW01312.0150

COC Number(1): _____

LIMS Number: _____

Facility/Base I.D.: <u>LHAAP</u>								Sample Analysis Requested ⁽⁵⁾										Quality Assurance Samples ⁽⁶⁾			Cooler ID			
Project/Site Name: <u>LHAAP / GWTP MONTHLY EFFLUENT</u>								Number of containers	VOC	SILVER, SELENIUM, LEAD, BARIUM, HEXACHLORANT, CHLOROPYRIFOS	1,4-DIBENZO	PERCHLORATE											Ambient Blank Lot Control Number	Equipment Blank Lot Control Number
Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mm-YYYY)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (1)	Sample Number (2)	Sample Matrix (3)																	
<u>LHA014-SPLSD-091019</u>		<u>10 Sep 2019</u>	<u>1400</u>	-	<u>N</u>		<u>WG</u>	<u>6</u>																
<u>LHA014-SPLSD-091919-ATX</u>		<u>10 Sep 2019</u>	<u>1400</u>	-	<u>N</u>		<u>WG</u>	<u>1</u>																
<u>Trip Blank</u>		<u>10 Sep 2019</u>	<u>1400</u>	-	<u>TB</u>		<u>W</u>	<u>2</u>	<u>X</u>															

HS19090454

Bhate Environmental Associates, Inc.
 Trough GW Treatment Plant Monthly Effluent Sample

COMMENTS: STANDARD TAT

Relinquished By (Signed)				Received by (signed)				Sample Delivery Details / Laboratory Receipt			
<u>Scott Bessinger</u>	<u>9/10/19</u>	<u>1430</u>		<u>AC</u>	<u>9/11/19</u>	<u>08:54</u>		Delivered Directly to Lab: _____	Shipped _____	No.:	
2. _____				1. _____				Method of Shipment: _____			
3. _____				2. _____				Fed _____ Ex _____	Airbill _____	Number:	
				3. _____				Analytical Lab: <u>ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77029 (281) 530-5656</u>			
							<u>45038</u>	ATTN: <u>SONIA WEST</u>	Lab Recipient: _____	Delivery Date/Time: _____	

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)
 2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)
 3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)
 4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks
 5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.
 6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control



ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5687

CUSTODY SEAL

Date: 9/10/19 Time: 1430
Name: Scott Beesiner
Company: EMB

Seal Broken By:

9/10/19

**Must Deliver Next Business Day
Time and Temperature Sensitive!**



45038

ORIGIN ID: 56RA (903) 930-6193
SCOTT BEESINER
BATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PNB202

SHIP DATE: 22MAY18
ACTWT: 1.00 LB MAN
CAD: 300130/CAFE3111
DIMS: 26x14x14 IN

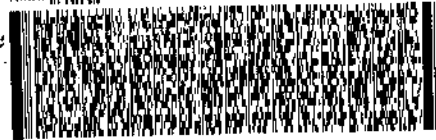
MARSHALL, TX 75670
UNITED STATES US

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099

(281) 690-6688

REF: LHAAP -- 19/24 SURFACE WATER -- RJ

RMA: 000000



FedEx
Express



RETURNS MON-SAT

FedEx

223 4380 9529 3512

WED - 11 SEP 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH



130 16276 185P19 GGA 50C1/904/ECBA



Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1925603; 1926281; 1926282;
1926283

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2292 (247901)

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 1926282001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 673905) was less than 1/2 the CRDL. The recovery for the LCS (673906) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on sample 1925603001 (Client ID: LH18/24-SP650_090419_AIX). 3.0 μ l of Working Standard Solution Horizon ID 43701 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 – 673903) is reported from the analysis of the Laboratory Control Sample (LCS – 673906) 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: 19MARI03) along with datafiles 17SEPD11. Sample 1926282001 failed the 50-150% method requirement for ISTD recovery. This sample was re-prepped, re-analyzed and reported.

Thomas Bosch September 18, 2019

Analyst

Date



ANALYTICAL REPORT

Report Date: September 19, 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: **34-1926281**

Project ID: HS19090454

Purchase Order: HS19090454

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_091019_AIX	1926281001	09/10/19	09/12/19	

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: 34-1926281

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: LH18/24-SP650_091019_AIX	Sampling Site: NA	Collected: 09/10/2019				
Lab ID: 1926281001	Media: 125 mL Nalgene	Received: 09/12/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2292 (HBN: 247901) Analyzed: 09/17/2019 10:37	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: 247901)

Field sample 1926282001 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 09/17/2019 14:12	/S/ Stephen Brose 09/19/2019 09:58

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: 34-1926281

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

00952189

Analysis Information

Workorder: 1926281

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2292 (HBN: 247901)
Analyzed By: Thomas Bosch

Blank

LMB: 673905 Analyzed: 09/17/2019 09:41 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 673906 Analyzed: 09/17/2019 08:57 Dilution: 1 Units: ug/L					
Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	2.72	3.00	90.5	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1925603001 Analyzed: 09/17/2019 09:55 Dilution: 1 Units: ug/L		MS: 673907 Analyzed: 09/17/2019 10:09 Dilution: 1 Units: ug/L				MSD: 673908 Analyzed: 09/17/2019 10:23 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	2.47	3	82.5	78.8 123.8	2.5	83.2	0.861	0.0 20.0

Comments

Field sample 1926282001 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 09/18/2019 11:11	/S/ Stephen Brose 09/19/2019 09:58

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



1926281

18098/2

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: 12145

SUBCONTRACT TO:

1926281

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: HS19090454
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19090454-02	LH18/24-SP650_091019_AIX	Water	10 Sep 2019 14:00
SUB_Perch-6850			25 Sep 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: 9/11/19 1800
 Date/Time: 9/12/19 09:59
 Temperature(s): _____

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston Project/Task/Site: 1926281
 Date/Time of Receipt: _____ Number of Coolers Received: 1
 Condition of Coolers: Acceptable/Unacceptable
 Cooler Custody Seals: Present/Absent/NA
 Container Custody Seals: Intact/Broken/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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 <u>9882</u>	<u>1</u> °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Jay Lynn Johnson Signature Jay Lynn Johnson Printed Name 9/12/19 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 # 159469-434 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

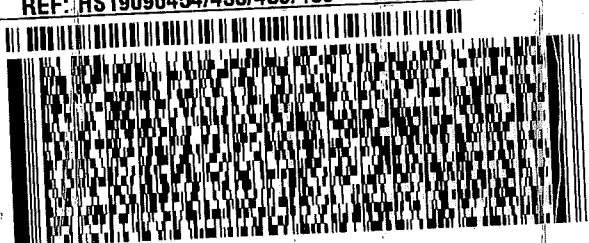
SHIP DATE: 11SEP19
ACTWGT: 13.55 LB
CAD: 300130/CAFE3211
DIMS: 14x10x10 IN
BILL THIRD PARTY

TO **SAMPLE RECEIVING**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123

(801) 288-7700

REF: HS19090454/455/456/459 - RJ



FedEx
Express



J181118060501 1W

TRK# 4809 7837 8521
0201

THU - 12 SEP 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC



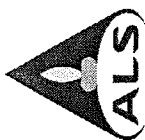
551CL/P004/104C



ALS Environmental CHAIN-OF-CUSTODY

Project / Job / Task: HS19090454		Split:		Workorder ID: 1926281		Level: ENV_LVL4		Requested Analysis											
Client: ALS Environmental (Houston)		Account: 8101		Matrix: EPA 6850, D+D QSM		Type: 125Poly													
Comments:																			
	Collect Date/Time	Sample ID	Lab ID	QC	Matrix		Containers		Count										
1	09/10/2019 14:00	LH18/24-SP650_091019_AIX	1926281001		Water		A		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)	Date / Time	Reason for Transfer / Storage Location	Sample Prep / Analysis for:		Lab Notebook No.:		
 P.33.1		09/12/2019 09:59	ALS Sample Receiving		Sample Login	Prepared / Analyzed by:			Date / Time:	
			 T. Bess		Storage	Relinquished By: (Signature)			Received By: (Signature)	
						Date / Time			Reason for Transfer / Storage Location	



Batch Worklist

HBN: 247901

Instrument: WP
Status: WP

Created: 9/17/2019 07:46
Analyst: T. Bosch

Batch: ELMS/ 2292
Rule: EPA 6850, DoD QSM Water

- Workorder: 1925603 [ENV_LVL4]
- Workorder: 1926281 [ENV_LVL4]
- Workorder: 1926282 [ENV_LVL4]
- Workorder: 1926283 [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	673902	CCV for HBN 247901 [ELMS/2292]				CCV	3		E685041C3Q	5311		9/19/2019	
2	673903	RLYS for HBN 247901 [ELMS/2292]				RLYS	3		E685041C3Q	5311		9/19/2019	
3	673904	ICS for HBN 247901 [ELMS/2292]				ICS	3		E6850.D3Q	5311		9/19/2019	
4	673905	LMB for HBN 247901 [ELMS/2292]				LMB	3		E6850Q413Q	5311		9/19/2019	
5	673906	LCS for HBN 247901 [ELMS/2292]				LCS	3		E6850Q413Q	5311		9/19/2019	
6	1925603001	LH18/24-SP650-090419-AIX				SAMPLE	3	1925603001-A	E6850Q41.3	5480	10/2/2019	9/19/2019	
7	673907	LH18/24-SP650...(1925603001MS)				MS	3		E6850Q413Q	5311		9/19/2019	
8	673908	LH18/24-SP65...(1925603001MSD)				MSD	3		E6850Q413Q	5311		9/19/2019	
9	1926281001	LH18/24-SP650_091019_AIX				SAMPLE	3	1926281001-A	E6850Q41.3	5480	10/8/2019	9/25/2019	
10	1926282001	LH18/24-SP140_091019				SAMPLE	3	1926282001-A	E6850Q41.3	5480	10/8/2019	9/25/2019	
11	1926283001	LH18/24-SP650_091019_AIX				SAMPLE	3	1926283001-A	E6850Q41.3	5480	10/8/2019	9/25/2019	
12	673909	CCV for HBN 247901 [ELMS/2292]				CCV	3		E685041C3Q	5311		9/19/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-upALS Work Order #'s & Sample #()'s: 1925603 (001); 1926281 (001) 1926282 (001); 1926283 (001)ELMS Batch/HBN ID: 2292 (247901)Prep Date: 09/16/2019 Analysis Date: 09/17/2019 Analyst: T. BoschAnalyte: **Perchlorate** Matrix: **Water** Method: **6850**Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\SEP\17SEP19D.sReported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**SAMPLE PREPARATION/ANALYSIS:

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

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

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

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.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: 40µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

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 673906; Target = 3.0µg/L. ASTM type II water was used for LMB 673905.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1925603001 (Client ID: LH18/24-SP650_090419_AIX). 3.0µL of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters. Field sample 1926282001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly. Sample 1926282001 failed the 50-150% method requirement for ISTD recovery. This sample was re-prepped, re-analyzed and reported.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\SEP\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\247901-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 673903) is reported from the analysis of the Laboratory Control Sample (LCS – 673906) 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: 19MARI03) along with datafiles 17SEPD11.

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: 2292 HBN: 247901</u> <u>1926283</u>		
Sample Set IDs if Applicable: <u>1925603/1926281/1926282</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	—	— SB
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 - CLO4 WRK

CLO4 WRK			Description - 6850.WKG Std:100.ug/L		
Standard: 43702		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/18/2018 02:09PM		Expires: 09/18/2019	
MFG Lot: TNB: 09/18/2018				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 WRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019



STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK			Description - 6850: Stock AccStd 1,000ug/mL
Standard: 43659		Created By: Thomas Bosch	
MFG: AccuStandard		Create Date: 09/17/2018 09:09AM	
MFG Lot: 218065075		Amount: 100 mL	
Part ID: IC-PER-10X-1		Expires: 07/25/2020	
		Usable: No	
		Lab Lot: CLO4 STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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: 43701		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/18/2018 02:09PM		Expires: 09/18/2019	
MFG Lot: TNB: 09/18/2018				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 INT	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020



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



STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK			Description - Perchlorate ISTD Wrk 1,000ug/L		
Standard: 43730		Created By: Thomas Bosch		Amount: 25 mL	
MFG: ALS/SLC		Create Date: 09/20/2018 09:09AM		Expires: 09/20/2019	
MFG Lot: TNB: 05/09/2018		Verified By: Thomas Bosch		Usable: Yes	
Pipette ID: Not Provided		Verify Date:		Lab Lot: CLO4ISTDWRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026



STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK			Description - Perchlorate ISTD Stock
Standard: 43729		Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope		Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFP-012A		Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S		Verify Date:	Lab Lot: CLO4ISTDSTK
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL



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.





Certificate of Analysis



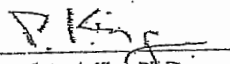
ISO Guide 34 Reference Material

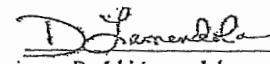
Product Number: ICC-013
Lot Number: CP-0860

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 QAVRA



125 Market Street
New Haven, CT 06513
USA



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

CERTIFICATE OF ANALYSIS



S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (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

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

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



23118

Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDDG-013

Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

Labeled CAS Number: NA

Unlabeled CAS Number: 7601-89-0

MW*: 130.4

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.

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

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

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

Approved by: T. J. Eckersley

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

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 $\mu\text{g/mL}$
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 \pm 2.8 $\mu\text{g/mL}$ (k=2)



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP2.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	
*	673902	CCV@25	Vial 71	1	Control	1	2.11095e6	7.718	26.01274
*	673906	QC@3.0	Vial 72	1	Control	2	2.38232e5	7.546	2.71615
*	673904	ICS@3.0	Vial 73	1	Control	3	1.94502e5	7.427	3.19438
*	673905	LMB	Vial 74	1	Control	5	0.00000	0.000	0.00000
*	1925603001		Vial 75	1	Sample	6	0.00000	0.000	0.00000
*	673907	256031S	Vial 76	1	Sample	7	1.44508e5	7.417	2.47376
*	673908	256031D	Vial 77	1	Sample	8	1.50348e5	7.390	2.49518
*	1926281001		Vial 78	1	Sample	9	0.00000	0.000	0.00000
*	1926282001	1K	Vial 79	1	Sample	10	7.57421e5	7.740	4926.17796 <i>-NR REP</i>
*	1926283001		Vial 80	1	Sample	11	5.00363e4	7.319	9.83188e-1 <i>< RL</i>
*	1926282001	1K	Vial 79	1	Sample	12	4.98891e5	7.765	4904.43754
*	673909	CCV@25	Vial 71	1	Control	13	2.04203e6	7.785	26.00821

##	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
*	673902	CCV@25	Vial 71	1	Control	1	6.35094e5	7.742	26.35431
*	673906	QC@3.0	Vial 72	1	Control	2	7.43744e4	7.563	2.70140
*	673904	ICS@3.0	Vial 73	1	Control	3	6.33519e4	7.450	3.34525
*	673905	LMB	Vial 74	1	Control	5	0.00000	0.000	0.00000
*	1925603001		Vial 75	1	Sample	6	0.00000	0.000	0.00000
*	673907	256031S	Vial 76	1	Sample	7	5.21915e4	7.445	2.82706
*	673908	256031D	Vial 77	1	Sample	8	5.26531e4	7.420	2.76701
*	1926281001		Vial 78	1	Sample	9	0.00000	0.000	0.00000
*	1926282001	1K	Vial 79	1	Sample	10	2.36316e5	7.779	5035.13054
*	1926283001		Vial 80	1	Sample	11	1.87749e4	7.329	1.04440
*	1926282001	1K	Vial 79	1	Sample	12	1.57327e5	7.787	5065.48124
*	673909	CCV@25	Vial 71	1	Control	13	6.17795e5	7.802	26.48941

##	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-ISTD RT	CLO4-89-ISTD Amount	
*	673902	CCV@25	Vial 71	1	Control	1	2.46298e5	7.734	5.00000
*	673906	QC@3.0	Vial 72	1	Control	2	2.95565e5	7.573	5.00000
*	673904	ICS@3.0	Vial 73	1	Control	3	2.03094e5	7.453	5.00000
*	673905	LMB	Vial 74	1	Control	5	2.63662e5	7.809	5.00000
*	1925603001		Vial 75	1	Sample	6	2.04752e5	7.431	5.00000
*	673907	256031S	Vial 76	1	Sample	7	1.98153e5	7.432	5.00000
*	673908	256031D	Vial 77	1	Sample	8	2.04262e5	7.411	5.00000
*	1926281001		Vial 78	1	Sample	9	1.87883e5	7.386	5.00000
*	1926282001	1K	Vial 79	1	Sample	10	5.01727e5	7.772	5000.00000 <i>ISTD</i>
*	1926283001		Vial 80	1	Sample	11	1.93087e5	7.333	5.00000 <i>HIGH</i>
*	1926282001	1K	Vial 79	1	Sample	12	3.32002e5	7.798	5000.00000 <i>REP</i>
*	673909	CCV@25	Vial 71	1	Control	13	2.38300e5	7.815	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	673902	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	673906	QC@3.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	673904	ICS@3.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	673905	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 74	673905	LMB	CLO4-AQN	1	Ctrl Samp	
6	Vial 75	1925603001		CLO4-AQN	1	Sample	
7	Vial 76	673907	256031S	CLO4-AQN	1	Sample	
8	Vial 77	673908	256031D	CLO4-AQN	1	Sample	
9	Vial 78	1926281001		CLO4-AQN	1	Sample	
10	Vial 79	1926282001	1K	CLO4-AQN	1	Sample	
11	Vial 80	1926283001		CLO4-AQN	1	Sample	
12	Vial 79	1926282001	1K	CLO4-AQN	1	Sample	
13	Vial 71	673909	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD01.D

Sample Name: 673902 CCV@25

Injection Date: 9/17/2019 08:40:19

Seq Line: 1

Sample Name: 673902 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

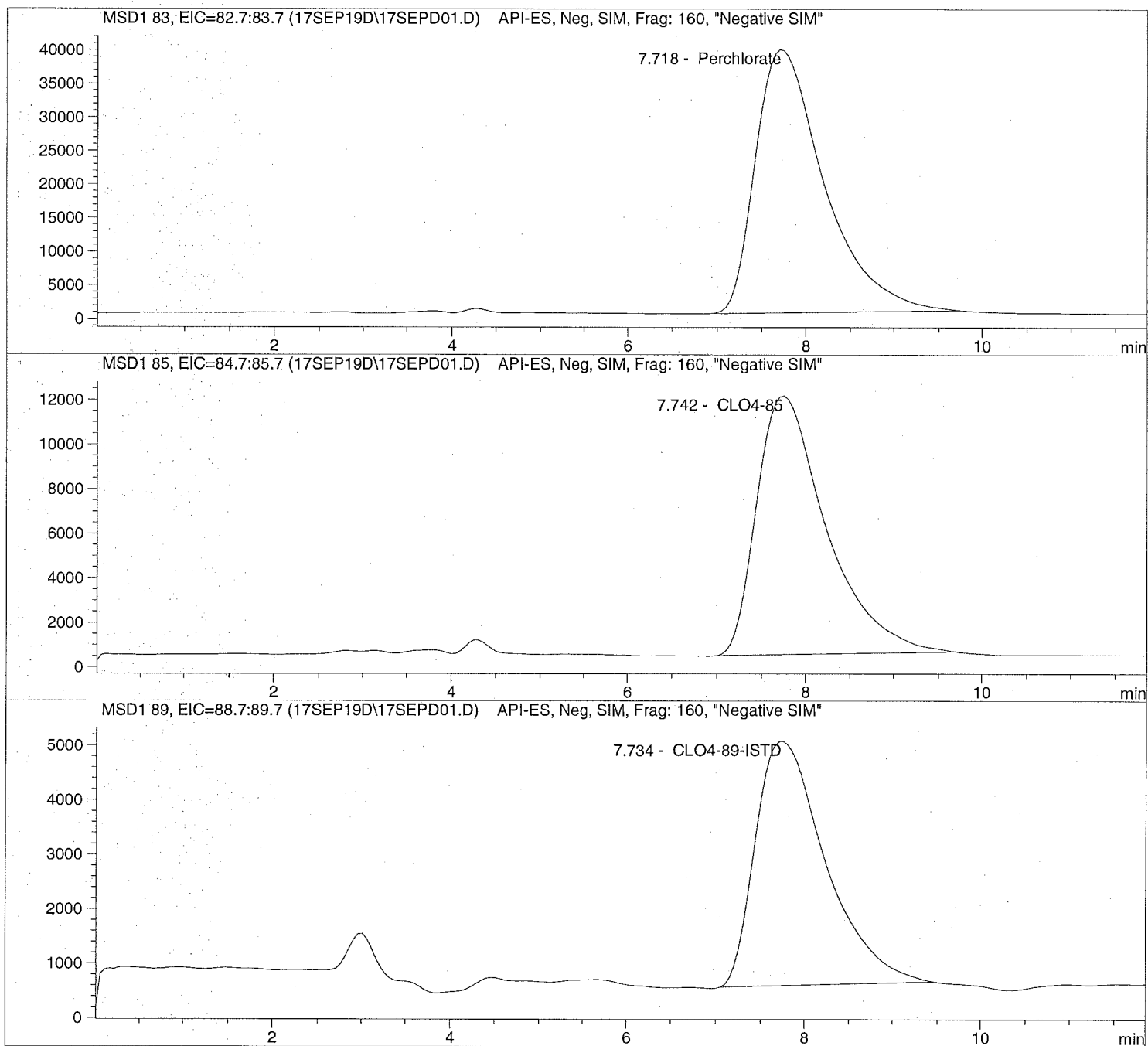
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD01.D Sample Name: 673902 CCV@25

```

=====
Injection Date: 9/17/2019 08:40:19      Seq Line: 1
Sample Name: 673902      CCV@25      Location: Vial 71
Acq Operator: TNB      Inj. No.: 1
                                         Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.718	PBA	2110953.5	26.0127	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.742	PBA	635093.8	26.3543	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.734	PBA	246298.2	5.0000	CLO4-89-ISTD

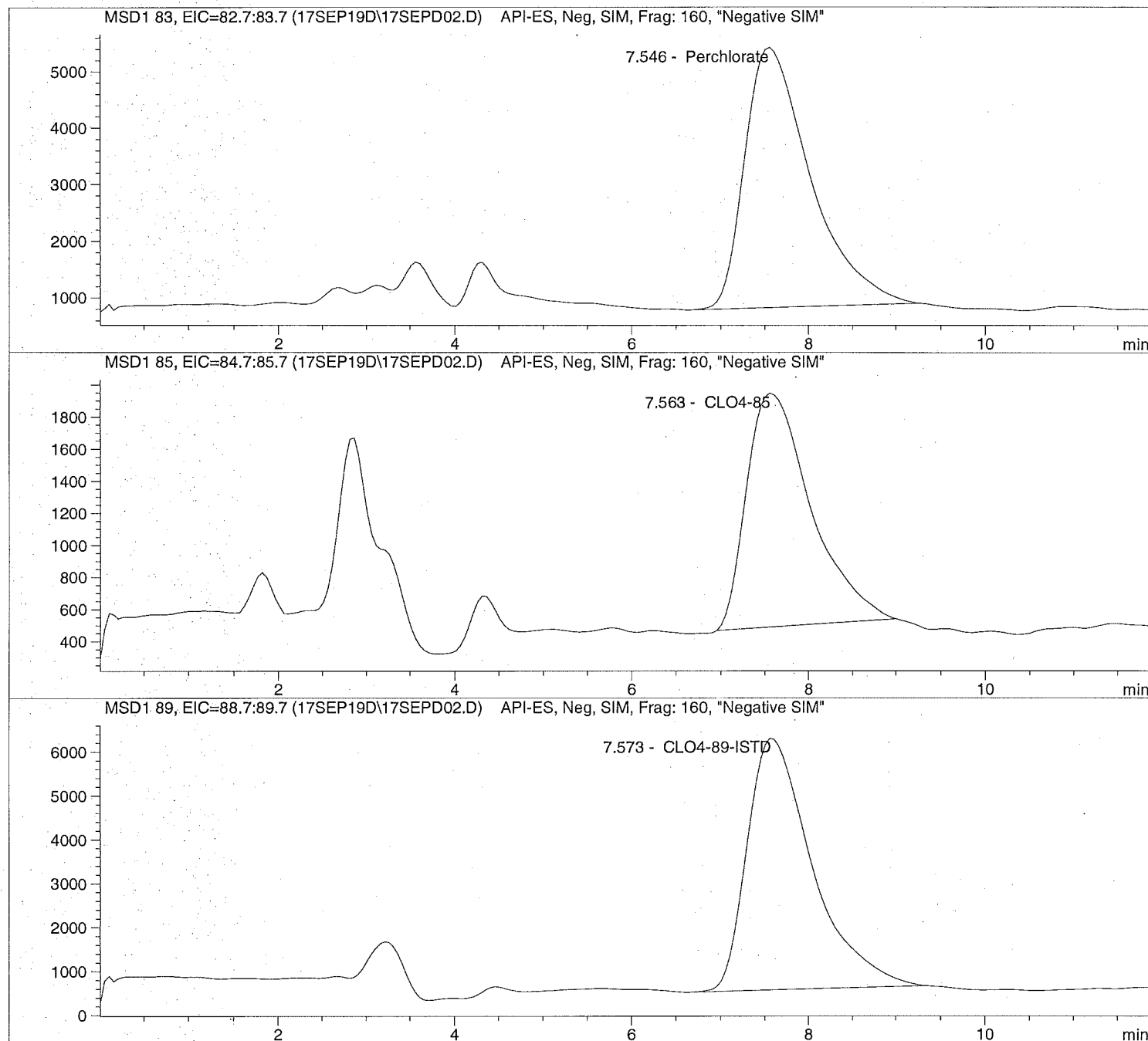
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD02.D Sample Name: 673906 QC@3.0

=====
Injection Date: 9/17/2019 08:57:27 Seq Line: 2
Sample Name: 673906 QC@3.0 Location: Vial 72
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD02.D Sample Name: 673906 QC@3.0

=====
 Injection Date: 9/17/2019 08:57:27 Seq Line: 2
 Sample Name: 673906 QC@3.0 Location: Vial 72
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
 Last Changed: 9/17/2019 12:34:41

Perchlorate analysis

=====
 Sample Information
 =====

Sorted By: Signal
 Calib. Data Modified: Tue, 20. Aug. 2019, 10:15:00 am
 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
7.546	PBA	238232.5	2.7161	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.563	PBA	74374.4	2.7014	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.573	PBA	295565.3	5.0000	CLO4-89-ISTD

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

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD03.D

Sample Name: 673904 ICS@3.0

Injection Date: 9/17/2019 09:11:28

Seq Line: 3

Sample Name: 673904 ICS@3.0

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

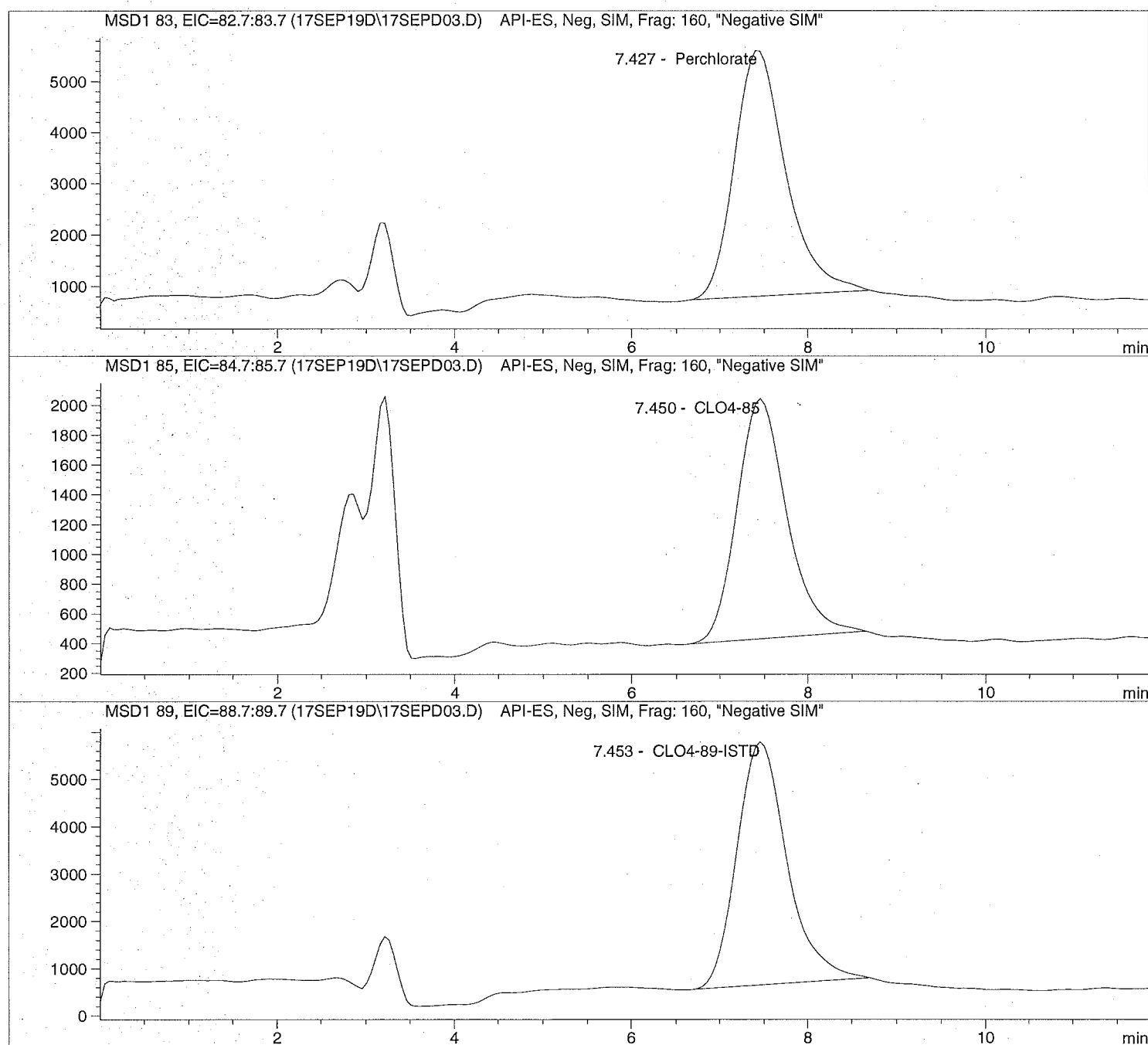
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD03.D Sample Name: 673904 ICS@3.0

```

=====
Injection Date: 9/17/2019 09:11:28      Seq Line: 3
Sample Name:    673904 ICS@3.0          Location:  Vial 73
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 40 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.427	PBA	194501.8	3.1944	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.450	PBA	63351.9	3.3452	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.453	PBA	203094.5	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD05.D

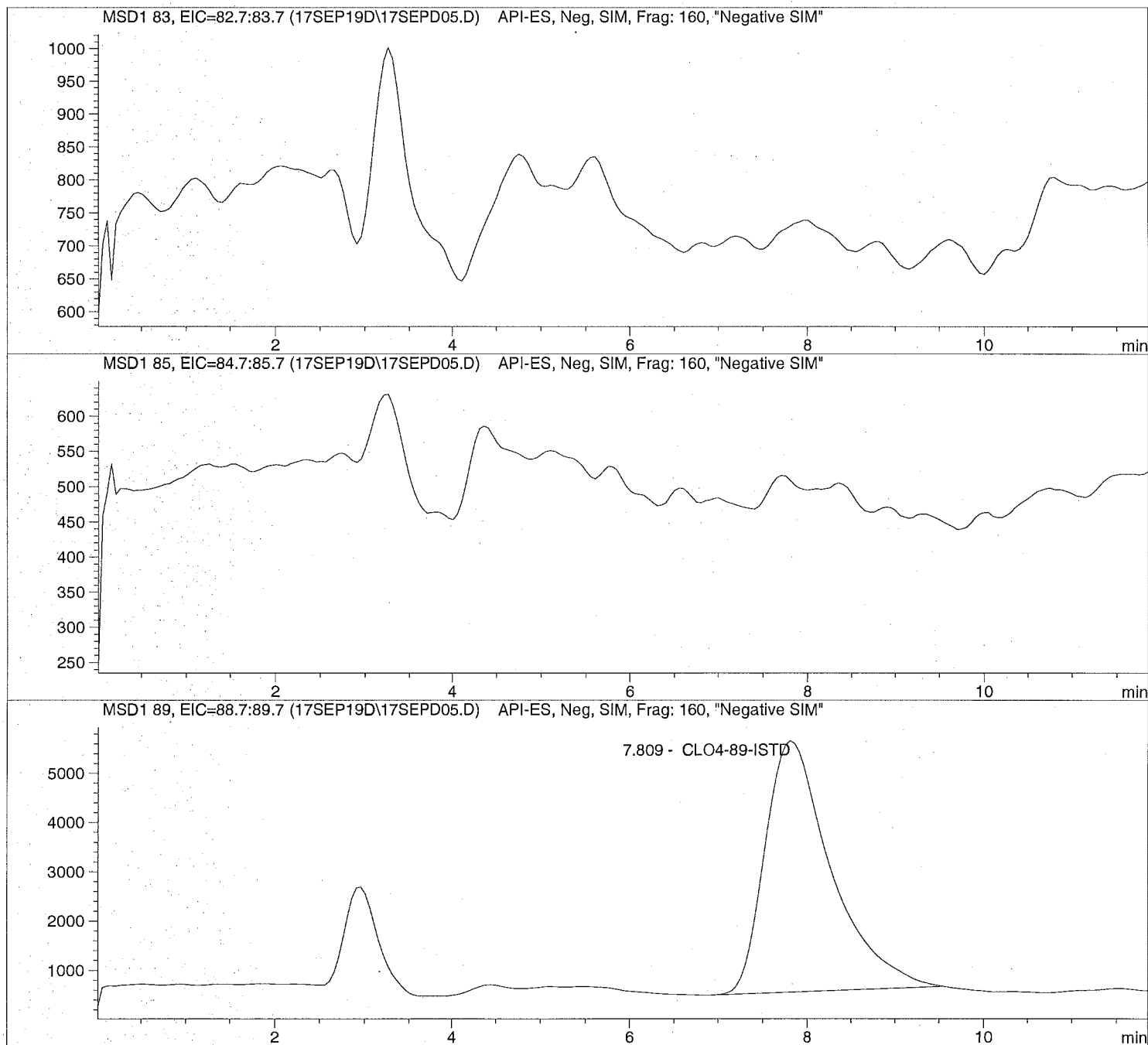
Sample Name: 673905 LMB

Injection Date: 9/17/2019 09:41:11
Sample Name: 673905 LMB
Acq Operator: TNB

Seq Line: 5
Location: Vial 74
Inj. No.: 1
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD05.D Sample Name: 673905 LMB

```

=====
Injection Date: 9/17/2019 09:41:11      Seq Line:          5
Sample Name:    673905 LMB                Location:         Vial 74
Acq Operator:   TNB                       Inj. No.:        1
                                           Inj. Vol.:       40 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019, 10:15:00 am
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
7.809	PBA	263661.9	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD06.D

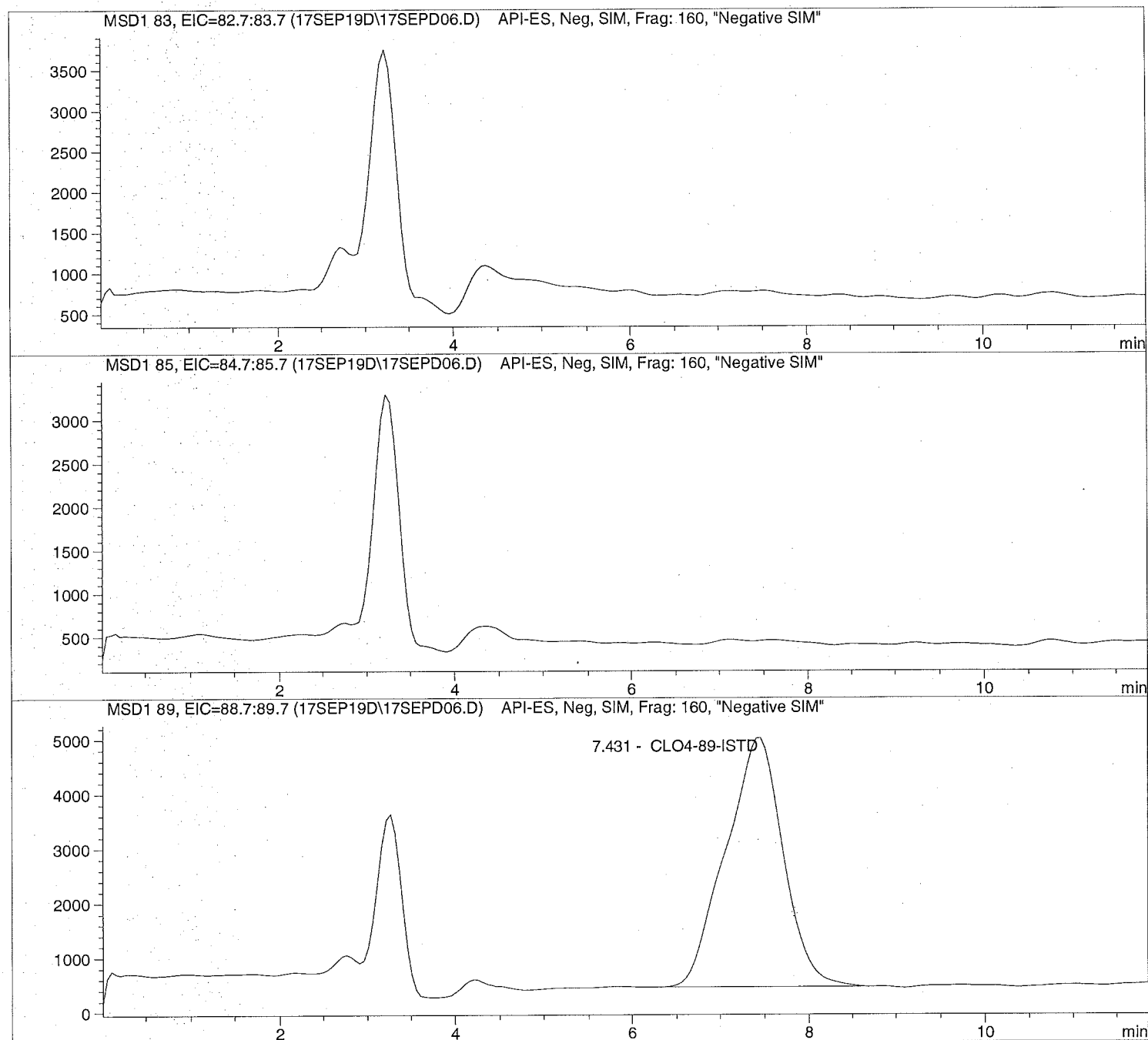
Sample Name: 1925603001

Injection Date: 9/17/2019 09:55:10
Sample Name: 1925603001
Acq Operator: TNB

Seq Line: 6
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD06.D

Sample Name: 1925603001

```

=====
Injection Date: 9/17/2019 09:55:10      Seq Line: 6
Sample Name: 1925603001                Location: Vial 75
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019, 10:15:00 am
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
7.431	BBA	204752.5	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD07.D

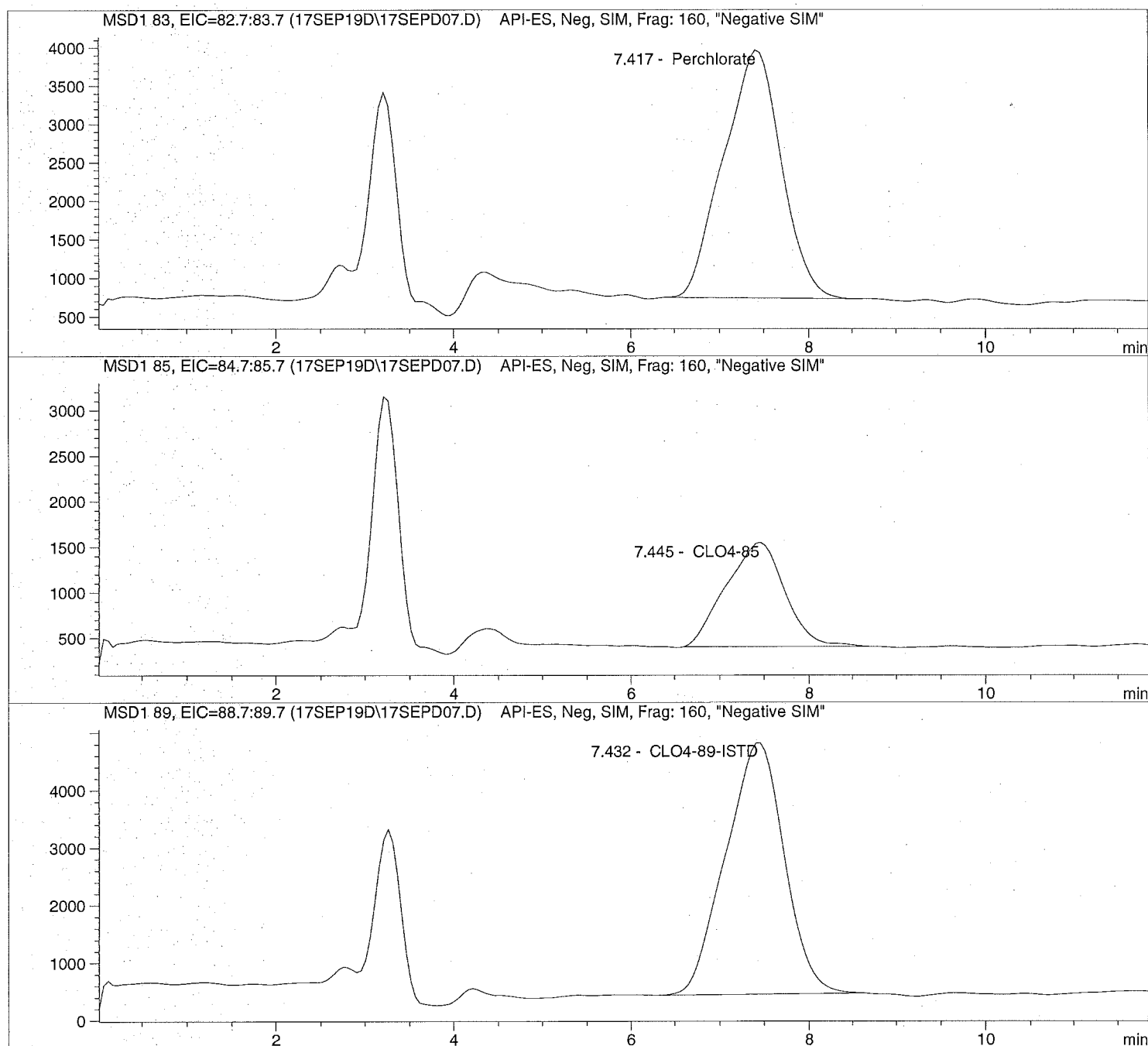
Sample Name: 673907 256031S

Injection Date: 9/17/2019 10:09:10
Sample Name: 673907 256031S
Acq Operator: TNB

Seq Line: 7
Location: Vial 76
Inj. No.: 1
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD07.D Sample Name: 673907 256031S

```

=====
Injection Date: 9/17/2019 10:09:10      Seq Line: 7
Sample Name: 673907 256031S             Location: Vial 76
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.417	PBA	144507.9	2.4738	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.445	PBA	52191.5	2.8271	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.432	PBA	198152.6	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD08.D

Sample Name: 673908 256031D

Injection Date: 9/17/2019 10:23:18

Seq Line: 8

Sample Name: 673908 256031D

Location: Vial 77

Acq Operator: TNB

Inj. No.: 1

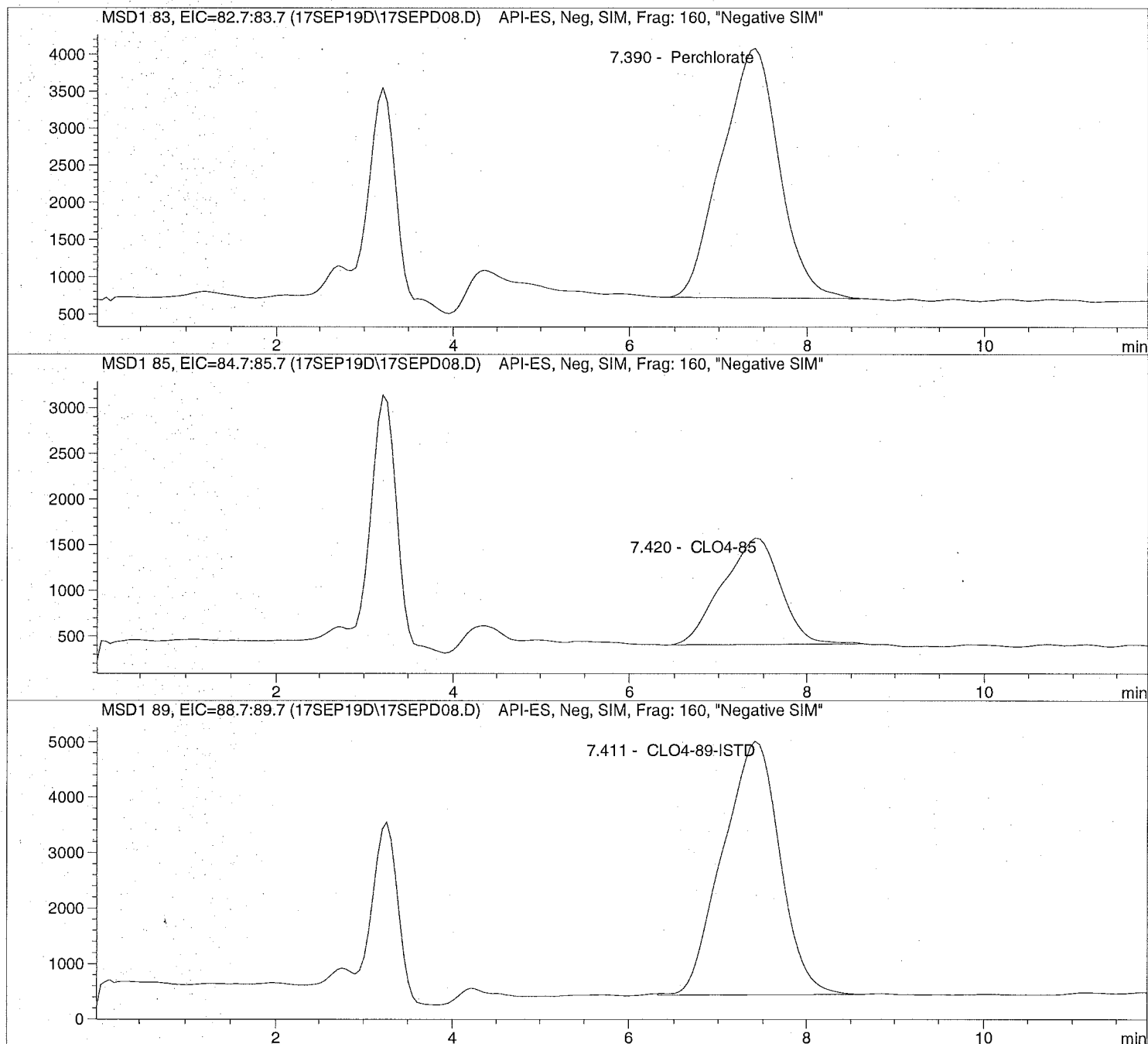
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD08.D Sample Name: 673908 256031D

```

=====
Injection Date: 9/17/2019 10:23:18      Seq Line:      8
Sample Name:    673908 256031D          Location:      Vial 77
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    40 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.390	PBA	150348.3	2.4952	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.420	PBA	52653.1	2.7670	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.411	BBA	204262.4	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD09.D

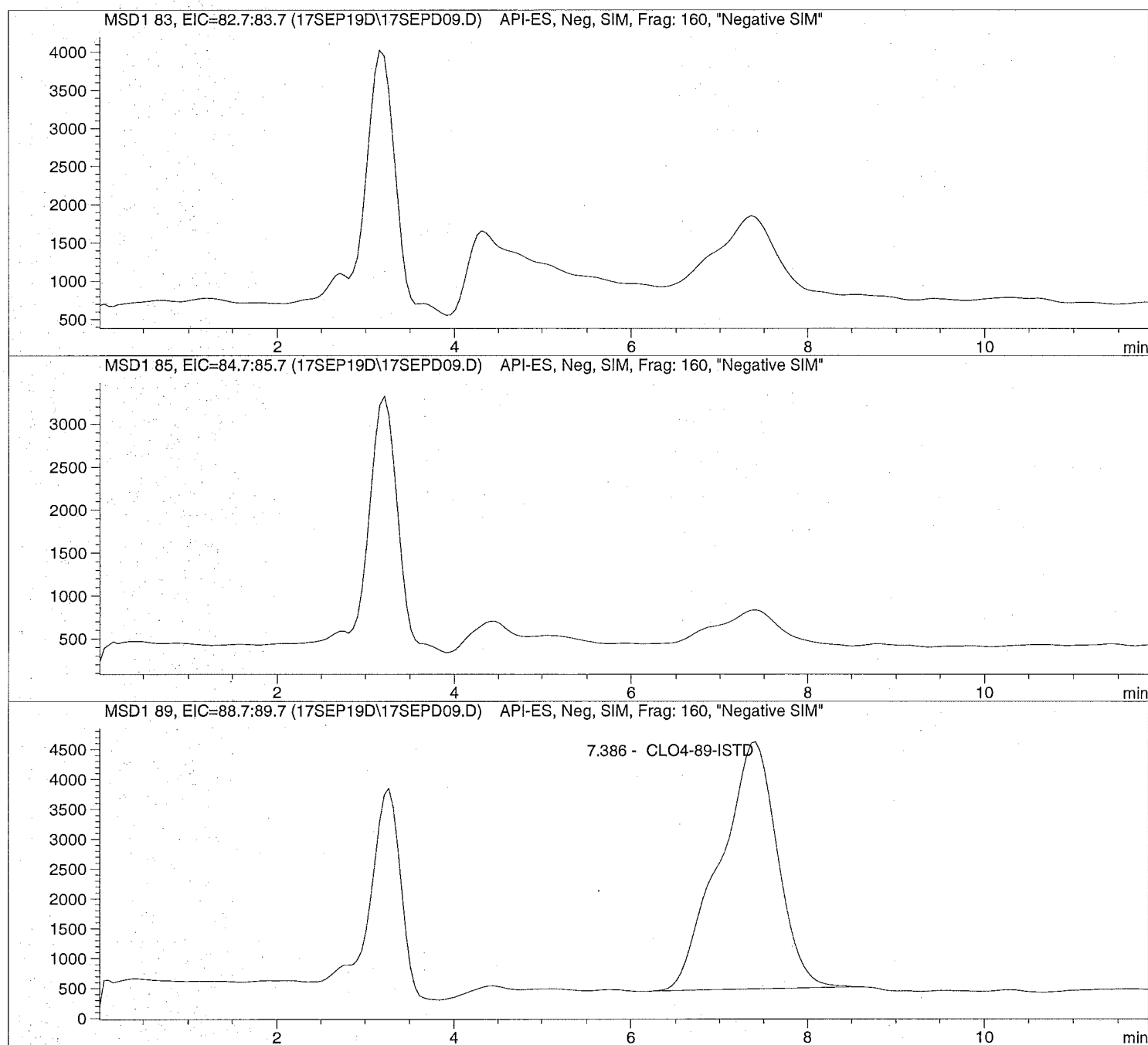
Sample Name: 1926281001

Injection Date: 9/17/2019 10:37:19
Sample Name: 1926281001
Acq Operator: TNB

Seq Line: 9
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD09.D

Sample Name: 1926281001

```

=====
Injection Date:  9/17/2019  10:37:19      Seq Line:      9
Sample Name:    1926281001                Location:      Vial 78
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    40 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/17/2019  12:34:41
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified:  Tue, 20. Aug. 2019,10:15:00 am
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
7.386	PBA	187882.8	5.0000	CLO4-89-ISTD

```

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

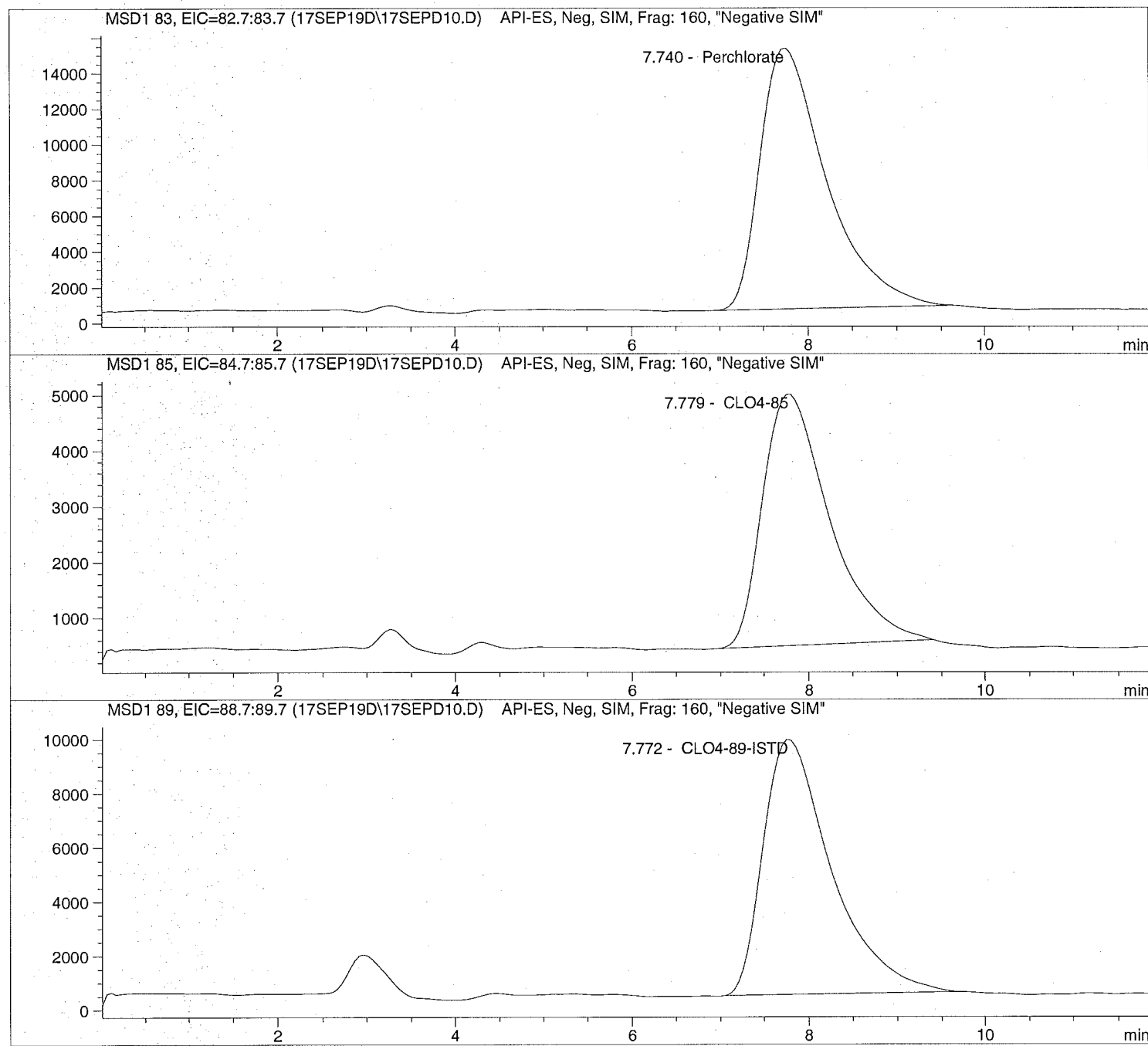
```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD10.D Sample Name: 1926282001 1K

```
=====
Injection Date: 9/17/2019 10:51:21      Seq Line:      10
Sample Name:    1926282001 1K          Location:      Vial 79
Acq Operator:   TNB                    Inj. No.:     1
                                           Inj. Vol.:    40 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/17/2019 12:34:41
=====
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD10.D Sample Name: 1926282001 1K

```

=====
Injection Date:  9/17/2019  10:51:21            Seq Line:            10
Sample Name:     1926282001    1K            Location:            Vial 79
Acq Operator:    TNB                            Inj. No.:            1
                                                 Inj. Vol.:            40 µl

```

```

Acq. Method:     CLO4-AQN.M
Analysis Method:  C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:    9/17/2019  12:34:41

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:                    Signal
Calib. Data Modified:        Tue, 20. Aug. 2019,10:15:00 am
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
7.740	PBA	757420.9	4926.1780	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.779	PBA	236315.7	5035.1305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.772	PBA	501726.5	5000.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD11.D

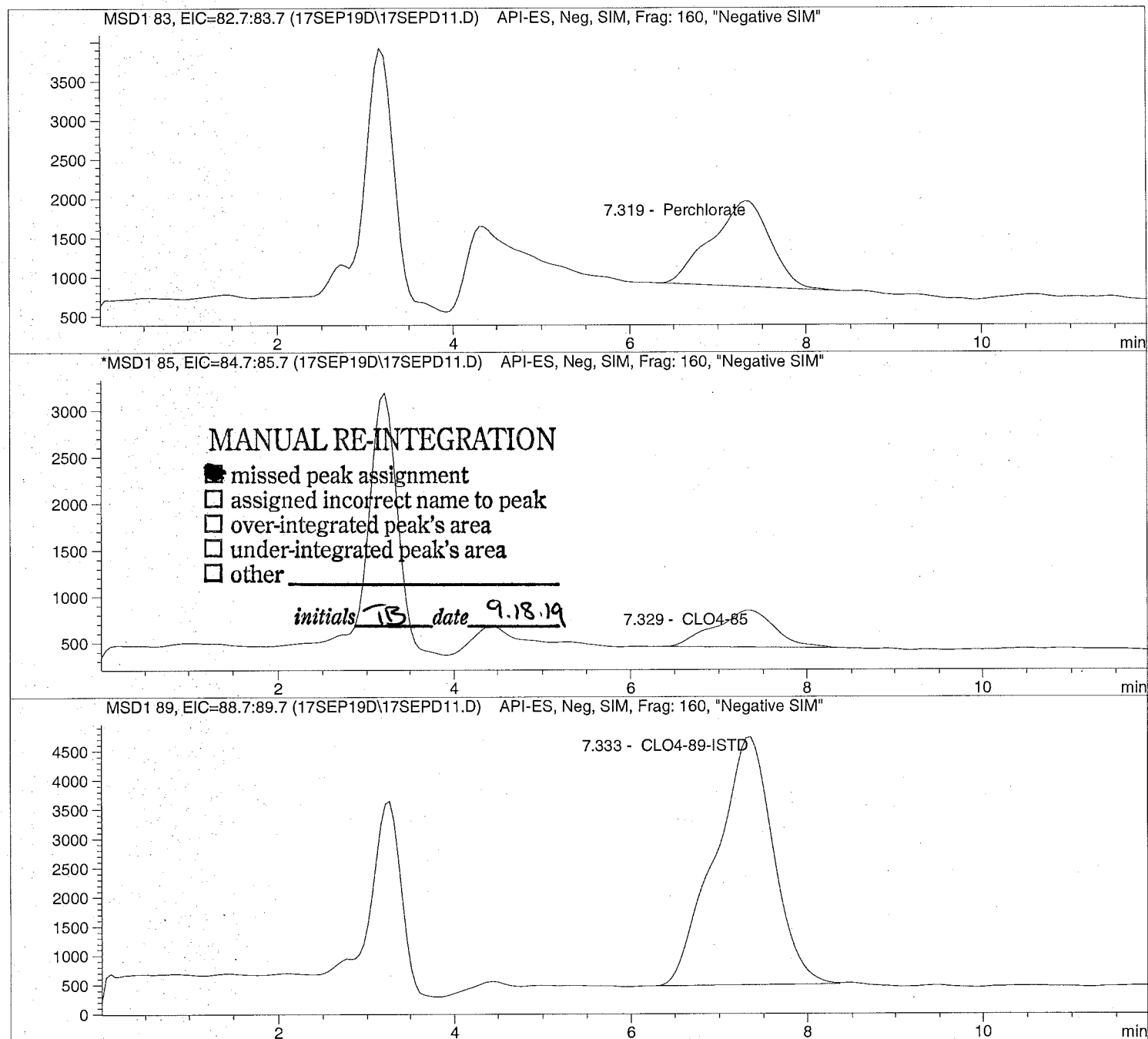
Sample Name: 1926283001

Injection Date: 9/17/2019 11:05:22
Sample Name: 1926283001
Acq Operator: TNB

Seq Line: 11
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD11.D Sample Name: 1926283001

```

=====
Injection Date: 9/17/2019 11:05:22 Seq Line: 11
Sample Name: 1926283001 Location: Vial 80
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019, 10:15:00 am
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
7.319	PBA	50036.3	0.9832	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.329	MM	18774.9	1.0444	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.333	PBA	193086.8	5.0000	CLO4-89-ISTD

```

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

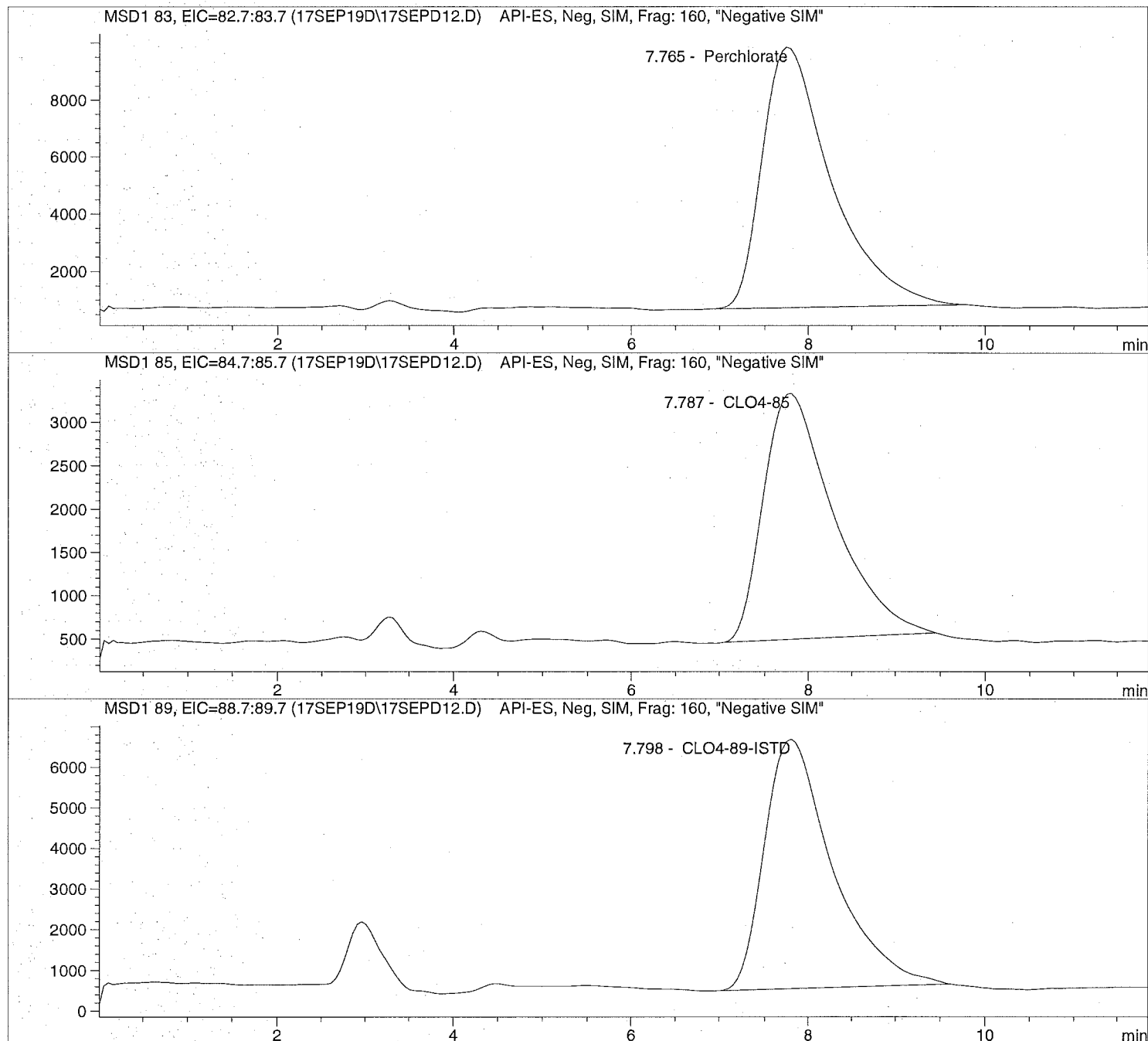
```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD12.D Sample Name: 1926282001 1K

=====
Injection Date: 9/17/2019 11:22:08 Seq Line: 12
Sample Name: 1926282001 1K Location: Vial 79
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD12.D Sample Name: 1926282001 1K

```

=====
Injection Date: 9/17/2019 11:22:08      Seq Line:      12
Sample Name:    1926282001 1K           Location:      Vial 79
Acq Operator:   TNB                    Inj. No.:     1
                                           Inj. Vol.:    40 µl

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/17/2019 12:34:41

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.765	PBA	498890.6	4904.4375	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.787	PBA	157326.7	5065.4812	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.798	PBA	332001.9	5000.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD13.D

Sample Name: 673909 CCV@25

Injection Date: 9/17/2019 11:37:02

Seq Line: 13

Sample Name: 673909 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

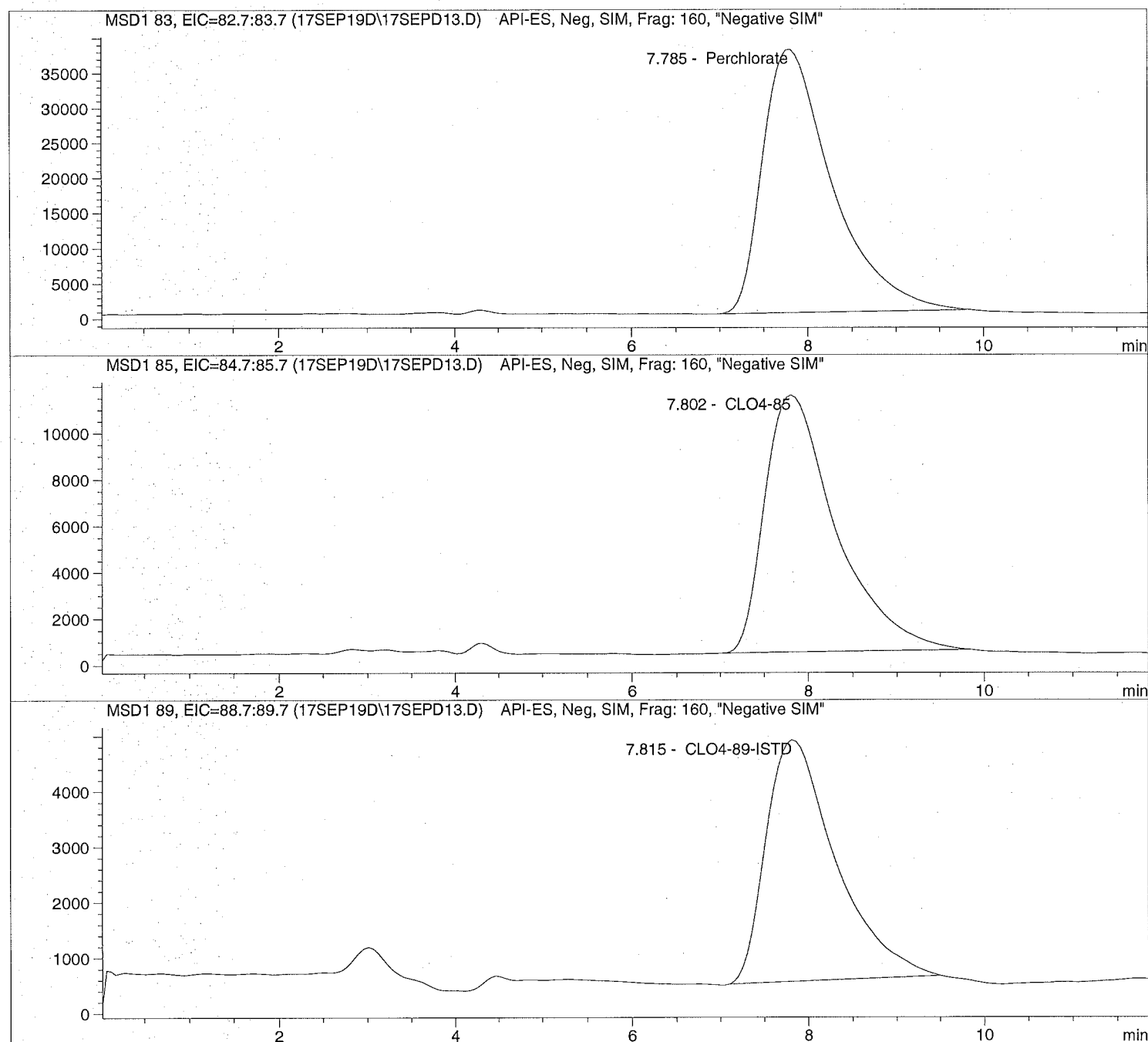
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD13.D Sample Name: 673909 CCV@25

```
=====
Injection Date:  9/17/2019  11:37:02           Seq Line:      13
Sample Name:    673909   CCV@25             Location:      Vial 71
Acq Operator:   TNB                               Inj. No.:     1
                                           Inj. Vol.:    40 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/17/2019  12:34:41
=====
```

Perchlorate analysis

=====

Sample Information

=====

```
Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.785	PBA	2042028.8	26.0082	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.802	PBA	617795.5	26.4894	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.815	PBA	238300.4	5.0000	CLO4-89-ISTD

=====

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

**Initial
Calibration**

=====
 Calibration Table
 =====

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 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	Amount	Area	Amt/Area	Ref Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5	1 Perchlorate
		2	2.00000	1.35273e5	1.47849e-5	
		3	5.00000	3.37764e5	1.48033e-5	
		4	10.00000	6.83454e5	1.46316e-5	
		5	25.00000	2.08433e6	1.19943e-5	
		6	50.00000	4.13334e6	1.20968e-5	
		7	75.00000	5.99313e6	1.25143e-5	
8.755	2	1	1.00000	2.36780e4	4.22333e-5	1 CLO4-85
		2	2.00000	4.69486e4	4.25998e-5	
		3	5.00000	1.06124e5	4.71147e-5	
		4	10.00000	2.13523e5	4.68335e-5	
		5	25.00000	6.14295e5	4.06971e-5	
		6	50.00000	1.19814e6	4.17315e-5	
		7	75.00000	1.78355e6	4.20509e-5	
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1 CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5	
		3	5.00000	2.33196e5	2.14412e-5	
		4	5.00000	2.34454e5	2.13262e-5	
		5	5.00000	2.50568e5	1.99547e-5	
		6	5.00000	2.30977e5	2.16472e-5	

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp Name
7		5.00000	2.21504e5	2.25729e-5	

More compound-specific settings:

Compound: Perchlorate

Time Window : From 6.654 min To 12.544 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333

Compound: CLO4-85

Time Window : From 6.650 min To 12.505 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333

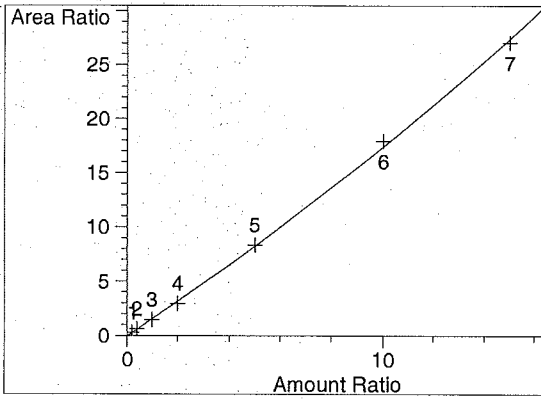
Compound: CLO4-89-ISTD

Time Window : From 6.659 min To 12.466 min
 Curve Type : Linear
 Origin : Included
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 1
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1

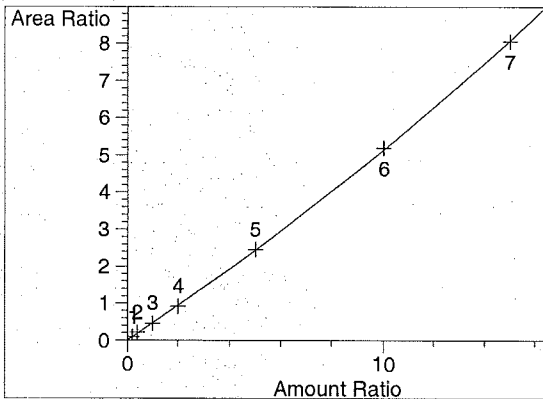
=====
 Peak Sum Table
 =====

No Entries in table
 =====

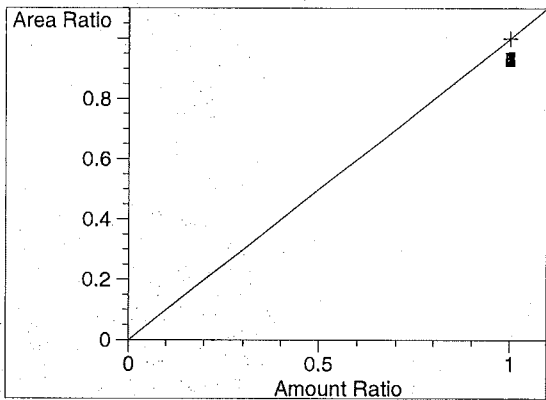
=====
 Calibration Curves
 =====



Perchlorate at exp. RT: 8.744
 MSD1 83, EIC=82.7:83.7
 Correlation: 0.99957
 Residual Std. Dev.: 0.30744
 Formula: $y = ax^2 + bx + c$
 a: 1.76988e-2
 b: 1.56480
 c: -4.92430e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
 MSD1 85, EIC=84.7:85.7
 Correlation: 0.99983
 Residual Std. Dev.: 0.03473
 Formula: $y = ax^2 + bx + c$
 a: 5.13396e-3
 b: 4.62055e-1
 c: 4.97209e-4
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
 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 1 : 1
 Level 2 : 1
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP2.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	7.76074e4	8.744	1.06245
##	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
##	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
##	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
##	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
##	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
##	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
##	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

##	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
##	---	---	---	---	---	---	---	---
##	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
##	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
##	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
##	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
##	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
##	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
##	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
##	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

##	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	2.73208e5	8.766	5.00000
##	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
##	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
##	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
##	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
##	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
##	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
##	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** 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 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\19MAR19\19MARI03.D

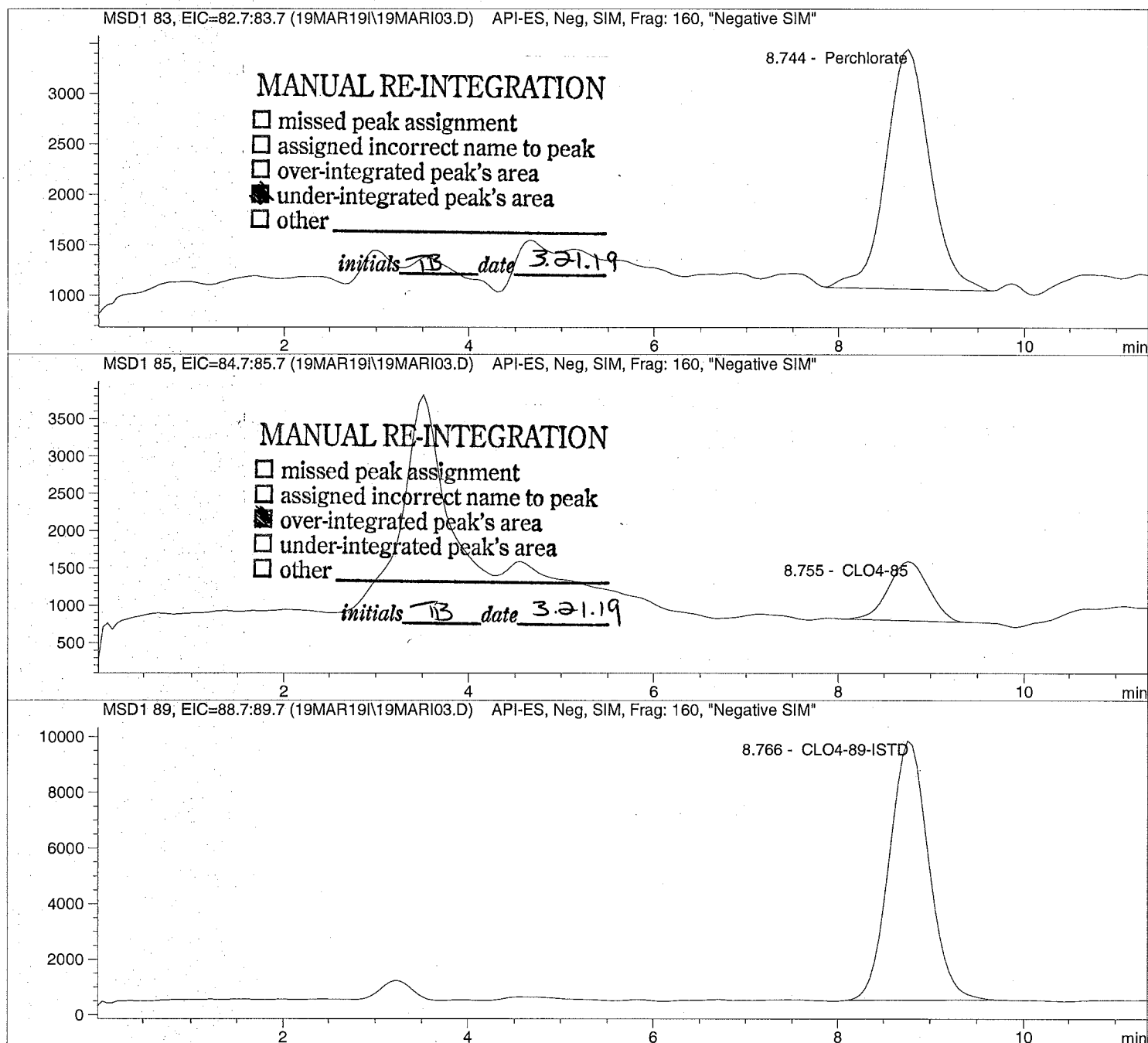
Sample Name: CLO4@ 1.0ug/L

Injection Date: 3/19/2019 09:39:40
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 3/19/2019 09:39:40      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-DP2.M
Last Changed:   3/19/2019 14:35:22

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D

Sample Name: CLO4@ 2.0ug/L

Injection Date: 3/19/2019 09:53:00

Seq Line: 4

Sample Name: CLO4@ 2.0ug/L

Location: Vial 74

Acq Operator: TNB

Inj. No.: 1

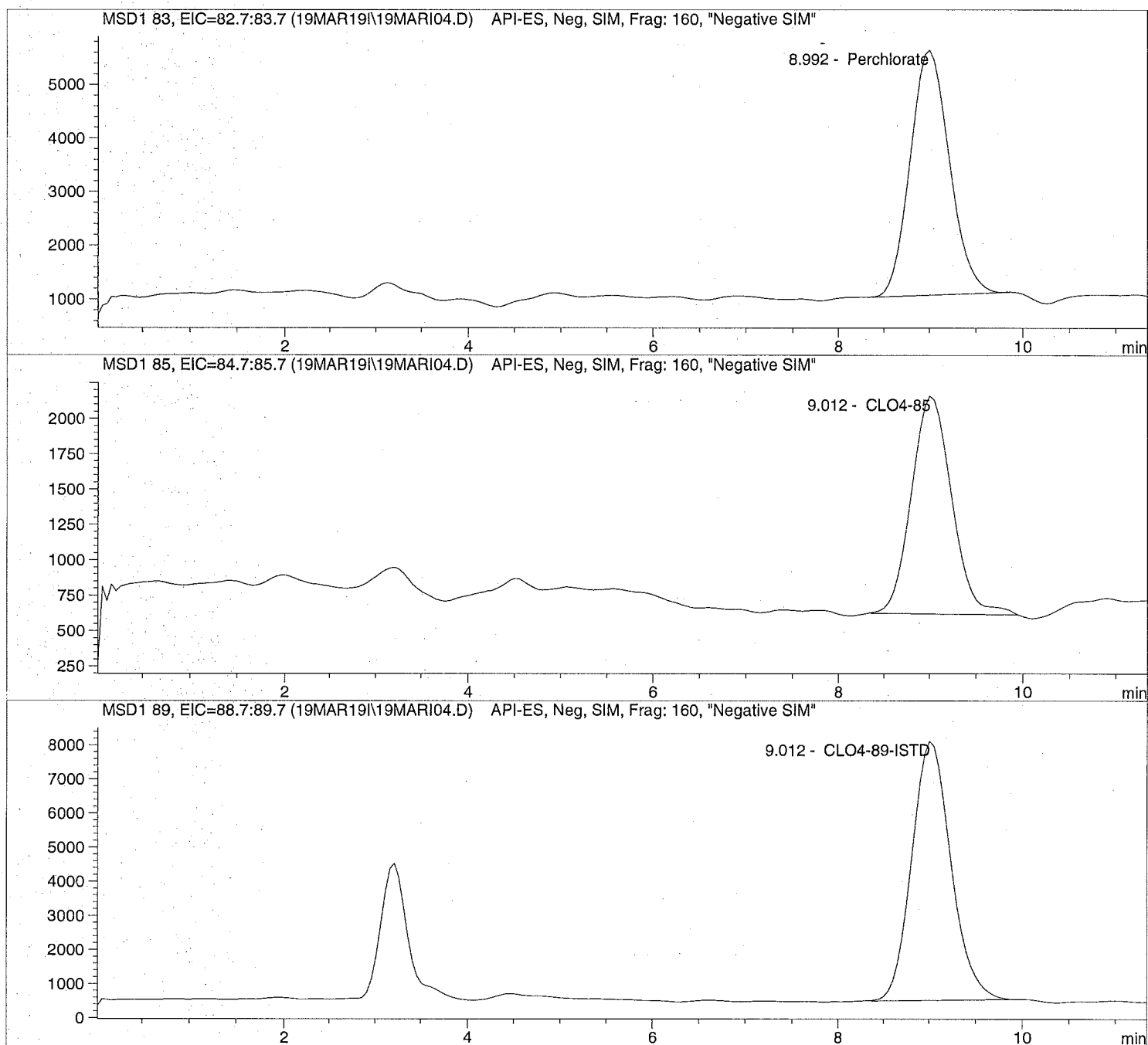
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

```

=====
Injection Date: 3/19/2019 09:53:00      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019, 02:35:19 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
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\19MAR19\19MARI05.D

Sample Name: CLO4@ 5.0ug/L

Injection Date: 3/19/2019 10:06:16

Seq Line: 5

Sample Name: CLO4@ 5.0ug/L

Location: Vial 75

Acq Operator: TNB

Inj. No.: 1

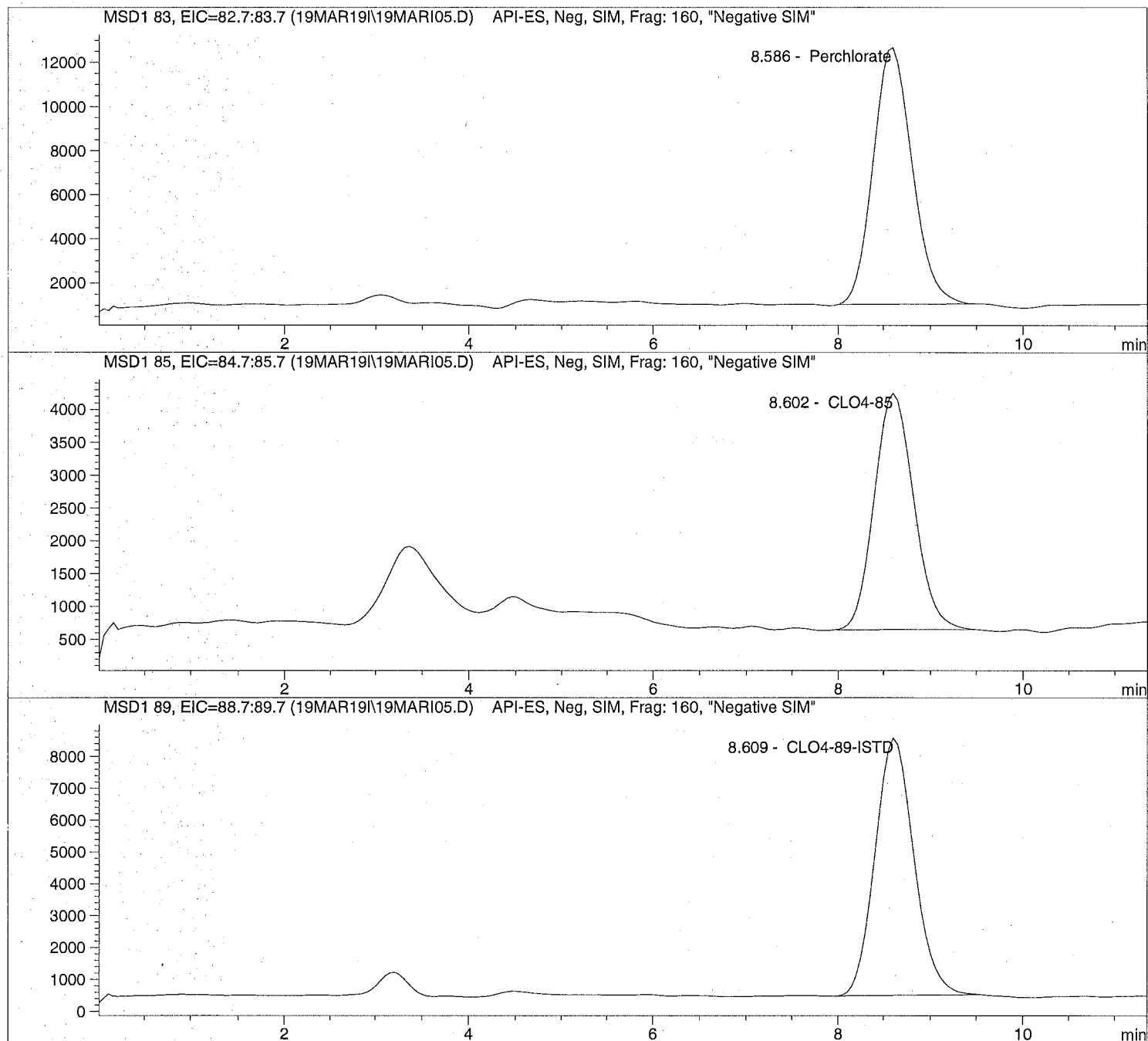
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D

Sample Name: CLO4@ 5.0ug/L

```

=====
Injection Date: 3/19/2019 10:06:16      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\19MAR19\19MARI06.D

Sample Name: CLO4@ 10.ug/L

Injection Date: 3/19/2019 10:19:32

Seq Line: 6

Sample Name: CLO4@ 10.ug/L

Location: Vial 76

Acq Operator: TNB

Inj. No.: 1

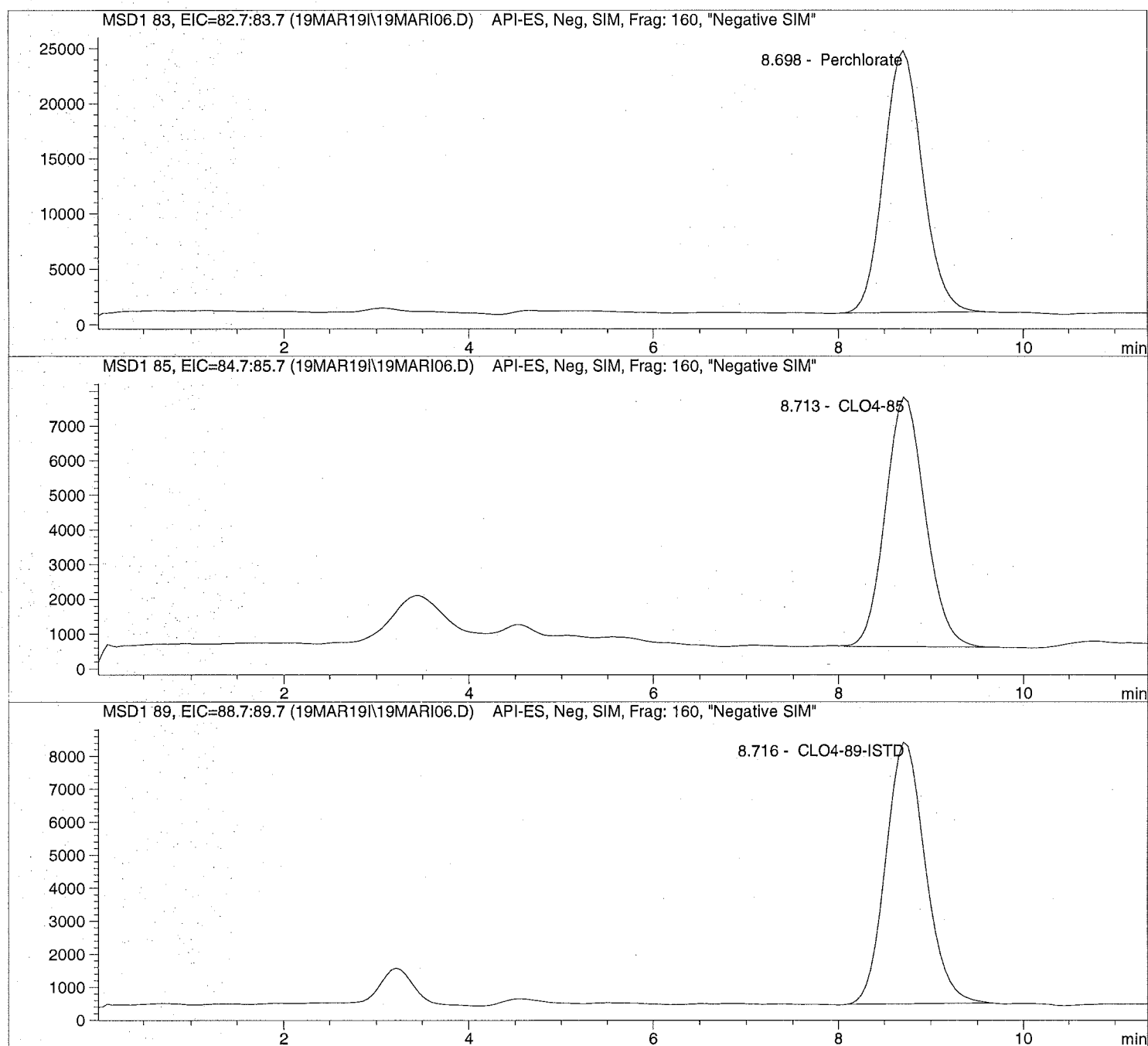
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

```
=====
Injection Date: 3/19/2019 10:19:32      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-DP2.M
Last Changed: 3/19/2019 14:35:22
```

Perchlorate analysis

Sample Information

```
Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019, 02:35:19 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
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D

Sample Name: CLO4@ 25.ug/L

Injection Date: 3/19/2019 10:32:49

Seq Line: 7

Sample Name: CLO4@ 25.ug/L

Location: Vial 77

Acq Operator: TNB

Inj. No.: 1

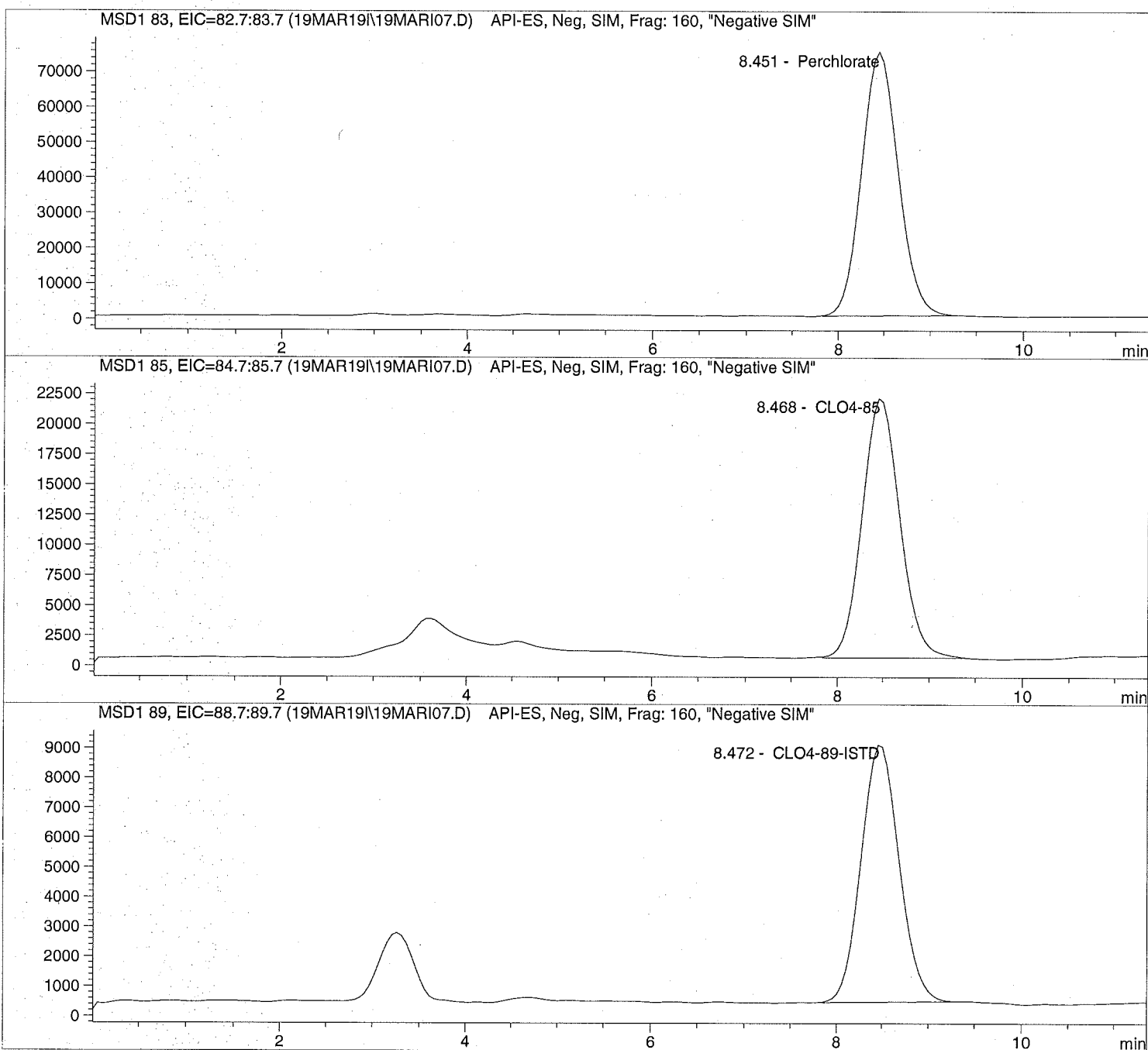
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

```

=====
Injection Date: 3/19/2019 10:32:49      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019, 02:35:19 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
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\19MAR19\19MARI08.D

Sample Name: CLO4@ 50.ug/L

Injection Date: 3/19/2019 10:46:05

Seq Line: 8

Sample Name: CLO4@ 50.ug/L

Location: Vial 78

Acq Operator: TNB

Inj. No.: 1

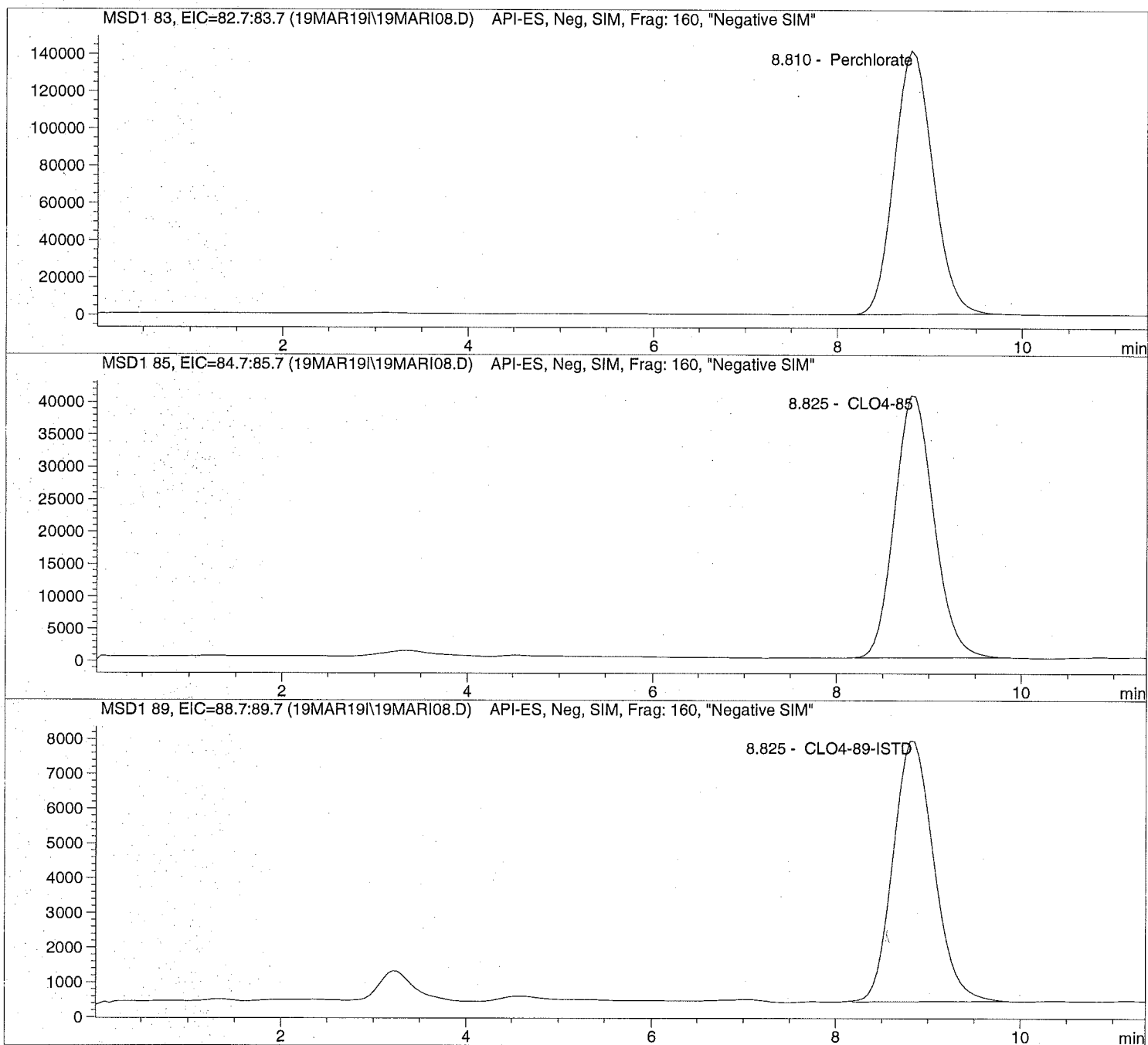
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

```

=====
Injection Date: 3/19/2019 10:46:05      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-DP2.M
Last Changed: 3/19/2019 14:35:22
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019, 02:35:19 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
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D

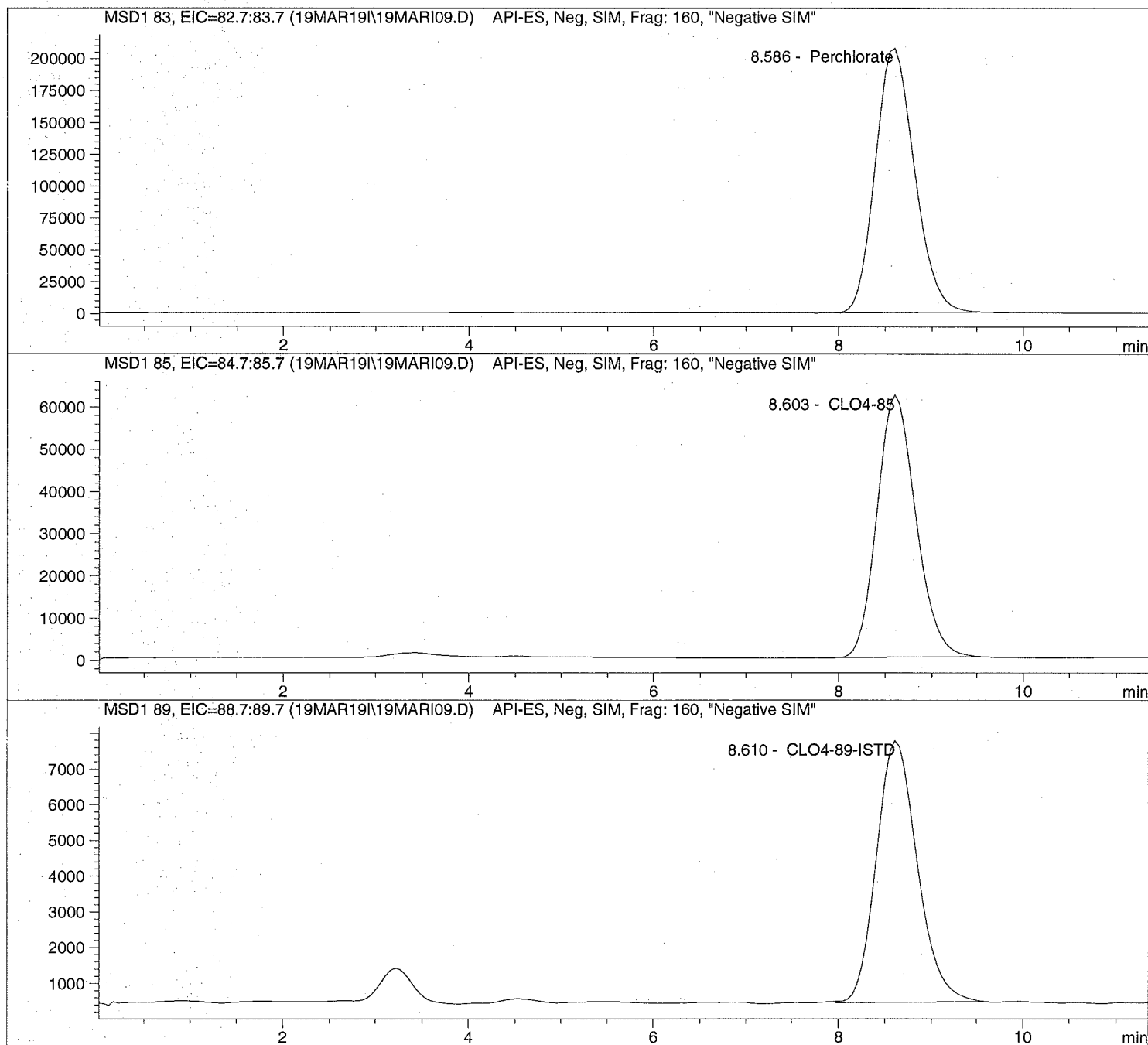
Sample Name: CLO4@ 75.ug/L

Injection Date: 3/19/2019 10:59:22
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

```

=====
Injection Date: 3/19/2019 10:59:22      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\19MAR19\19MARI10.D

Sample Name: ICAL Verf@10ug/L

Injection Date: 3/19/2019 11:12:42

Seq Line: 10

Sample Name: ICAL Verf@10ug/L

Location: Vial 80

Acq Operator: TNB

Inj. No.: 1

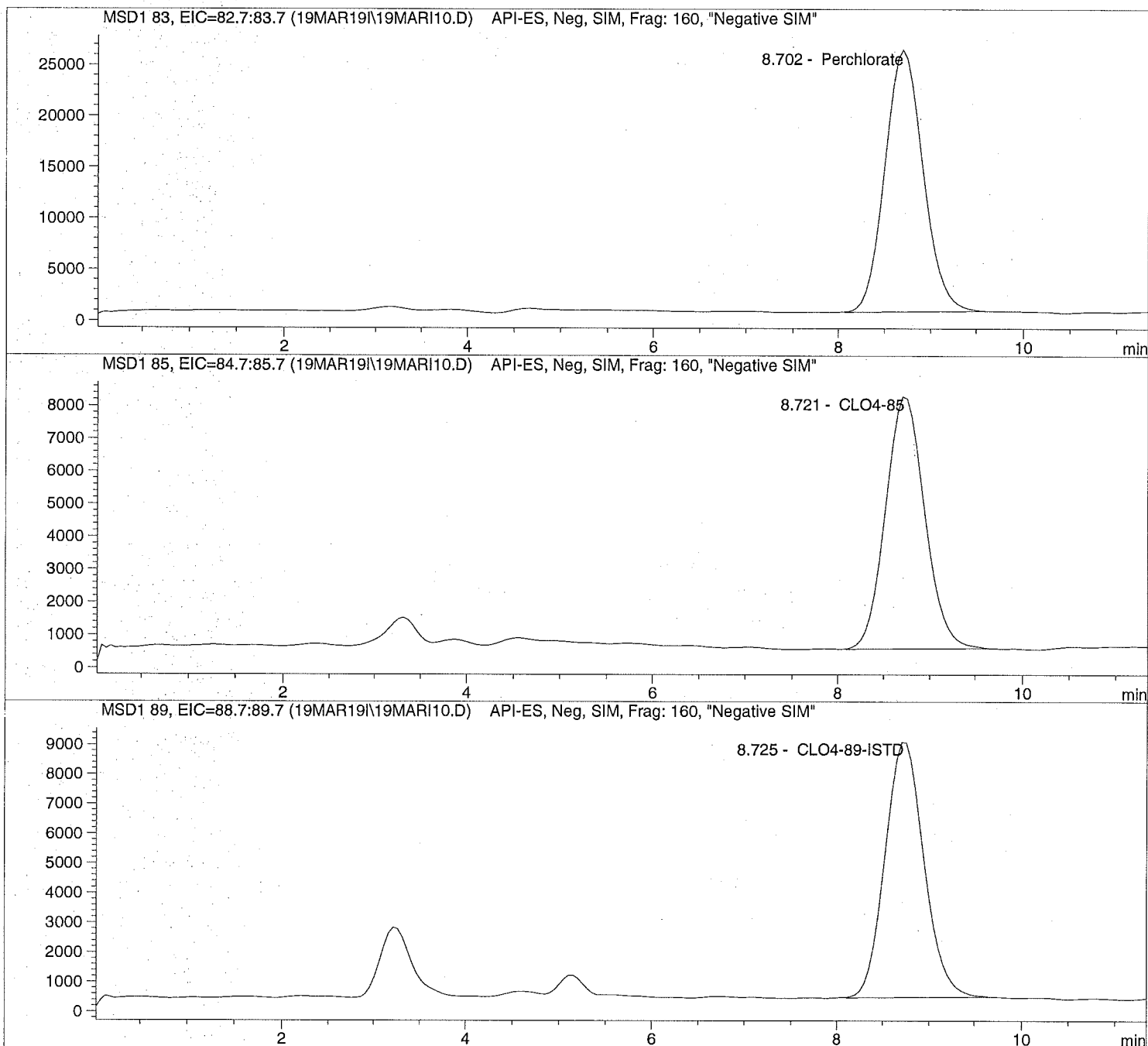
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

```

=====
Injection Date:  3/19/2019  11:12:42                    Seq Line:                    10
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-DP2.M
Last Changed:   3/19/2019  14:35:22
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:                    Signal
Calib. Data Modified:        Tue, 19. Mar. 2019,02:35:19 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
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	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\19MAR19I\19MARI03.D

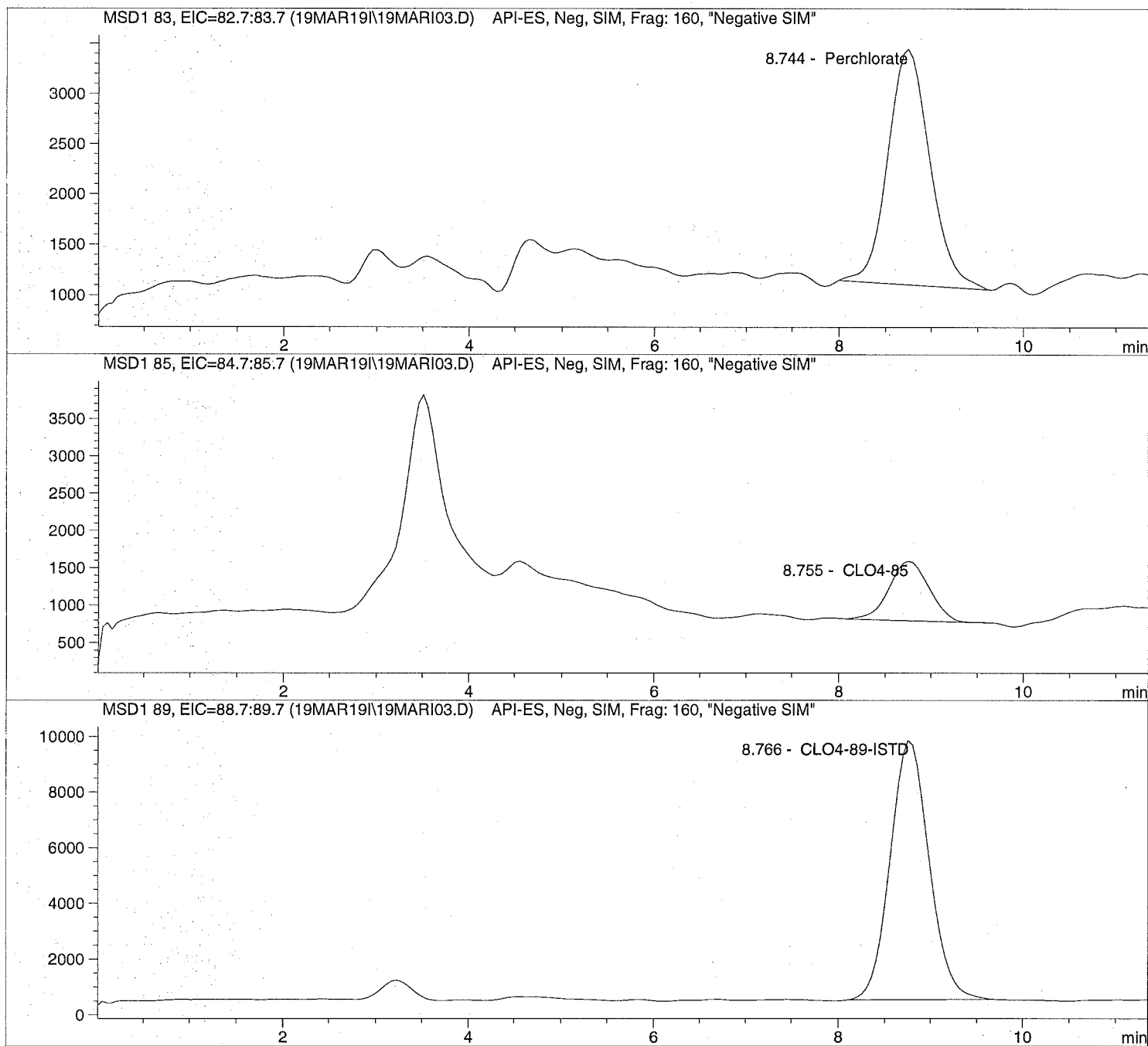
Sample Name: CLO4@ 1.0ug/L

Injection Date: 3/19/2019 09:39:40
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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 3/19/2019 09:39:40      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-DP2.M
Last Changed:   3/19/2019 14:38:25
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD11.D

Sample Name: 1926283001

Injection Date: 9/17/2019 11:05:22

Seq Line: 11

Sample Name: 1926283001

Location: Vial 80

Acq Operator: TNB

Inj. No.: 1

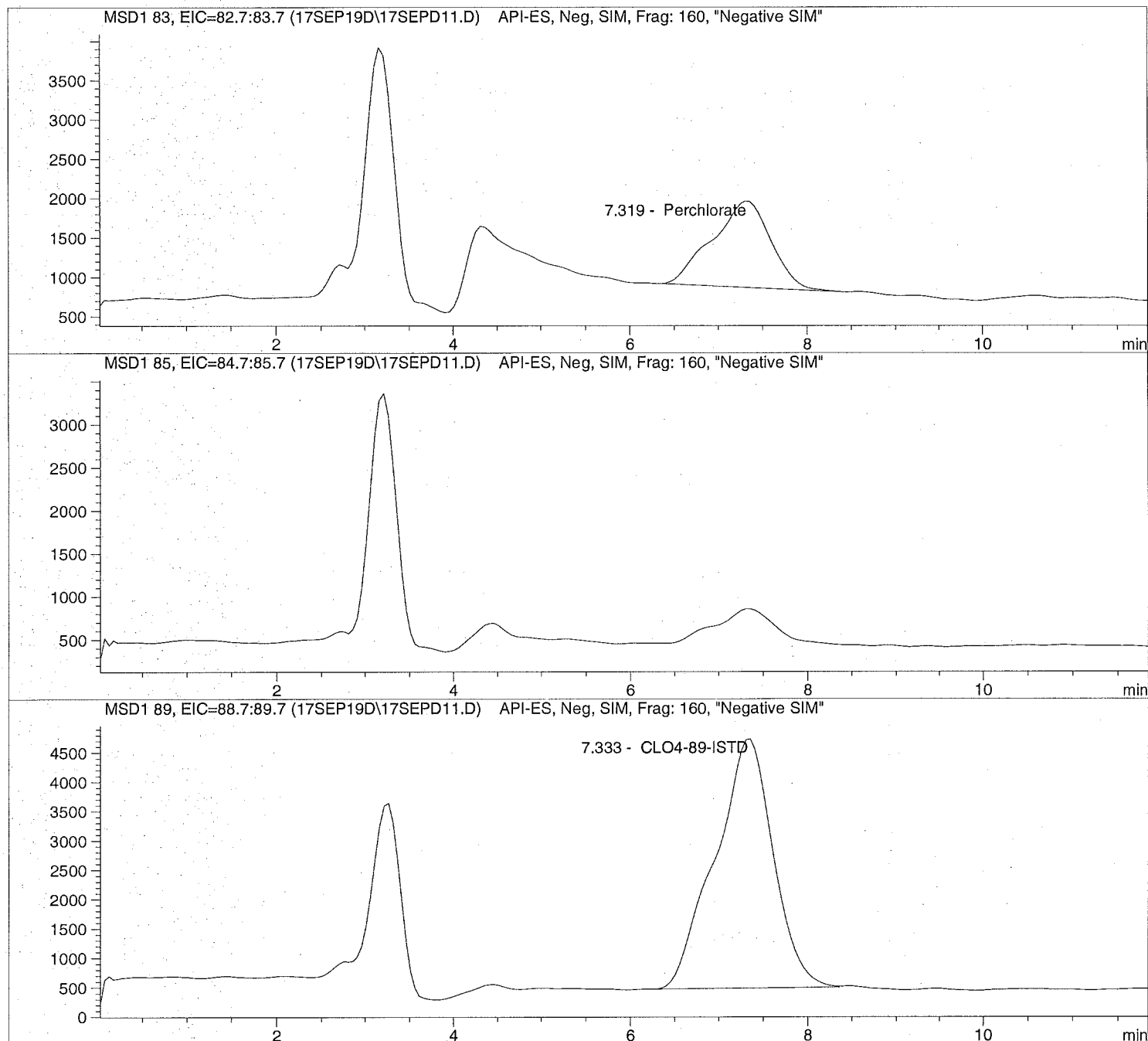
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD11.D Sample Name: 1926283001

```

=====
Injection Date: 9/17/2019 11:05:22      Seq Line: 11
Sample Name: 1926283001                  Location: Vial 80
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.319	PBA	50036.3	0.9832	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
7.333	PBA	193086.8	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

September 25, 2019

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

Work Order: **HS19090455**

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

Dear Marcia,

ALS Environmental received 1 sample(s) on Sep 11, 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 simple oval scribble.

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
Work Order: HS19090455

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19090455-01	LH18/24-SP140_091019	Water		10-Sep-2019 14:00	11-Sep-2019 08:59	<input type="checkbox"/>

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
Work Order: HS19090455

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: 145210**

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

WetChemistry by Method SW7196**Batch ID: R346144**

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

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant Monthly Influent Samples
 Sample ID: LH18/24-SP140_091019
 Collection Date: 10-Sep-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19090455
 Lab ID:HS19090455-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A	Method:SW6020		Prep:SW3010A / 13-Sep-2019 Analyst: JHD					
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	24-Sep-2019 19:01
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	24-Sep-2019 19:01
HEXAVALENT CHROMIUM BY SW7196A	Method:SW7196		Analyst: MZD					
Chromium, Hexavalent	0.0100	U	0.00600	0.0100	0.0100	mg/L	1	11-Sep-2019 13:34
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)	Method:NA		Analyst: SUB					
Subcontract Analysis	See Attached		0	0		NA	1	19-Sep-2019 16:33

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19090455

Batch ID: 145210 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampleID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19090455-01	1	10	10 (mL)	1

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19090455

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 145210 (0)		Test Name : METALS BY ICPMS BY SW6020A			Matrix: Water	
HS19090455-01	LH18/24-SP140_091019	10 Sep 2019 14:00		13 Sep 2019 12:30	24 Sep 2019 19:01	1
Batch ID: R346144 (0)		Test Name : HEXAVALENT CHROMIUM BY SW7196A			Matrix: Water	
HS19090455-01	LH18/24-SP140_091019	10 Sep 2019 14:00			11 Sep 2019 13:34	1
Batch ID: R346576 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Water	
HS19090455-01	LH18/24-SP140_091019	10 Sep 2019 14:00			19 Sep 2019 16:33	1

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19090455

QC BATCH REPORT

Batch ID: 145210 (0)		Instrument: ICPMS04		Method: METALS BY ICPMS BY SW6020A						
MBLK	Sample ID: MBLK-145210	Units: mg/L		Analysis Date: 24-Sep-2019 18:45						
Client ID:	Run ID: ICPMS04_346816	SeqNo: 5266437	PrepDate: 13-Sep-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-145210	Units: mg/L		Analysis Date: 24-Sep-2019 18:48						
Client ID:	Run ID: ICPMS04_346816	SeqNo: 5266438	PrepDate: 13-Sep-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Selenium	0.04081	0.00500	0.05	0	81.6	80 - 120				
Silver	0.04786	0.00500	0.05	0	95.7	85 - 116				
MS	Sample ID: HS19090454-01MS	Units: mg/L		Analysis Date: 24-Sep-2019 18:54						
Client ID:	Run ID: ICPMS04_346816	SeqNo: 5266441	PrepDate: 13-Sep-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Selenium	0.04304	0.00500	0.05	0.000755	84.6	80 - 120				
Silver	0.04597	0.00500	0.05	0.000007	91.9	85 - 116				
MSD	Sample ID: HS19090454-01MSD	Units: mg/L		Analysis Date: 24-Sep-2019 18:57						
Client ID:	Run ID: ICPMS04_346816	SeqNo: 5266442	PrepDate: 13-Sep-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Selenium	0.04142	0.00500	0.05	0.000755	81.3	80 - 120	0.04304	3.83	20	
Silver	0.04473	0.00500	0.05	0.000007	89.5	85 - 116	0.04597	2.74	20	
PDS	Sample ID: HS19090454-01PDS	Units: mg/L		Analysis Date: 24-Sep-2019 18:59						
Client ID:	Run ID: ICPMS04_346816	SeqNo: 5266443	PrepDate: 13-Sep-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Selenium	0.09874	0.00500	0.1	0.000755	98.0	80 - 120				
Silver	0.08726	0.00500	0.1	0.000007	87.3	80 - 120				

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19090455

QC BATCH REPORT

Batch ID: 145210 (0) **Instrument:** ICPMS04 **Method:** METALS BY ICPMS BY SW6020A

SD	Sample ID:	HS19090454-01SD			Units:	mg/L					Analysis Date:	24-Sep-2019 18:52	
Client ID:	Run ID:	ICPMS04_346816			SeqNo:	5266440		PrepDate:	13-Sep-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					0.000755	0	10	U			
Silver	0.00250	0.0250					0.000007	0	10	U			

The following samples were analyzed in this batch:

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19090455

QC BATCH REPORT

Batch ID: R346144 (0)		Instrument: UV-2450		Method: HEXAVALENT CHROMIUM BY SW7196A					
MBLK	Sample ID: MBLK-346144	Units: mg/L		Analysis Date: 11-Sep-2019 13:34					
Client ID:	Run ID: UV-2450_346144	SeqNo: 5250372		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual	
Chromium, Hexavalent	0.0100	0.0100						U	
LCS	Sample ID: LCS-346144	Units: mg/L		Analysis Date: 11-Sep-2019 13:34					
Client ID:	Run ID: UV-2450_346144	SeqNo: 5250373		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual	
Chromium, Hexavalent	0.261	0.0100	0.25	0	104	90 - 111			
MS	Sample ID: HS19090447-02MS	Units: mg/L		Analysis Date: 11-Sep-2019 13:34					
Client ID:	Run ID: UV-2450_346144	SeqNo: 5250375		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual	
Chromium, Hexavalent	0.252	0.0100	0.25	0.005	98.8	90 - 111			
MSD	Sample ID: HS19090447-02MSD	Units: mg/L		Analysis Date: 11-Sep-2019 13:34					
Client ID:	Run ID: UV-2450_346144	SeqNo: 5250376		PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual	
Chromium, Hexavalent	0.25	0.0100	0.25	0.005	98.0	90 - 111	0.252	0.797 20	

The following samples were analyzed in this batch: HS19090455-01

ALS Houston, US

Date: 25-Sep-19

Client:	Bhate Environmental Associates, Inc.	QUALIFIERS, ACRONYMS, UNITS
Project:	Longhorn GW Treatment Plant Monthly Influent Samples	
WorkOrder:	HS19090455	

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	2019-141	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US

Date: 25-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Monthly Influent Samples
Work Order: HS19090455

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19090455-01	LH18/24-SP140_091019	Login	9/11/2019 11:34:00 AM	PMG	Sub
HS19090455-01	LH18/24-SP140_091019	Login	9/11/2019 11:34:00 AM	PMG	WET336
HS19090455-01	LH18/24-SP140_091019	Login	9/11/2019 11:34:00 AM	PMG	MET090

ALS Houston, US

Date: 25-Sep-19

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19090455

Date/Time Received: **11-Sep-2019 08:59**
 Received by: **AC**

Checklist completed by: Paresh M. Giga 11-Sep-2019
 eSignature Date

Reviewed by: RJ Modashia 11-Sep-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):

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage:

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:



1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: _____

Facility/Base I.D.: <u>LHAAP</u>									Sample Analysis Requested ⁽¹⁾						Quality Assurance Samples ⁽⁶⁾							
Project/Site Name: <u>LHAAP / GWTP MONTHLY INFLUENT</u>									Number of containers	Silver, Selenium	Hexavalent Chromium	Perchlorate							Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Container ID
Client Name:																						
Collected by: <u>Scott Beesinger</u>																						
Field Sample ID (30 Characters Max)	ERPIIMS LOCID (15 Characters Max)	Date Collected (dd-mm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (1)	Sample Number (2)	Sample Matrix (4)															
<u>WHBY-SP140-V1919</u>		<u>10Sep2019</u>	<u>1400</u>		<u>N</u>	<u>WG</u>	<u>3</u>	<u>X</u>	<u>X</u>	<u>X</u>												

HS19090455

Bhate Environmental Associates, Inc.
Birmingham GW Treatment Plant Monthly Influent Sample



COMMENTS:

STANDARD TAT

Relinquished By (Signed) <u>Scott Beesinger</u> Date <u>9/11/19</u> Time <u>1430</u>				Custody Transfers Prior to Receipt by Laboratory				Sample Delivery Details / Laboratory Receipt			
				Received by (signed) <u>AC</u> Date <u>9/11/19</u> Time <u>08:59</u>				Delivered Directly to Lab: _____ Shipped _____ No.:			
								Method of Shipment: _____			
								Fed _____ Ex _____ Airbill _____ Number: _____			
								Analytical Lab: <u>ALS 10450 SpringHill Rd, Suite 210 Houston, TX 77099 (281) 530-5656</u>			
								Lab Recipient: <u>ATTN: SONIA WEST</u> Delivery Date/Time: _____			

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control



ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5556
Fax. +1 281 530 5887

CUSTODY SEAL	
Date: 9/10/19	Time: 1430
Name: Scott Beesimer	
Company: S. H. P. Y.	

Seal Broken By:
Date: 9/10/19



Must Deliver Next Business Day
Time and Temperature Sensitive!

45638

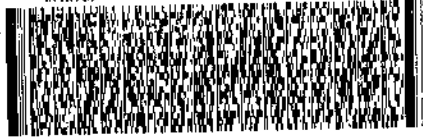
ORIGIN ID: SGRA (603) 930-6193
SCOTT BEESIMER
BIOMTE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PHB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 22MAY18
ACTGTY: 1.00 LB MAN
CRD: 300130/CAFE3111
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099

(281) 530-5656
REF: LHAAP-18/24 SURFACE WATER-RJ

RMA: 011011



RETURNS MON-SAT

WED - 11 SEP 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH



162206 1030P19 06GA 568C1/0084/0C0A



Case Narrative

Method: 6850

Analysis: Perchlorate

Analysis SOP: LC-MS-CLO4

ALS WO ID(s): 1925603; 1926281; 1926282;
1926283

Client: ALS Laboratories (Houston, TX)

Matrix: Water

ELMS Batch (HBN): 2292 (247901)

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 1926282001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 673905) was less than 1/2 the CRDL. The recovery for the LCS (673906) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on sample 1925603001 (Client ID: LH18/24-SP650_090419_AIX). 3.0 μ l of Working Standard Solution Horizon ID 43701 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 – 673903) is reported from the analysis of the Laboratory Control Sample (LCS – 673906) 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: 19MARI03) along with datafiles 17SEPD11. Sample 1926282001 failed the 50-150% method requirement for ISTD recovery. This sample was re-prepped, re-analyzed and reported.

Thomas Bosch September 18, 2019

Analyst

Date



ANALYTICAL REPORT

Report Date: September 19, 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: **34-1926282**

Project ID: HS19090455

Purchase Order: HS19090455

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP140_091019	1926282001	09/10/19	09/12/19	

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: 34-1926282

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: LH18/24-SP140_091019	Sampling Site: NA	Collected: 09/10/2019				
Lab ID: 1926282001	Media: 125 mL Nalgene	Received: 09/12/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2292 (HBN: 247901) Analyzed: 09/17/2019 11:22	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	4900	1000	2000	4000	1000	

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 247901)

Field sample 1926282001 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 09/17/2019 14:12	/S/ Stephen Brose 09/19/2019 09:58

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: 34-1926282

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

00952286

Analysis Information

Workorder: 1926282

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2292 (HBN: 247901)
Analyzed By: Thomas Bosch

Blank

LMB: 673905 Analyzed: 09/17/2019 09:41 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 673906 Analyzed: 09/17/2019 08:57 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	2.72	3.00	90.5	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1925603001 Analyzed: 09/17/2019 09:55 Dilution: 1 Units: ug/L		MS: 673907 Analyzed: 09/17/2019 10:09 Dilution: 1 Units: ug/L				MSD: 673908 Analyzed: 09/17/2019 10:23 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	2.47	3	82.5	78.8 123.8	2.5	83.2	0.861	0.0 20.0

Comments

Field sample 1926282001 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 09/18/2019 11:11	/S/ Stephen Brose 09/19/2019 09:58

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



1926282

12098/2

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: 12146

SUBCONTRACT TO:

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

1926282

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: HS19090455
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19090455-01	LH18/24-SP140_091019	Water	10 Sep 2019 14:00
SUB_Perch-6850			25 Sep 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By:

Date/Time:

9/11/19 1800.

Received By:

Date/Time:

9/12/19 09:59

Cooler ID(s):

Temperature(s):

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS HOUSTON Project/Task/Site: 1926282
 Date/Time of Receipt: _____ Number of Coolers Received: 1

Condition of Coolers: Acceptable/Unacceptable
 Cooler Custody Seals: Present/Absent/NA
 Container Custody Seals: Intact/Broken/NA
 Present/Absent/NA
 Intact/Broken/NA
 Ice Present: Yes/No/NA
Frozen/Melted/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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 <u>9882</u>	<u>1</u> °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Jay Lynn Johnson Jay Lynn Johnson 9/12/19
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



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

SHIP DATE: 11SEP19
ACTWGT: 13.55 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN
BILL THIRD PARTY

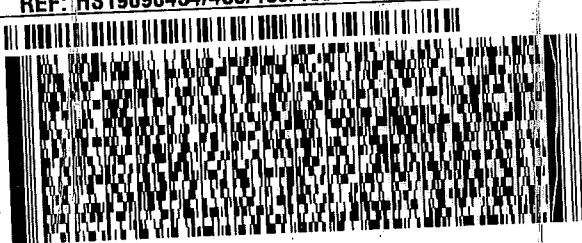
Pat # 159469-434 RIT EXP 07/20 **

TO **SAMPLE RECEIVING**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123

(801) 286-7700

REF: HS19090454/455/456/459 - RJ



FedEx
Express



AN L050908113817

TRK# 4809 7837 8521
02101

THU - 12 SEP 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC



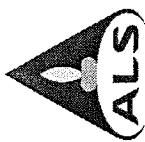
3017406613155



**ALS Environmental
CHAIN-OF-CUSTODY**

Project / Job / Task: HS19090455		Split:	Workorder ID: 1926282	Level: ENV_LVL4	Requested Analysis			
Client: ALS Environmental (Houston)			Account: 8101	Type: 125Poly				
Comments:								
Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Preservatives			
1 09/10/2019 14:00	LH18/24-SP140_091019	1926282001		Water	A	1	A	EPA 6650, DoD GSM
2								
3								
4								
5								
6								
7								
8								
9								
10								

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY									SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY					
Relinquished By: (Signature) <i>W. [Signature]</i>					Date / Time 09/12/2019 09:59		Received By: (Signature) ALS Sample Receiving <i>YC</i>		Date / Time		Sample Prep / Analysis for:		Lab Notebook No.:	
Reason for Transfer / Storage Location					Sample Login		Relinquished By: (Signature)		Date / Time		Received By: (Signature)		Reason for Transfer / Storage Location	
Staging					Staging									
P-23-1					9/16/19 12:45		TB							



Batch Worklist

HBN: 247901

Instrument: WP
Status: WP

Created: 9/17/2019 07:46
Analyst: T. Bosch

Batch: ELMS/ 2292
Rule: EPA 6850, DoD QSM Water

- Workorder: 1925603 [ENV_LVL4]
- Workorder: 1926281 [ENV_LVL4]
- Workorder: 1926282 [ENV_LVL4]
- Workorder: 1926283 [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	673902	CCV for HBN 247901 [ELMS/2292]				CCV	3		E685041C3Q	5311		9/19/2019	
2	673903	RLYS for HBN 247901 [ELMS/2292]				RLYS	3		E685041C3Q	5311		9/19/2019	
3	673904	ICS for HBN 247901 [ELMS/2292]				ICS	3		E6850.D3Q	5311		9/19/2019	
4	673905	LMB for HBN 247901 [ELMS/2292]				LMB	3		E6850Q413Q	5311		9/19/2019	
5	673906	LCS for HBN 247901 [ELMS/2292]				LCS	3		E6850Q413Q	5311		9/19/2019	
6	1925603001	LH18/24-SP650-090419-AIX				SAMPLE	3	1925603001-A	E6850Q41.3	5480	10/2/2019	9/19/2019	
7	673907	LH18/24-SP650...(1925603001MS)				MS	3		E6850Q413Q	5311		9/19/2019	
8	673908	LH18/24-SP65...(1925603001MSD)				MSD	3		E6850Q413Q	5311		9/19/2019	
9	1926281001	LH18/24-SP650_091019_AIX				SAMPLE	3	1926281001-A	E6850Q41.3	5480	10/8/2019	9/25/2019	
10	1926282001	LH18/24-SP140_091019				SAMPLE	3	1926282001-A	E6850Q41.3	5480	10/8/2019	9/25/2019	
11	1926283001	LH18/24-SP650_091019_AIX				SAMPLE	3	1926283001-A	E6850Q41.3	5480	10/8/2019	9/25/2019	
12	673909	CCV for HBN 247901 [ELMS/2292]				CCV	3		E685041C3Q	5311		9/19/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-upALS Work Order #'s & Sample #()'s: 1925603 (001); 1926281 (001) 1926282 (001); 1926283 (001)ELMS Batch/HBN ID: 2292 (247901)Prep Date: 09/16/2019 Analysis Date: 09/17/2019 Analyst: T. BoschAnalyte: **Perchlorate** Matrix: **Water** Method: **6850**Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\SEP\17SEP19D.sReported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**SAMPLE PREPARATION/ANALYSIS:

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

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

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

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.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: 40µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

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 673906; Target = 3.0µg/L. ASTM type II water was used for LMB 673905.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1925603001 (Client ID: LH18/24-SP650_090419_AIX). 3.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters. Field sample 1926282001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly. Sample 1926282001 failed the 50-150% method requirement for ISTD recovery. This sample was re-prepped, re-analyzed and reported.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\SEP\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\247901-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 673903) is reported from the analysis of the Laboratory Control Sample (LCS – 673906) 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: 19MARI03) along with datafiles 17SEPD11.

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: 2292 HBN: 247901</u> <u>1926283</u>		
Sample Set IDs if Applicable: <u>1925603/1926281/1926282</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	—	— SB
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 - CLO4 WRK

CLO4 WRK			Description - 6850.WKG Std:100.ug/L		
Standard: 43702		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/18/2018 02:09PM		Expires: 09/18/2019	
MFG Lot: TNB: 09/18/2018				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 WRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019



STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK			Description - 6850: Stock AccStd 1,000ug/mL
Standard: 43659		Created By: Thomas Bosch	Amount: 100 mL
MFG: AccuStandard		Create Date: 09/17/2018 09:09AM	Expires: 07/25/2020
MFG Lot: 218065075			Usable: No
Part ID: IC-PER-10X-1			Lab Lot: CLO4 STOCK
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL



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: 43701		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/18/2018 02:09PM		Expires: 09/18/2019	
MFG Lot: TNB: 09/18/2018				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 INT	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020



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



STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK			Description - Perchlorate ISTD Wrk 1,000ug/L		
Standard: 43730		Created By: Thomas Bosch		Amount: 25 mL	
MFG: ALS/SLC		Create Date: 09/20/2018 09:09AM		Expires: 09/20/2019	
MFG Lot: TNB: 05/09/2018		Verified By: Thomas Bosch		Usable: Yes	
Pipette ID: Not Provided		Verify Date:		Lab Lot: CLO4ISTDWRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026



STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock	
Standard: 43729		Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope		Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDF-012A		Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S		Verify Date:	Lab Lot: CLO4ISTDSTK
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL



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.





Certificate of Analysis



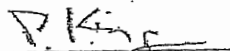
ISO Guide 34 Reference Material

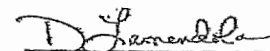
Product Number: ICC-013
Lot Number: CP-0860

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 QMRA



125 Market Street
New Haven, CT 06513
USA



AccuStandard®

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

CERTIFICATE OF ANALYSIS



S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (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

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

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



23118

Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O₄, 90%+) 100 UG/ML IN WATER

Lot Number: SDDG-013

Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

Labeled CAS Number: NA

Unlabeled CAS Number: 7601-89-0

MW*: 130.4

Chemical Formula: NaCl*O₄

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration data.

Certification

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

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

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

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

Approved by: T. J. Eckersley

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

Quality Control Tests and Results

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



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP2.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	
*	673902	CCV@25	Vial 71	1	Control	1	2.11095e6	7.718	26.01274
*	673906	QC@3.0	Vial 72	1	Control	2	2.38232e5	7.546	2.71615
*	673904	ICS@3.0	Vial 73	1	Control	3	1.94502e5	7.427	3.19438
*	673905	LMB	Vial 74	1	Control	5	0.00000	0.000	0.00000
*	1925603001		Vial 75	1	Sample	6	0.00000	0.000	0.00000
*	673907	256031S	Vial 76	1	Sample	7	1.44508e5	7.417	2.47376
*	673908	256031D	Vial 77	1	Sample	8	1.50348e5	7.390	2.49518
*	1926281001		Vial 78	1	Sample	9	0.00000	0.000	0.00000
*	1926282001	1K	Vial 79	1	Sample	10	7.57421e5	7.740	4926.17796 <i>-NR REP</i>
*	1926283001		Vial 80	1	Sample	11	5.00363e4	7.319	9.83188e-1 <i>< RL</i>
*	1926282001	1K	Vial 79	1	Sample	12	4.98891e5	7.765	4904.43754
*	673909	CCV@25	Vial 71	1	Control	13	2.04203e6	7.785	26.00821

##	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
*	673902	CCV@25	Vial 71	1	Control	1	6.35094e5	7.742	26.35431
*	673906	QC@3.0	Vial 72	1	Control	2	7.43744e4	7.563	2.70140
*	673904	ICS@3.0	Vial 73	1	Control	3	6.33519e4	7.450	3.34525
*	673905	LMB	Vial 74	1	Control	5	0.00000	0.000	0.00000
*	1925603001		Vial 75	1	Sample	6	0.00000	0.000	0.00000
*	673907	256031S	Vial 76	1	Sample	7	5.21915e4	7.445	2.82706
*	673908	256031D	Vial 77	1	Sample	8	5.26531e4	7.420	2.76701
*	1926281001		Vial 78	1	Sample	9	0.00000	0.000	0.00000
*	1926282001	1K	Vial 79	1	Sample	10	2.36316e5	7.779	5035.13054
*	1926283001		Vial 80	1	Sample	11	1.87749e4	7.329	1.04440
*	1926282001	1K	Vial 79	1	Sample	12	1.57327e5	7.787	5065.48124
*	673909	CCV@25	Vial 71	1	Control	13	6.17795e5	7.802	26.48941

##	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-ISTD RT	CLO4-89-ISTD Amount	
*	673902	CCV@25	Vial 71	1	Control	1	2.46298e5	7.734	5.00000
*	673906	QC@3.0	Vial 72	1	Control	2	2.95565e5	7.573	5.00000
*	673904	ICS@3.0	Vial 73	1	Control	3	2.03094e5	7.453	5.00000
*	673905	LMB	Vial 74	1	Control	5	2.63662e5	7.809	5.00000
*	1925603001		Vial 75	1	Sample	6	2.04752e5	7.431	5.00000
*	673907	256031S	Vial 76	1	Sample	7	1.98153e5	7.432	5.00000
*	673908	256031D	Vial 77	1	Sample	8	2.04262e5	7.411	5.00000
*	1926281001		Vial 78	1	Sample	9	1.87883e5	7.386	5.00000
*	1926282001	1K	Vial 79	1	Sample	10	5.01727e5	7.772	5000.00000 <i>ISTD</i>
*	1926283001		Vial 80	1	Sample	11	1.93087e5	7.333	5.00000 <i>HIGH</i>
*	1926282001	1K	Vial 79	1	Sample	12	3.32002e5	7.798	5000.00000 <i>REP</i>
*	673909	CCV@25	Vial 71	1	Control	13	2.38300e5	7.815	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	673902	CCV@25	CLO4-AQN	1		Ctrl Samp
2	Vial 72	673906	QC@3.0	CLO4-AQN	1		Ctrl Samp
3	Vial 73	673904	ICS@3.0	CLO4-AQN	1		Ctrl Samp
4	Vial 74	673905	LMB	CLO4-AQN	1		Ctrl Samp
5	Vial 74	673905	LMB	CLO4-AQN	1		Ctrl Samp
6	Vial 75	1925603001		CLO4-AQN	1		Sample
7	Vial 76	673907	256031S	CLO4-AQN	1		Sample
8	Vial 77	673908	256031D	CLO4-AQN	1		Sample
9	Vial 78	1926281001		CLO4-AQN	1		Sample
10	Vial 79	1926282001	1K	CLO4-AQN	1		Sample
11	Vial 80	1926283001		CLO4-AQN	1		Sample
12	Vial 79	1926282001	1K	CLO4-AQN	1		Sample
13	Vial 71	673909	CCV@25	CLO4-AQN	1		Ctrl Samp

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD01.D

Sample Name: 673902 CCV@25

Injection Date: 9/17/2019 08:40:19

Seq Line: 1

Sample Name: 673902 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

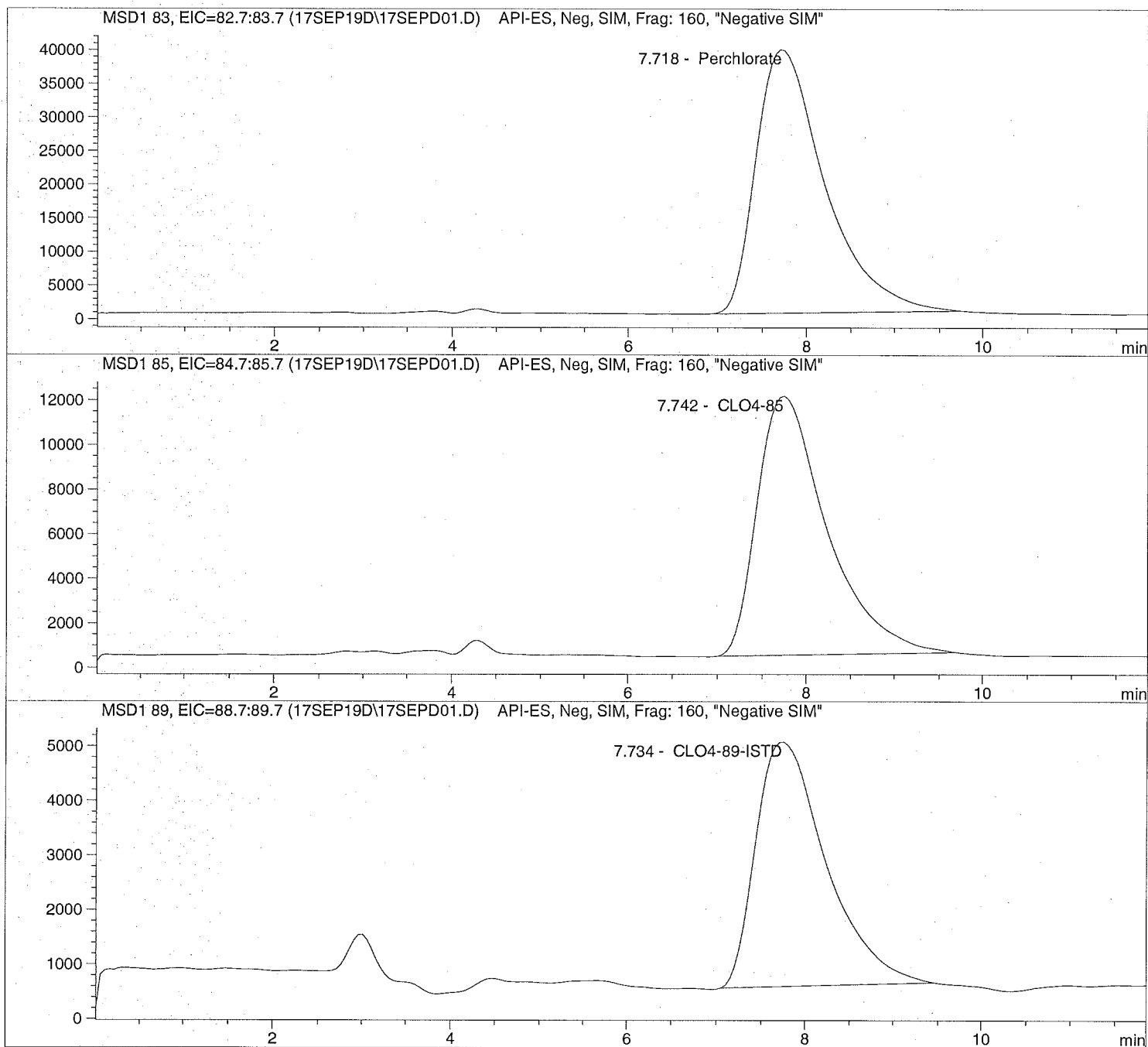
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD01.D Sample Name: 673902 CCV@25

```

=====
Injection Date: 9/17/2019 08:40:19      Seq Line: 1
Sample Name: 673902    CCV@25      Location: Vial 71
Acq Operator: TNB      Inj. No.: 1
                                         Inj. Vol.: 40 µl

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.718	PBA	2110953.5	26.0127	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.742	PBA	635093.8	26.3543	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.734	PBA	246298.2	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD02.D

Sample Name: 673906 QC@3.0

Injection Date: 9/17/2019 08:57:27

Seq Line: 2

Sample Name: 673906 QC@3.0

Location: Vial 72

Acq Operator: TNB

Inj. No.: 1

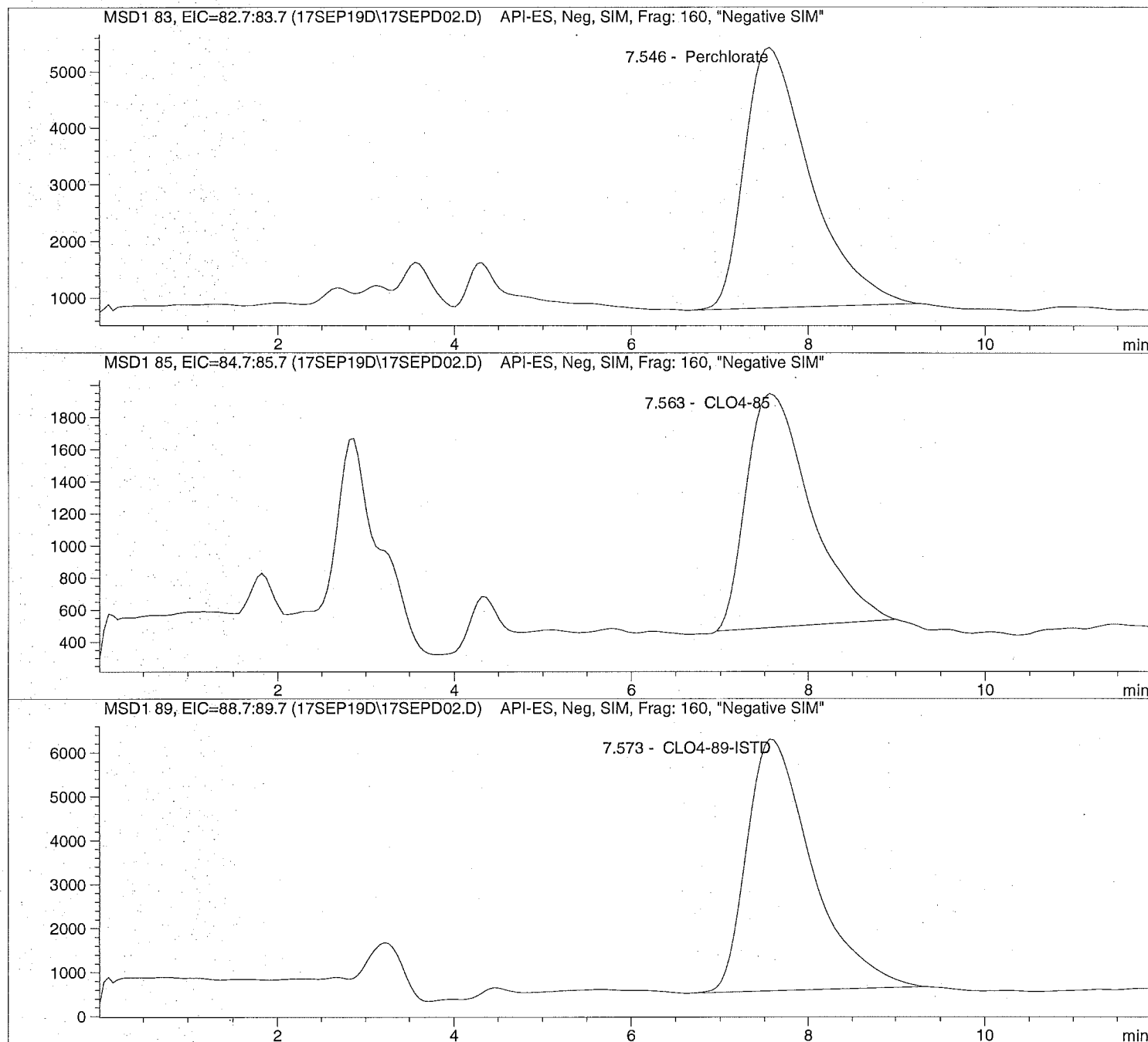
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD02.D Sample Name: 673906 QC@3.0

```

=====
Injection Date:  9/17/2019  08:57:27          Seq Line:           2
Sample Name:    673906   QC@3.0              Location:           Vial 72
Acq Operator:   TNB                               Inj. No.:          1
                                           Inj. Vol.:         40 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/17/2019  12:34:41
=====

```

Perchlorate analysis

=====
Sample Information
=====

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019, 10:15:00 am
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
7.546	PBA	238232.5	2.7161	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.563	PBA	74374.4	2.7014	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.573	PBA	295565.3	5.0000	CLO4-89-ISTD

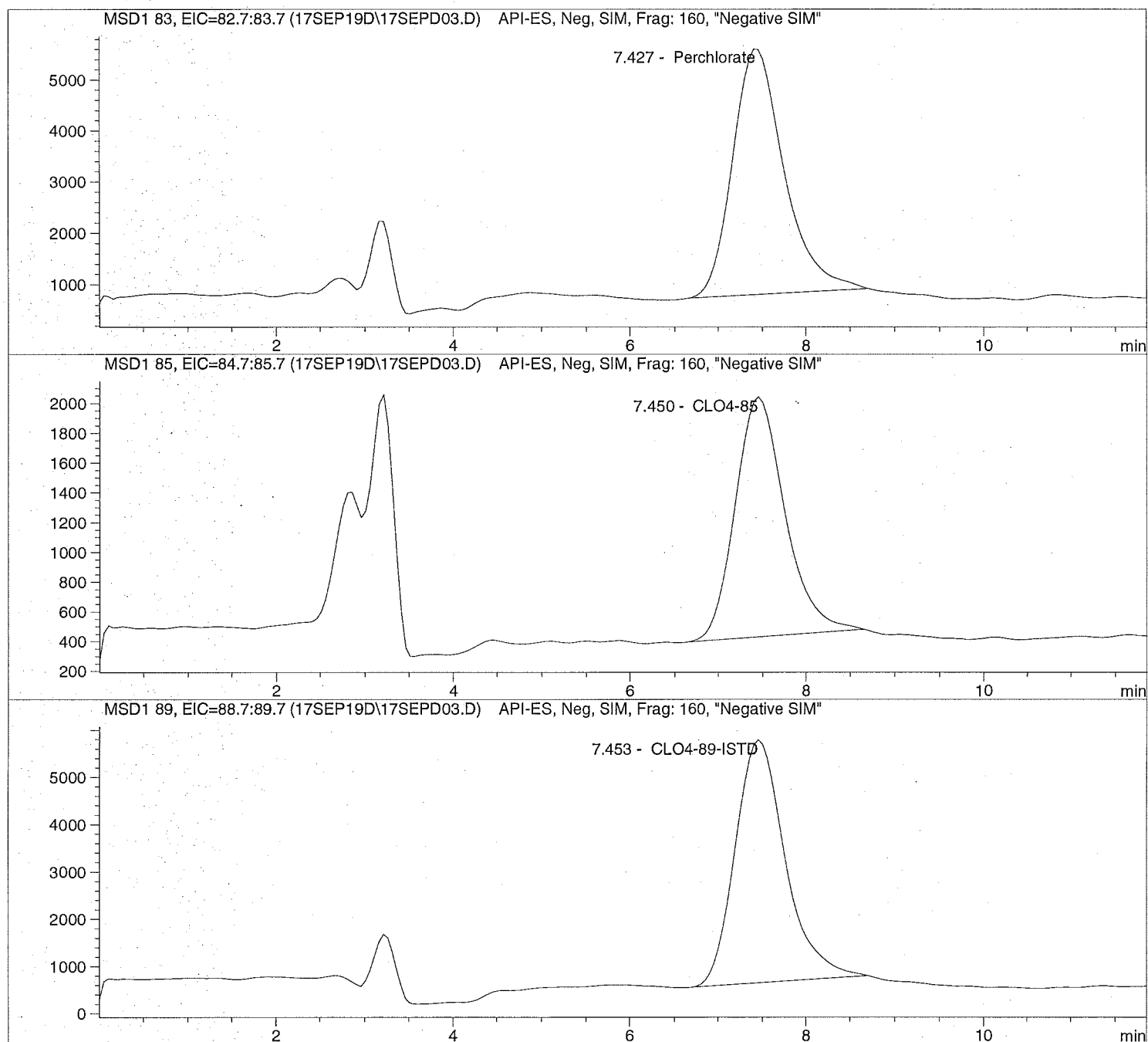
=====
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD03.D Sample Name: 673904 ICS@3.0

=====
Injection Date: 9/17/2019 09:11:28 Seq Line: 3
Sample Name: 673904 ICS@3.0 Location: Vial 73
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD03.D Sample Name: 673904 ICS@3.0

```

=====
Injection Date: 9/17/2019 09:11:28      Seq Line: 3
Sample Name: 673904 ICS@3.0           Location: Vial 73
Acq Operator: TNB                      Inj. No.: 1
                                         Inj. Vol.: 40 µl

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.427	PBA	194501.8	3.1944	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.450	PBA	63351.9	3.3452	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.453	PBA	203094.5	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD05.D

Sample Name: 673905 LMB

Injection Date: 9/17/2019 09:41:11

Seq Line: 5

Sample Name: 673905 LMB

Location: Vial 74

Acq Operator: TNB

Inj. No.: 1

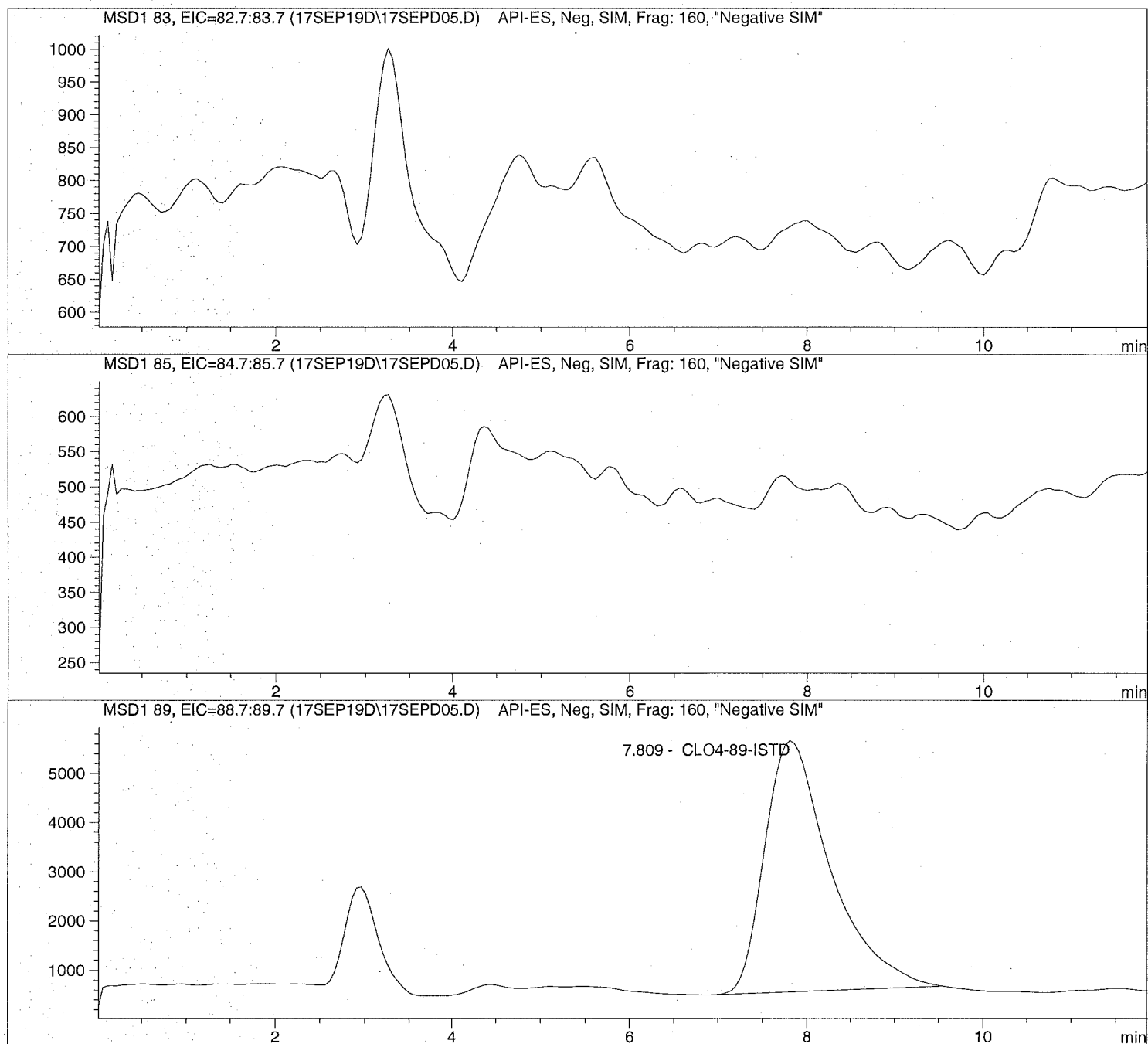
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD05.D Sample Name: 673905 LMB

```

=====
Injection Date: 9/17/2019 09:41:11      Seq Line: 5
Sample Name: 673905 LMB                 Location: Vial 74
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.809	PBA	263661.9	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD06.D

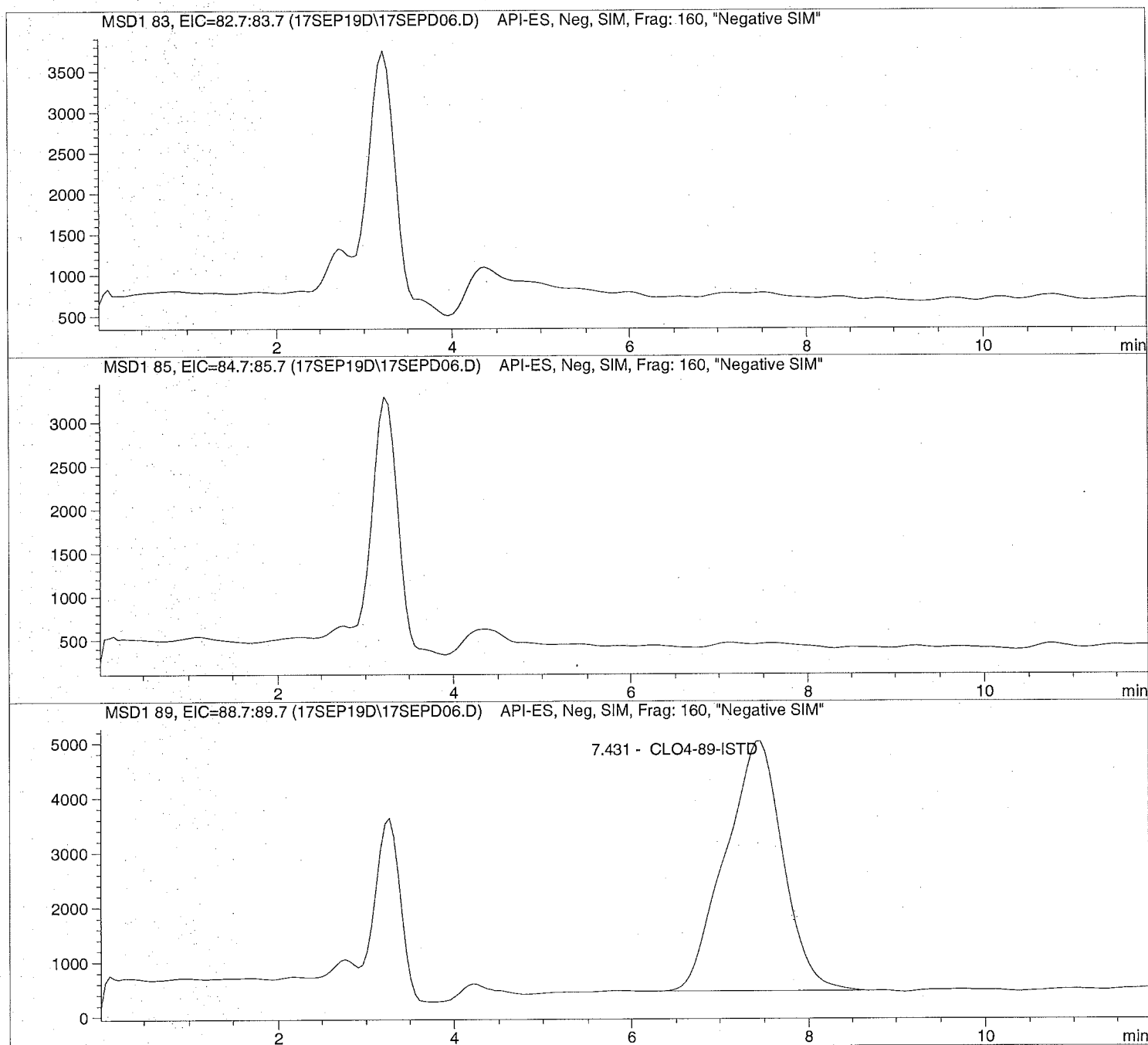
Sample Name: 1925603001

Injection Date: 9/17/2019 09:55:10
Sample Name: 1925603001
Acq Operator: TNB

Seq Line: 6
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD06.D

Sample Name: 1925603001

```

=====
Injection Date: 9/17/2019 09:55:10      Seq Line: 6
Sample Name:    1925603001              Location:  Vial 75
Acq Operator:  TNB                      Inj. No.: 1
                                           Inj. Vol.: 40 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.431	BBA	204752.5	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD07.D

Sample Name: 673907 256031S

Injection Date: 9/17/2019 10:09:10

Seq Line: 7

Sample Name: 673907 256031S

Location: Vial 76

Acq Operator: TNB

Inj. No.: 1

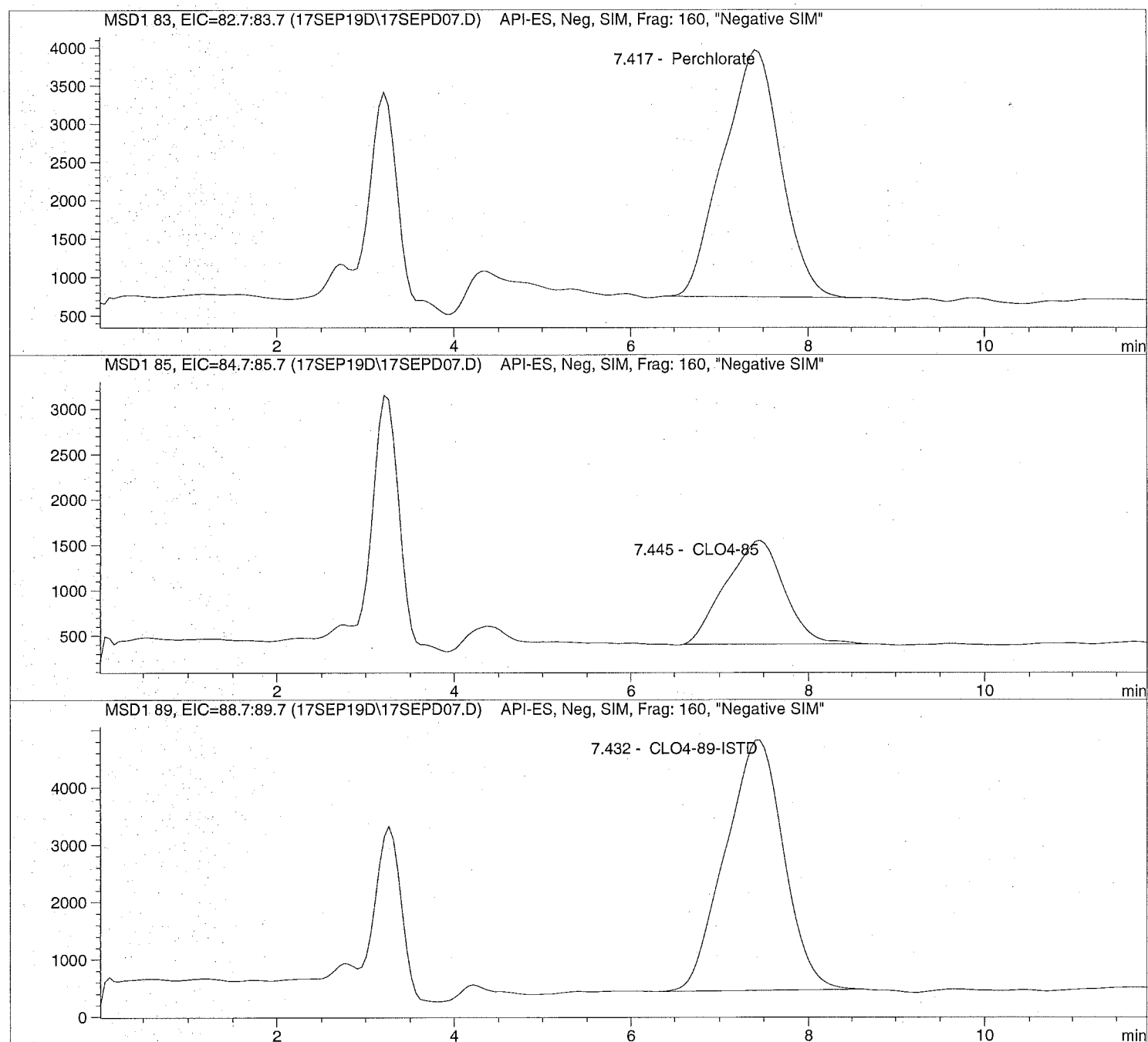
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD07.D Sample Name: 673907 256031S

```

=====
Injection Date: 9/17/2019 10:09:10      Seq Line: 7
Sample Name: 673907 256031S           Location: Vial 76
Acq Operator: TNB                      Inj. No.: 1
                                           Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.417	PBA	144507.9	2.4738	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.445	PBA	52191.5	2.8271	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.432	PBA	198152.6	5.0000	CLO4-89-ISTD

```

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

```


Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD08.D

Sample Name: 673908 256031D

Injection Date: 9/17/2019 10:23:18

Seq Line: 8

Sample Name: 673908 256031D

Location: Vial 77

Acq Operator: TNB

Inj. No.: 1

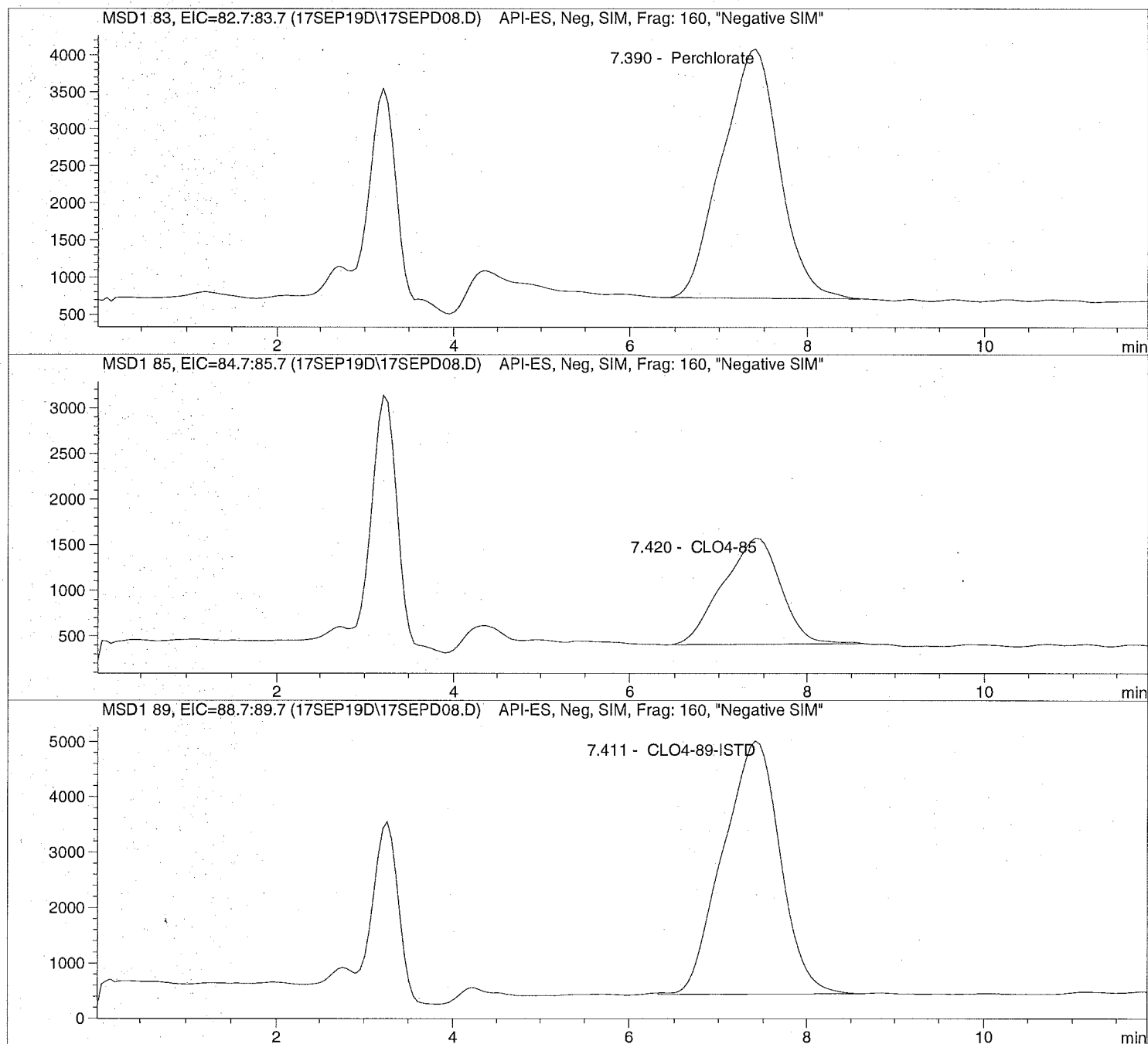
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD08.D Sample Name: 673908 256031D

```

=====
Injection Date: 9/17/2019 10:23:18      Seq Line:      8
Sample Name:    673908 256031D          Location:      Vial 77
Acq Operator:  TNB                      Inj. No.:     1
                                           Inj. Vol.:    40 µl

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/17/2019 12:34:41

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.390	PBA	150348.3	2.4952	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.420	PBA	52653.1	2.7670	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.411	BBA	204262.4	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD09.D

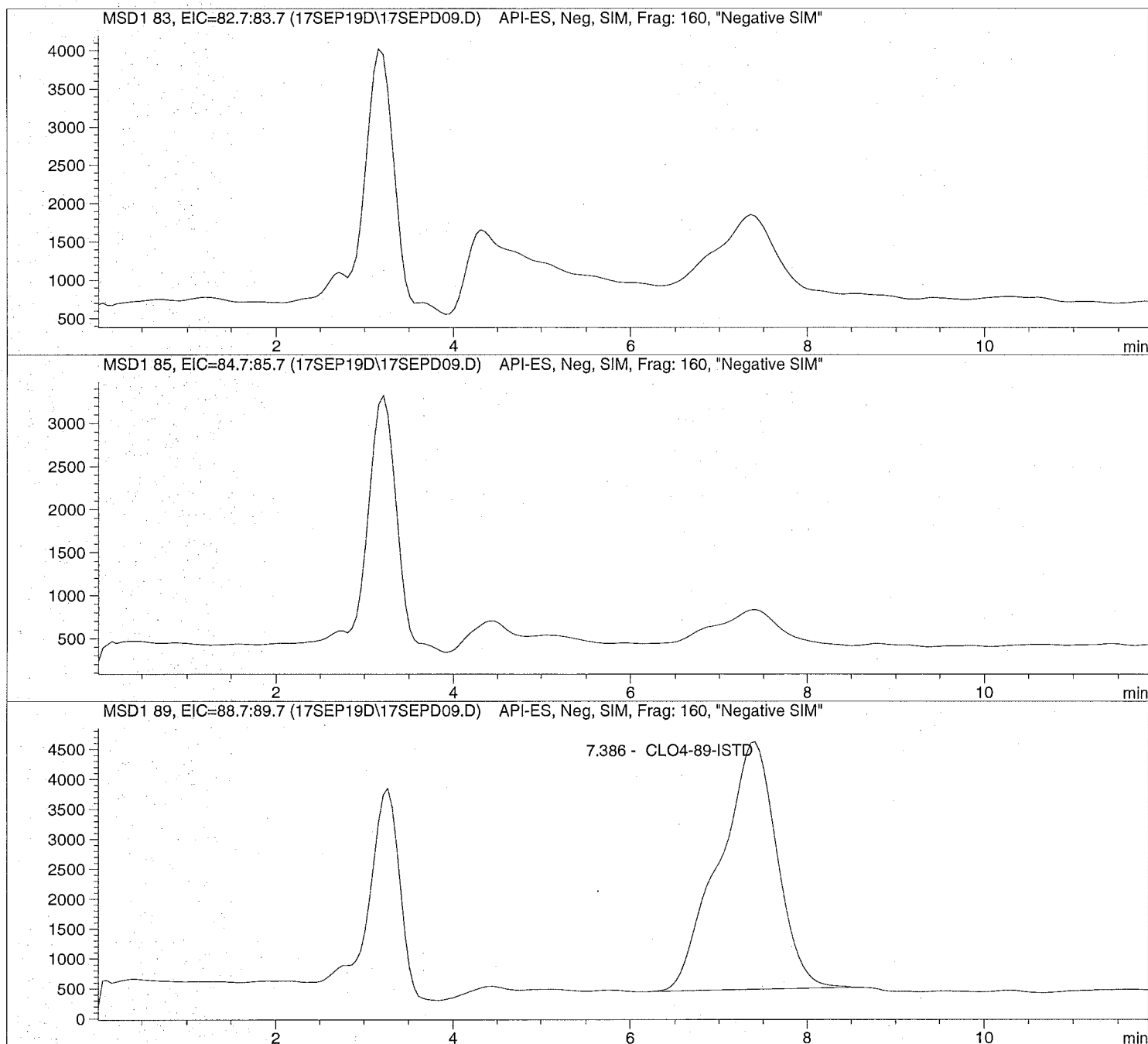
Sample Name: 1926281001

Injection Date: 9/17/2019 10:37:19
Sample Name: 1926281001
Acq Operator: TNB

Seq Line: 9
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD09.D Sample Name: 1926281001

```

=====
Injection Date: 9/17/2019 10:37:19      Seq Line: 9
Sample Name: 1926281001                Location: Vial 78
Acq Operator: TNB                      Inj. No.: 1
                                           Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.386	PBA	187882.8	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD10.D

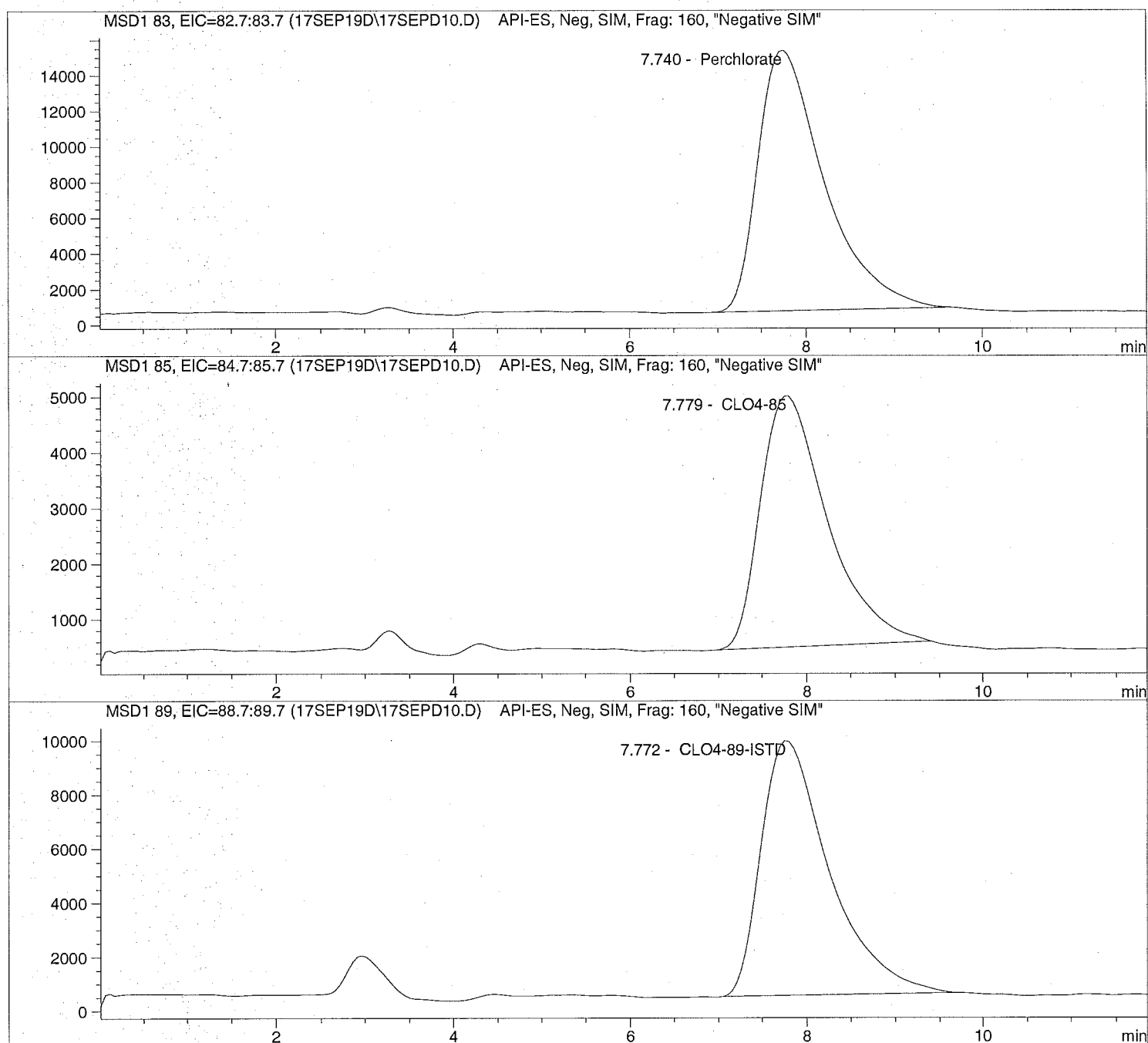
Sample Name: 1926282001 1K

Injection Date: 9/17/2019 10:51:21
Sample Name: 1926282001 1K
Acq Operator: TNB

Seq Line: 10
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEP10.D Sample Name: 1926282001 1K

```
=====  
Injection Date: 9/17/2019 10:51:21 Seq Line: 10  
Sample Name: 1926282001 1K Location: Vial 79  
Acq Operator: TNB Inj. No.: 1  
Inj. Vol.: 40 µl
```

```
Acq. Method: CLO4-AQN.M  
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M  
Last Changed: 9/17/2019 12:34:41
```

Perchlorate analysis

=====
Sample Information
=====

```
Sorted By: Signal  
Calib. Data Modified: Tue, 20. Aug. 2019, 10:15:00 am  
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
7.740	PBA	757420.9	4926.1780	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.779	PBA	236315.7	5035.1305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.772	PBA	501726.5	5000.0000	CLO4-89-ISTD

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

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD11.D

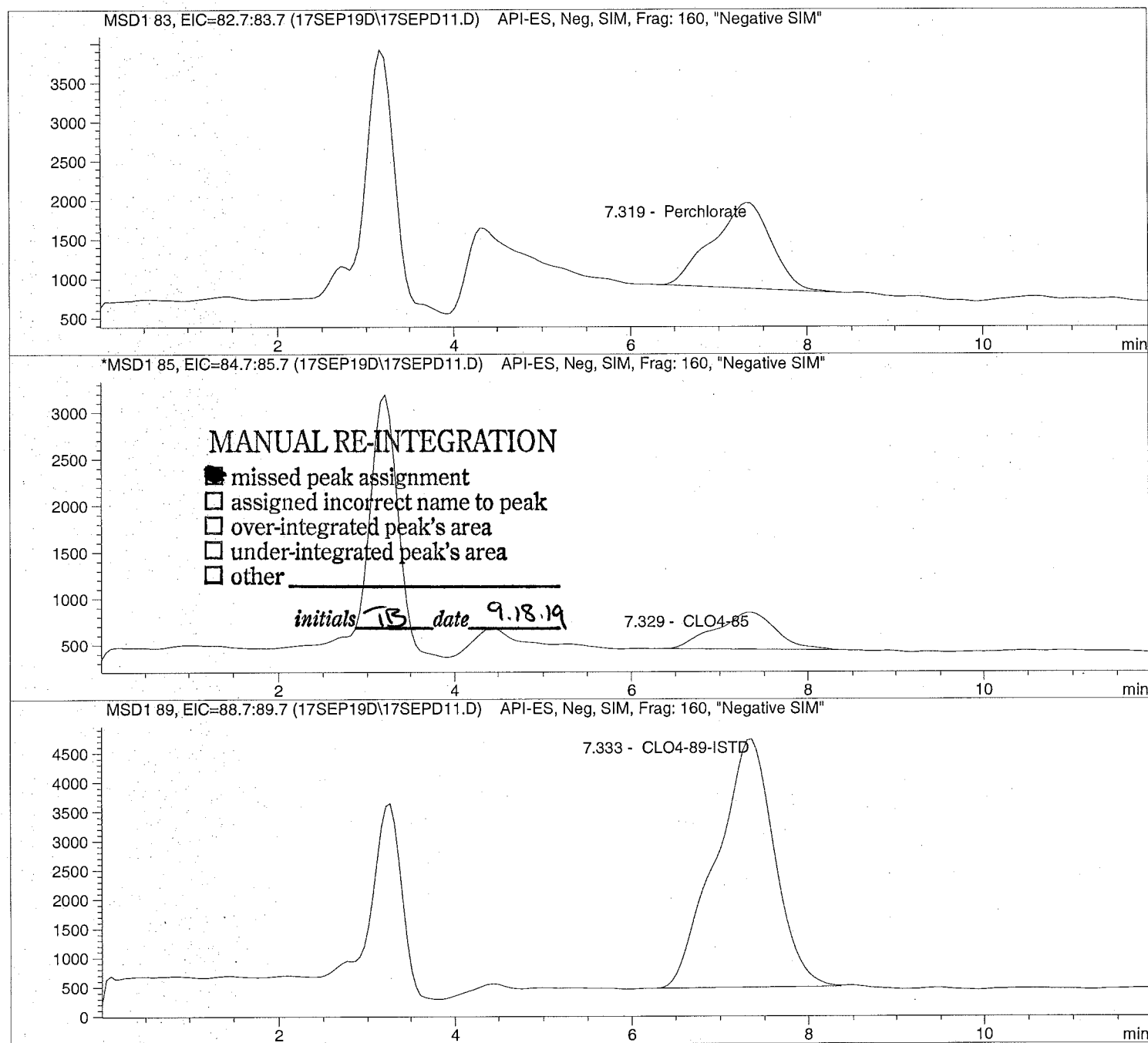
Sample Name: 1926283001

Injection Date: 9/17/2019 11:05:22
Sample Name: 1926283001
Acq Operator: TNB

Seq Line: 11
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD11.D

Sample Name: 1926283001

```

=====
Injection Date:  9/17/2019  11:05:22      Seq Line:      11
Sample Name:    1926283001                Location:      Vial 80
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    40 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/17/2019  12:34:41
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.319	PBA	50036.3	0.9832	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.329	MM	18774.9	1.0444	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.333	PBA	193086.8	5.0000	CLO4-89-ISTD

```

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

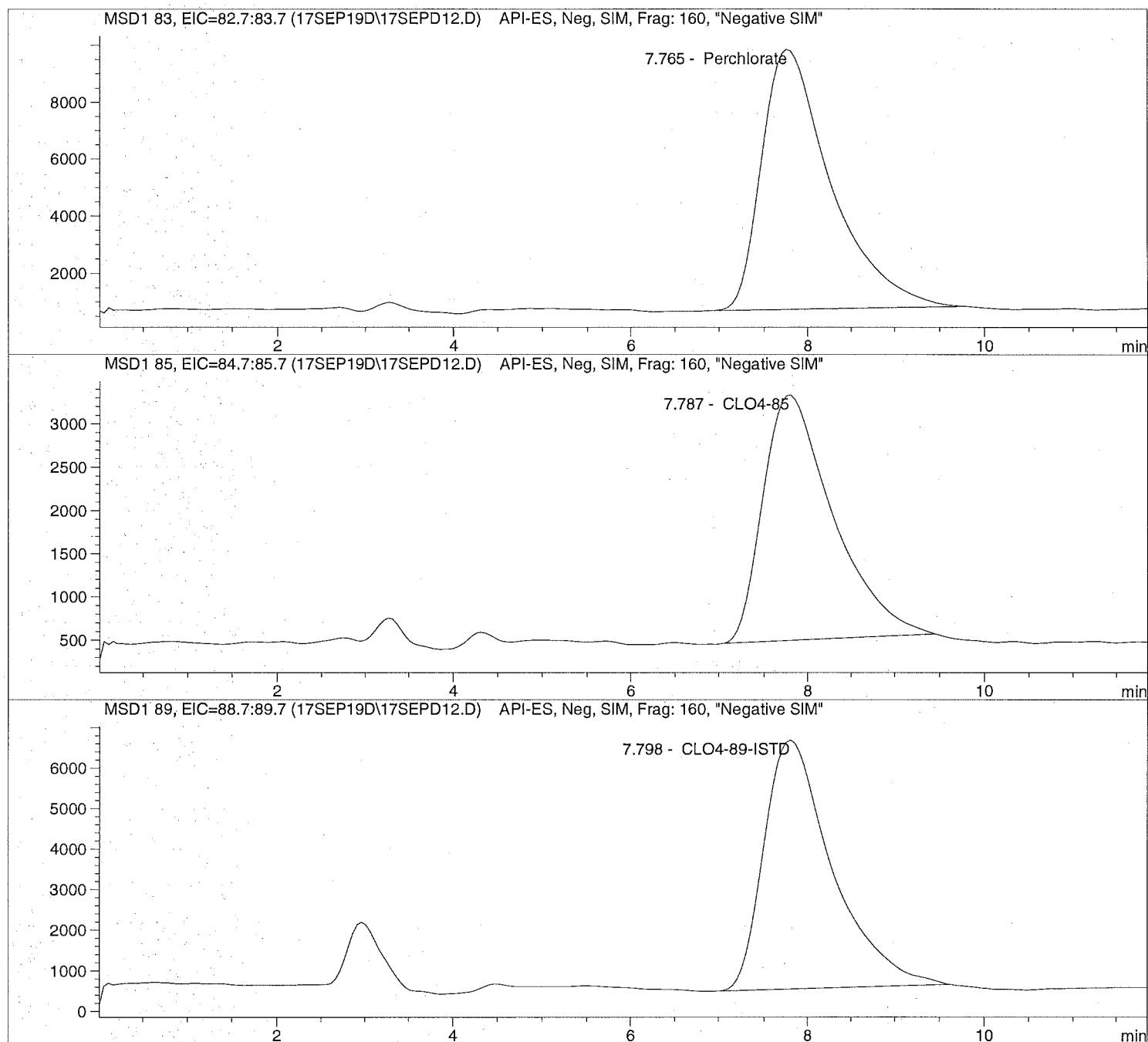
```


Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD12.D Sample Name: 1926282001 1K

Injection Date: 9/17/2019 11:22:08 Seq Line: 12
Sample Name: 1926282001 1K Location: Vial 79
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD12.D Sample Name: 1926282001 1K

```

=====
Injection Date:  9/17/2019  11:22:08      Seq Line:      12
Sample Name:    1926282001   1K          Location:      Vial 79
Acq Operator:   TNB          Inj. No.:      1
                                           Inj. Vol.:     40 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/17/2019  12:34:41
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.765	PBA	498890.6	4904.4375	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.787	PBA	157326.7	5065.4812	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.798	PBA	332001.9	5000.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD13.D

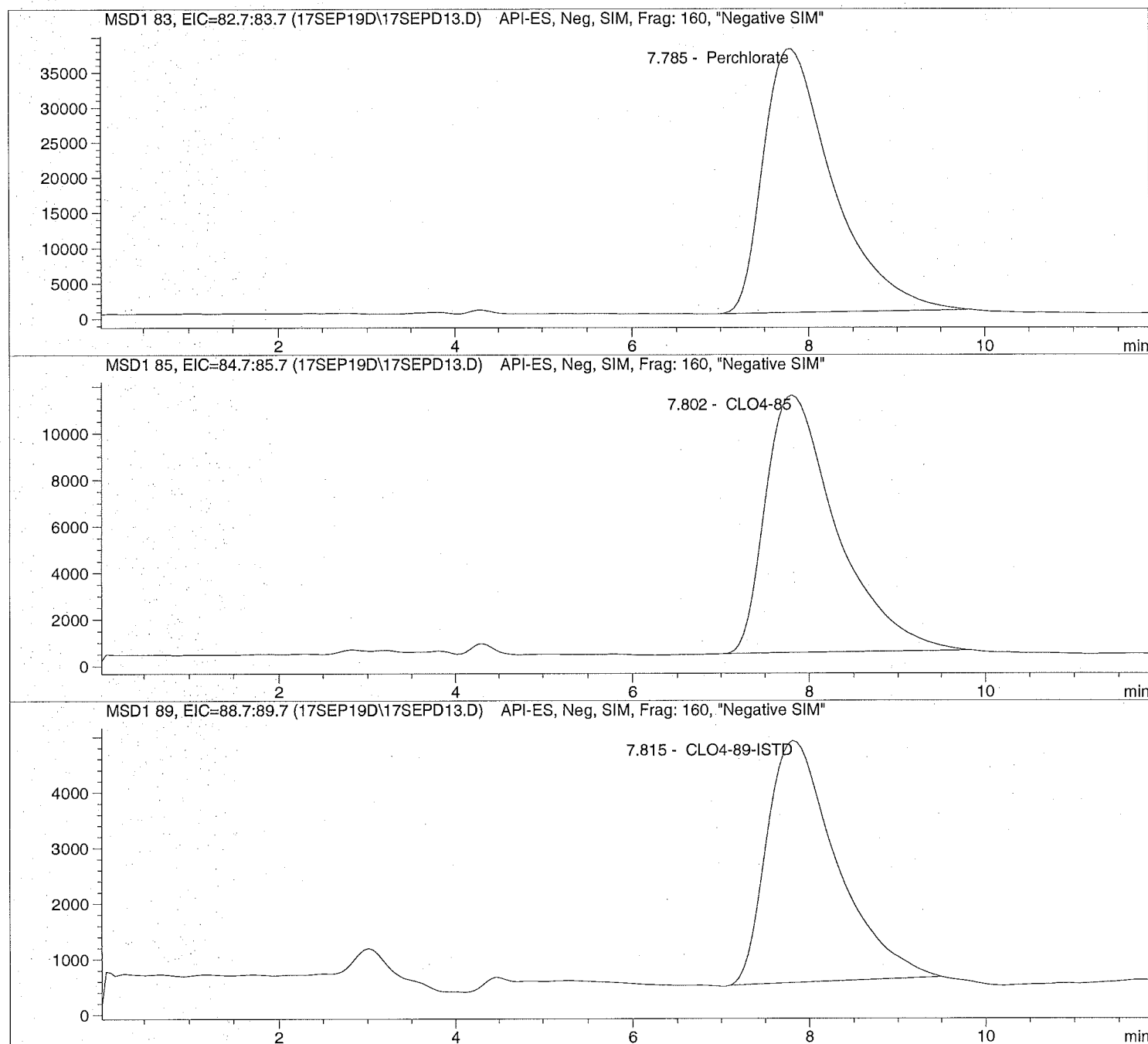
Sample Name: 673909 CCV@25

Injection Date: 9/17/2019 11:37:02
Sample Name: 673909 CCV@25
Acq Operator: TNB

Seq Line: 13
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD13.D Sample Name: 673909 CCV@25

=====
 Injection Date: 9/17/2019 11:37:02 Seq Line: 13
 Sample Name: 673909 CCV@25 Location: Vial 71
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
 Last Changed: 9/17/2019 12:34:41

Perchlorate analysis

=====
 Sample Information
 =====

Sorted By: Signal
 Calib. Data Modified: Tue, 20. Aug. 2019, 10:15:00 am
 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
7.785	PBA	2042028.8	26.0082	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.802	PBA	617795.5	26.4894	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.815	PBA	238300.4	5.0000	CLO4-89-ISTD

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



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

=====
 Calibration Table
 =====

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 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	Amount	Area	Amt/Area	Ref Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5	1 Perchlorate
		2	2.00000	1.35273e5	1.47849e-5	
		3	5.00000	3.37764e5	1.48033e-5	
		4	10.00000	6.83454e5	1.46316e-5	
		5	25.00000	2.08433e6	1.19943e-5	
		6	50.00000	4.13334e6	1.20968e-5	
		7	75.00000	5.99313e6	1.25143e-5	
8.755	2	1	1.00000	2.36780e4	4.22333e-5	1 CLO4-85
		2	2.00000	4.69486e4	4.25998e-5	
		3	5.00000	1.06124e5	4.71147e-5	
		4	10.00000	2.13523e5	4.68335e-5	
		5	25.00000	6.14295e5	4.06971e-5	
		6	50.00000	1.19814e6	4.17315e-5	
		7	75.00000	1.78355e6	4.20509e-5	
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1 CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5	
		3	5.00000	2.33196e5	2.14412e-5	
		4	5.00000	2.34454e5	2.13262e-5	
		5	5.00000	2.50568e5	1.99547e-5	
		6	5.00000	2.30977e5	2.16472e-5	

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp Name
7		5.00000	2.21504e5	2.25729e-5	

More compound-specific settings:

Compound: Perchlorate

Time Window : From 6.654 min To 12.544 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333

Compound: CLO4-85

Time Window : From 6.650 min To 12.505 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333

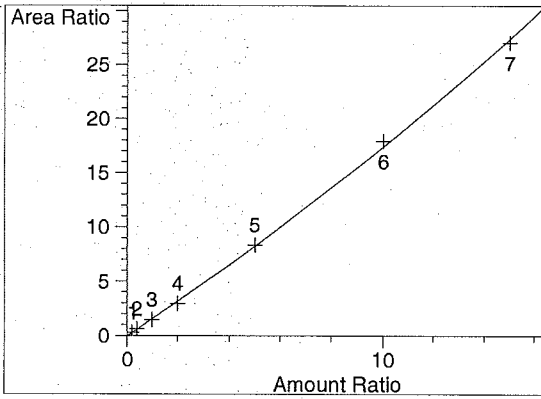
Compound: CLO4-89-ISTD

Time Window : From 6.659 min To 12.466 min
 Curve Type : Linear
 Origin : Included
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 1
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1

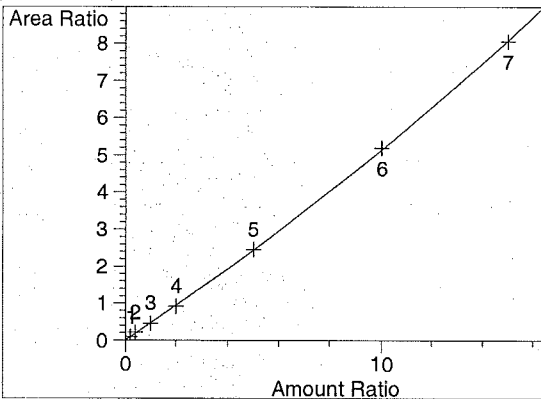
=====
 Peak Sum Table
 =====

No Entries in table
 =====

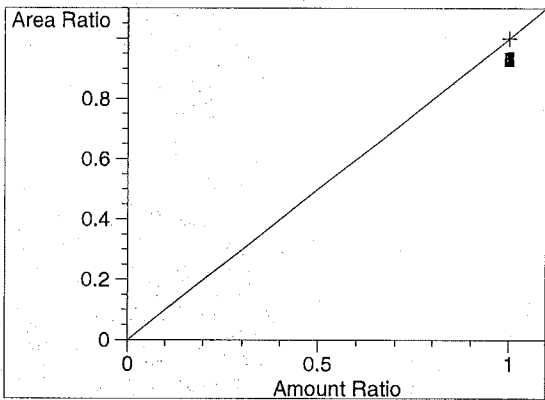
=====
 Calibration Curves
 =====



Perchlorate at exp. RT: 8.744
 MSD1 83, EIC=82.7:83.7
 Correlation: 0.99957
 Residual Std. Dev.: 0.30744
 Formula: $y = ax^2 + bx + c$
 a: 1.76988e-2
 b: 1.56480
 c: -4.92430e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
 MSD1 85, EIC=84.7:85.7
 Correlation: 0.99983
 Residual Std. Dev.: 0.03473
 Formula: $y = ax^2 + bx + c$
 a: 5.13396e-3
 b: 4.62055e-1
 c: 4.97209e-4
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
 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 1 : 1
 Level 2 : 1
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP2.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	7.76074e4	8.744	1.06245
##	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
##	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
##	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
##	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
##	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
##	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
##	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

##	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
##	---	---	---	---	---	---	---	---
##	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
##	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
##	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
##	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
##	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
##	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
##	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
##	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

##	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	2.73208e5	8.766	5.00000
##	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
##	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
##	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
##	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
##	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
##	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
##	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** 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 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 3/19/2019 09:39:40

Seq Line: 3

Sample Name: CLO4@ 1.0ug/L

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

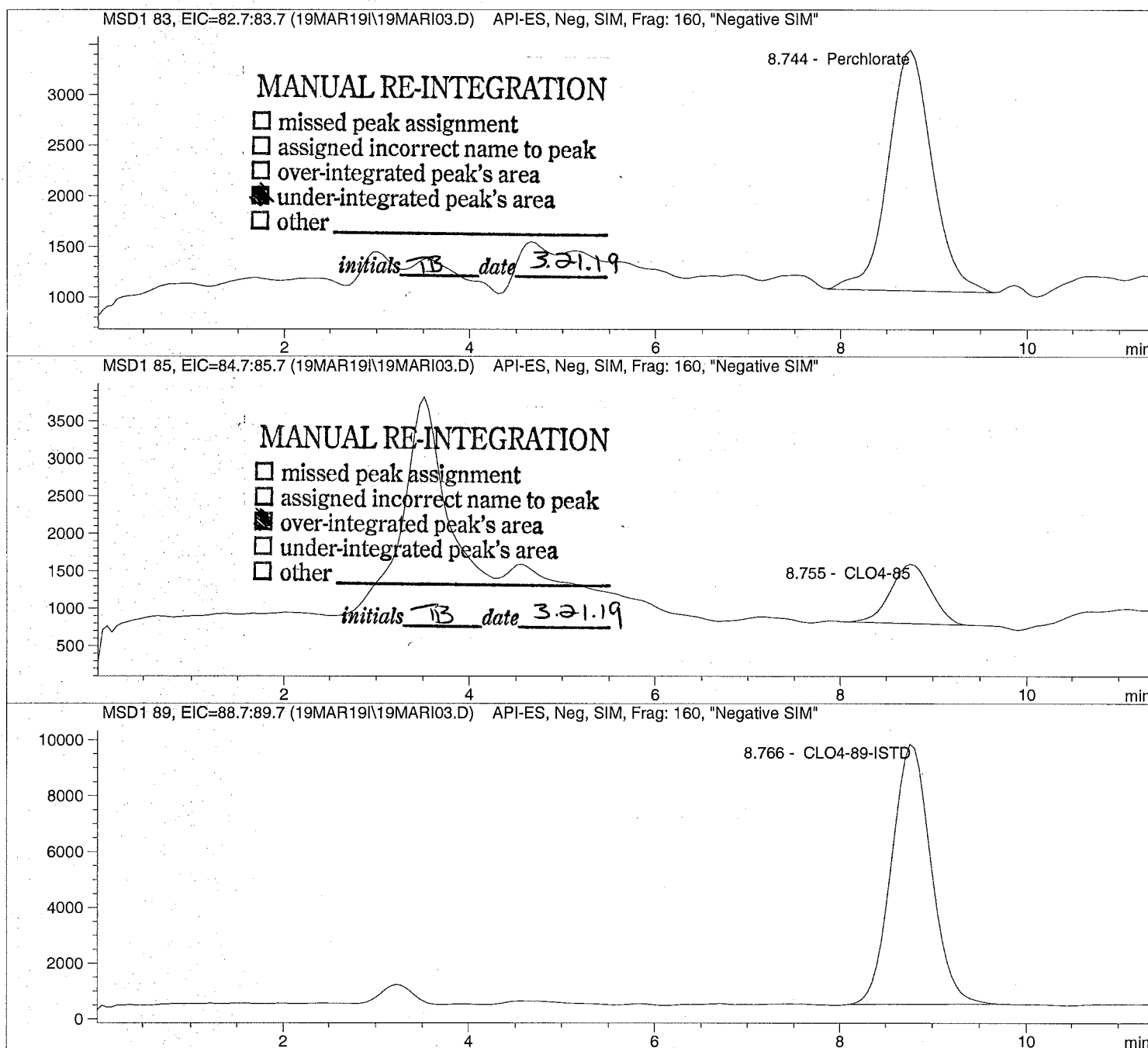
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 3/19/2019 09:39:40      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D

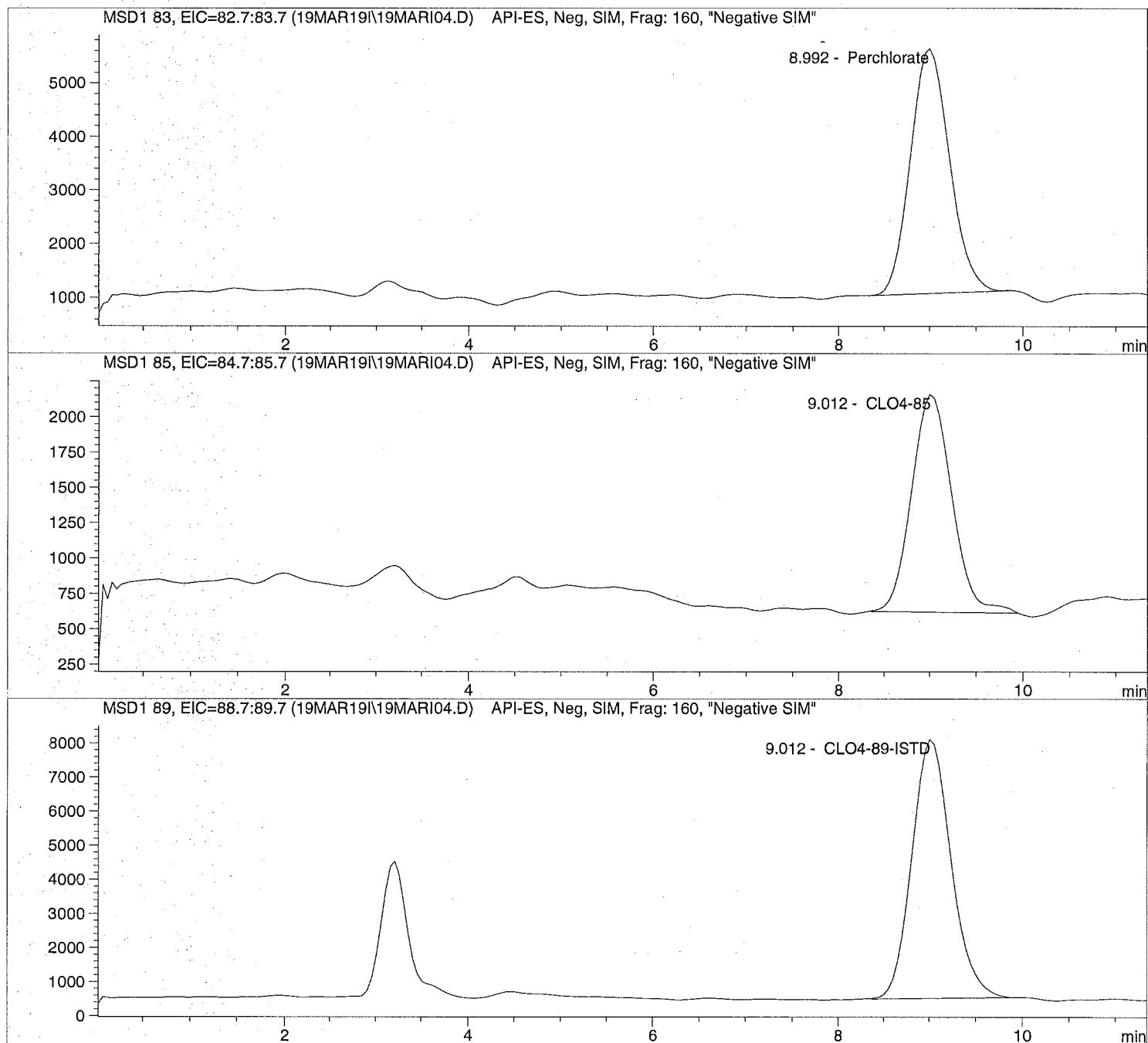
Sample Name: CLO4@ 2.0ug/L

Injection Date: 3/19/2019 09:53:00
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

```

=====
Injection Date: 3/19/2019 09:53:00      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19\19MARI05.D

Sample Name: CLO4@ 5.0ug/L

Injection Date: 3/19/2019 10:06:16

Seq Line: 5

Sample Name: CLO4@ 5.0ug/L

Location: Vial 75

Acq Operator: TNB

Inj. No.: 1

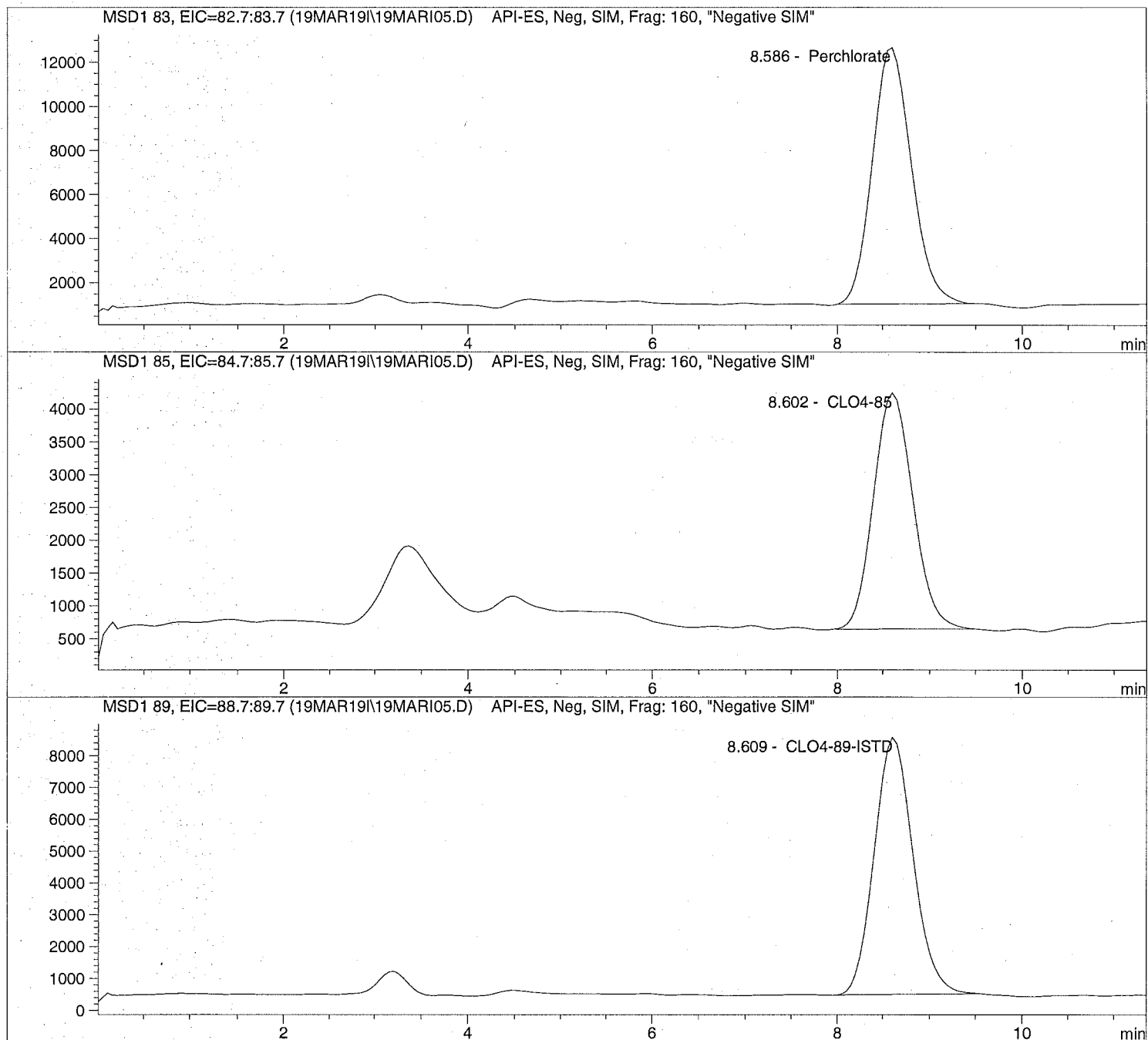
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D

Sample Name: CLO4@ 5.0ug/L

```

=====
Injection Date: 3/19/2019 10:06:16      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

```

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

```


Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D

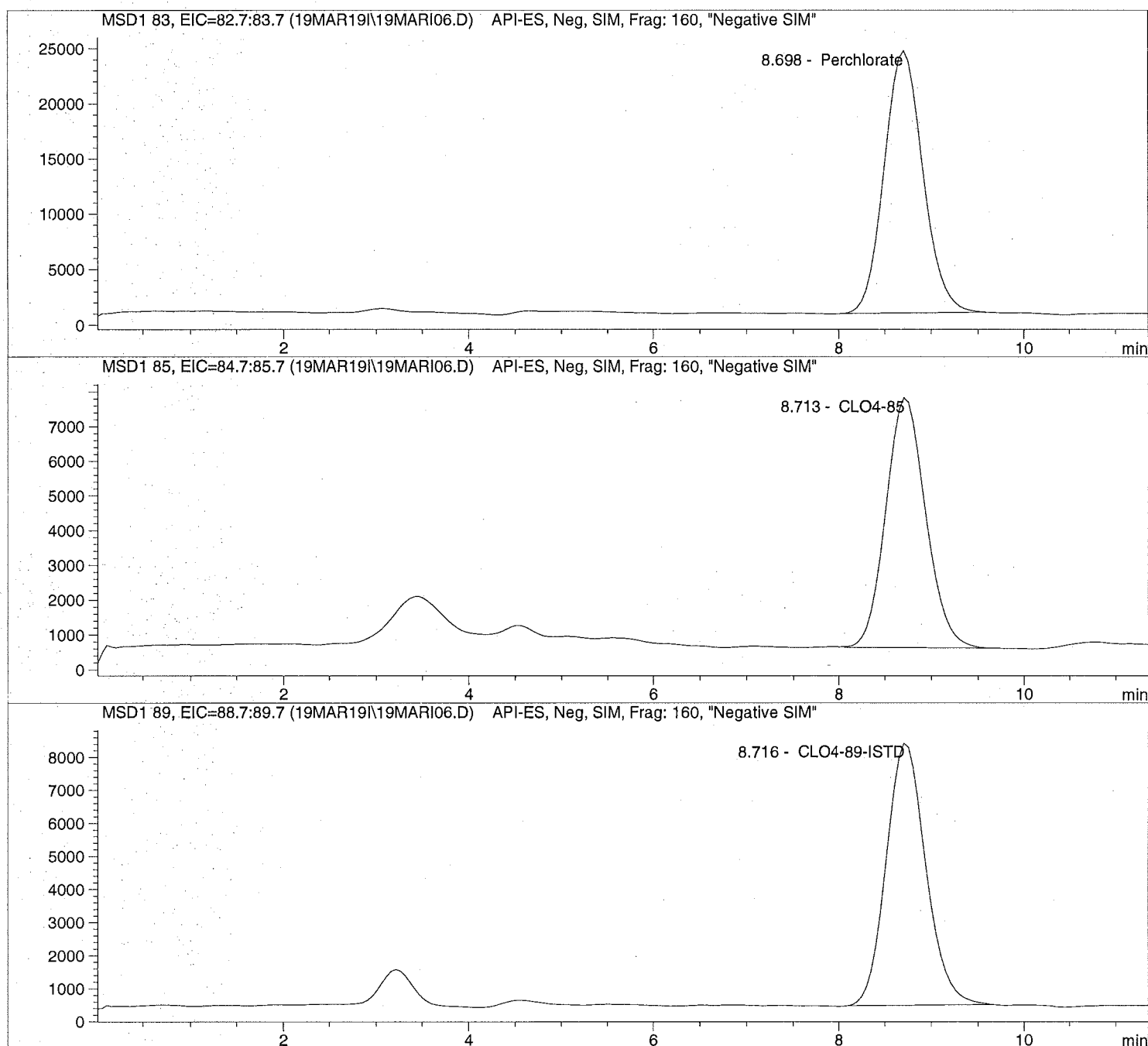
Sample Name: CLO4@ 10.ug/L

Injection Date: 3/19/2019 10:19:32
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

```

=====
Injection Date:  3/19/2019  10:19:32      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-DP2.M
Last Changed:   3/19/2019  14:35:22
  
```

Perchlorate analysis

Sample Information

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019, 02:35:19 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
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D

Sample Name: CLO4@ 25.ug/L

Injection Date: 3/19/2019 10:32:49

Seq Line: 7

Sample Name: CLO4@ 25.ug/L

Location: Vial 77

Acq Operator: TNB

Inj. No.: 1

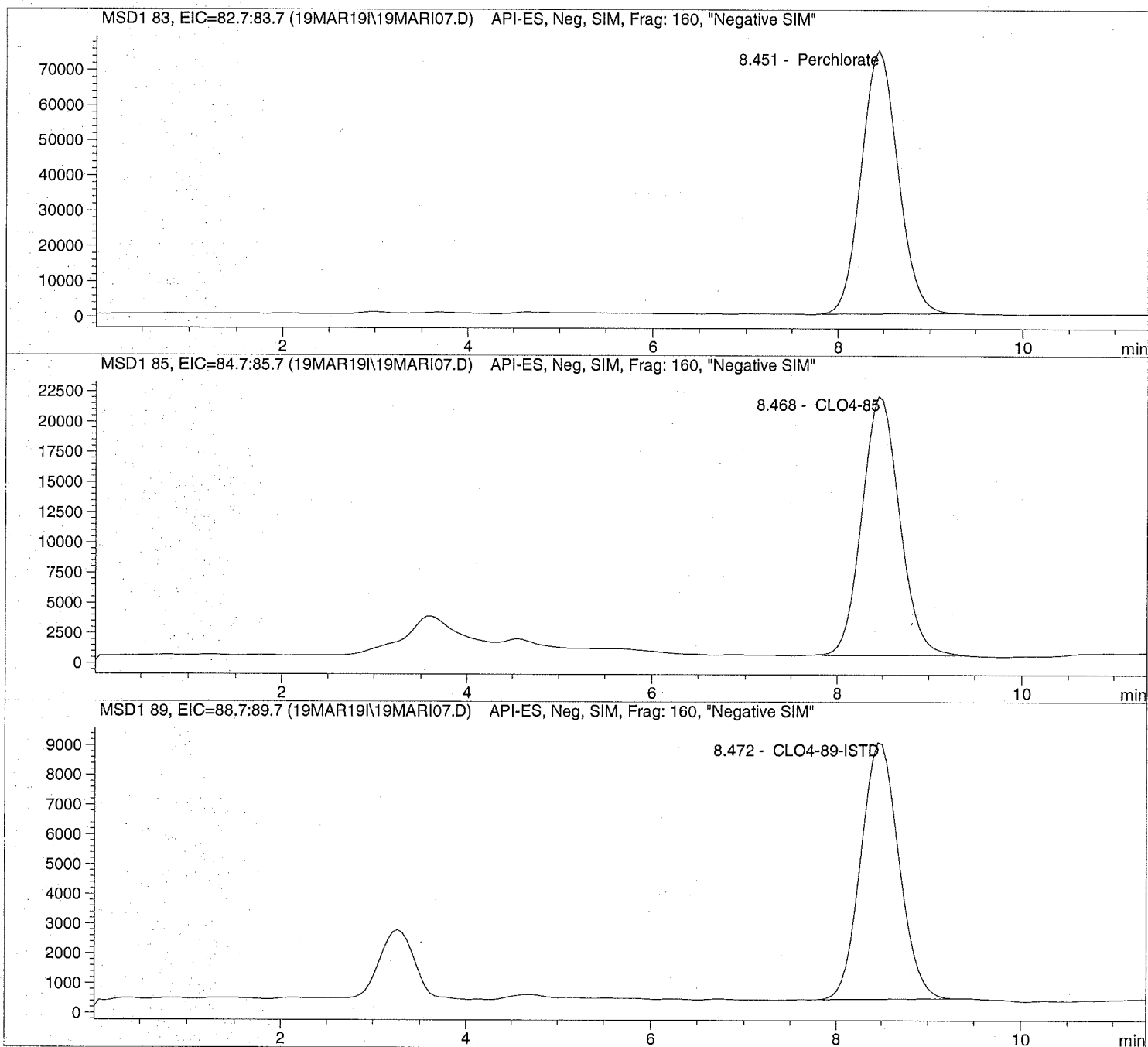
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

```

=====
Injection Date: 3/19/2019 10:32:49 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-DP2.M
Last Changed: 3/19/2019 14:35:22
  
```

Perchlorate analysis

Sample Information

```

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D

Sample Name: CLO4@ 50.ug/L

Injection Date: 3/19/2019 10:46:05

Seq Line: 8

Sample Name: CLO4@ 50.ug/L

Location: Vial 78

Acq Operator: TNB

Inj. No.: 1

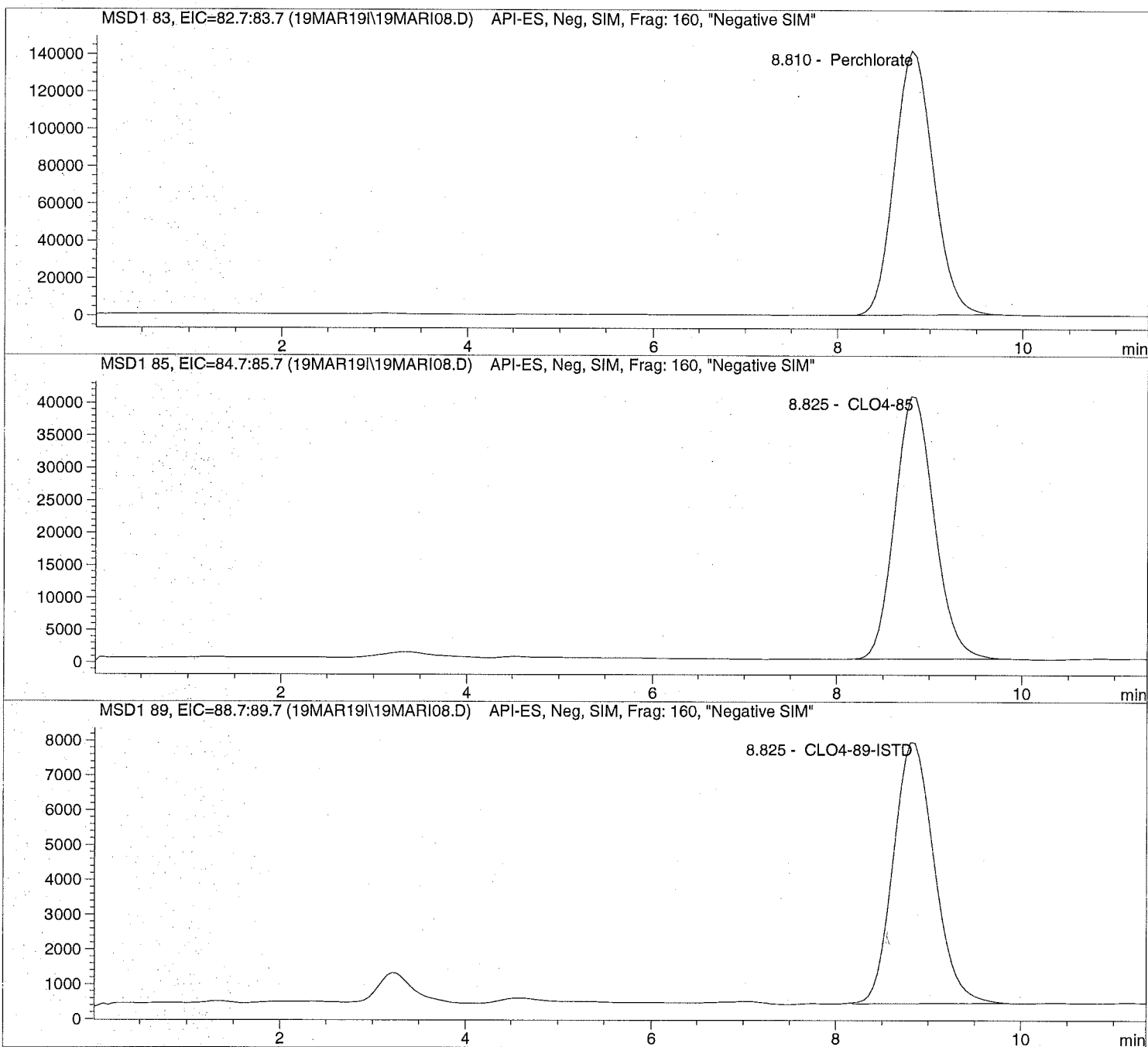
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

```

=====
Injection Date: 3/19/2019 10:46:05 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-DP2.M
Last Changed: 3/19/2019 14:35:22
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019, 02:35:19 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
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D

Sample Name: CLO4@ 75.ug/L

Injection Date: 3/19/2019 10:59:22

Seq Line: 9

Sample Name: CLO4@ 75.ug/L

Location: Vial 79

Acq Operator: TNB

Inj. No.: 1

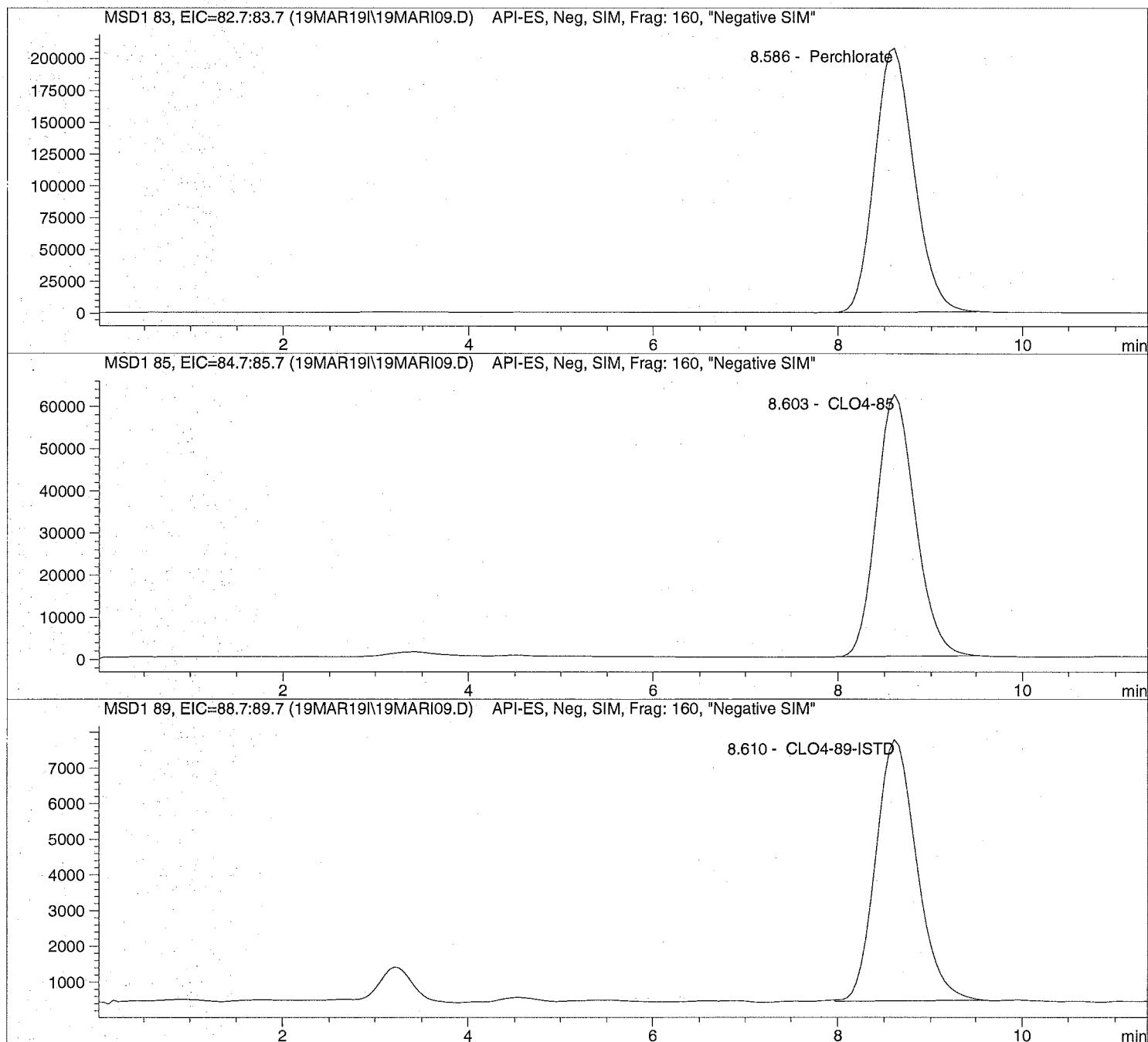
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

```

=====
Injection Date: 3/19/2019 10:59:22      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-DP2.M
Last Changed: 3/19/2019 14:35:22
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

```

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

```


Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D

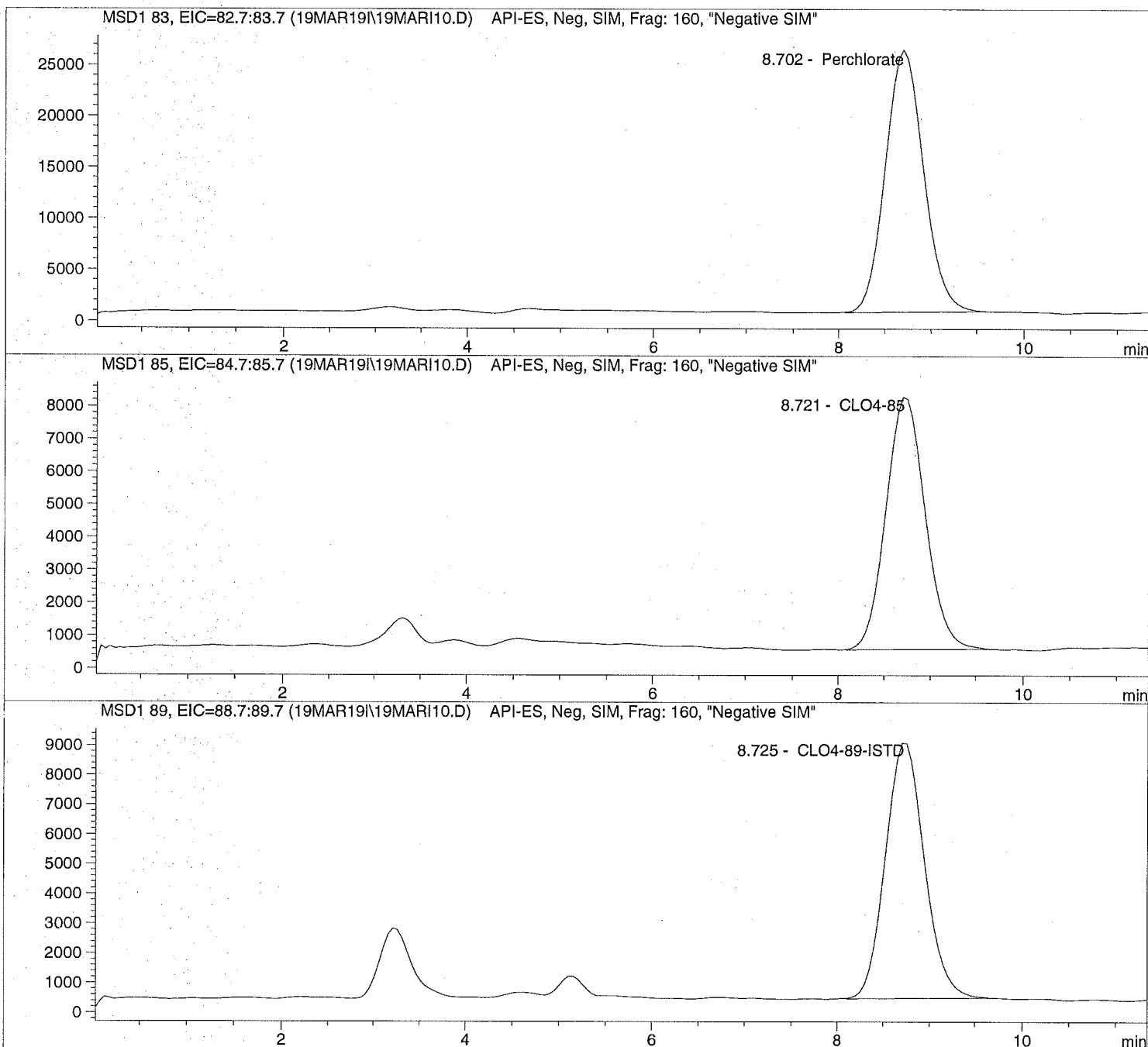
Sample Name: ICAL Verf@10ug/L

Injection Date: 3/19/2019 11:12:42
Sample Name: ICAL Verf@10ug/L
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

```

=====
Injection Date: 3/19/2019 11:12:42      Seq Line:      10
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-DP2.M
Last Changed:   3/19/2019 14:35:22
  
```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	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\19MAR19I\19MARI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 3/19/2019 09:39:40

Seq Line: 3

Sample Name: CLO4@ 1.0ug/L

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

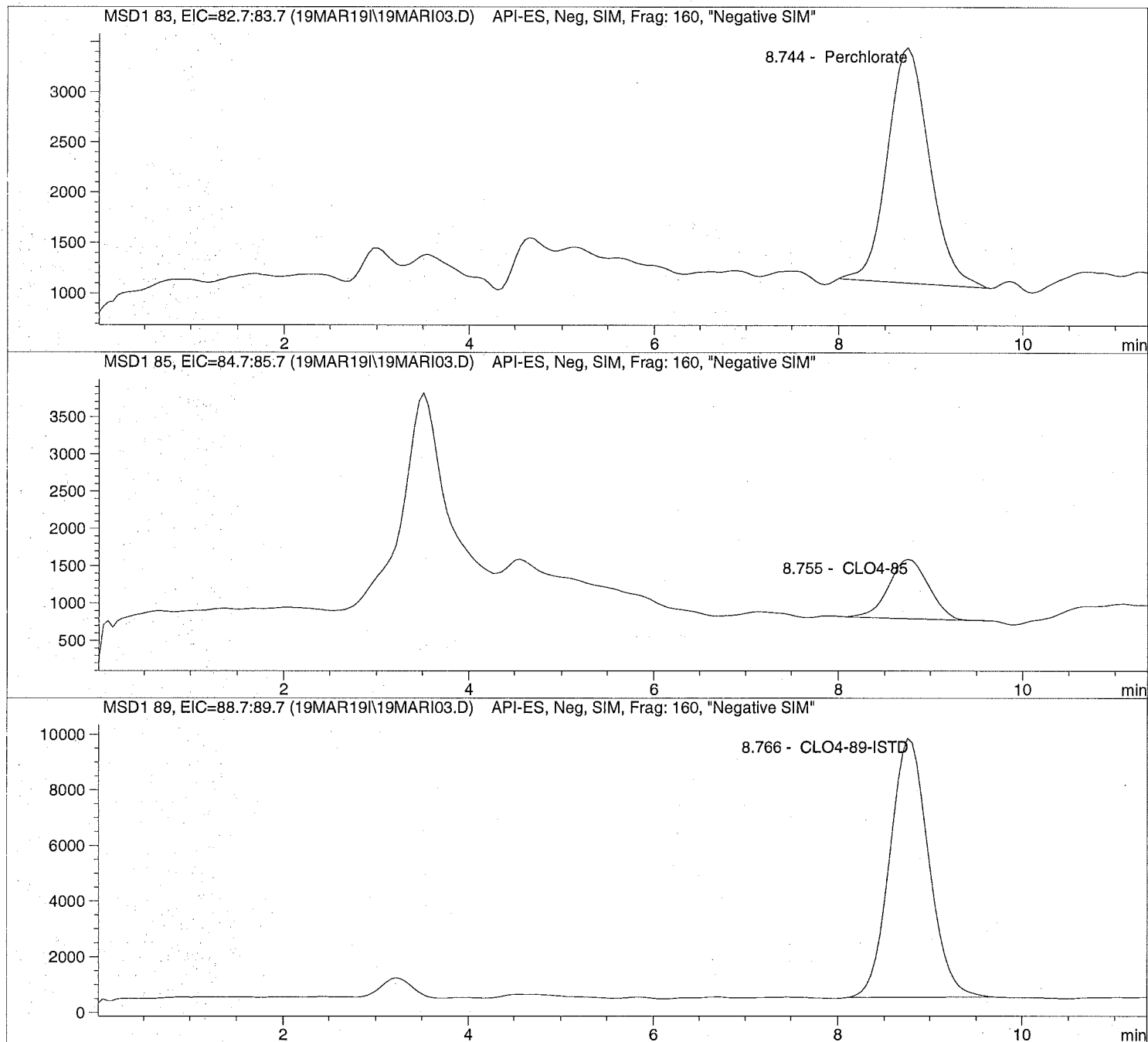
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date:  3/19/2019  09:39:40      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-DP2.M
Last Changed:   3/19/2019  14:38:25
  
```

Perchlorate analysis

Sample Information

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD11.D

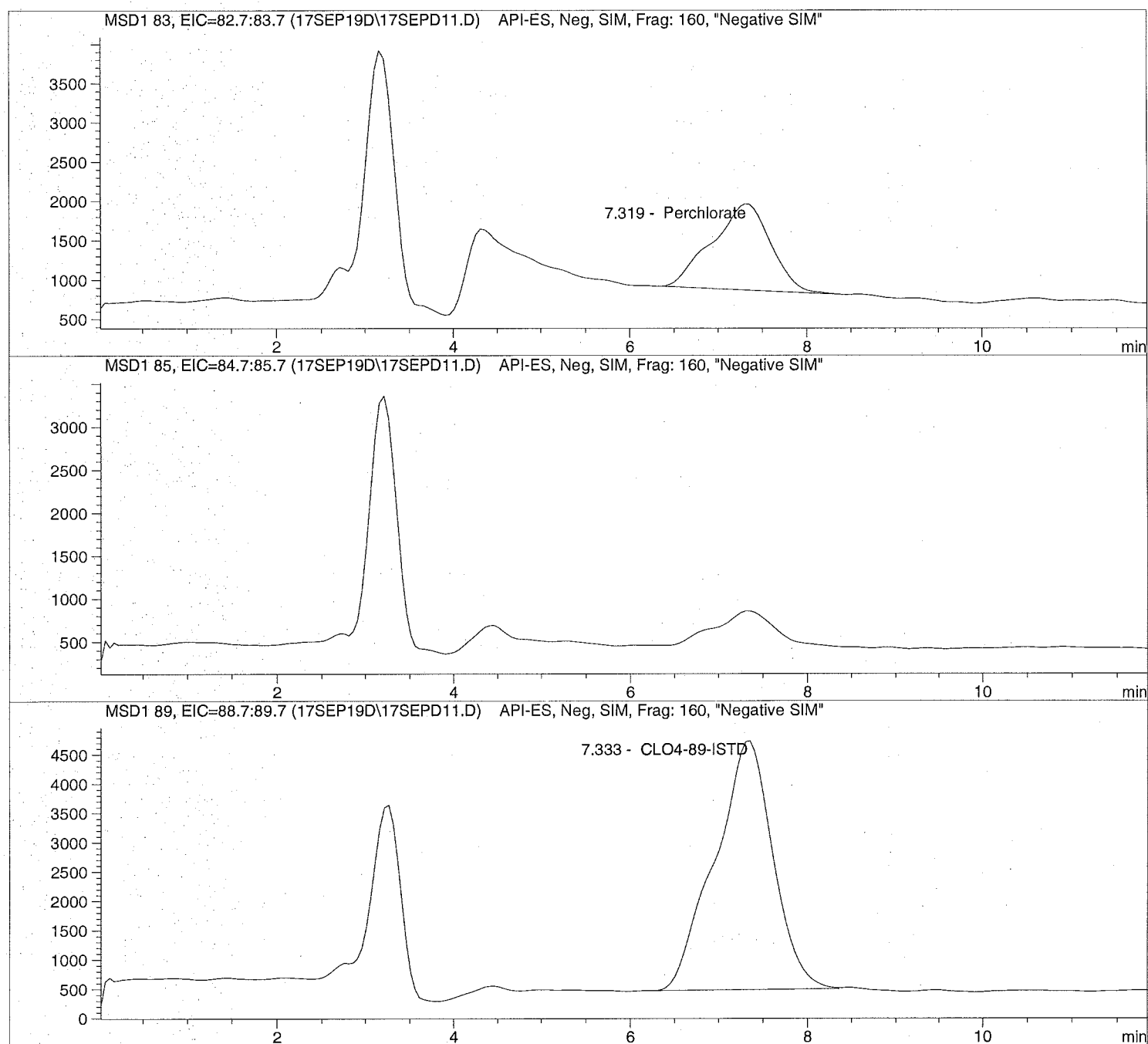
Sample Name: 1926283001

Injection Date: 9/17/2019 11:05:22
Sample Name: 1926283001
Acq Operator: TNB

Seq Line: 11
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD11.D Sample Name: 1926283001

```

=====
Injection Date: 9/17/2019 11:05:22      Seq Line:      11
Sample Name:   1926283001                Location:      Vial 80
Acq Operator:  TNB                       Inj. No.:     1
                                           Inj. Vol.:    40 µl

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:  9/17/2019 12:34:41

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.319	PBA	50036.3	0.9832	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
7.333	PBA	193086.8	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

September 30, 2019

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

Work Order: **HS19090456**

Laboratory Results for: **Longhorn GW Treatment Plant - GWTP Weekly Effluent**

Dear Marcia,

ALS Environmental received 2 sample(s) on Sep 11, 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 simple oval scribble.

Generated By: DAYNA.FISHER

RJ Modashia
Project Manager

ALS Houston, US

Date: 30-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
Work Order: HS19090456

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19090456-01	LH18/24-SP650_091019	Groundwater		10-Sep-2019 14:00	11-Sep-2019 08:59	<input type="checkbox"/>
HS19090456-02	LH18/24-SP650_091019_AIX	Groundwater		10-Sep-2019 14:00	11-Sep-2019 08:59	<input type="checkbox"/>

ALS Houston, US

Date: 30-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
Work Order: HS19090456

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: R346676**

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

WetChemistry by Method E365.3**Batch ID: R346070**

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

ALS Houston, US

Date: 30-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
 Sample ID: LH18/24-SP650_091019
 Collection Date: 10-Sep-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19090456
 Lab ID:HS19090456-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)								Analyst: RG
Nitrogen, Ammonia (As N)	9.1		0.20	0.20	0.20	mg/L	1	20-Sep-2019 15:30
ORTHO PHOSPHATE (PO4) AS P BY E365.3								Analyst: KVL
Phosphorus, Total Orthophosphate (As P)	2.83		0.100	0.250	0.250	mg/L	10	11-Sep-2019 12:43
SUBCONTRACT ANALYSIS - TOC ANALYSIS								Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	29-Sep-2019 12:45

ALS Houston, US

Date: 30-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
 Sample ID: LH18/24-SP650_091019_AIX
 Collection Date: 10-Sep-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19090456
 Lab ID:HS19090456-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA		Analyst: SUB				
Subcontract Analysis	See Attached		0	0		NA	1	19-Sep-2019 16:33

ALS Houston, US

Date: 30-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: HS19090456

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R346070 (0)		Test Name : ORTHO PHOSPHATE (PO4) AS P BY E365.3			Matrix: Groundwater	
HS19090456-01	LH18/24-SP650_091019	10 Sep 2019 14:00			11 Sep 2019 12:43	10
Batch ID: R346576 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Groundwater	
HS19090456-02	LH18/24-SP650_091019_AIX	10 Sep 2019 14:00			19 Sep 2019 16:33	1
Batch ID: R346676 (0)		Test Name : AMMONIA AS N BY E350.3(ISE)			Matrix: Groundwater	
HS19090456-01	LH18/24-SP650_091019	10 Sep 2019 14:00			20 Sep 2019 15:30	1
Batch ID: R347196 (0)		Test Name : SUBCONTRACT ANALYSIS - TOC ANALYSIS			Matrix: Groundwater	
HS19090456-01	LH18/24-SP650_091019	10 Sep 2019 14:00			29 Sep 2019 12:45	1

ALS Houston, US

Date: 30-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: HS19090456

QC BATCH REPORT

Batch ID:	R346070 (0)	Instrument:	UV-2450	Method:	ORTHO PHOSPHATE (PO4) AS P BY E365.3					
MBLK	Sample ID: MBLK-R346070	Units: mg/L		Analysis Date: 11-Sep-2019 12:43						
Client ID:	Run ID: UV-2450_346070	SeqNo: 5248677		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-R346070	Units: mg/L		Analysis Date: 11-Sep-2019 12:43						
Client ID:	Run ID: UV-2450_346070	SeqNo: 5248676		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)	0.246	0.0250	0.25	0	98.4	85 - 115				
MS	Sample ID: HS19090456-01MS	Units: mg/L		Analysis Date: 11-Sep-2019 12:43						
Client ID: LH18/24-SP650_091019	Run ID: UV-2450_346070	SeqNo: 5248679		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)	5.22	0.250	2.5	2.83	95.6	80 - 120				
MSD	Sample ID: HS19090456-01MSD	Units: mg/L		Analysis Date: 11-Sep-2019 12:43						
Client ID: LH18/24-SP650_091019	Run ID: UV-2450_346070	SeqNo: 5248678		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)	5.19	0.250	2.5	2.83	94.4	80 - 120	5.22	0.576	20	

The following samples were analyzed in this batch:

ALS Houston, US

Date: 30-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: HS19090456

QC BATCH REPORT

Batch ID: R346676 (0)		Instrument: WetChem_HS		Method: AMMONIA AS N BY E350.3(ISE)					
MBLK	Sample ID: MBLK-R346676	Units: mg/L		Analysis Date: 20-Sep-2019 15:30					
Client ID:	Run ID: WetChem_HS_346676	SeqNo: 5262154		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)	0.20	0.20							U
LCS	Sample ID: LCS-R346676	Units: mg/L		Analysis Date: 20-Sep-2019 15:30					
Client ID:	Run ID: WetChem_HS_346676	SeqNo: 5262153		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)	10.15	0.20	10	0	102	80 - 120			
MS	Sample ID: HS19090747-01MS	Units: mg/L		Analysis Date: 20-Sep-2019 15:30					
Client ID:	Run ID: WetChem_HS_346676	SeqNo: 5262156		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)	10.51	0.20	10	0.435	101	80 - 120			
MSD	Sample ID: HS19090747-01MSD	Units: mg/L		Analysis Date: 20-Sep-2019 15:30					
Client ID:	Run ID: WetChem_HS_346676	SeqNo: 5262155		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)	10.42	0.20	10	0.435	99.8	80 - 120	10.51	0.917	20

The following samples were analyzed in this batch: HS19090456-01

ALS Houston, US

Date: 30-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: **HS19090456**

**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	2019-141	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US

Date: 30-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
Work Order: HS19090456

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19090456-01	LH18/24-SP650_091019	Login	9/11/2019 11:43:19 AM	PMG	WET380
HS19090456-01	LH18/24-SP650_091019	Login	9/11/2019 11:43:19 AM	PMG	WET380
HS19090456-01	LH18/24-SP650_091019	Login	9/11/2019 11:43:19 AM	PMG	Sub
HS19090456-02	LH18/24-SP650_091019_AIX	Login	9/11/2019 11:43:19 AM	PMG	Sub

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19090456

Date/Time Received: **11-Sep-2019 08:59**
 Received by: **AC**

Checklist completed by:	<u>Paresh M. Giga</u>	<u>11-Sep-2019</u>	Reviewed by:		
	eSignature	Date		eSignature	Date

Matrices: **GW**

Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	1 Page(s)
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	COC IDs:None
Samplers name present on COC?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

Temperature(s)/Thermometer(s):	2.7c U/C		IR25
Cooler(s)/Kit(s):	45038		
Date/Time sample(s) sent to storage:	9/11/19 11:55		
Water - VOA vials have zero headspace?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted by:	<input type="text"/>		

Login Notes:

Client Contacted: _____ Date Contacted: _____ Person Contacted: _____

Contacted By: _____ Regarding: _____

Comments:

Corrective Action:



1608 13th Avenue South, Suite 300
 Birmingham Alabama 35205
 Tel: 205-918-4000
 Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____
 Project/Phase No: NW01312.0150
 CQC Number(1): _____
 LIMS Number: _____


Facility/Base I.D.: <u>LHAAP</u>								Sample Analysis Requested ⁽⁵⁾								Quality Assurance Samples ⁽⁶⁾					
Project/Site Name: <u>LHAAP / GWTP weekly Effluent</u>																					
Client Name:																					
Collected by: <u>Scott Beesinger</u>																					
Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (1)	Sample Number (1)	Sample Matrix ⁽¹⁾	Number of containers	TD	Ammonia-N	Orthophosphate	Perchlorate						Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
<u>LHAAP-SPLSD-041019</u>		<u>10 Sep 2019</u>	<u>1400</u>			<u>N</u>	<u>WG</u>	<u>4</u>	<u>X</u>	<u>X</u>	<u>X</u>										
<u>LHAAP-SPLSD-041019-ATX</u>		<u>10 Sep 2019</u>	<u>1400</u>			<u>N</u>	<u>WG</u>	<u>1</u>			<u>X</u>										

HS19090456
 Bhate Environmental Associates, Inc.
 Birmingham GW Treatment Plant - GWTP Weekly Effluent

COMMENTS: STANDARD TAT

Custody Transfers Prior to Receipt by Laboratory				Sample Delivery Details / Laboratory Receipt			
Relinquished By (Signed): <u>Scott Beesinger</u>	Date: <u>9/10/19</u>	Time: <u>1430</u>		Delivered Directly to Lab: _____	Shipped: _____	No.:	
Received by (Signed): <u>AC</u>	Date: <u>9/11/19</u>	Time: <u>08:59</u>		Method of Shipment: _____			
2. _____				Fed: _____	Ex: _____	Airbill	Number: _____
3. _____				Analytical Lab: <u>ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656</u>			
			<u>45058</u>	Lab Recipient: <u>ATTN: SONIA WEST</u>	Delivery Date/Time:		

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)
 2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)
 3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)
 4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SD = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks
 5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.
 6.) Quality assurance samples are assigned by date (ddmmmy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	CUSTODY SEAL		Seal Broken By: <input checked="" type="checkbox"/>
	Date: 9/10/19	Time: 10:30	Date: 9/10/19
	Name: Scott Bessinger		
	Company: S.M.P.E.		

Must Deliver Next Business Day
Time and Temperature Sensitive!



45038

ORIGIN ID: SGRA (903) 930-6193
SCOTT BESSINGER
BIMATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PHD202

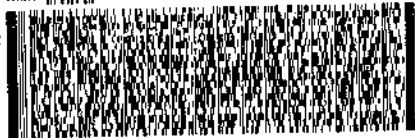
SHIP DATE: 22MAY18
ACTWT: 1.00 LB MAN
CAD: 300130/CAFE3111
DIMS: 26x14x14 IN

MARSHALL, TX 75670
UNITED STATES US

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099

(281) 630-5656
REF: LHAAP - 18/24 SURFACE WATER - RJ

RMA: ||| ||| |||



FedEx
Express



RETURNS MON--SAT

WED - 11 SEP 10:30A
PRIORITY OVERNIGHT

FedEx
3037
4380 9529 3512

AB SGRA

77099
TX-US
IAH



ITC 152785 18SEP19 666A 588CL/9004/0C6A



Case Narrative

Method: 6850

Analysis: Perchlorate

Analysis SOP: LC-MS-CLO4

ALS WO ID(s): 1925603; 1926281; 1926282;
1926283

Client: ALS Laboratories (Houston, TX)

Matrix: Water

ELMS Batch (HBN): 2292 (247901)

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 1926282001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 673905) was less than 1/2 the CRDL. The recovery for the LCS (673906) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on sample 1925603001 (Client ID: LH18/24-SP650_090419_AIX). 3.0 μ l of Working Standard Solution Horizon ID 43701 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 – 673903) is reported from the analysis of the Laboratory Control Sample (LCS – 673906) 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: 19MARI03) along with datafiles 17SEPD11. Sample 1926282001 failed the 50-150% method requirement for ISTD recovery. This sample was re-prepped, re-analyzed and reported.

Thomas Bosch September 18, 2019

Analyst

Date



ANALYTICAL REPORT

Report Date: September 19, 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: **34-1926283**

Project ID: HS19090456

Purchase Order: HS19090456

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_091019_AIX	1926283001	09/10/19	09/12/19	

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: 34-1926283

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: LH18/24-SP650_091019_AIX	Sampling Site: NA	Collected: 09/10/2019				
Lab ID: 1926283001	Media: 125 mL Nalgene	Received: 09/12/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2292 (HBN: 247901) Analyzed: 09/17/2019 11:05	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: 247901)

Field sample 1926282001 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 09/17/2019 14:12	/S/ Stephen Brose 09/19/2019 09:58

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: 34-1926283

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

00952382

Analysis Information

Workorder: 1926283

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2292 (HBN: 247901)
Analyzed By: Thomas Bosch

Blank

LMB: 673905 Analyzed: 09/17/2019 09:41 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 673906 Analyzed: 09/17/2019 08:57 Dilution: 1 Units: ug/L					
Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	2.72	3.00	90.5	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1925603001 Analyzed: 09/17/2019 09:55 Dilution: 1 Units: ug/L		MS: 673907 Analyzed: 09/17/2019 10:09 Dilution: 1 Units: ug/L				MSD: 673908 Analyzed: 09/17/2019 10:23 Dilution: 1 Units: ug/L					
Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	2.47	3	82.5	78.8	123.8	2.5	83.2	0.861	0.0	20.0

Comments

Field sample 1926282001 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 09/18/2019 11:11	/S/ Stephen Brose 09/19/2019 09:58

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



1926283

18098/2

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: 12148

SUBCONTRACT TO:

1926283

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: HS19090456
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19090456-02	LH18/24-SP650_091019_AIX	Groundwater	10 Sep 2019 14:00
SUB_Perch-6850			25 Sep 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: Jay Lynn
Cooler ID(s): _____

Date/Time: 9/11/19 1800
Date/Time: 9/12/19 09:59
Temperature(s): _____

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston Project/Task/Site: _____
 Date/Time of Receipt: _____ Number of Coolers Received: 1

Condition of Coolers: Acceptable/Unacceptable
 Cooler Custody Seals: Present/Absent/NA
 Container Custody Seals: Intact/Broken/NA
 Present/Absent/NA
 Intact/Broken/NA
 Ice Present: Yes/No/NA
 Frozen/Melted/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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 <u>9882</u>	<u>1</u> °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Jay Lynn Johnson Jay Lynn Johnson 9/12/19
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 # 159469-434 HIT EXP 07/20

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

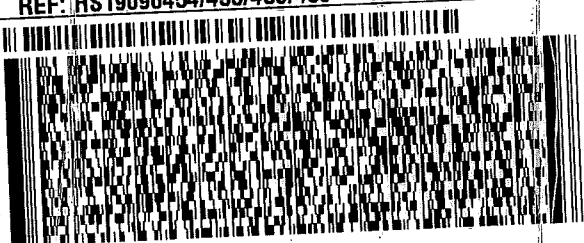
SHIP DATE: 11SEP19
ACTWGT: 13.55 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN
BILL THIRD PARTY

TO **SAMPLE RECEIVING**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123

(801) 266-7700

REF: HS19090454/455/456/459 - RJ



FedEx
Express



551C1/P004/104C

TRK# 4809 7837 8521
02101

THU - 12 SEP 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC

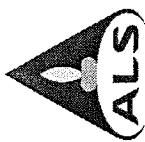




ALS Environmental CHAIN-OF-CUSTODY

Project / Job / Task: HS19090456		Sp/It:		Workorder ID: 1926283		Level: ENV_LVL4		Requested Analysis	
Client: ALS Environmental (Houston)				Account: 8101		Type: 125Poly		EPA 8950, DOD QSM	
Comments:									
Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Containers	Count	
1	09/10/2019 14:00	LH18/24-SP650_091019_AIX	1926283001		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				
Relinquished By: (Signature)					Sample Prep / Analysis for: _____ Prepared / Analyzed by: _____				
Date / Time					Lab Notebook No.: _____ Date / Time: _____				
Received By: (Signature)					Received By: (Signature)				
Date / Time					Date / Time				
Reason for Transfer / Storage Location					Reason for Transfer / Storage Location				
Sample Login									
<i>Wally Julier</i> <i>Julia Waratta 9/13/19 0800</i> <i>R-33.1 9.16.19/12:50 T.B. wash</i>					<i>Storage</i> <i>CL04</i> <i>omalyjms</i>				



Batch Worklist

HBN: 247901

Instrument: WP
Status: WP

Created: 9/17/2019 07:46
Analyst: T. Bosch

Batch: ELMS/ 2292
Rule: EPA 6850, DoD QSM Water

- Workorder: 1925603 [ENV_LVL4]
- Workorder: 1926281 [ENV_LVL4]
- Workorder: 1926282 [ENV_LVL4]
- Workorder: 1926283 [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	673902	CCV for HBN 247901 [ELMS/2292]				CCV	3		E685041C3Q	5311		9/19/2019	
2	673903	RLYS for HBN 247901 [ELMS/2292]				RLYS	3		E685041C3Q	5311		9/19/2019	
3	673904	ICS for HBN 247901 [ELMS/2292]				ICS	3		E6850.D3Q	5311		9/19/2019	
4	673905	LMB for HBN 247901 [ELMS/2292]				LMB	3		E6850Q413Q	5311		9/19/2019	
5	673906	LCS for HBN 247901 [ELMS/2292]				LCS	3		E6850Q413Q	5311		9/19/2019	
6	1925603001	LH18/24-SP650-090419-AIX				SAMPLE	3	1925603001-A	E6850Q41.3	5480	10/2/2019	9/19/2019	
7	673907	LH18/24-SP650...(1925603001MS)				MS	3		E6850Q413Q	5311		9/19/2019	
8	673908	LH18/24-SP65...(1925603001MSD)				MSD	3		E6850Q413Q	5311		9/19/2019	
9	1926281001	LH18/24-SP650_091019_AIX				SAMPLE	3	1926281001-A	E6850Q41.3	5480	10/8/2019	9/25/2019	
10	1926282001	LH18/24-SP140_091019				SAMPLE	3	1926282001-A	E6850Q41.3	5480	10/8/2019	9/25/2019	
11	1926283001	LH18/24-SP650_091019_AIX				SAMPLE	3	1926283001-A	E6850Q41.3	5480	10/8/2019	9/25/2019	
12	673909	CCV for HBN 247901 [ELMS/2292]				CCV	3		E685041C3Q	5311		9/19/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-upALS Work Order #'s & Sample #()'s: 1925603 (001); 1926281 (001) 1926282 (001); 1926283 (001)ELMS Batch/HBN ID: 2292 (247901)Prep Date: 09/16/2019 Analysis Date: 09/17/2019 Analyst: T. BoschAnalyte: **Perchlorate** Matrix: **Water** Method: **6850**Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\SEP\17SEP19D.sReported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**SAMPLE PREPARATION/ANALYSIS:

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

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

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

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.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: 40µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

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 673906; Target = 3.0µg/L. ASTM type II water was used for LMB 673905.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1925603001 (Client ID: LH18/24-SP650_090419_AIX). 3.0µL of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters. Field sample 1926282001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly. Sample 1926282001 failed the 50-150% method requirement for ISTD recovery. This sample was re-prepped, re-analyzed and reported.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\SEP\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\247901-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 673903) is reported from the analysis of the Laboratory Control Sample (LCS – 673906) 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: 19MARI03) along with datafiles 17SEPD11.

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: 2292 HBN: 247901</u> <u>1926283</u>		
Sample Set IDs if Applicable: <u>1925603/1926281/1926282</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	—	— SB
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 - CLO4 WRK

CLO4 WRK			Description - 6850.WKG Std:100.ug/L		
Standard: 43702		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/18/2018 02:09PM		Expires: 09/18/2019	
MFG Lot: TNB: 09/18/2018				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 WRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019



STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK			Description - 6850: Stock AccStd 1,000ug/mL
Standard: 43659		Created By: Thomas Bosch	
MFG: AccuStandard		Create Date: 09/17/2018 09:09AM	
MFG Lot: 218065075		Amount: 100 mL	
Part ID: IC-PER-10X-1		Expires: 07/25/2020	
		Usable: No	
		Lab Lot: CLO4 STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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: 43701		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/18/2018 02:09PM		Expires: 09/18/2019	
MFG Lot: TNB: 09/18/2018				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 INT	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020



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



STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK			Description - Perchlorate ISTD Wrk 1,000ug/L		
Standard: 43730		Created By: Thomas Bosch		Amount: 25 mL	
MFG: ALS/SLC		Create Date: 09/20/2018 09:09AM		Expires: 09/20/2019	
MFG Lot: TNB: 05/09/2018		Verified By: Thomas Bosch		Usable: Yes	
Pipette ID: Not Provided		Verify Date:		Lab Lot: CLO4ISTDWRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026



STANDARD REPORT

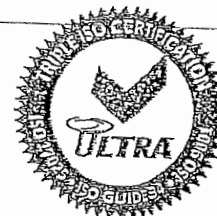
Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK			Description - Perchlorate ISTD Stock
Standard: 43729		Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope		Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDF-012A		Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S		Verify Date:	Lab Lot: CLO4ISTDSTK
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL



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.





Certificate of Analysis



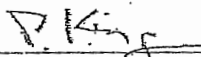
ISO Guide 34 Reference Material

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/QA



125 Market Street
New Haven, CT 06513
USA



AccuStandard®

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

CERTIFICATE OF ANALYSIS



S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (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:

Morgan O'Leary

Morgan O'Leary, Inorganic QC Manager

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:

ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP



23118

Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O₄, 90%+) 100 UG/ML IN WATER

Lot Number: SDDG-013

Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

Labeled CAS Number: NA

Unlabeled CAS Number: 7601-89-0

MW*: 130.4

Chemical Formula: NaClO₄

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration data.

Certification

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

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

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

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

Approved by: T. J. Eckersley

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

Quality Control Tests and Results

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



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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	
*	673902	CCV@25	Vial 71	1	Control	1	2.11095e6	7.718	26.01274
*	673906	QC@3.0	Vial 72	1	Control	2	2.38232e5	7.546	2.71615
*	673904	ICS@3.0	Vial 73	1	Control	3	1.94502e5	7.427	3.19438
*	673905	LMB	Vial 74	1	Control	5	0.00000	0.000	0.00000
*	1925603001		Vial 75	1	Sample	6	0.00000	0.000	0.00000
*	673907	256031S	Vial 76	1	Sample	7	1.44508e5	7.417	2.47376
*	673908	256031D	Vial 77	1	Sample	8	1.50348e5	7.390	2.49518
*	1926281001		Vial 78	1	Sample	9	0.00000	0.000	0.00000
*	1926282001	1K	Vial 79	1	Sample	10	7.57421e5	7.740	4926.17796 <i>-NR REP</i>
*	1926283001		Vial 80	1	Sample	11	5.00363e4	7.319	9.83188e-1 <i>< RL</i>
*	1926282001	1K	Vial 79	1	Sample	12	4.98891e5	7.765	4904.43754
*	673909	CCV@25	Vial 71	1	Control	13	2.04203e6	7.785	26.00821

##	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
*	673902	CCV@25	Vial 71	1	Control	1	6.35094e5	7.742	26.35431
*	673906	QC@3.0	Vial 72	1	Control	2	7.43744e4	7.563	2.70140
*	673904	ICS@3.0	Vial 73	1	Control	3	6.33519e4	7.450	3.34525
*	673905	LMB	Vial 74	1	Control	5	0.00000	0.000	0.00000
*	1925603001		Vial 75	1	Sample	6	0.00000	0.000	0.00000
*	673907	256031S	Vial 76	1	Sample	7	5.21915e4	7.445	2.82706
*	673908	256031D	Vial 77	1	Sample	8	5.26531e4	7.420	2.76701
*	1926281001		Vial 78	1	Sample	9	0.00000	0.000	0.00000
*	1926282001	1K	Vial 79	1	Sample	10	2.36316e5	7.779	5035.13054
*	1926283001		Vial 80	1	Sample	11	1.87749e4	7.329	1.04440
*	1926282001	1K	Vial 79	1	Sample	12	1.57327e5	7.787	5065.48124
*	673909	CCV@25	Vial 71	1	Control	13	6.17795e5	7.802	26.48941

##	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-ISTD RT	CLO4-89-ISTD Amount	
*	673902	CCV@25	Vial 71	1	Control	1	2.46298e5	7.734	5.00000
*	673906	QC@3.0	Vial 72	1	Control	2	2.95565e5	7.573	5.00000
*	673904	ICS@3.0	Vial 73	1	Control	3	2.03094e5	7.453	5.00000
*	673905	LMB	Vial 74	1	Control	5	2.63662e5	7.809	5.00000
*	1925603001		Vial 75	1	Sample	6	2.04752e5	7.431	5.00000
*	673907	256031S	Vial 76	1	Sample	7	1.98153e5	7.432	5.00000
*	673908	256031D	Vial 77	1	Sample	8	2.04262e5	7.411	5.00000
*	1926281001		Vial 78	1	Sample	9	1.87883e5	7.386	5.00000
*	1926282001	1K	Vial 79	1	Sample	10	5.01727e5	7.772	5000.00000 <i>ISTD</i>
*	1926283001		Vial 80	1	Sample	11	1.93087e5	7.333	5.00000 <i>HIGH</i>
*	1926282001	1K	Vial 79	1	Sample	12	3.32002e5	7.798	5000.00000 <i>REP</i>
*	673909	CCV@25	Vial 71	1	Control	13	2.38300e5	7.815	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	673902	CCV@25	CLO4-AQN	1		Ctrl Samp
2	Vial 72	673906	QC@3.0	CLO4-AQN	1		Ctrl Samp
3	Vial 73	673904	ICS@3.0	CLO4-AQN	1		Ctrl Samp
4	Vial 74	673905	LMB	CLO4-AQN	1		Ctrl Samp
5	Vial 74	673905	LMB	CLO4-AQN	1		Ctrl Samp
6	Vial 75	1925603001		CLO4-AQN	1		Sample
7	Vial 76	673907	256031S	CLO4-AQN	1		Sample
8	Vial 77	673908	256031D	CLO4-AQN	1		Sample
9	Vial 78	1926281001		CLO4-AQN	1		Sample
10	Vial 79	1926282001	1K	CLO4-AQN	1		Sample
11	Vial 80	1926283001		CLO4-AQN	1		Sample
12	Vial 79	1926282001	1K	CLO4-AQN	1		Sample
13	Vial 71	673909	CCV@25	CLO4-AQN	1		Ctrl Samp

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD01.D

Sample Name: 673902 CCV@25

Injection Date: 9/17/2019 08:40:19

Seq Line: 1

Sample Name: 673902 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

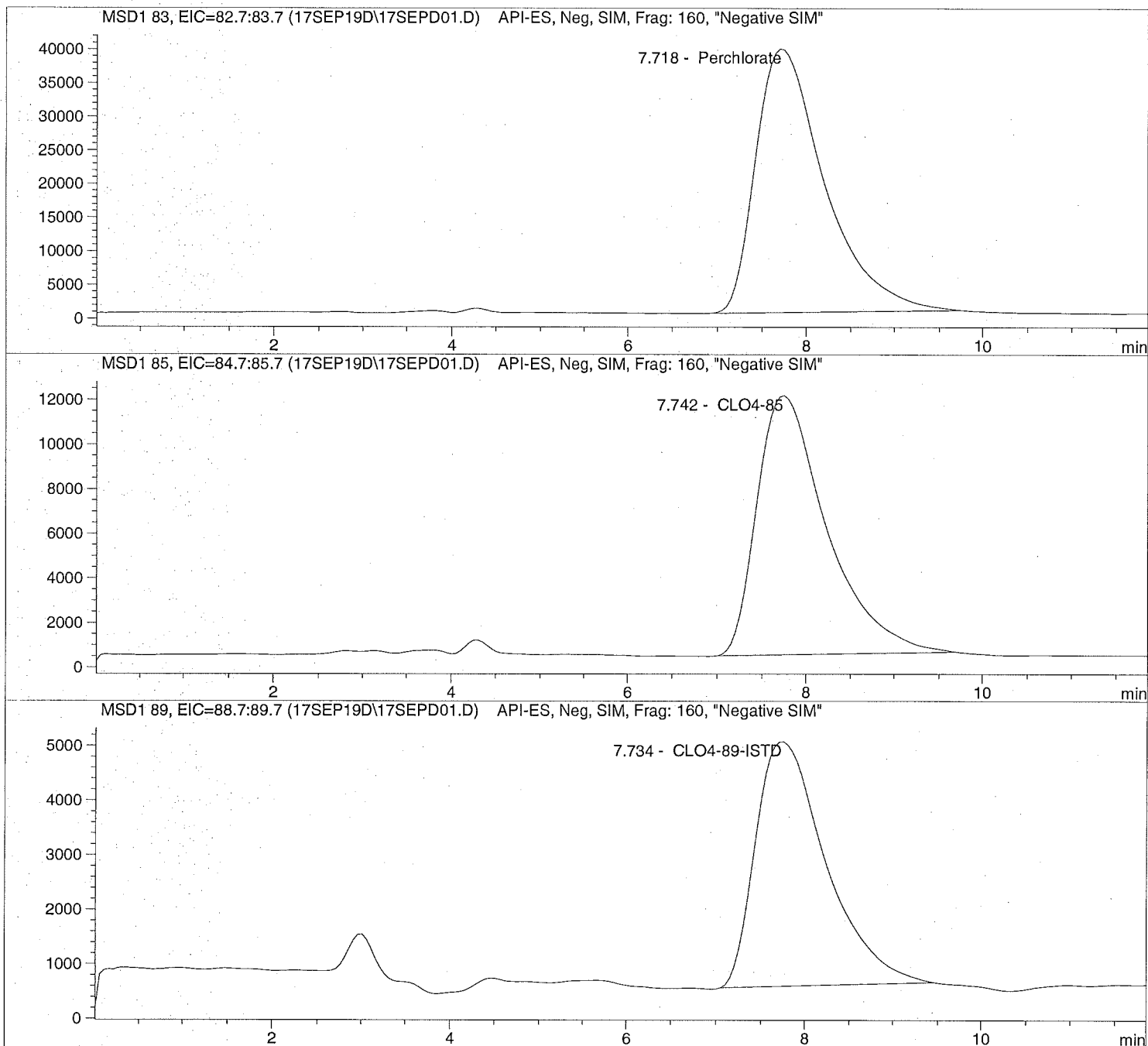
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD01.D Sample Name: 673902 CCV@25

```

=====
Injection Date: 9/17/2019 08:40:19 Seq Line: 1
Sample Name: 673902 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019, 10:15:00 am
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
7.718	PBA	2110953.5	26.0127	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.742	PBA	635093.8	26.3543	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.734	PBA	246298.2	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD02.D

Sample Name: 673906 QC@3.0

Injection Date: 9/17/2019 08:57:27

Seq Line: 2

Sample Name: 673906 QC@3.0

Location: Vial 72

Acq Operator: TNB

Inj. No.: 1

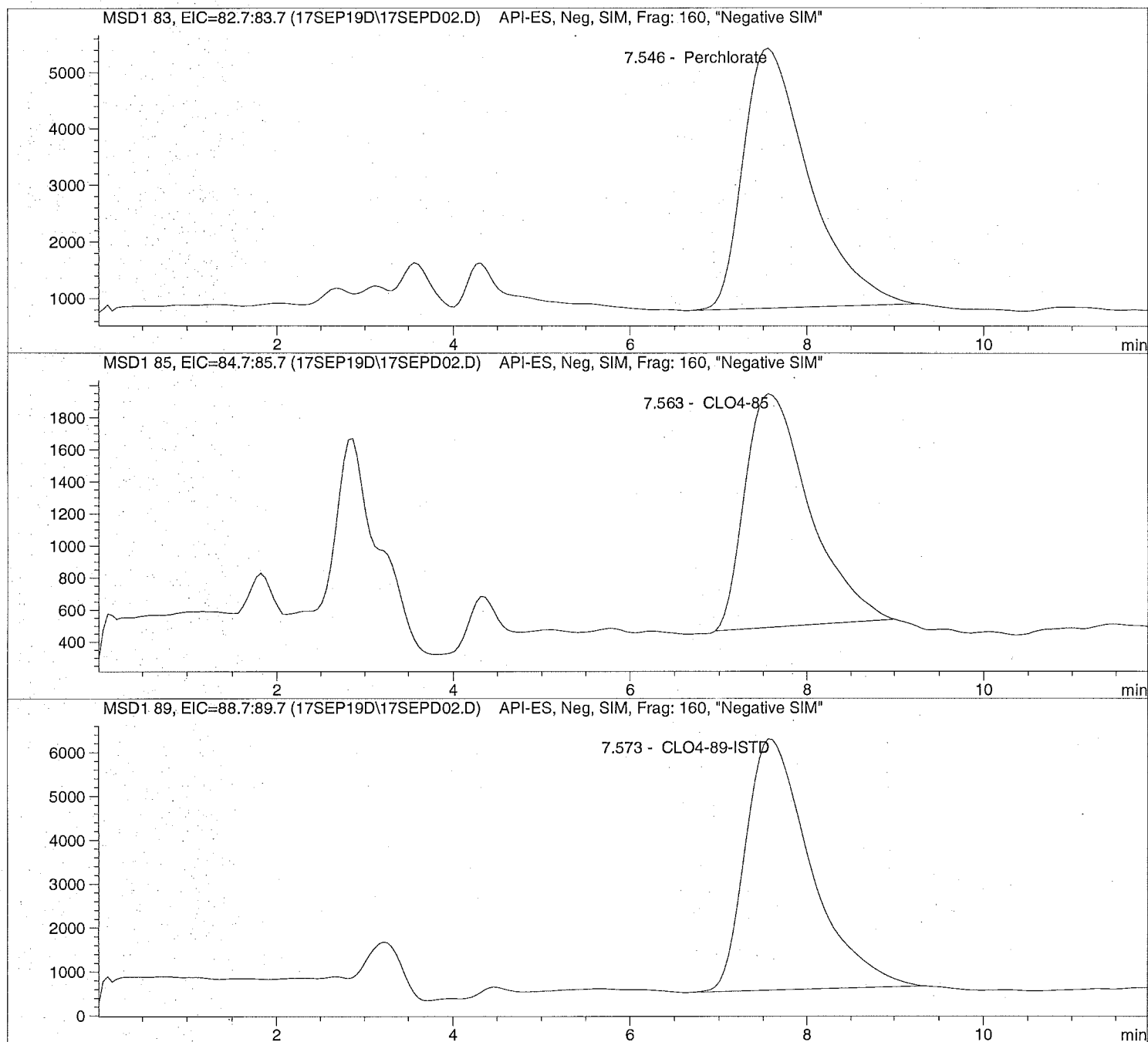
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD02.D Sample Name: 673906 QC@3.0

Injection Date: 9/17/2019 08:57:27 Seq Line: 2
 Sample Name: 673906 QC@3.0 Location: Vial 72
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
 Last Changed: 9/17/2019 12:34:41

Perchlorate analysis

Sample Information

Sorted By: Signal
 Calib. Data Modified: Tue, 20. Aug. 2019, 10:15:00 am
 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
7.546	PBA	238232.5	2.7161	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.563	PBA	74374.4	2.7014	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.573	PBA	295565.3	5.0000	CLO4-89-ISTD

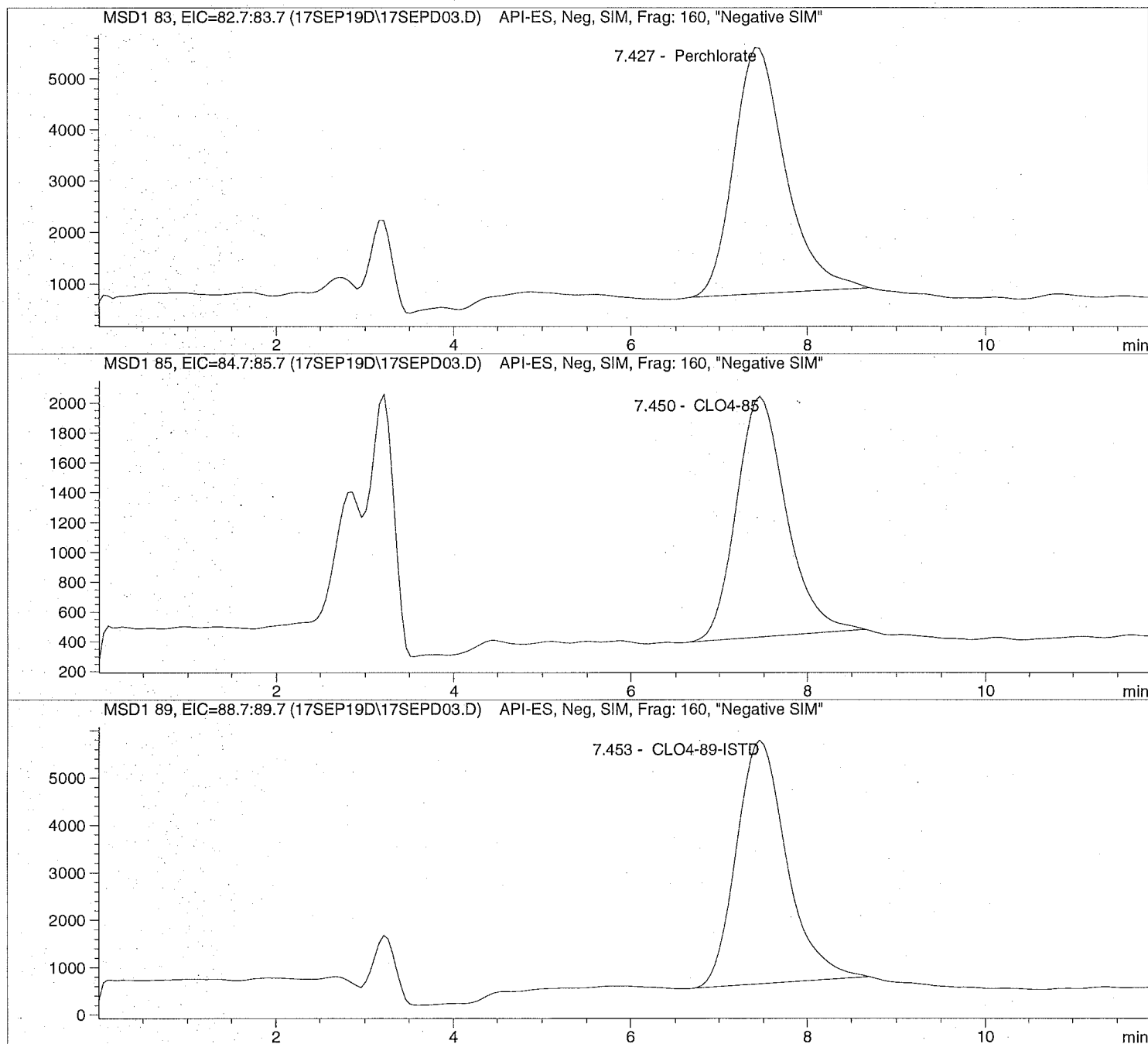
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD03.D Sample Name: 673904 ICS@3.0

```
=====
Injection Date: 9/17/2019 09:11:28   Seq Line: 3
Sample Name:    673904 ICS@3.0         Location:  Vial 73
Acq Operator:  TNB                     Inj. No.: 1
                                           Inj. Vol.: 40 µl
=====
```

```
Acq. Method:  CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:  9/17/2019 12:34:41
=====
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD03.D Sample Name: 673904 ICS@3.0

```

=====
Injection Date: 9/17/2019 09:11:28 Seq Line: 3
Sample Name: 673904 ICS@3.0 Location: Vial 73
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 40 µl

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.427	PBA	194501.8	3.1944	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.450	PBA	63351.9	3.3452	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.453	PBA	203094.5	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD05.D

Sample Name: 673905 LMB

Injection Date: 9/17/2019 09:41:11

Seq Line: 5

Sample Name: 673905 LMB

Location: Vial 74

Acq Operator: TNB

Inj. No.: 1

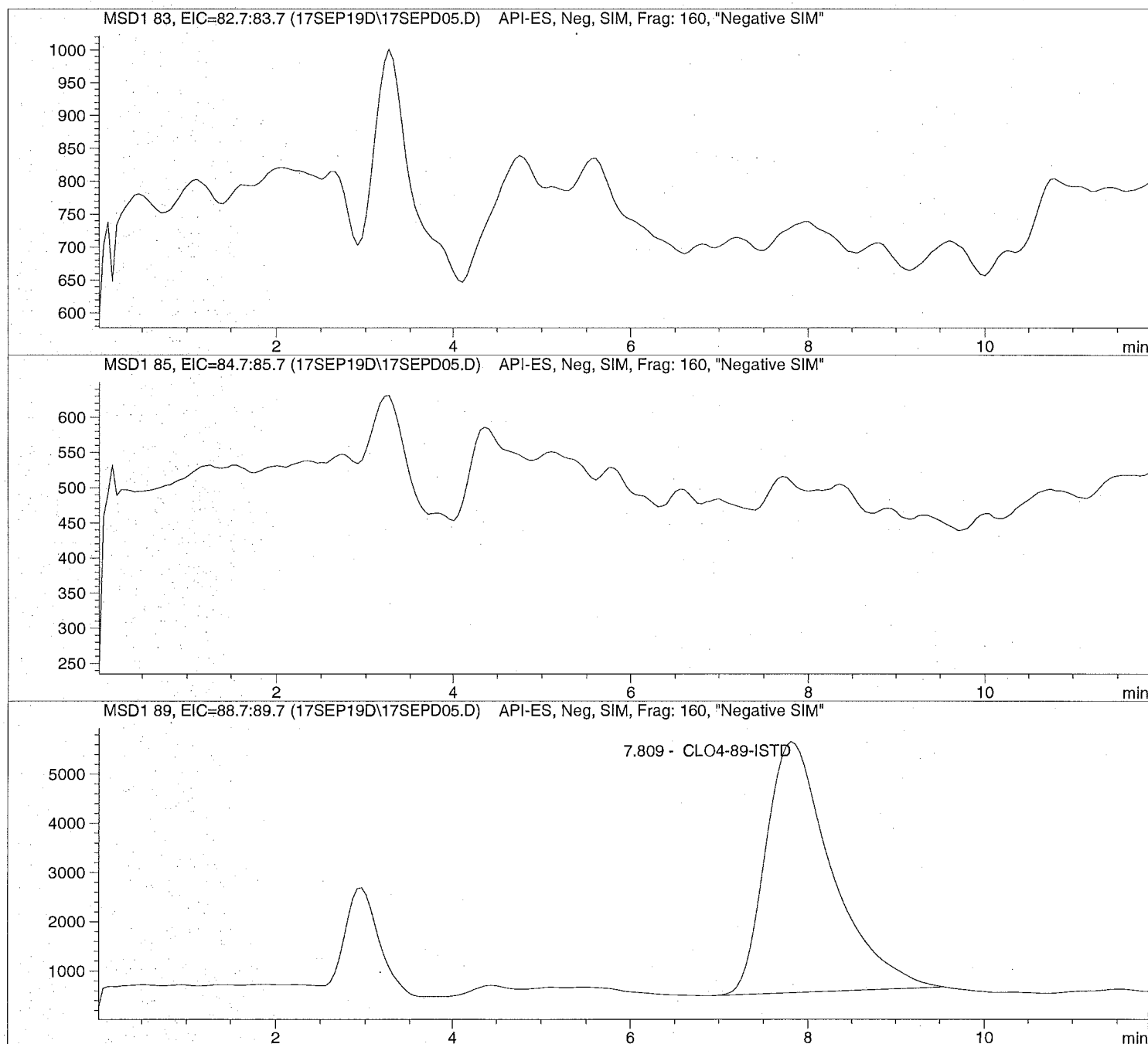
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD05.D Sample Name: 673905 LMB

```

=====
Injection Date: 9/17/2019 09:41:11      Seq Line: 5
Sample Name: 673905 LMB                  Location: Vial 74
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019, 10:15:00 am
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
7.809	PBA	263661.9	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD06.D

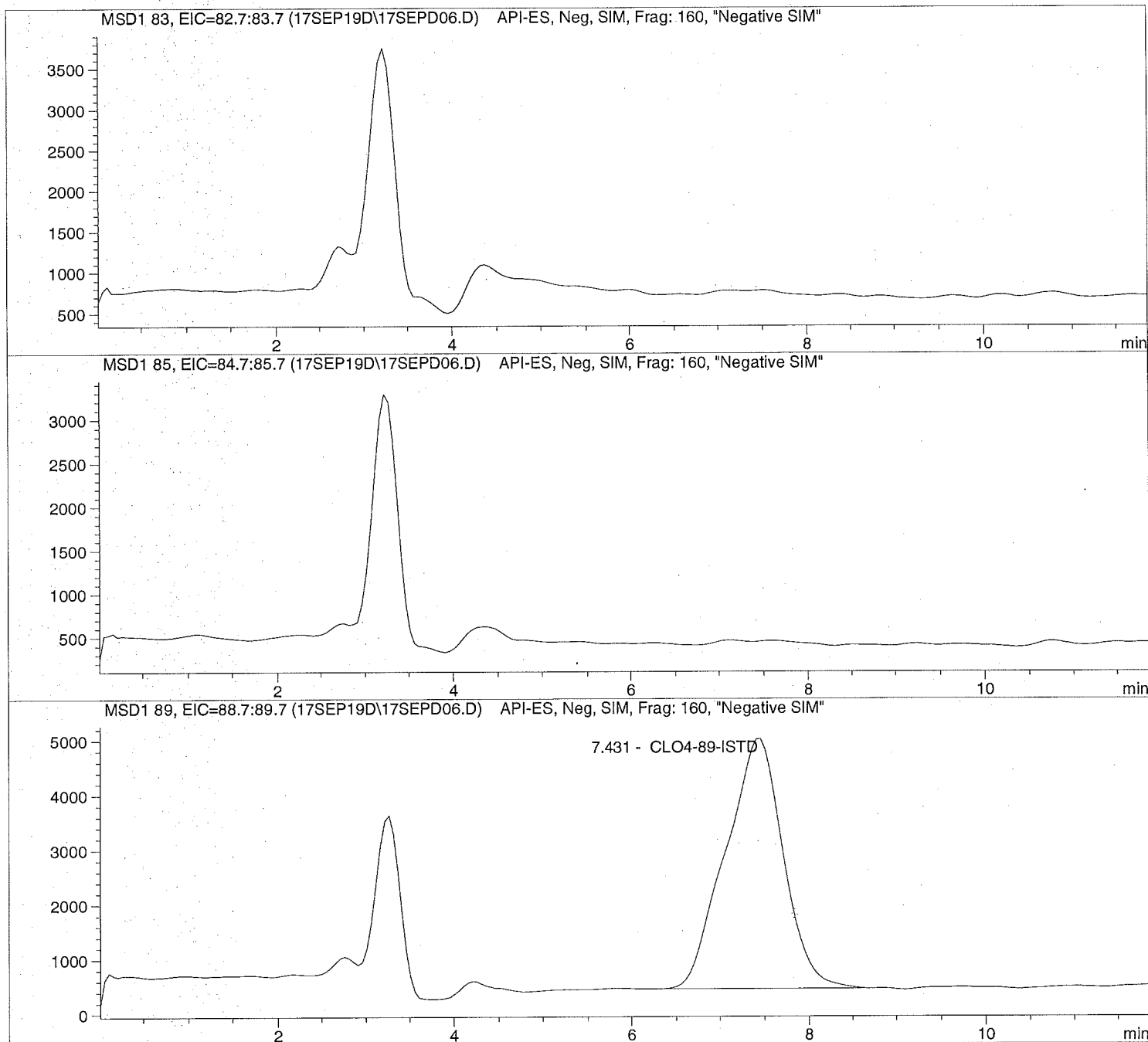
Sample Name: 1925603001

Injection Date: 9/17/2019 09:55:10
Sample Name: 1925603001
Acq Operator: TNB

Seq Line: 6
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD06.D Sample Name: 1925603001

```

=====
Injection Date: 9/17/2019 09:55:10      Seq Line: 6
Sample Name: 1925603001                Location: Vial 75
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.431	BBA	204752.5	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD07.D

Sample Name: 673907 256031S

Injection Date: 9/17/2019 10:09:10

Seq Line: 7

Sample Name: 673907 256031S

Location: Vial 76

Acq Operator: TNB

Inj. No.: 1

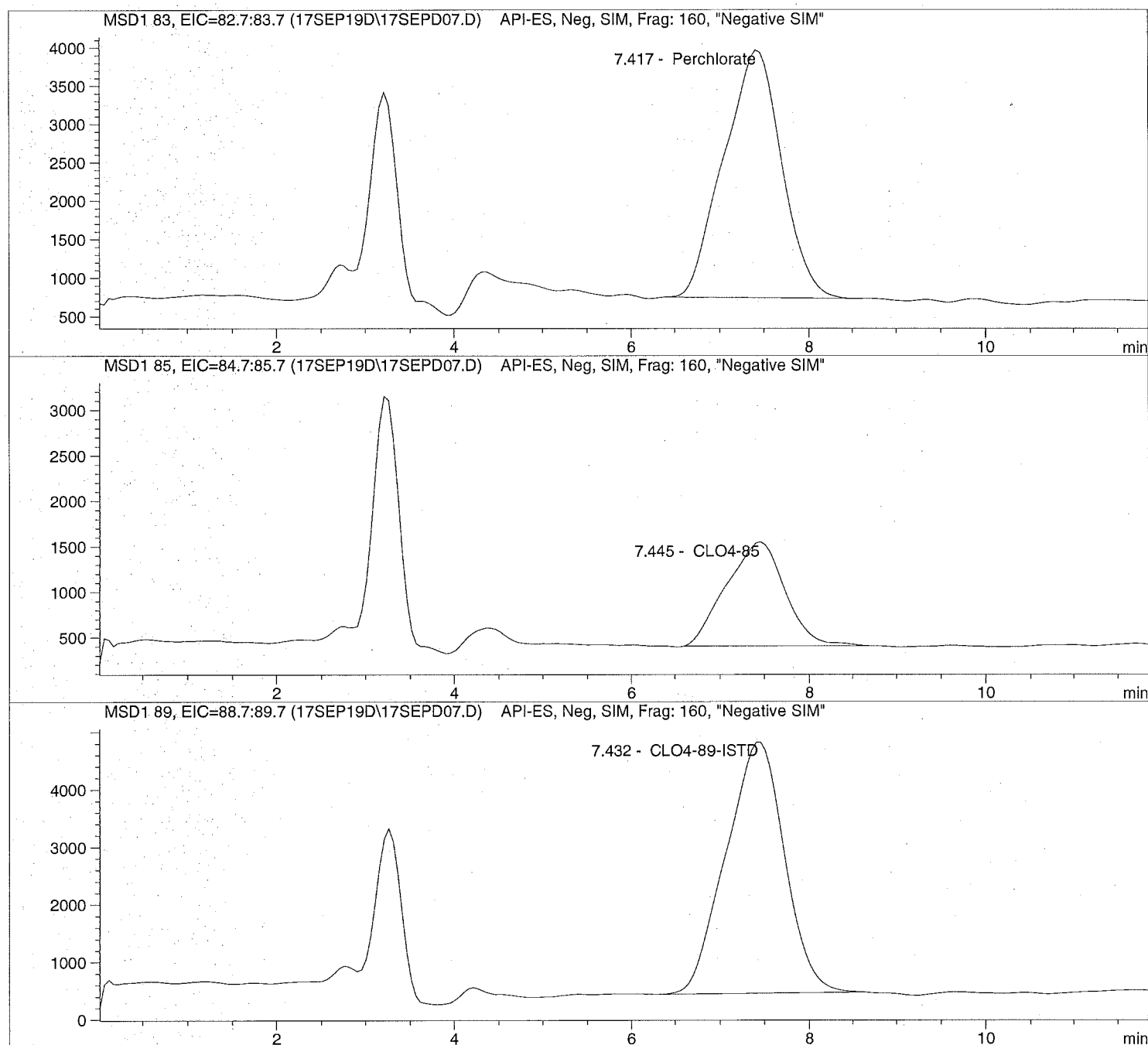
Inj. Vol.: 40 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD07.D Sample Name: 673907 256031S

```

=====
Injection Date: 9/17/2019 10:09:10      Seq Line: 7
Sample Name: 673907 256031S      Location: Vial 76
Acq Operator: TNB      Inj. No.: 1
                                         Inj. Vol.: 40 µl

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.417	PBA	144507.9	2.4738	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.445	PBA	52191.5	2.8271	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.432	PBA	198152.6	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD08.D

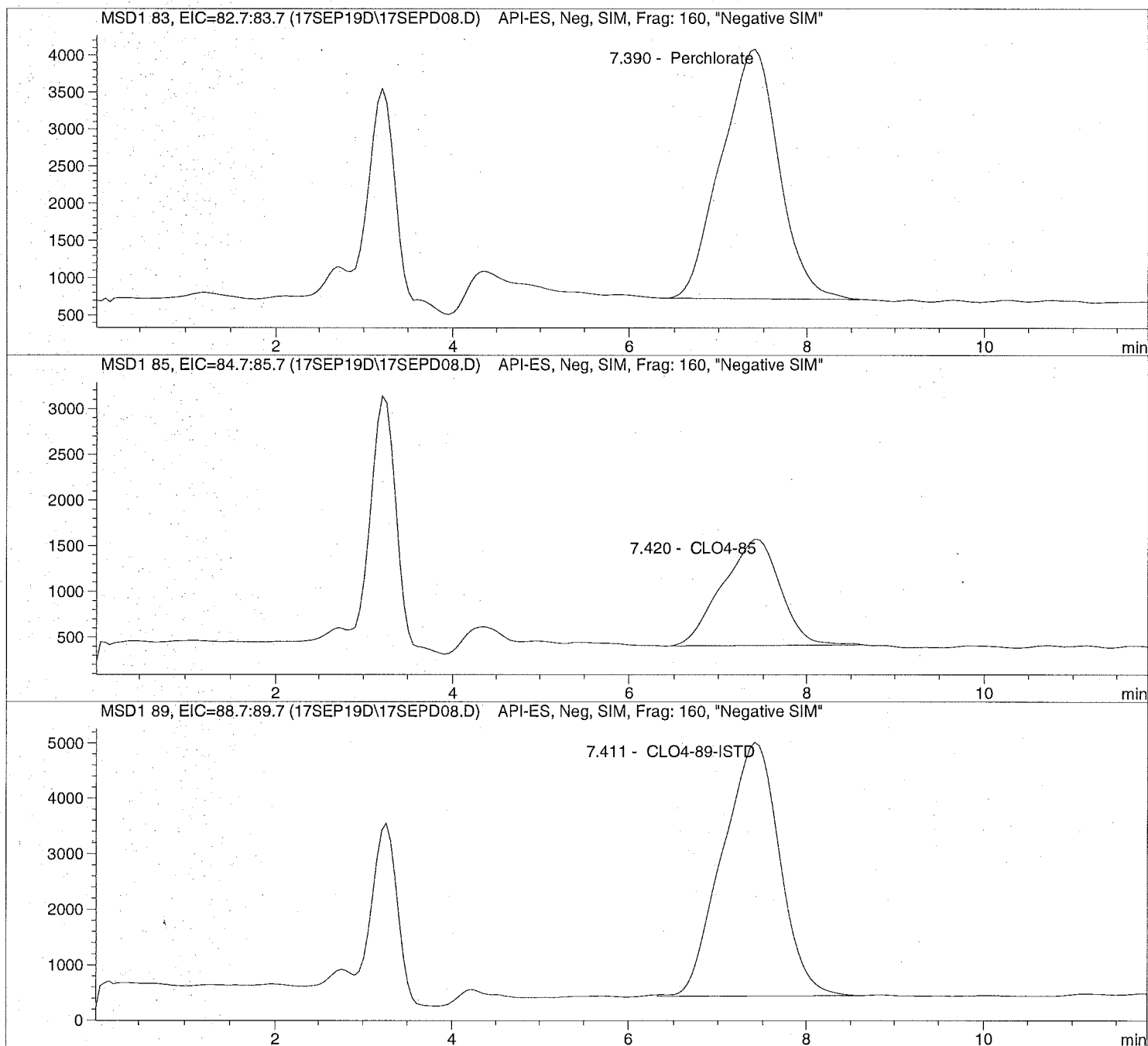
Sample Name: 673908 256031D

Injection Date: 9/17/2019 10:23:18
Sample Name: 673908 256031D
Acq Operator: TNB

Seq Line: 8
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD08.D Sample Name: 673908 256031D

```

=====
Injection Date: 9/17/2019 10:23:18      Seq Line:      8
Sample Name:    673908 256031D          Location:      Vial 77
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    40 µl

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/17/2019 12:34:41

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.390	PBA	150348.3	2.4952	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.420	PBA	52653.1	2.7670	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.411	BBA	204262.4	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD09.D

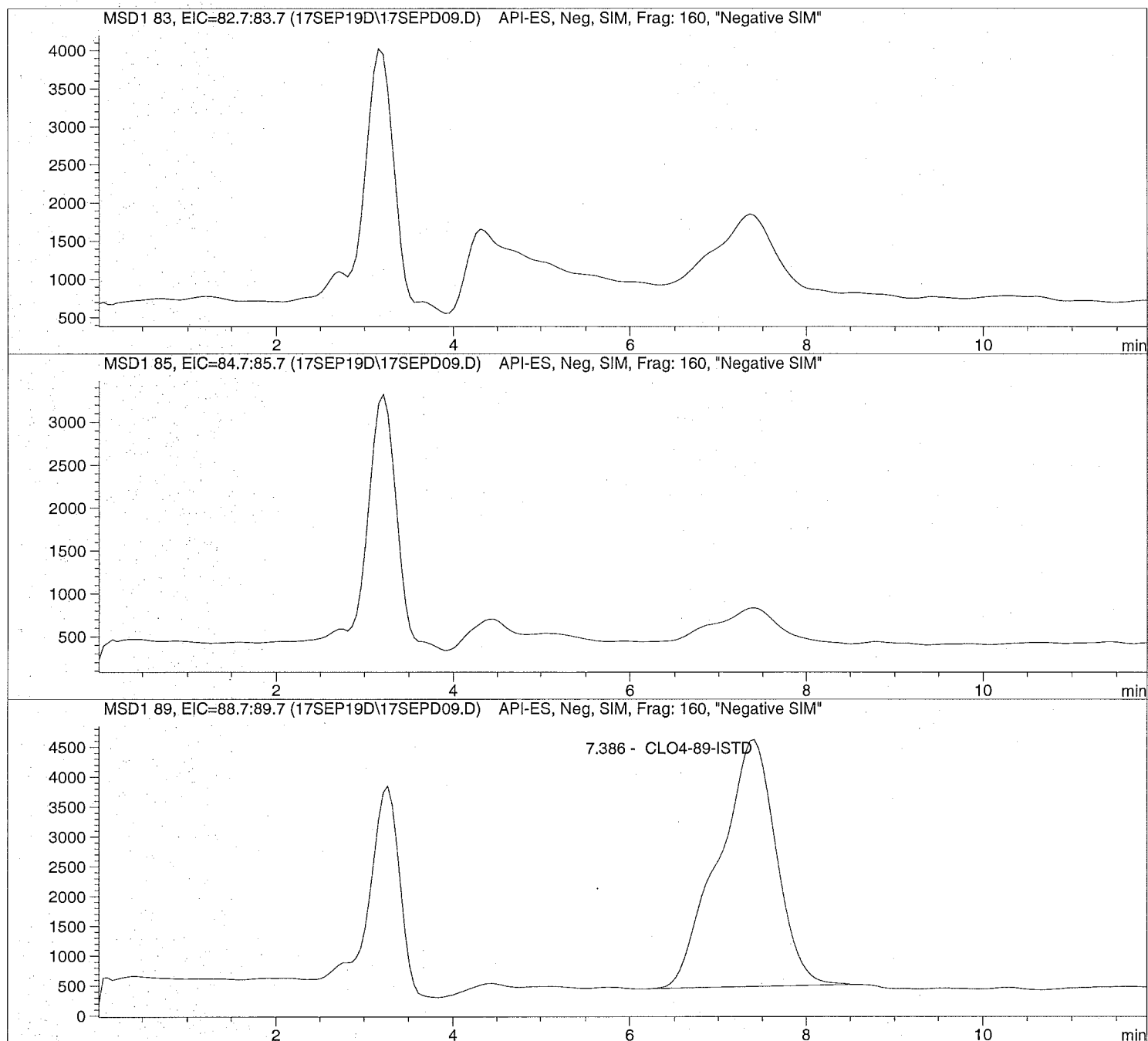
Sample Name: 1926281001

Injection Date: 9/17/2019 10:37:19
Sample Name: 1926281001
Acq Operator: TNB

Seq Line: 9
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD09.D Sample Name: 1926281001

```

=====
Injection Date: 9/17/2019 10:37:19      Seq Line:          9
Sample Name:    1926281001              Location:         Vial 78
Acq Operator:   TNB                     Inj. No.:        1
                                           Inj. Vol.:       40 µl

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/17/2019 12:34:41

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.386	PBA	187882.8	5.0000	CLO4-89-ISTD

```

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

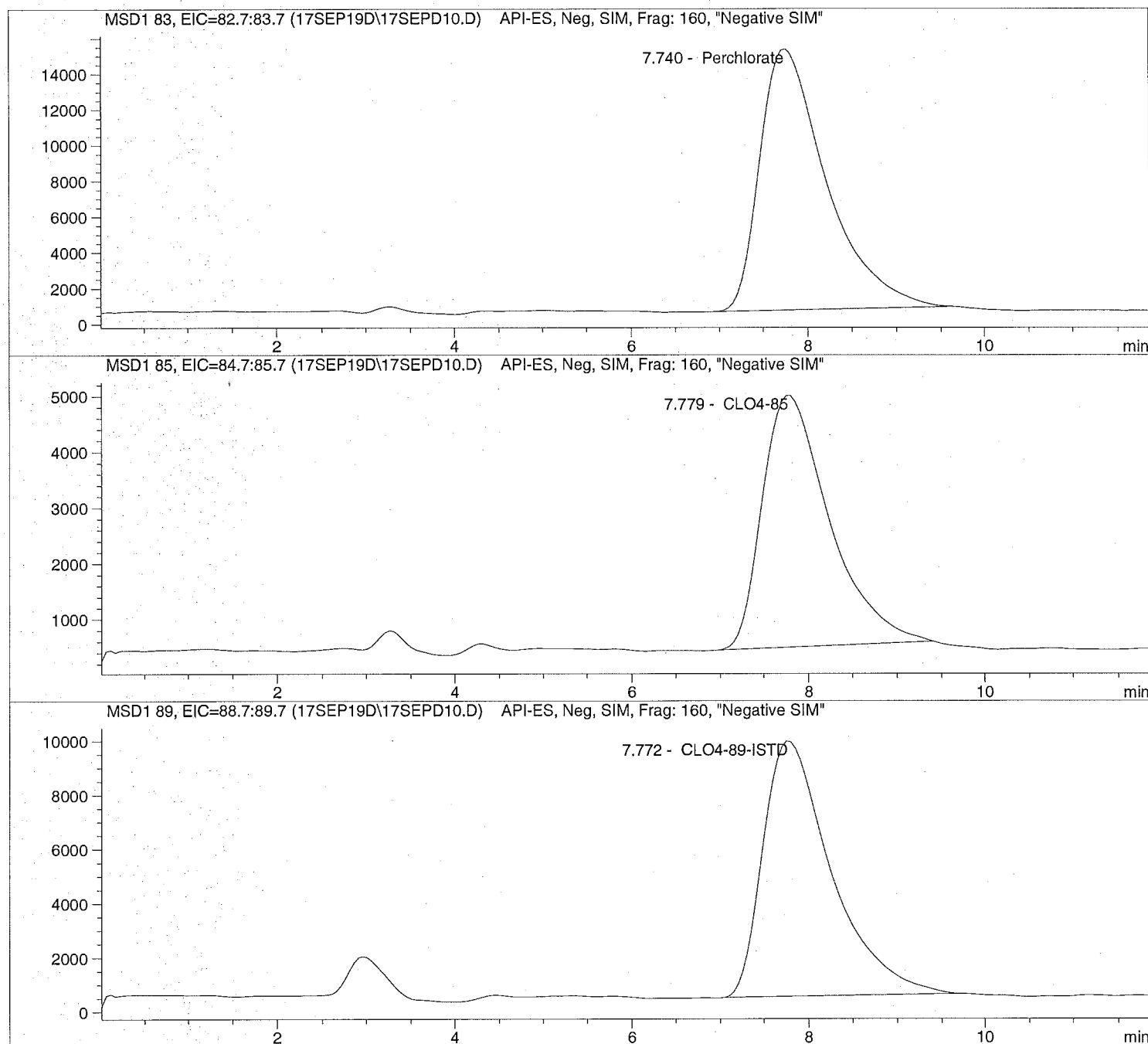
```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD10.D Sample Name: 1926282001 1K

```
=====
Injection Date: 9/17/2019 10:51:21      Seq Line:      10
Sample Name:    1926282001 1K           Location:      Vial 79
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    40 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/17/2019 12:34:41
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD10.D Sample Name: 1926282001 1K

```

=====
Injection Date: 9/17/2019 10:51:21      Seq Line: 10
Sample Name: 1926282001 1K              Location: Vial 79
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 40 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.740	PBA	757420.9	4926.1780	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.779	PBA	236315.7	5035.1305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.772	PBA	501726.5	5000.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD11.D

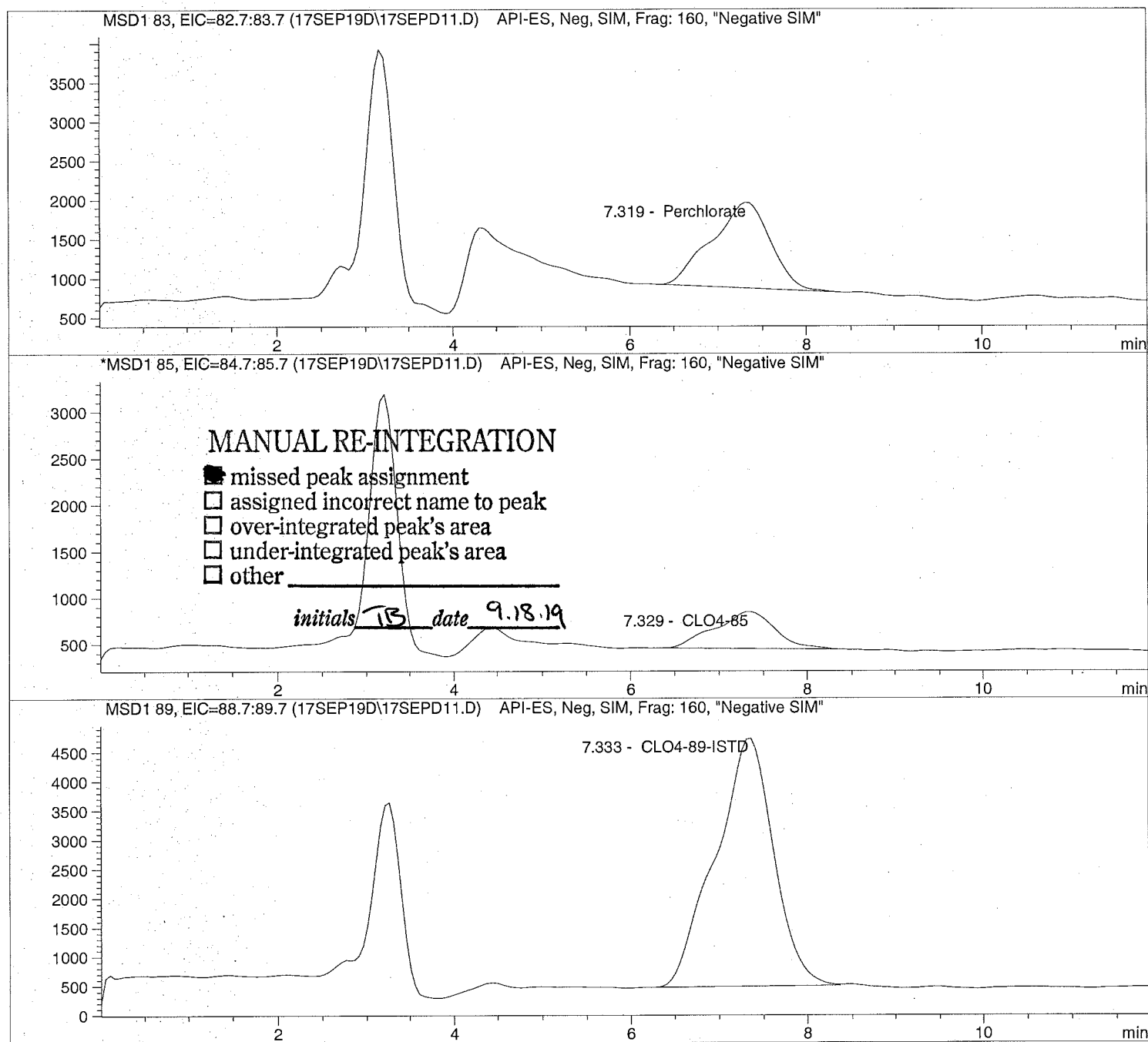
Sample Name: 1926283001

Injection Date: 9/17/2019 11:05:22
Sample Name: 1926283001
Acq Operator: TNB

Seq Line: 11
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD11.D Sample Name: 1926283001

```

=====
Injection Date: 9/17/2019 11:05:22      Seq Line:            11
Sample Name:    1926283001                Location:            Vial 80
Acq Operator:   TNB                        Inj. No.:            1
                                          Inj. Vol.:           40 µl
  
```

```

Acq. Method:        CLO4-AQN.M
Analysis Method:    C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:       9/17/2019 12:34:41
  
```

Perchlorate analysis

Sample Information

```

=====
Sorted By:            Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.319	PBA	50036.3	0.9832	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.329	MM	18774.9	1.0444	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.333	PBA	193086.8	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD12.D

Sample Name: 1926282001 1K

Injection Date: 9/17/2019 11:22:08

Seq Line: 12

Sample Name: 1926282001 1K

Location: Vial 79

Acq Operator: TNB

Inj. No.: 1

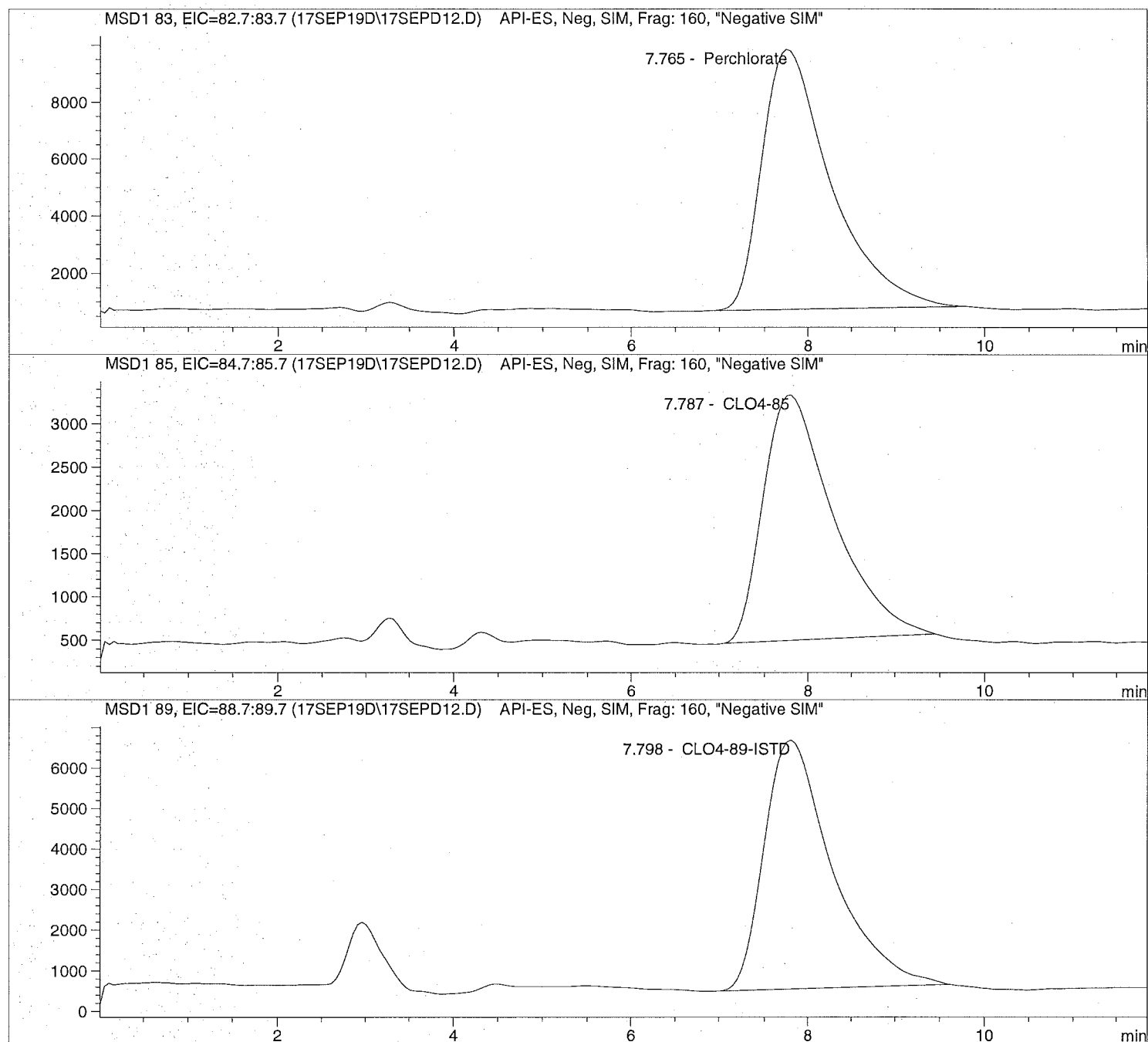
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD12.D Sample Name: 1926282001 1K

```
=====
Injection Date: 9/17/2019 11:22:08      Seq Line: 12
Sample Name: 1926282001 1K             Location: Vial 79
Acq Operator: TNB                      Inj. No.: 1
                                         Inj. Vol.: 40 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By: Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.765	PBA	498890.6	4904.4375	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.787	PBA	157326.7	5065.4812	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.798	PBA	332001.9	5000.0000	CLO4-89-ISTD

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

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD13.D

Sample Name: 673909 CCV@25

Injection Date: 9/17/2019 11:37:02

Seq Line: 13

Sample Name: 673909 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

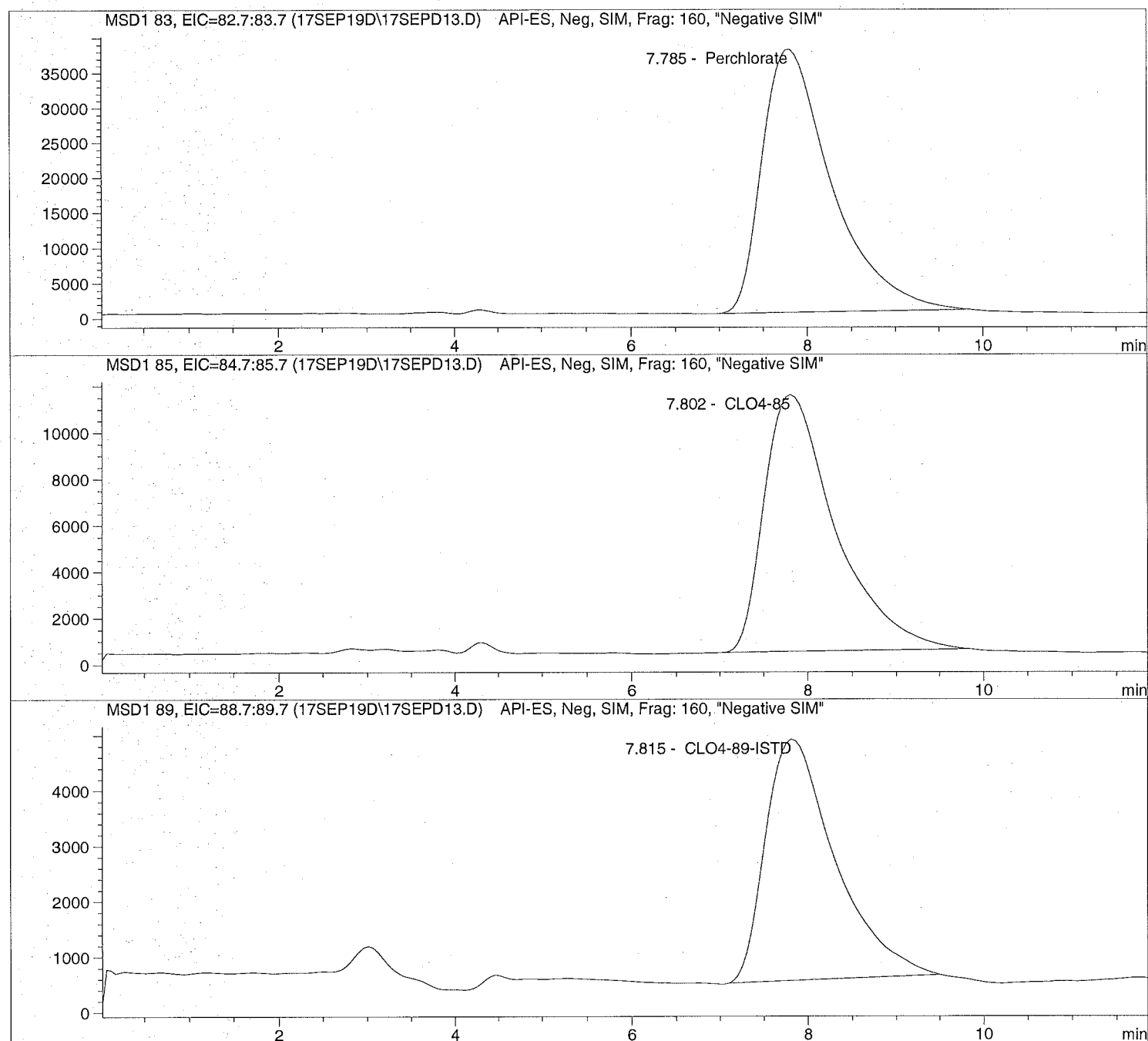
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD13.D Sample Name: 673909 CCV@25

```

=====
Injection Date: 9/17/2019 11:37:02      Seq Line:            13
Sample Name:    673909    CCV@25            Location:            Vial 71
Acq Operator:    TNB                            Inj. No.:            1
                                                                                 Inj. Vol.:            40 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/17/2019 12:34:41
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:                    Signal
Calib. Data Modified:    Tue, 20. Aug. 2019,10:15:00 am
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
7.785	PBA	2042028.8	26.0082	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.802	PBA	617795.5	26.4894	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.815	PBA	238300.4	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

**Initial
Calibration**

=====
 Calibration Table
 =====

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 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
8.744	1	1	1.00000	7.76074e4	1.28854e-5	1 Perchlorate
		2	2.00000	1.35273e5	1.47849e-5	
		3	5.00000	3.37764e5	1.48033e-5	
		4	10.00000	6.83454e5	1.46316e-5	
		5	25.00000	2.08433e6	1.19943e-5	
		6	50.00000	4.13334e6	1.20968e-5	
		7	75.00000	5.99313e6	1.25143e-5	
8.755	2	1	1.00000	2.36780e4	4.22333e-5	1 CLO4-85
		2	2.00000	4.69486e4	4.25998e-5	
		3	5.00000	1.06124e5	4.71147e-5	
		4	10.00000	2.13523e5	4.68335e-5	
		5	25.00000	6.14295e5	4.06971e-5	
		6	50.00000	1.19814e6	4.17315e-5	
		7	75.00000	1.78355e6	4.20509e-5	
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1 CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5	
		3	5.00000	2.33196e5	2.14412e-5	
		4	5.00000	2.34454e5	2.13262e-5	
		5	5.00000	2.50568e5	1.99547e-5	
		6	5.00000	2.30977e5	2.16472e-5	

RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp Name
7		5.00000	2.21504e5	2.25729e-5	

More compound-specific settings:

Compound: Perchlorate

Time Window : From 6.654 min To 12.544 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333

Compound: CLO4-85

Time Window : From 6.650 min To 12.505 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333

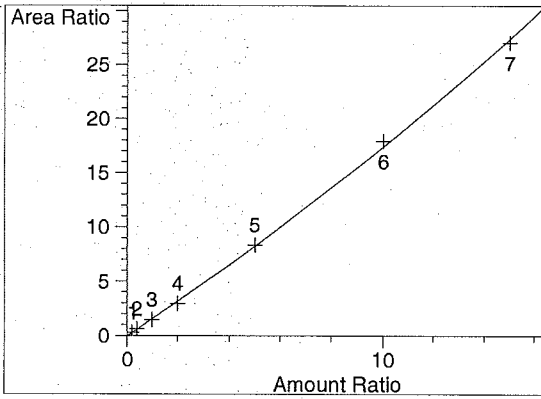
Compound: CLO4-89-ISTD

Time Window : From 6.659 min To 12.466 min
 Curve Type : Linear
 Origin : Included
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 1
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1

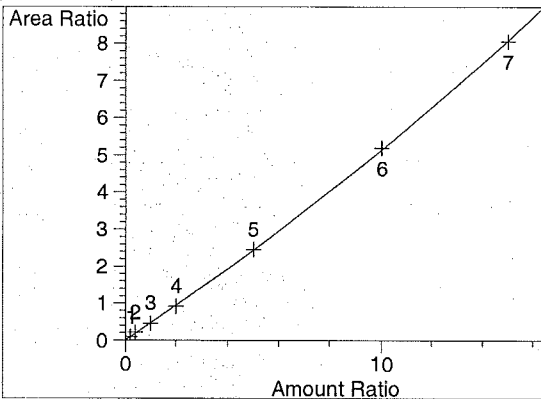
=====
 Peak Sum Table
 =====

No Entries in table

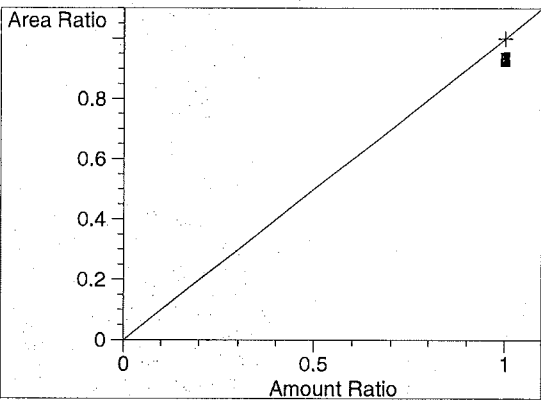
=====
 Calibration Curves
 =====



Perchlorate at exp. RT: 8.744
 MSD1 83, EIC=82.7:83.7
 Correlation: 0.99957
 Residual Std. Dev.: 0.30744
 Formula: $y = ax^2 + bx + c$
 a: 1.76988e-2
 b: 1.56480
 c: -4.92430e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
 MSD1 85, EIC=84.7:85.7
 Correlation: 0.99983
 Residual Std. Dev.: 0.03473
 Formula: $y = ax^2 + bx + c$
 a: 5.13396e-3
 b: 4.62055e-1
 c: 4.97209e-4
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
 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 1 : 1
 Level 2 : 1
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP2.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	7.76074e4	8.744	1.06245
##	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
##	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
##	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
##	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
##	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
##	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
##	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

##	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
##	---	---	---	---	---	---	---	---
##	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
##	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
##	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
##	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
##	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
##	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
##	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
##	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

##	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	2.73208e5	8.766	5.00000
##	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
##	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
##	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
##	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
##	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
##	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
##	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** 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 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D

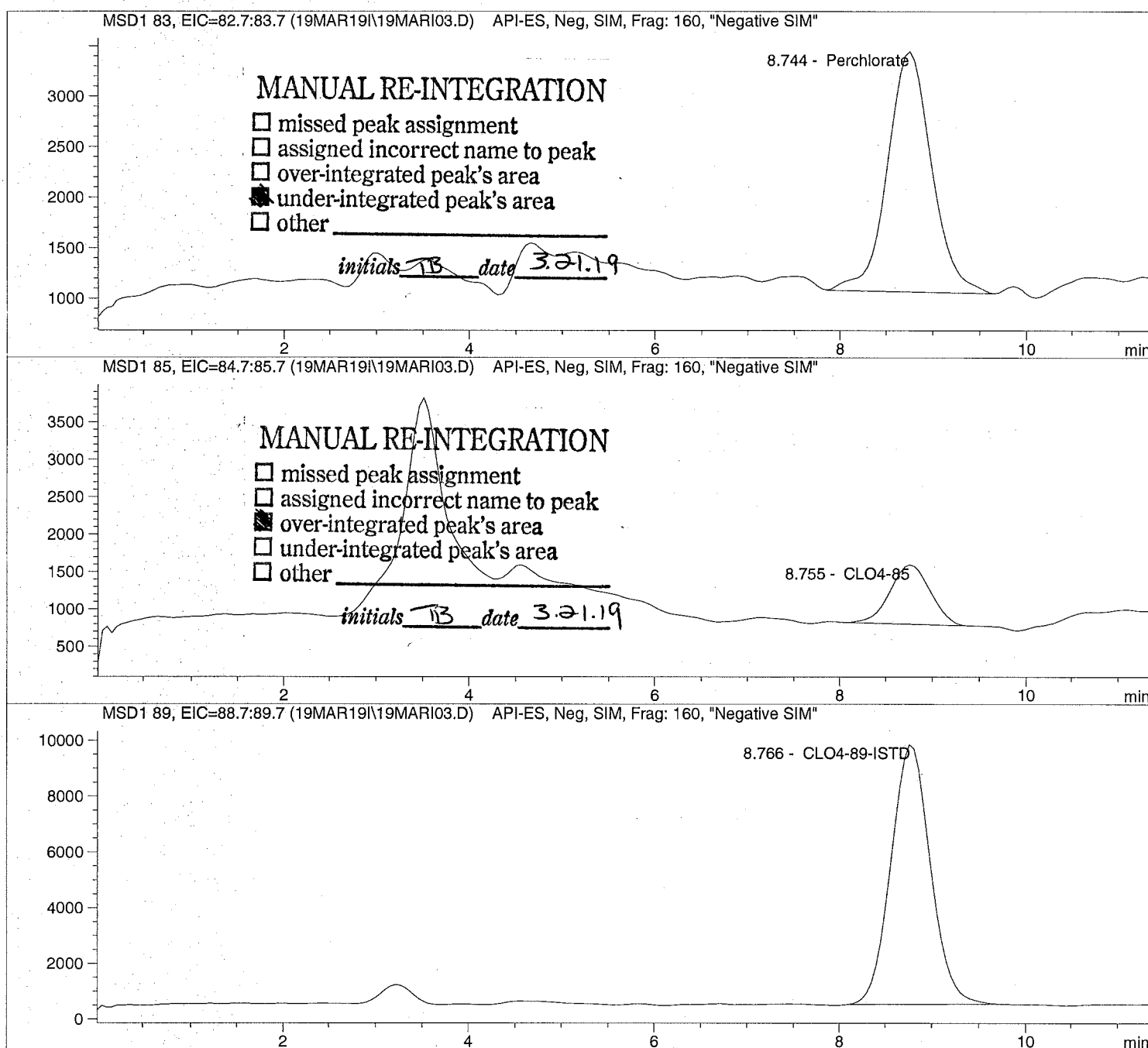
Sample Name: CLO4@ 1.0ug/L

Injection Date: 3/19/2019 09:39:40
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 3/19/2019 09:39:40      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D

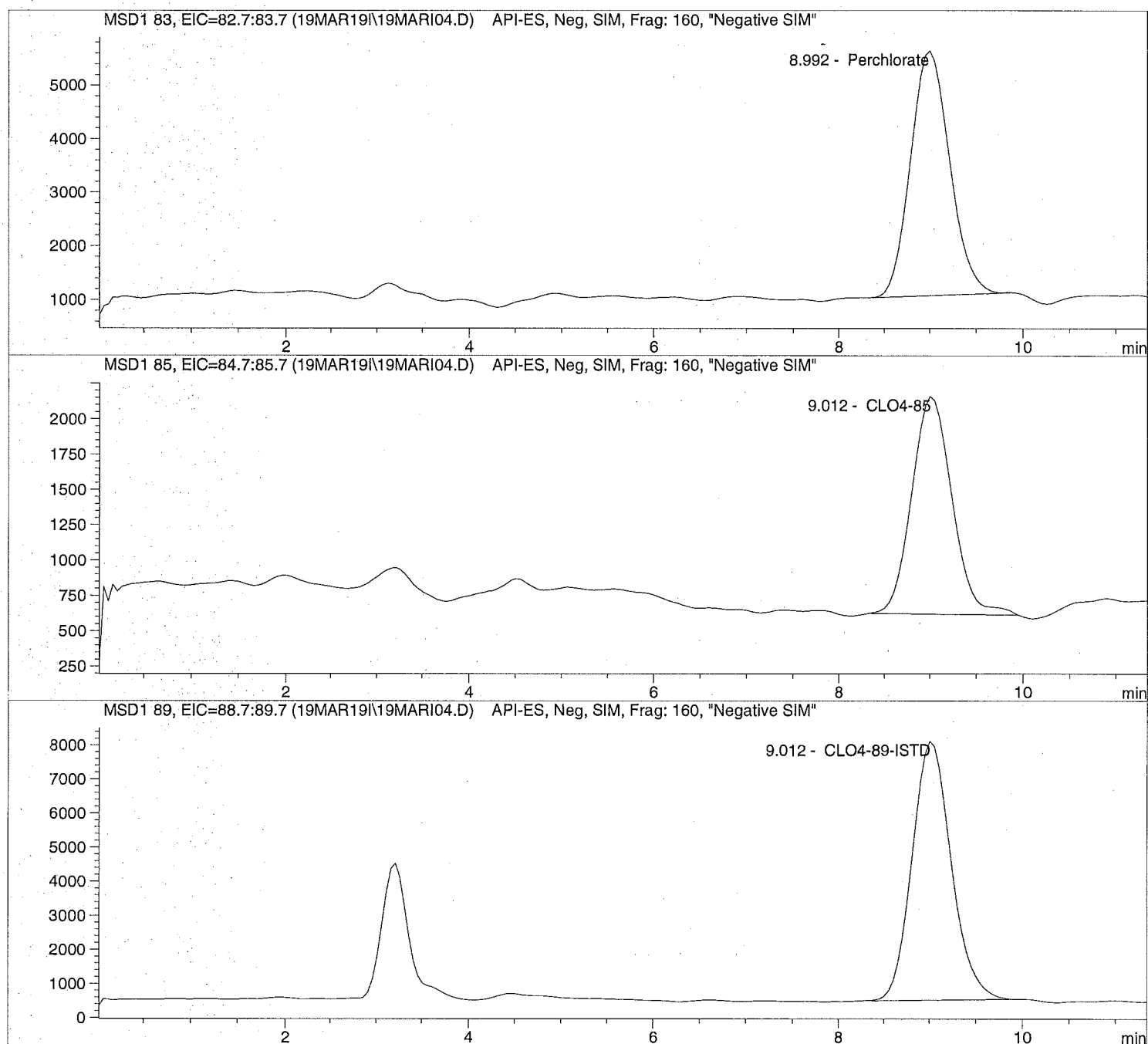
Sample Name: CLO4@ 2.0ug/L

Injection Date: 3/19/2019 09:53:00
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D

Sample Name: CLO4@ 2.0ug/L

```

=====
Injection Date: 3/19/2019 09:53:00      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D

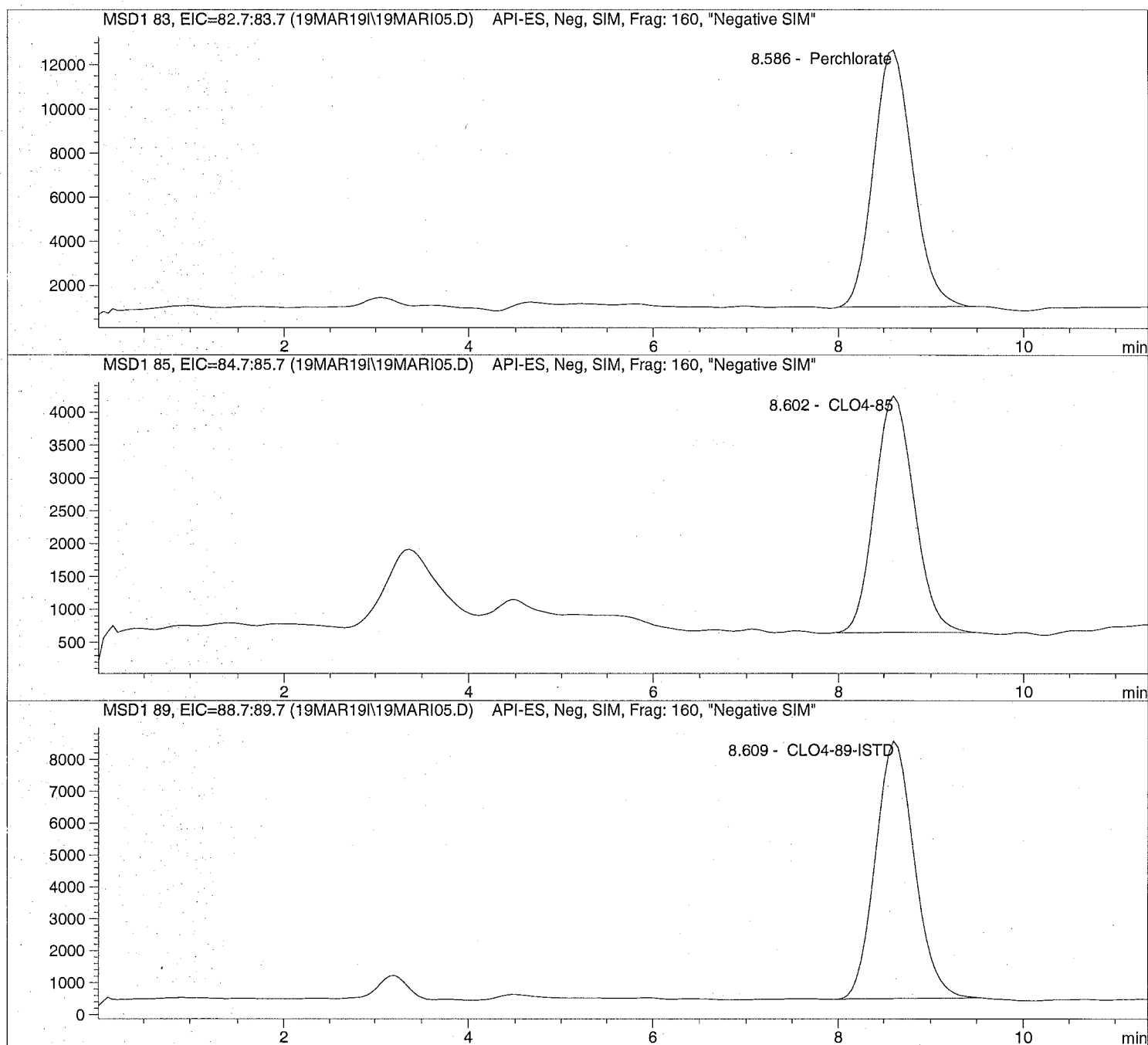
Sample Name: CLO4@ 5.0ug/L

=====
Injection Date: 3/19/2019 10:06:16
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

```

=====
Injection Date: 3/19/2019 10:06:16      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

```

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

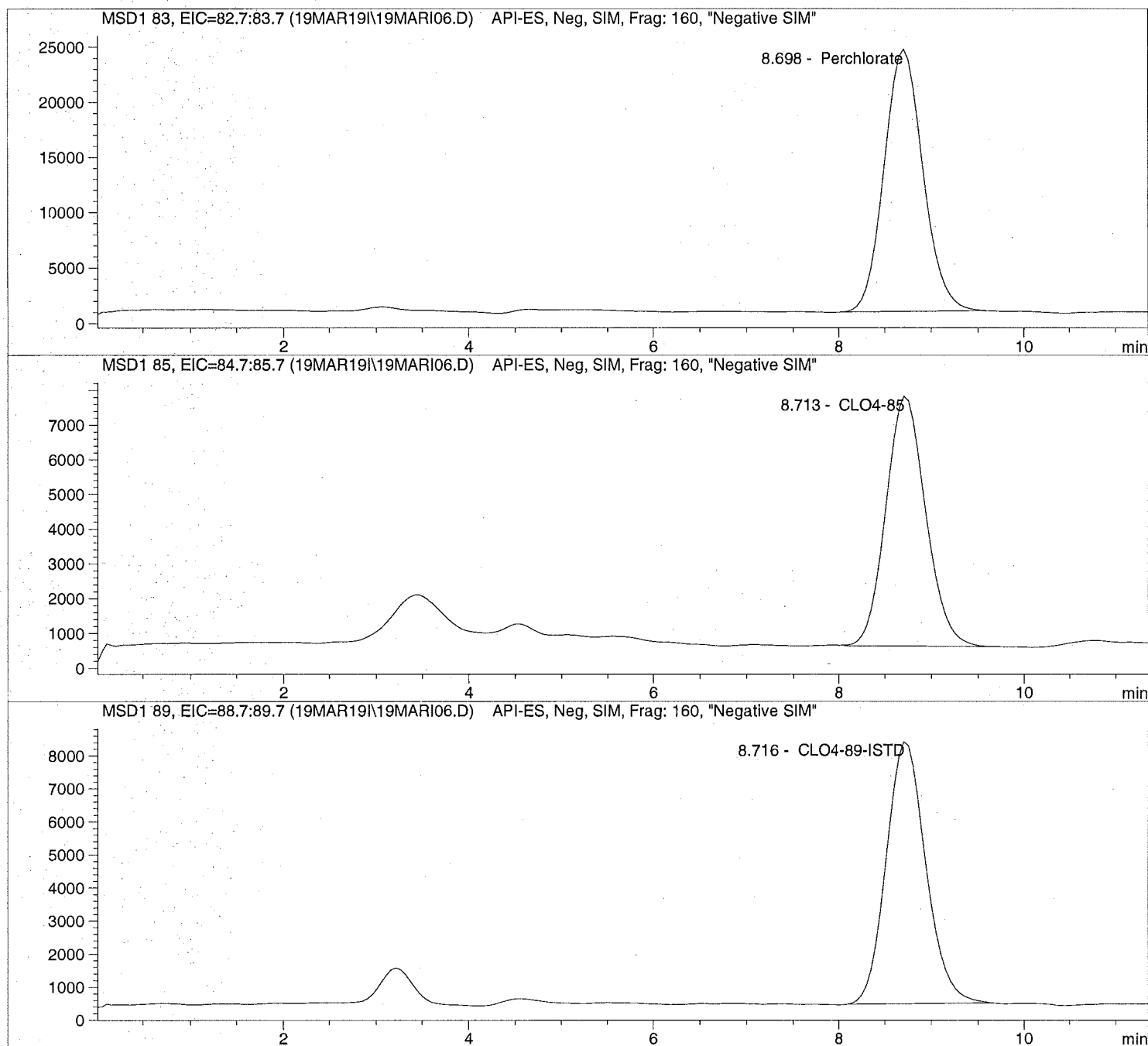
```


Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

```
=====
Injection Date: 3/19/2019 10:19:32      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-DP2.M
Last Changed:   3/19/2019 14:35:22
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

```

=====
Injection Date: 3/19/2019 10:19:32      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019, 02:35:19 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
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D

Sample Name: CLO4@ 25.ug/L

Injection Date: 3/19/2019 10:32:49

Seq Line: 7

Sample Name: CLO4@ 25.ug/L

Location: Vial 77

Acq Operator: TNB

Inj. No.: 1

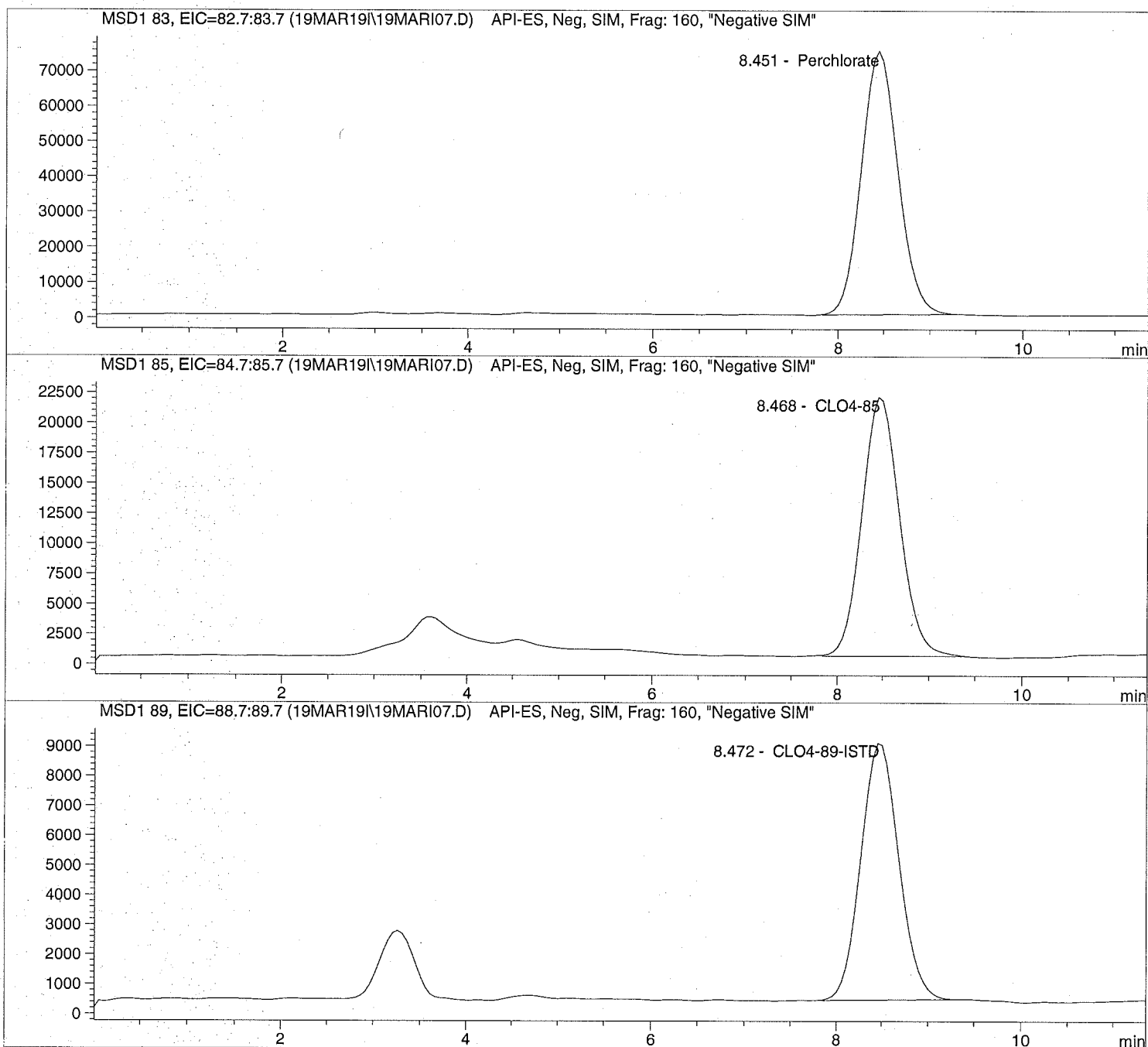
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

```

=====
Injection Date:   3/19/2019  10:32:49                    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-DP2.M
Last Changed:    3/19/2019  14:35:22
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:                    Signal
Calib. Data Modified:        Tue, 19. Mar. 2019, 02:35:19 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
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D

Sample Name: CLO4@ 50.ug/L

Injection Date: 3/19/2019 10:46:05

Seq Line: 8

Sample Name: CLO4@ 50.ug/L

Location: Vial 78

Acq Operator: TNB

Inj. No.: 1

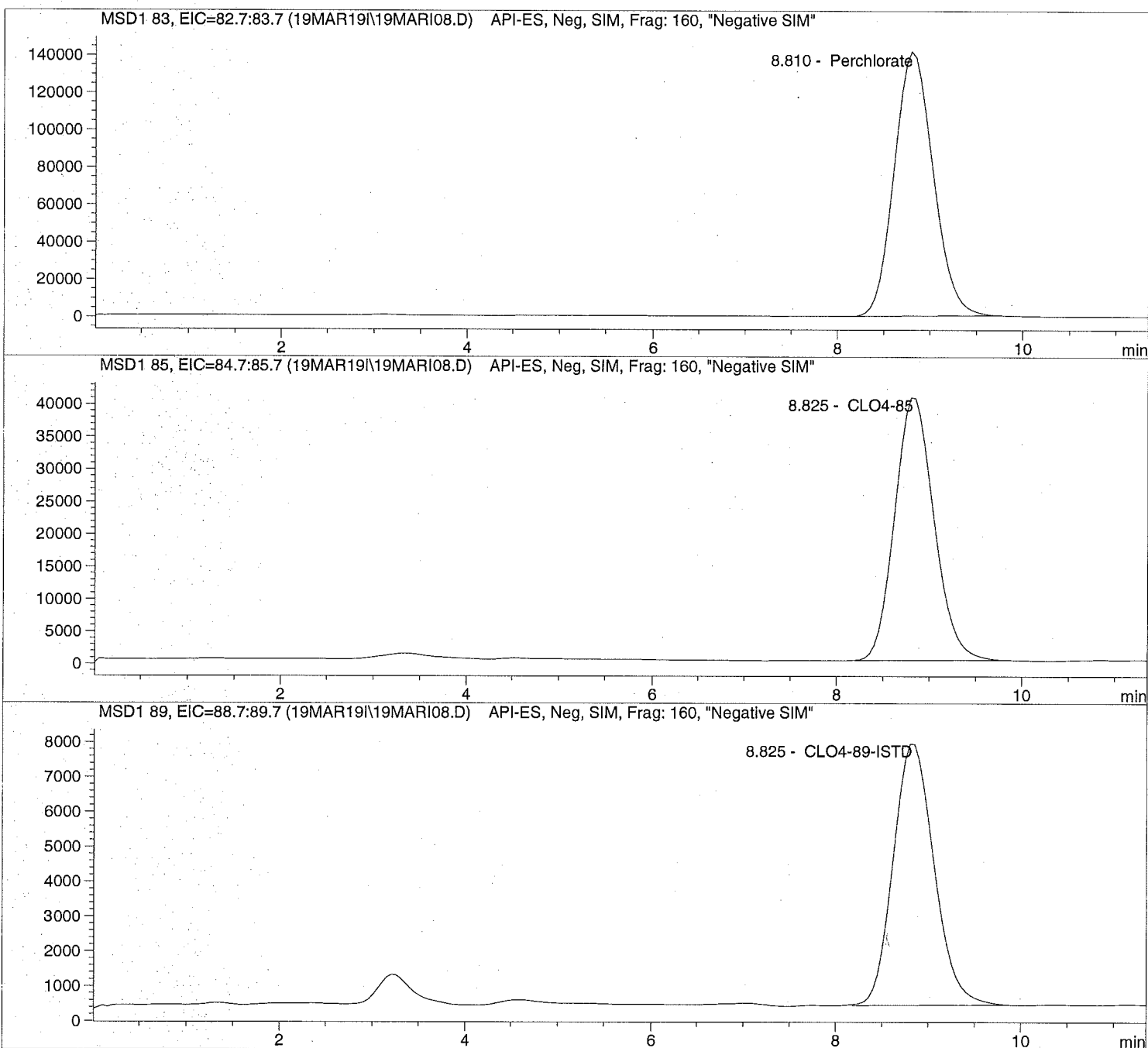
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

```

=====
Injection Date: 3/19/2019 10:46:05      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D

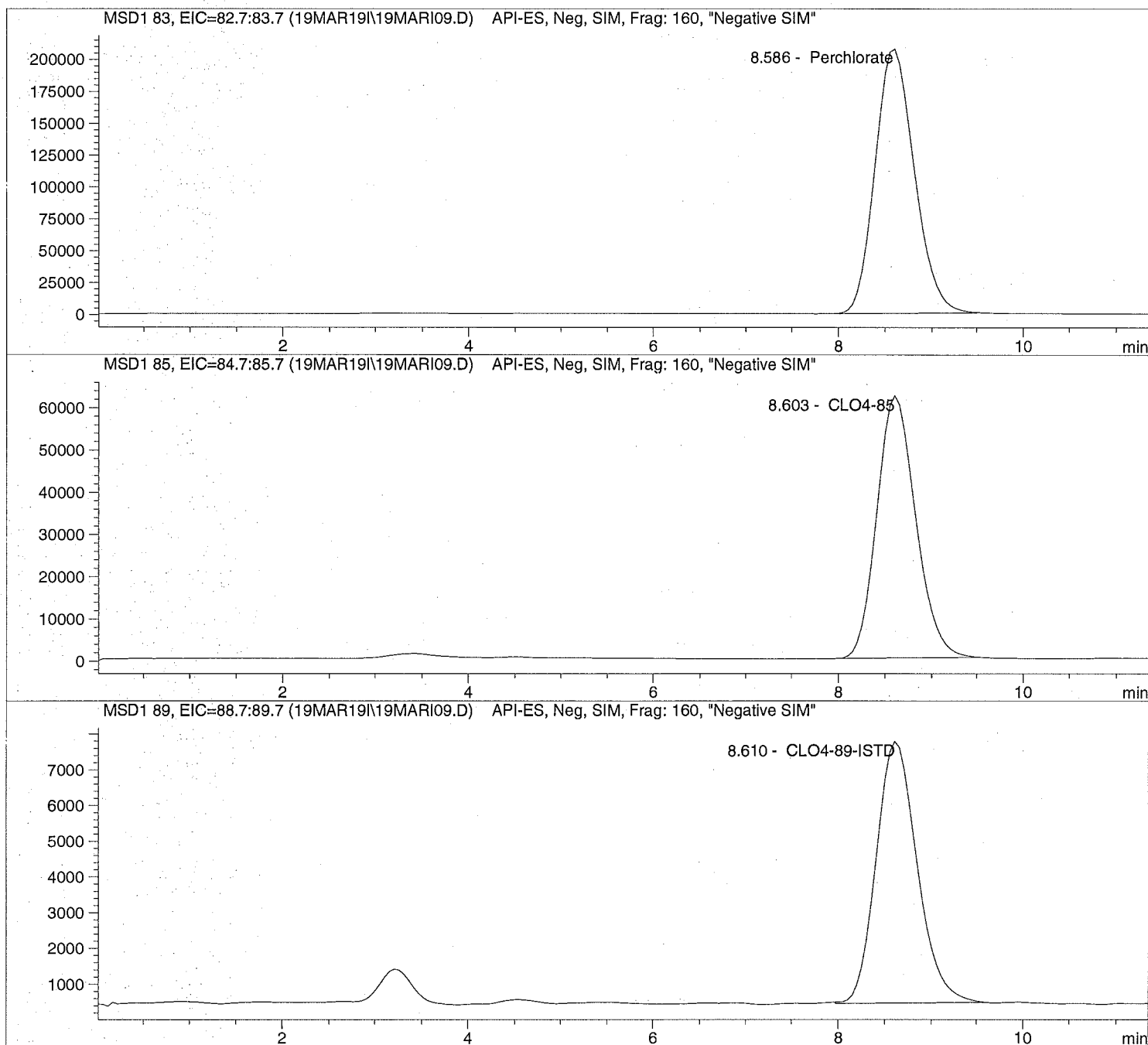
Sample Name: CLO4@ 75.ug/L

Injection Date: 3/19/2019 10:59:22
Sample Name: CLO4@ 75.ug/L
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

```

=====
Injection Date:  3/19/2019  10:59:22          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-DP2.M
Last Changed:   3/19/2019  14:35:22
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019, 02:35:19 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
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D

Sample Name: ICAL Verf@10ug/L

Injection Date: 3/19/2019 11:12:42

Seq Line: 10

Sample Name: ICAL Verf@10ug/L

Location: Vial 80

Acq Operator: TNB

Inj. No.: 1

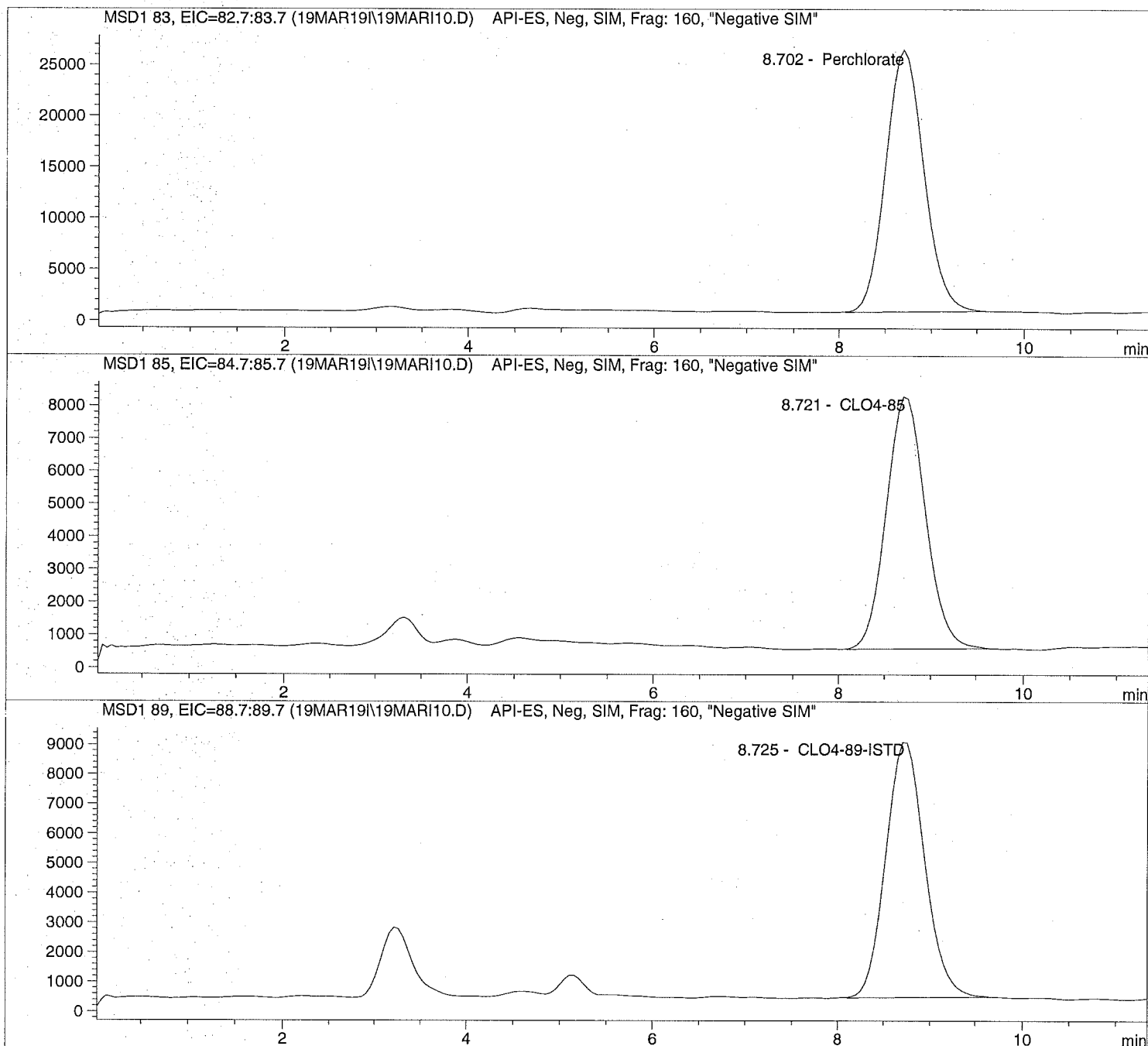
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M

Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

```

=====
Injection Date: 3/19/2019 11:12:42      Seq Line:      10
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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	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\19MAR19I\19MARI03.D

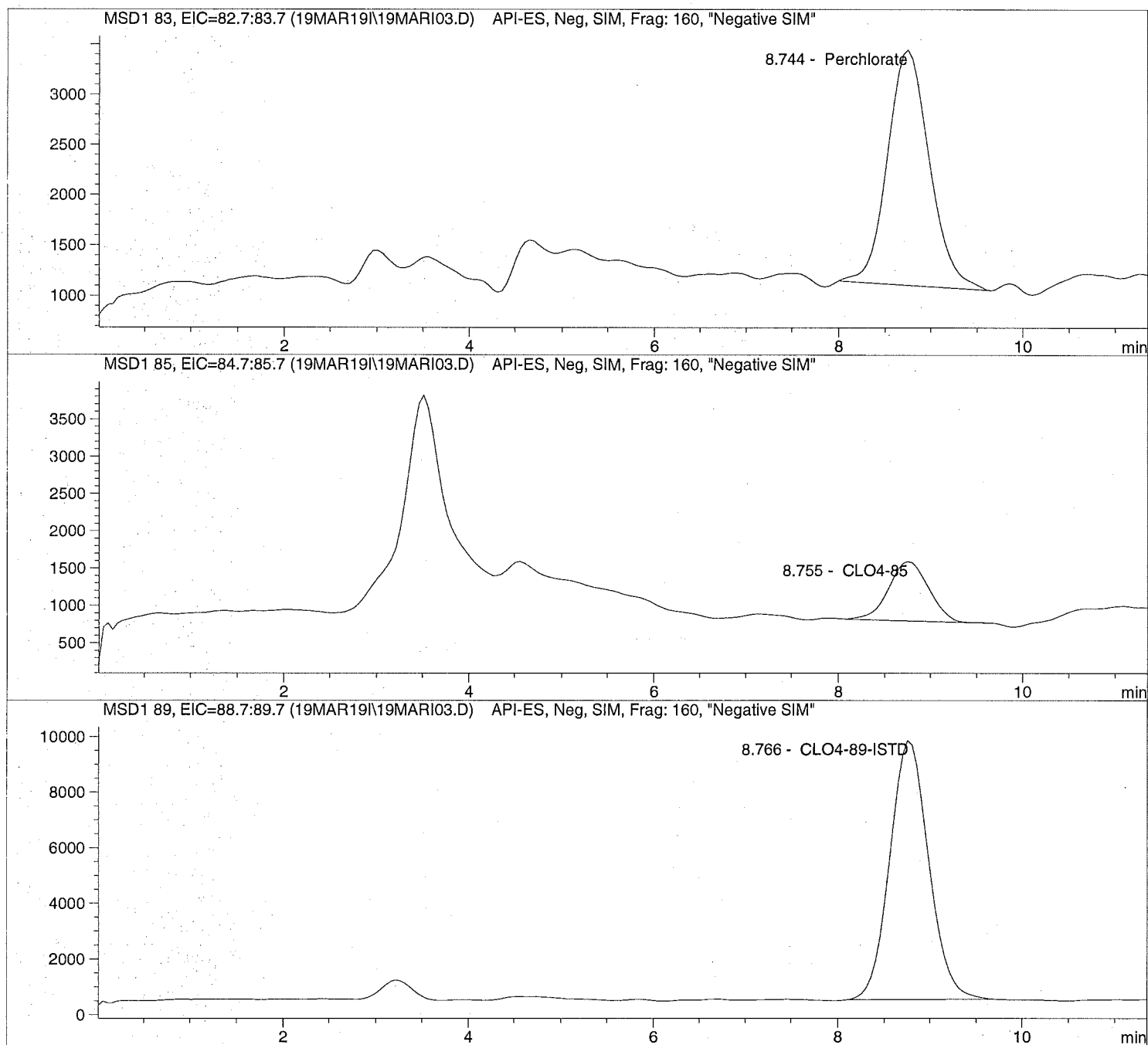
Sample Name: CLO4@ 1.0ug/L

Injection Date: 3/19/2019 09:39:40
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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

=====
Injection Date: 3/19/2019 09:39:40 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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

=====
Sample Information
=====

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019, 02:35:19 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
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

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

Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD11.D

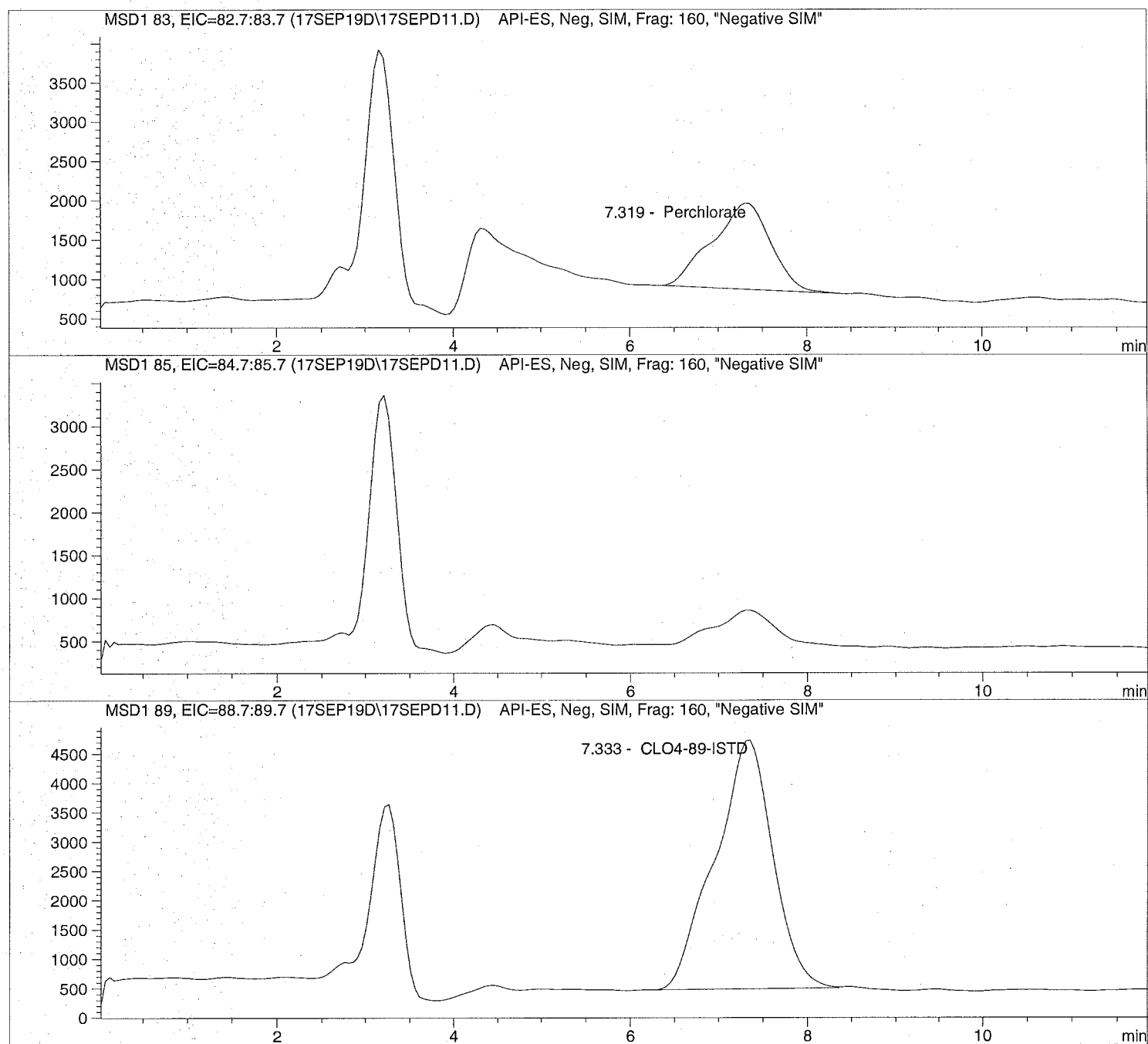
Sample Name: 1926283001

Injection Date: 9/17/2019 11:05:22
Sample Name: 1926283001
Acq Operator: TNB

Seq Line: 11
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 40 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 9/17/2019 12:34:41

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\17SEP19D\17SEPD11.D

Sample Name: 1926283001

```

=====
Injection Date: 9/17/2019 11:05:22      Seq Line:      11
Sample Name:    1926283001              Location:      Vial 80
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    40 µl

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:   9/17/2019 12:34:41

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 20. Aug. 2019,10:15:00 am
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
7.319	PBA	50036.3	0.9832	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
7.333	PBA	193086.8	5.0000	CLO4-89-ISTD

```

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

```



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

September 23, 2019

Analytical Report for Service Request No: K1908388

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

RE: HS19090456

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory September 12, 2019. For your reference, these analyses have been assigned our service request number **K1908388**.

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)636-1 068
www.alsglobal.com



Client: ALS Environmental - US
Project: HS19090456
Sample Matrix: Ground Water

Service Request: K1908388
Date Received: 09/12/2019

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 ground water sample was received for analysis at ALS Environmental on 09/12/2019. 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 Avoyjoy

Date 09/23/2019



Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com



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

11908388

Subcontract Chain of Custody

SAMPLING STATE: Dept of Defense

COC ID: 12147

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: HS19090456
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19090456-01	LH18/24-SP650_091019	Groundwater	10 Sep 2019 14:00
TOC Analysis for DOD Level IV			25 Sep 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: 9/10/19 1800
Date/Time: 9/12/19 0945
Temperature(s): _____

RIGHT SOLUTIONS | RIGHT PARTNER



PC Kelly

Cooler Receipt and Preservation Form

Client ALS - Houston Service Request K19 08388
 Received: 9/12/19 Opened: 9/12/19 By: BR Unloaded: 9/12/19 By: BR

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
-0.2	-0.6	0.7	0.3	-0.4	393	NA	480978378530	NA	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions:



General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

Analytical Report

Client: ALS Environmental - US
Project: HS19090456
Sample Matrix: Ground Water
Analysis Method: 9060A
Prep Method: None

Service Request: K1908388
Date Collected: 09/10/19
Date Received: 09/12/19
Units: mg/L
Basis: NA

Carbon, Total Organic (TOC)

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_091019	K1908388-001	1.50	0.50	0.20	0.07	1	09/16/19 04:09	
Method Blank	K1908388-MB1	ND U	0.50	0.20	0.07	1	09/15/19 14:26	
Method Blank	K1908388-MB2	ND U	0.50	0.20	0.07	1	09/15/19 14:26	
Method Blank	K1908388-MB3	ND U	0.50	0.20	0.07	1	09/15/19 14:26	
Method Blank	K1908388-MB4	ND U	0.50	0.20	0.07	1	09/15/19 14:26	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19090456
Sample Matrix: Ground Water

Service Request: K1908388
Date Collected: 09/10/19
Date Received: 09/12/19
Date Analyzed: 09/16/19

Quadruplicate Sample Summary
General Chemistry Parameters

Sample Name: LH18/24-SP650_091019
Lab Code: K1908388-001
Analysis Method: 9060A
Prep Method: None

Units: mg/L
Basis: NA

Analyte Name	LOQ	LOD	MDL	Sample Result	Duplicate K1908388-001DUP Result	Triplicate K1908388-001TRP Result	Quadruplicate K1908388-001QUAD Result	Average	RSD	RSD Limit
Carbon, Total Organic (TOC)	0.50	0.20	0.07	1.50	1.50	1.51	1.47	1.49	1	20

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

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

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

Printed 9/19/2019 4:09:08 PM

SuperSet Reference:19-0000522974 rev 00

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19090456
Sample Matrix: Ground Water

Service Request: K1908388
Date Analyzed: 09/15/19
Date Extracted: NA

Lab Control Sample Summary
Carbon, Total Organic (TOC)

Analysis Method: 9060A
Prep Method: None

Units: mg/L
Basis: NA
Analysis Lot: 651373

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1908388-LCS1	24.7	25.0	99	83-117
Lab Control Sample	K1908388-LCS2	24.7	25.0	99	83-117
Lab Control Sample	K1908388-LCS3	24.6	25.0	99	83-117
Lab Control Sample	K1908388-LCS4	24.5	25.0	98	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: HS19090456

Service Request: K1908388

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic (TOC)

Analysis Method: 9060A

Units: mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	651373	KQ1913110-49	09/15/19 13:56	25.0	24.1	97	90-110
CCV2	651373	KQ1913110-50	09/15/19 23:01	25.0	23.9	95	90-110
CCV3	651373	KQ1913110-51	09/16/19 06:43	25.0	24.3	97	90-110

Client: ALS Environmental - US
Project: HS19090456

Service Request: K1908388

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic (TOC)

Analysis Method: 9060A

Units: mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	651373	KQ1913110-52	09/15/19 14:11	0.50	0.20	0.07	ND	U
CCB2	651373	KQ1913110-53	09/15/19 23:16	0.50	0.20	0.07	ND	U
CCB3	651373	KQ1913110-54	09/16/19 06:58	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)636-1 068
www.alsglobal.com

Work Request # ^{Original} () K1908230, 8234, 8307, 8311, 8366, 8389, 8353, 8379, 8403, 8440, 8452, 8068, 8231, 8310, 8439
 Tier: IV IV IV IV IV IV II I II II IV IV III II II
 Date Analyzed: 9/14/19 TOC: 651372
651373
651374
651375
 Analyst: SCP Run # DOC: 651376
 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: K1908452-3/3d, 8452-4/4d, 8452-5/5d sent to RA due to being above calibration.
K1908452-6/6d sent for RA due to previous sample carry-over.
K1908230-3/3d/3t, report a high %RSD, however, these samples are less than 5x the MRL.
K1908439-1/1d, 8068-7/7d report a high %RSD due to non-homogeneous sample.

Final Approved by: Famuyu Date: 09/18/19 DQREPORT

Analytical Results Summary

00952478

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 651372 Method/Testcode: 9060/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
K1908230-002	Carbon, Total Organic	N/A		Ground Water	0.43 mg/L	10 mL	0.43 mg/L	J 1	0.07	0.50			9/14/19 22:21:00	N	IV
K1908230-003	Carbon, Total Organic	N/A		Ground Water	0.16 mg/L	10 mL	0.16 mg/L	J 1	0.07	0.50			9/14/19 23:17:00	N	IV
K1908230-004	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/15/19 00:12:00	N	IV
K1908230-005	Carbon, Total Organic	N/A		Ground Water	0.55 mg/L	10 mL	0.55 mg/L	1	0.07	0.50			9/15/19 01:08:00	N	IV
K1908230-006	Carbon, Total Organic	N/A		Ground Water	0.02 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/15/19 02:04:00	N	IV
K1908234-002	Carbon, Total Organic	N/A		Ground Water	0.30 mg/L	10 mL	0.30 mg/L	J 1	0.07	0.50			9/15/19 03:00:00	N	IV
K1908234-003	Carbon, Total Organic	N/A		Ground Water	0.66 mg/L	10 mL	0.66 mg/L	1	0.07	0.50			9/15/19 03:55:00	N	IV
K1908234-004	Carbon, Total Organic	N/A		Ground Water	0.62 mg/L	10 mL	0.62 mg/L	1	0.07	0.50			9/15/19 05:20:00	N	IV
K1908234-005	Carbon, Total Organic	N/A		Ground Water	0.05 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/15/19 06:16:00	N	IV
K1908234-006	Carbon, Total Organic	N/A		Ground Water	1.44 mg/L	10 mL	1.44 mg/L	1	0.07	0.50			9/15/19 07:12:00	N	IV
K1908234-008	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/15/19 08:08:00	N	IV
K1908307-001	Carbon, Total Organic	N/A		Ground Water	3.18 mg/L	10 mL	3.18 mg/L	1	0.07	0.50			9/15/19 09:04:00	Y	IV
K1908307-002	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/15/19 11:09:00	N	IV
K1908307-003	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/15/19 12:05:00	N	IV
K1908307-004	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/15/19 13:01:00	N	IV
KQ1913245-01	Carbon, Total Organic	CCV		Ground Water	24.39 mg/L	10 mL	24.4 mg/L	1					9/14/19 19:45:00	N	IV
KQ1913245-02	Carbon, Total Organic	CCV		Ground Water	24.44 mg/L	10 mL	24.4 mg/L	1					9/15/19 04:51:00	N	IV
KQ1913245-03	Carbon, Total Organic	CCV		Ground Water	24.13 mg/L	10 mL	24.1 mg/L	1					9/15/19 13:56:00	N	IV
KQ1913245-04	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/14/19 20:00:00	N	IV
KQ1913245-05	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/15/19 05:06:00	N	IV
KQ1913245-06	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/15/19 14:11:00	N	IV
KQ1913245-07	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/14/19 20:15:00	N	IV
KQ1913245-08	Carbon, Total Organic	LCS		Ground Water	24.96 mg/L	10 mL	25.0 mg/L	1	0.07	0.50	100		9/14/19 21:11:00	N	IV

Page 20 of 64

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

Printed 9/17/19 17:01

Results Summary

09/18/19


Page 1 of 4

Analytical Results Summary

00952479

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 651372 **Method/Testcode:** 9060/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
KQ1913245-09	Carbon, Total Organic	MS	K1908307-001	Ground Water	29.26 mg/L	10 mL	29.3 mg/L	1	0.07	0.50	104		9/15/19 09:59:00	N	IV
KQ1913245-10	Carbon, Total Organic	MS	K1908307-001	Ground Water	29.42 mg/L	10 mL	29.4 mg/L	1	0.07	0.50	105		9/15/19 09:59:00	N	IV
KQ1913245-11	Carbon, Total Organic	MS	K1908307-001	Ground Water	29.21 mg/L	10 mL	29.2 mg/L	1	0.07	0.50	104		9/15/19 09:59:00	N	IV
KQ1913245-12	Carbon, Total Organic	MS	K1908307-001	Ground Water	29.54 mg/L	10 mL	29.5 mg/L	1	0.07	0.50	105		9/15/19 09:59:00	N	IV
KQ1913245-13	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/14/19 20:15:00	N	IV
KQ1913245-14	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/14/19 20:15:00	N	IV
KQ1913245-15	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/14/19 20:15:00	N	IV
KQ1913245-16	Carbon, Total Organic	LCS		Ground Water	24.88 mg/L	10 mL	24.9 mg/L	1	0.07	0.50	100		9/14/19 21:11:00	N	IV
KQ1913245-17	Carbon, Total Organic	LCS		Ground Water	24.97 mg/L	10 mL	25.0 mg/L	1	0.07	0.50	100		9/14/19 21:11:00	N	IV
KQ1913245-18	Carbon, Total Organic	LCS		Ground Water	24.99 mg/L	10 mL	25.0 mg/L	1	0.07	0.50	100		9/14/19 21:11:00	N	IV
KQ1913245-19	Carbon, Total Organic	DUP	K1908230-002	Ground Water	0.45 mg/L	10 mL	0.45 mg/L J	1	0.07	0.50		4	9/14/19 22:21:00	N	IV
KQ1913245-20	Carbon, Total Organic	TRP	K1908230-002	Ground Water	0.42 mg/L	10 mL	0.42 mg/L J	1	0.07	0.50		3	9/14/19 22:21:00	N	IV
KQ1913245-21	Carbon, Total Organic	QUAD	K1908230-002	Ground Water	0.45 mg/L	10 mL	0.45 mg/L J	1	0.07	0.50		4	9/14/19 22:21:00	N	IV
KQ1913245-22	Carbon, Total Organic	DUP	K1908230-003	Ground Water	0.10 mg/L	10 mL	0.10 mg/L J	1	0.07	0.50		43*	9/14/19 23:17:00	N	IV
KQ1913245-23	Carbon, Total Organic	TRP	K1908230-003	Ground Water	0.16 mg/L	10 mL	0.16 mg/L J	1	0.07	0.50		23*	9/14/19 23:17:00	N	IV
KQ1913245-24	Carbon, Total Organic	QUAD	K1908230-003	Ground Water	0.15 mg/L	10 mL	0.15 mg/L J	1	0.07	0.50		19	9/14/19 23:17:00	N	IV
KQ1913245-25	Carbon, Total Organic	DUP	K1908230-004	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 00:12:00	N	IV
KQ1913245-26	Carbon, Total Organic	TRP	K1908230-004	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 00:12:00	N	IV
KQ1913245-27	Carbon, Total Organic	QUAD	K1908230-004	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 00:12:00	N	IV
KQ1913245-28	Carbon, Total Organic	DUP	K1908230-005	Ground Water	0.54 mg/L	10 mL	0.54 mg/L	1	0.07	0.50		3	9/15/19 01:08:00	N	IV
KQ1913245-29	Carbon, Total Organic	TRP	K1908230-005	Ground Water	0.58 mg/L	10 mL	0.58 mg/L	1	0.07	0.50		4	9/15/19 01:08:00	N	IV
KQ1913245-30	Carbon, Total Organic	QUAD	K1908230-005	Ground Water	0.56 mg/L	10 mL	0.56 mg/L	1	0.07	0.50		3	9/15/19 01:08:00	N	IV
KQ1913245-31	Carbon, Total Organic	DUP	K1908230-006	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 02:04:00	N	IV

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

Analytical Results Summary

00952480

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 651372 Method/Testcode: 9060/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
KQ1913245-32	Carbon, Total Organic	TRP	K1908230-006	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 02:04:00	N	IV
KQ1913245-33	Carbon, Total Organic	QUAD	K1908230-006	Ground Water	0.04 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 02:04:00	N	IV
KQ1913245-34	Carbon, Total Organic	DUP	K1908234-002	Ground Water	0.34 mg/L	10 mL	0.34 mg/L J	1	0.07	0.50		12	9/15/19 03:00:00	N	IV
KQ1913245-35	Carbon, Total Organic	TRP	K1908234-002	Ground Water	0.34 mg/L	10 mL	0.34 mg/L J	1	0.07	0.50		7	9/15/19 03:00:00	N	IV
KQ1913245-36	Carbon, Total Organic	QUAD	K1908234-002	Ground Water	0.36 mg/L	10 mL	0.36 mg/L J	1	0.07	0.50		7	9/15/19 03:00:00	N	IV
KQ1913245-37	Carbon, Total Organic	DUP	K1908234-003	Ground Water	0.64 mg/L	10 mL	0.64 mg/L	1	0.07	0.50		3	9/15/19 03:55:00	N	IV
KQ1913245-38	Carbon, Total Organic	TRP	K1908234-003	Ground Water	0.67 mg/L	10 mL	0.67 mg/L	1	0.07	0.50		2	9/15/19 03:55:00	N	IV
KQ1913245-39	Carbon, Total Organic	QUAD	K1908234-003	Ground Water	0.65 mg/L	10 mL	0.65 mg/L	1	0.07	0.50		2	9/15/19 03:55:00	N	IV
KQ1913245-40	Carbon, Total Organic	DUP	K1908234-004	Ground Water	0.64 mg/L	10 mL	0.64 mg/L	1	0.07	0.50		3	9/15/19 05:20:00	N	IV
KQ1913245-41	Carbon, Total Organic	TRP	K1908234-004	Ground Water	0.63 mg/L	10 mL	0.63 mg/L	1	0.07	0.50		2	9/15/19 05:20:00	N	IV
KQ1913245-42	Carbon, Total Organic	QUAD	K1908234-004	Ground Water	0.58 mg/L	10 mL	0.58 mg/L	1	0.07	0.50		4	9/15/19 05:20:00	N	IV
KQ1913245-43	Carbon, Total Organic	DUP	K1908234-005	Ground Water	0.04 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 06:16:00	N	IV
KQ1913245-44	Carbon, Total Organic	TRP	K1908234-005	Ground Water	0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 06:16:00	N	IV
KQ1913245-45	Carbon, Total Organic	QUAD	K1908234-005	Ground Water	0.12 mg/L	10 mL	0.12 mg/L J	1	0.07	0.50		NC	9/15/19 06:16:00	N	IV
KQ1913245-46	Carbon, Total Organic	DUP	K1908234-006	Ground Water	1.52 mg/L	10 mL	1.52 mg/L	1	0.07	0.50		6	9/15/19 07:12:00	N	IV
KQ1913245-47	Carbon, Total Organic	TRP	K1908234-006	Ground Water	1.50 mg/L	10 mL	1.50 mg/L	1	0.07	0.50		3	9/15/19 07:12:00	N	IV
KQ1913245-48	Carbon, Total Organic	QUAD	K1908234-006	Ground Water	1.47 mg/L	10 mL	1.47 mg/L	1	0.07	0.50		2	9/15/19 07:12:00	N	IV
KQ1913245-49	Carbon, Total Organic	DUP	K1908234-008	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 08:08:00	N	IV
KQ1913245-50	Carbon, Total Organic	TRP	K1908234-008	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 08:08:00	N	IV
KQ1913245-51	Carbon, Total Organic	QUAD	K1908234-008	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 08:08:00	N	IV
KQ1913245-52	Carbon, Total Organic	DUP	K1908307-001	Ground Water	3.10 mg/L	10 mL	3.10 mg/L	1	0.07	0.50		3	9/15/19 09:04:00	N	IV
KQ1913245-53	Carbon, Total Organic	TRP	K1908307-001	Ground Water	3.18 mg/L	10 mL	3.18 mg/L	1	0.07	0.50		2	9/15/19 09:04:00	N	IV
KQ1913245-54	Carbon, Total Organic	QUAD	K1908307-001	Ground Water	3.20 mg/L	10 mL	3.20 mg/L	1	0.07	0.50		1	9/15/19 09:04:00	N	IV

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

Analytical Results Summary

00952481

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 651372 Method/Testcode: 9060/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>
KQ1913245-55	Carbon, Total Organic	DUP	K1908307-002	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 11:09:00	N	IV
KQ1913245-56	Carbon, Total Organic	TRP	K1908307-002	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 11:09:00	N	IV
KQ1913245-57	Carbon, Total Organic	QUAD	K1908307-002	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 11:09:00	N	IV
KQ1913245-58	Carbon, Total Organic	DUP	K1908307-003	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 12:05:00	N	IV
KQ1913245-59	Carbon, Total Organic	TRP	K1908307-003	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 12:05:00	N	IV
KQ1913245-60	Carbon, Total Organic	QUAD	K1908307-003	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 12:05:00	N	IV
KQ1913245-61	Carbon, Total Organic	DUP	K1908307-004	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 13:01:00	N	IV
KQ1913245-62	Carbon, Total Organic	TRP	K1908307-004	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 13:01:00	N	IV
KQ1913245-63	Carbon, Total Organic	QUAD	K1908307-004	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 13:01:00	N	IV

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

Analytical Results Summary

00952482

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 651373 Method/Testcode: 9060/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
K1908311-001	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/15/19 16:17:00	Y	IV
K1908311-002	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/15/19 18:23:00	N	IV
K1908311-003	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/15/19 19:19:00	N	IV
K1908311-004	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/15/19 20:14:00	N	IV
K1908311-005	Carbon, Total Organic	N/A		Ground Water	9.07 mg/L	10 mL	9.07 mg/L	1	0.07	0.50			9/15/19 21:10:00	N	IV
K1908366-001	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/15/19 22:05:00	N	IV
K1908366-002	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/15/19 23:31:00	N	IV
K1908366-003	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 00:26:00	N	IV
K1908366-004	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 01:22:00	N	IV
K1908366-005	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 02:17:00	N	IV
K1908366-006	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 03:13:00	N	IV
K1908388-001	Carbon, Total Organic (TOC)	N/A		Ground Water	1.50 mg/L	10 mL	1.50 mg/L	1		0.50			9/16/19 04:09:00	N	IV
KQ1913110-01	Carbon, Total Organic (TOC)	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			9/15/19 16:17:00	N	IV
KQ1913110-02	Carbon, Total Organic (TOC)	MS	KQ1913110-01	Ground Water	25.85 mg/L	10 mL	25.9 mg/L	1		0.50	103		9/15/19 17:13:00	N	IV
KQ1913110-03	Carbon, Total Organic (TOC)	MS	KQ1913110-01	Ground Water	25.95 mg/L	10 mL	26.0 mg/L	1		0.50	104		9/15/19 17:13:00	N	IV
KQ1913110-04	Carbon, Total Organic (TOC)	MS	KQ1913110-01	Ground Water	25.45 mg/L	10 mL	25.4 mg/L	1		0.50	102		9/15/19 17:13:00	N	IV
KQ1913110-05	Carbon, Total Organic (TOC)	MS	KQ1913110-01	Ground Water	25.91 mg/L	10 mL	25.9 mg/L	1		0.50	104		9/15/19 17:13:00	N	IV
KQ1913110-06	Carbon, Total Organic (TOC)	DUP	KQ1913110-01	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	9/15/19 16:17:00	N	IV
KQ1913110-07	Carbon, Total Organic (TOC)	TRP	KQ1913110-01	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	9/15/19 16:17:00	N	IV
KQ1913110-08	Carbon, Total Organic (TOC)	QUAD	KQ1913110-01	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	9/15/19 16:17:00	N	IV
KQ1913110-09	Carbon, Total Organic (TOC)	DUP	K1908388-001	Ground Water	1.50 mg/L	10 mL	1.50 mg/L	1		0.50		<1	9/16/19 04:09:00	N	IV
KQ1913110-10	Carbon, Total Organic (TOC)	TRP	K1908388-001	Ground Water	1.51 mg/L	10 mL	1.51 mg/L	1		0.50		<1	9/16/19 04:09:00	N	IV
KQ1913110-11	Carbon, Total Organic (TOC)	QUAD	K1908388-001	Ground Water	1.47 mg/L	10 mL	1.47 mg/L	1		0.50		1	9/16/19 04:09:00	N	IV

Page 24 of 64

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

09/18/19
[Handwritten Signature]

Analytical Results Summary

00952483

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 651373 Method/Testcode: 9060/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
KQ1913110-12	Carbon, Total Organic	DUP	K1908366-006	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/16/19 03:13:00	N	IV
KQ1913110-13	Carbon, Total Organic	TRP	K1908366-006	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/16/19 03:13:00	N	IV
KQ1913110-14	Carbon, Total Organic	QUAD	K1908366-006	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/16/19 03:13:00	N	IV
KQ1913110-15	Carbon, Total Organic	DUP	K1908311-001	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 16:17:00	N	IV
KQ1913110-16	Carbon, Total Organic	TRP	K1908311-001	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 16:17:00	N	IV
KQ1913110-17	Carbon, Total Organic	QUAD	K1908311-001	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 16:17:00	N	IV
KQ1913110-18	Carbon, Total Organic	DUP	K1908311-002	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 18:23:00	N	IV
KQ1913110-19	Carbon, Total Organic	TRP	K1908311-002	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 18:23:00	N	IV
KQ1913110-20	Carbon, Total Organic	QUAD	K1908311-002	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 18:23:00	N	IV
KQ1913110-21	Carbon, Total Organic	DUP	K1908311-003	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 19:19:00	N	IV
KQ1913110-22	Carbon, Total Organic	TRP	K1908311-003	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 19:19:00	N	IV
KQ1913110-23	Carbon, Total Organic	QUAD	K1908311-003	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 19:19:00	N	IV
KQ1913110-24	Carbon, Total Organic	DUP	K1908311-004	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 20:14:00	N	IV
KQ1913110-25	Carbon, Total Organic	TRP	K1908311-004	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 20:14:00	N	IV
KQ1913110-26	Carbon, Total Organic	QUAD	K1908311-004	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 20:14:00	N	IV
KQ1913110-27	Carbon, Total Organic	DUP	K1908311-005	Ground Water	9.29 mg/L	10 mL	9.29 mg/L	1	0.07	0.50		2	9/15/19 21:10:00	N	IV
KQ1913110-28	Carbon, Total Organic	TRP	K1908311-005	Ground Water	9.28 mg/L	10 mL	9.28 mg/L	1	0.07	0.50		1	9/15/19 21:10:00	N	IV
KQ1913110-29	Carbon, Total Organic	QUAD	K1908311-005	Ground Water	9.27 mg/L	10 mL	9.27 mg/L	1	0.07	0.50		1	9/15/19 21:10:00	N	IV
KQ1913110-30	Carbon, Total Organic	DUP	K1908366-001	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 22:05:00	N	IV
KQ1913110-31	Carbon, Total Organic	TRP	K1908366-001	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 22:05:00	N	IV
KQ1913110-32	Carbon, Total Organic	QUAD	K1908366-001	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 22:05:00	N	IV
KQ1913110-33	Carbon, Total Organic	DUP	K1908366-002	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 23:31:00	N	IV
KQ1913110-34	Carbon, Total Organic	TRP	K1908366-002	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 23:31:00	N	IV

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

Analytical Results Summary

00952484

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 651373 Method/Testcode: 9060/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
KQ1913110-35	Carbon, Total Organic	QUAD	K1908366-002	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/15/19 23:31:00	N	IV
KQ1913110-36	Carbon, Total Organic	DUP	K1908366-003	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/16/19 00:26:00	N	IV
KQ1913110-37	Carbon, Total Organic	TRP	K1908366-003	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/16/19 00:26:00	N	IV
KQ1913110-38	Carbon, Total Organic	QUAD	K1908366-003	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/16/19 00:26:00	N	IV
KQ1913110-39	Carbon, Total Organic	DUP	K1908366-004	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/16/19 01:22:00	N	IV
KQ1913110-40	Carbon, Total Organic	TRP	K1908366-004	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/16/19 01:22:00	N	IV
KQ1913110-41	Carbon, Total Organic	QUAD	K1908366-004	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/16/19 01:22:00	N	IV
KQ1913110-42	Carbon, Total Organic	DUP	K1908366-005	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/16/19 02:17:00	N	IV
KQ1913110-43	Carbon, Total Organic	TRP	K1908366-005	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/16/19 02:17:00	N	IV
KQ1913110-44	Carbon, Total Organic	QUAD	K1908366-005	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/16/19 02:17:00	N	IV
KQ1913110-45	Carbon, Total Organic	MS	K1908311-001	Ground Water	25.85 mg/L	10 mL	25.9 mg/L	1	0.07	0.50	103		9/15/19 17:13:00	N	IV
KQ1913110-46	Carbon, Total Organic	MS	K1908311-001	Ground Water	25.95 mg/L	10 mL	26.0 mg/L	1	0.07	0.50	104		9/15/19 17:13:00	N	IV
KQ1913110-47	Carbon, Total Organic	MS	K1908311-001	Ground Water	25.45 mg/L	10 mL	25.4 mg/L	1	0.07	0.50	102		9/15/19 17:13:00	N	IV
KQ1913110-48	Carbon, Total Organic	MS	K1908311-001	Ground Water	25.91 mg/L	10 mL	25.9 mg/L	1	0.07	0.50	104		9/15/19 17:13:00	N	IV
KQ1913110-49	Carbon, Total Organic	CCV		Ground Water	24.13 mg/L	10 mL	24.1 mg/L	1					9/15/19 13:56:00	N	IV
KQ1913110-49	Carbon, Total Organic (TOC)	CCV		Ground Water	24.13 mg/L	10 mL	24.1 mg/L	1					9/15/19 13:56:00	N	IV
KQ1913110-50	Carbon, Total Organic	CCV		Ground Water	23.87 mg/L	10 mL	23.9 mg/L	1					9/15/19 23:01:00	N	IV
KQ1913110-50	Carbon, Total Organic (TOC)	CCV		Ground Water	23.87 mg/L	10 mL	23.9 mg/L	1					9/15/19 23:01:00	N	IV
KQ1913110-51	Carbon, Total Organic	CCV		Ground Water	24.31 mg/L	10 mL	24.3 mg/L	1					9/16/19 06:43:00	N	IV
KQ1913110-51	Carbon, Total Organic (TOC)	CCV		Ground Water	24.31 mg/L	10 mL	24.3 mg/L	1					9/16/19 06:43:00	N	IV
KQ1913110-52	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/15/19 14:11:00	N	IV
KQ1913110-52	Carbon, Total Organic (TOC)	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			9/15/19 14:11:00	N	IV
KQ1913110-53	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/15/19 23:16:00	N	IV

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

Analytical Results Summary

00952485

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 651373 Method/Testcode: 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1913110-53	Carbon, Total Organic (TOC)	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			9/15/19 23:16:00	N	IV
KQ1913110-54	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 06:58:00	N	IV
KQ1913110-54	Carbon, Total Organic (TOC)	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			9/16/19 06:58:00	N	IV
KQ1913110-55	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/15/19 14:26:00	N	IV
KQ1913110-55	Carbon, Total Organic (TOC)	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			9/15/19 14:26:00	N	IV
KQ1913110-56	Carbon, Total Organic	LCS		Ground Water	24.66 mg/L	10 mL	24.7 mg/L	1	0.07	0.50	99		9/15/19 15:21:00	N	IV
KQ1913110-56	Carbon, Total Organic (TOC)	LCS		Ground Water	24.66 mg/L	10 mL	24.7 mg/L	1		0.50	99		9/15/19 15:21:00	N	IV
KQ1913110-57	Carbon, Total Organic	LCS		Ground Water	24.66 mg/L	10 mL	24.7 mg/L	1	0.07	0.50	99		9/15/19 15:21:00	N	IV
KQ1913110-57	Carbon, Total Organic (TOC)	LCS		Ground Water	24.66 mg/L	10 mL	24.7 mg/L	1		0.50	99		9/15/19 15:21:00	N	IV
KQ1913110-58	Carbon, Total Organic	LCS		Ground Water	24.64 mg/L	10 mL	24.6 mg/L	1	0.07	0.50	99		9/15/19 15:21:00	N	IV
KQ1913110-58	Carbon, Total Organic (TOC)	LCS		Ground Water	24.64 mg/L	10 mL	24.6 mg/L	1		0.50	99		9/15/19 15:21:00	N	IV
KQ1913110-59	Carbon, Total Organic	LCS		Ground Water	24.46 mg/L	10 mL	24.5 mg/L	1	0.07	0.50	98		9/15/19 15:21:00	N	IV
KQ1913110-59	Carbon, Total Organic (TOC)	LCS		Ground Water	24.46 mg/L	10 mL	24.5 mg/L	1		0.50	98		9/15/19 15:21:00	N	IV
KQ1913110-60	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/15/19 14:26:00	N	IV
KQ1913110-60	Carbon, Total Organic (TOC)	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			9/15/19 14:26:00	N	IV
KQ1913110-61	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/15/19 14:26:00	N	IV
KQ1913110-61	Carbon, Total Organic (TOC)	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			9/15/19 14:26:00	N	IV
KQ1913110-62	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/15/19 14:26:00	N	IV
KQ1913110-62	Carbon, Total Organic (TOC)	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			9/15/19 14:26:00	N	IV

Page 27 of 64

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

Analytical Results Summary

00952486

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 651374 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
K1908353-001	Carbon, Total Organic	N/A		Water	9.49 mg/L	10 mL	949 mg/L	100	7	50			9/16/19 10:03:00	N	II
K1908353-002	Carbon, Total Organic	N/A		Water	7.68 mg/L	10 mL	768 mg/L	100	7	50			9/16/19 10:31:00	N	II
K1908379-001	Carbon, Total Organic	N/A		Drinking Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 05:33:00	N	I
K1908403-001	Carbon, Total Organic	N/A		Water	3.00 mg/L	10 mL	3.00 mg/L	1	0.07	0.50			9/16/19 05:04:00	N	II
K1908440-001	Carbon, Total Organic	N/A		Water	14.74 mg/L	10 mL	1470 mg/L	100	7	50			9/16/19 15:41:00	N	II
K1908440-002	Carbon, Total Organic	N/A		Water	2.47 mg/L	10 mL	247 mg/L	100	7	50			9/16/19 16:09:00	N	II
K1908440-003	Carbon, Total Organic	N/A		Water	1.84 mg/L	10 mL	1.84 mg/L	1	0.07	0.50			9/16/19 18:03:00	N	II
K1908440-004	Carbon, Total Organic	N/A		Water	6.20 mg/L	10 mL	124 mg/L	20	2	10			9/16/19 18:32:00	N	II
K1908452-001	Carbon, Total Organic	N/A		Water	14.99 mg/L	10 mL	15.0 mg/L	1	0.07	0.50			9/16/19 06:01:00	Y	IV
K1908452-002	Carbon, Total Organic	N/A		Water	3.42 mg/L	10 mL	3.42 mg/L	1	0.07	0.50			9/16/19 07:42:00	N	IV
K1908452-003	Carbon, Total Organic	N/A		Water	84.87 mg/L	10 mL	84.9 mg/L	1	0.07	0.50			9/16/19 08:11:00	N	IV
K1908452-004	Carbon, Total Organic	N/A		Water	83.82 mg/L	10 mL	83.8 mg/L	1	0.07	0.50			9/16/19 08:39:00	N	IV
K1908452-005	Carbon, Total Organic	N/A		Water	108.44 mg/L	10 mL	108 mg/L	1	0.07	0.50			9/16/19 09:07:00	N	IV
K1908452-006	Carbon, Total Organic	N/A		Water	28.04 mg/L	10 mL	28.0 mg/L	1	0.07	0.50			9/16/19 09:35:00	N	IV
KQ1913246-01	Carbon, Total Organic	CCV		Water	23.87 mg/L	10 mL	23.9 mg/L	1					9/15/19 23:01:00	N	II
KQ1913246-02	Carbon, Total Organic	CCV		Water	24.31 mg/L	10 mL	24.3 mg/L	1					9/16/19 06:43:00	N	II
KQ1913246-03	Carbon, Total Organic	CCV		Water	24.25 mg/L	10 mL	24.2 mg/L	1					9/16/19 11:27:00	N	II
KQ1913246-04	Carbon, Total Organic	CCV		Water	23.80 mg/L	10 mL	23.8 mg/L	1					9/16/19 16:37:00	N	II
KQ1913246-05	Carbon, Total Organic	CCV		Water	23.62 mg/L	10 mL	23.6 mg/L	1					9/16/19 21:48:00	N	II
KQ1913246-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/15/19 23:16:00	N	II
KQ1913246-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 06:58:00	N	II
KQ1913246-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 11:42:00	N	II
KQ1913246-09	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 16:52:00	N	II
KQ1913246-10	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 22:03:00	N	II
KQ1913246-11	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 07:13:00	N	II
KQ1913246-12	Carbon, Total Organic	LCS		Water	24.63 mg/L	10 mL	24.6 mg/L	1	0.07	0.50	99		9/16/19 07:27:00	N	II
KQ1913246-13	Carbon, Total Organic	MS	K1908452-001	Water	32.82 mg/L	10 mL	65.6 mg/L	2	0.2	1.0	101		9/16/19 06:29:00	N	IV
KQ1913246-14	Carbon, Total Organic	DUP	K1908403-001	Water	3.02 mg/L	10 mL	3.02 mg/L	1	0.07	0.50		<1	9/16/19 05:04:00	N	II
KQ1913246-15	Carbon, Total Organic	DUP	K1908379-001	Drinking Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/16/19 05:33:00	N	I
KQ1913246-16	Carbon, Total Organic	DUP	K1908452-001	Water	14.14 mg/L	10 mL	14.1 mg/L	1	0.07	0.50		6	9/16/19 06:01:00	N	IV
KQ1913246-17	Carbon, Total Organic	DUP	K1908452-002	Water	3.28 mg/L	10 mL	3.28 mg/L	1	0.07	0.50		4	9/16/19 07:42:00	N	IV
KQ1913246-18	Carbon, Total Organic	DUP	K1908452-003	Water	85.97 mg/L	10 mL	86.0 mg/L	1	0.07	0.50		1	9/16/19 08:11:00	N	IV
KQ1913246-19	Carbon, Total Organic	DUP	K1908452-004	Water	83.91 mg/L	10 mL	83.9 mg/L	1	0.07	0.50		<1	9/16/19 08:39:00	N	IV
KQ1913246-20	Carbon, Total Organic	DUP	K1908452-005	Water	104.54 mg/L	10 mL	105 mg/L	1	0.07	0.50		4	9/16/19 09:07:00	N	IV
KQ1913246-21	✗ Carbon, Total Organic	DUP	K1908452-006	Water	23.51 mg/L	10 mL	23.5 mg/L	1	0.07	0.50		18*	9/16/19 09:35:00	N	IV

Page 28 of 4

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

09/18/19
[Signature]

Analytical Results Summary

00952487

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 651374 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>
KQ1913246-22	Carbon, Total Organic	DUP	K1908353-001	Water	8.71 mg/L	10 mL	871 mg/L	100	7	50		9	9/16/19 10:03:00	N	II
KQ1913246-23	Carbon, Total Organic	DUP	K1908353-002	Water	7.42 mg/L	10 mL	742 mg/L	100	7	50		3	9/16/19 10:31:00	N	II
KQ1913246-24	Carbon, Total Organic	DUP	K1908440-001	Water	14.88 mg/L	10 mL	1490 mg/L	100	7	50		<1	9/16/19 15:41:00	N	II
KQ1913246-25	Carbon, Total Organic	DUP	K1908440-002	Water	2.31 mg/L	10 mL	231 mg/L	100	7	50		7	9/16/19 16:09:00	N	II
KQ1913246-26	Carbon, Total Organic	DUP	K1908440-003	Water	1.79 mg/L	10 mL	1.79 mg/L	1	0.07	0.50		3	9/16/19 18:03:00	N	II
KQ1913246-27	Carbon, Total Organic	DUP	K1908440-004	Water	6.31 mg/L	10 mL	126 mg/L	20	2	10		2	9/16/19 18:32:00	N	II

Page 29 of 64

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: 651375 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
K1908068-006	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 23:43:00	N	IV
K1908068-008	Carbon, Total Organic	N/A		Water	2.26 mg/L	10 mL	2.26 mg/L	1	0.07	0.50			9/17/19 00:11:00	N	IV
K1908231-001	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 19:00:00	N	II
K1908231-002	Carbon, Total Organic	N/A		Water	0.31 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 19:28:00	N	II
K1908231-003	Carbon, Total Organic	N/A		Water	0.14 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 19:56:00	N	II
K1908231-004	Carbon, Total Organic	N/A		Water	0.11 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 20:24:00	N	II
K1908231-005	Carbon, Total Organic	N/A		Water	0.40 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 20:52:00	N	II
K1908231-006	Carbon, Total Organic	N/A		Water	0.12 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 21:20:00	N	II
K1908310-001	Carbon, Total Organic	N/A		Water	2.33 mg/L	10 mL	2.33 mg/L	1	0.07	0.50			9/16/19 22:18:00	N	II
K1908310-002	Carbon, Total Organic	N/A		Water	3.10 mg/L	10 mL	3.10 mg/L	1	0.07	0.50			9/16/19 22:46:00	N	II
K1908310-003	Carbon, Total Organic	N/A		Water	0.42 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 23:15:00	N	II
K1908439-001	Carbon, Total Organic	N/A		Water	0.85 mg/L	10 mL	17 mg/L	20	2	10			9/16/19 10:59:00	Y	II
K1908439-002	Carbon, Total Organic	N/A		Water	1.94 mg/L	10 mL	7.8 mg/L	4	0.3	2.0			9/16/19 12:53:00	N	II
K1908439-003	Carbon, Total Organic	N/A		Water	1.99 mg/L	10 mL	8.0 mg/L	4	0.3	2.0			9/16/19 13:21:00	N	II
K1908439-004	Carbon, Total Organic	N/A		Water	0.30 mg/L	10 mL	0.30 mg/L J	1	0.07	0.50			9/16/19 13:49:00	N	II
K1908439-005	Carbon, Total Organic	N/A		Water	0.19 mg/L	10 mL	0.19 mg/L J	1	0.07	0.50			9/16/19 14:17:00	N	II
K1908439-006	Carbon, Total Organic	N/A		Water	0.49 mg/L	10 mL	0.49 mg/L J	1	0.07	0.50			9/16/19 14:45:00	N	II
K1908439-007	Carbon, Total Organic	N/A		Water	0.53 mg/L	10 mL	5.3 mg/L	10	0.7	5.0			9/16/19 15:13:00	N	II
KQ1913248-01	Carbon, Total Organic	CCV		Water	24.31 mg/L	10 mL	24.3 mg/L	1					9/16/19 06:43:00	N	II
KQ1913248-02	Carbon, Total Organic	CCV		Water	24.25 mg/L	10 mL	24.2 mg/L	1					9/16/19 11:27:00	N	II
KQ1913248-03	Carbon, Total Organic	CCV		Water	23.80 mg/L	10 mL	23.8 mg/L	1					9/16/19 16:37:00	N	II
KQ1913248-04	Carbon, Total Organic	CCV		Water	23.62 mg/L	10 mL	23.6 mg/L	1					9/16/19 21:48:00	N	II
KQ1913248-05	Carbon, Total Organic	CCV		Water	23.70 mg/L	10 mL	23.7 mg/L	1					9/17/19 02:04:00	N	II
KQ1913248-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 06:58:00	N	II
KQ1913248-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 11:42:00	N	II
KQ1913248-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 16:52:00	N	II
KQ1913248-09	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 22:03:00	N	II
KQ1913248-10	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/17/19 02:19:00	N	II
KQ1913248-11	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			9/16/19 17:07:00	N	II
KQ1913248-12	Carbon, Total Organic	LCS		Water	24.45 mg/L	10 mL	24.4 mg/L	1	0.07	0.50	98		9/16/19 17:35:00	N	II
KQ1913248-13	Carbon, Total Organic	MS	K1908439-001	Water	27.22 mg/L	10 mL	544 mg/L	20	2	10	105		9/16/19 11:56:00	N	II
KQ1913248-14	Carbon, Total Organic	DUP	K1908439-001	Water	0.69 mg/L	10 mL	14 mg/L	20	2	10		21*	9/16/19 10:59:00	N	II
KQ1913248-15	Carbon, Total Organic	DUP	K1908439-002	Water	2.04 mg/L	10 mL	8.2 mg/L	4	0.3	2.0		5	9/16/19 12:53:00	N	II
KQ1913248-16	Carbon, Total Organic	DUP	K1908439-003	Water	1.88 mg/L	10 mL	7.5 mg/L	4	0.3	2.0		6	9/16/19 13:21:00	N	II
KQ1913248-17	Carbon, Total Organic	DUP	K1908439-004	Water	0.29 mg/L	10 mL	0.29 mg/L J	1	0.07	0.50		2	9/16/19 13:49:00	N	II
KQ1913248-18	Carbon, Total Organic	DUP	K1908439-005	Water	0.17 mg/L	10 mL	0.17 mg/L J	1	0.07	0.50		10	9/16/19 14:17:00	N	II

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

09/18/19
Thompson

Analytical Results Summary

00952489

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 651375 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
KQ1913248-19	Carbon, Total Organic	DUP	K1908439-006	Water	0.53 mg/L	10 mL	0.53 mg/L	1	0.07	0.50		8	9/16/19 14:45:00	N	II
KQ1913248-20	Carbon, Total Organic	DUP	K1908439-007	Water	0.55 mg/L	10 mL	5.5 mg/L	10	0.7	5.0		5	9/16/19 15:13:00	N	II
KQ1913248-21	Carbon, Total Organic	DUP	K1908231-001	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/16/19 19:00:00	N	II
KQ1913248-22	Carbon, Total Organic	DUP	K1908231-002	Water	0.28 mg/L	10 mL	0.28 mg/L J	1	0.07	0.50		NC	9/16/19 19:28:00	N	II
KQ1913248-23	Carbon, Total Organic	DUP	K1908231-003	Water	0.18 mg/L	10 mL	0.18 mg/L J	1	0.07	0.50		NC	9/16/19 19:56:00	N	II
KQ1913248-24	Carbon, Total Organic	DUP	K1908231-004	Water	0.09 mg/L	10 mL	0.09 mg/L J	1	0.07	0.50		NC	9/16/19 20:24:00	N	II
KQ1913248-25	Carbon, Total Organic	DUP	K1908231-005	Water	0.34 mg/L	10 mL	0.34 mg/L J	1	0.07	0.50		NC	9/16/19 20:52:00	N	II
KQ1913248-26	Carbon, Total Organic	DUP	K1908231-006	Water	0.12 mg/L	10 mL	0.12 mg/L J	1	0.07	0.50		NC	9/16/19 21:20:00	N	II
KQ1913248-27	Carbon, Total Organic	DUP	K1908310-001	Water	2.39 mg/L	10 mL	2.39 mg/L	1	0.07	0.50		3	9/16/19 22:18:00	N	II
KQ1913248-28	Carbon, Total Organic	DUP	K1908310-002	Water	3.17 mg/L	10 mL	3.17 mg/L	1	0.07	0.50		2	9/16/19 22:46:00	N	II
KQ1913248-29	Carbon, Total Organic	DUP	K1908310-003	Water	0.34 mg/L	10 mL	0.34 mg/L J	1	0.07	0.50		NC	9/16/19 23:15:00	N	II
KQ1913248-30	Carbon, Total Organic	DUP	K1908068-006	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	9/16/19 23:43:00	N	IV
KQ1913248-31	Carbon, Total Organic	DUP	K1908068-008	Water	2.22 mg/L	10 mL	2.22 mg/L	1	0.07	0.50		3	9/17/19 00:11:00	N	IV

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

Analytical Results Summary

00952490

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 651376 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
K1908068-005	Carbon, Dissolved Organic (DOC)	N/A		Water	2.08 mg/L	10 mL	2.08 mg/L	1	0.07	0.50			9/17/19 00:39:00	N	IV
K1908068-007	Carbon, Dissolved Organic (DOC)	N/A		Water	24.41 mg/L	10 mL	24.4 mg/L	1	0.07	0.50			9/17/19 01:07:00	N	IV
KQ1913250-01	Carbon, Dissolved Organic (DOC)	CCV		Water	23.62 mg/L	10 mL	23.6 mg/L	1					9/16/19 21:48:00	N	IV
KQ1913250-02	Carbon, Dissolved Organic (DOC)	CCV		Water	23.70 mg/L	10 mL	23.7 mg/L	1					9/17/19 02:04:00	N	IV
KQ1913250-03	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/16/19 22:03:00	N	IV
KQ1913250-04	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/17/19 02:19:00	N	IV
KQ1913250-05	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/16/19 17:07:00	N	IV
KQ1913250-06	Carbon, Dissolved Organic (DOC)	LCS		Water	24.52 mg/L	10 mL	24.5 mg/L	1	0.07	0.50	98		9/16/19 17:35:00	N	IV
KQ1913250-07	Carbon, Dissolved Organic (DOC)	DUP	K1908068-005	Water	1.80 mg/L	10 mL	1.80 mg/L	1	0.07	0.50		10	9/17/19 00:39:00	N	IV
KQ1913250-08	Carbon, Dissolved Organic (DOC)	MS	K1908068-007	Water	47.57 mg/L	10 mL	47.6 mg/L	1	0.07	0.50	92		9/17/19 01:35:00	N	IV
KQ1913250-09	Carbon, Dissolved Organic (DOC)	DUP	K1908068-007	Water	22.08 mg/L	10 mL	22.1 mg/L	1	0.07	0.50		11*	9/17/19 01:07:00	N	IV

09/18/19
[Handwritten Signature]

Page 32 of 64

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

Schedule: 09142019

Version: 7

Instrument: Fusion1

Last Saved by: Fusion1 (Fusion1)

Last Saved on: 2019/09/14 19:00 - Saturday

TOC: 651372,
651373,
651374,
651375
DOC: 651376

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1908230-002.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
4	Sample	K1908230-003.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
5	Sample	K1908230-004.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
6	Sample	K1908230-005.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
7	Sample	K1908230-006.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
8	Sample	K1908234-002.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
9	Sample	K1908234-003.08	CAS_salt_010711 (CAS_salt_010711)	4	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	K1908234-004.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
11	Sample	K1908234-005.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
12	Sample	K1908234-006.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
13	Sample	K1908234-008.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
14	Sample	K1908307-001.24	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
15	Sample	K1908307-001.24 ms	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
16	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
17	Sample	K1908307-002.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
18	Sample	K1908307-003.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
19	Sample	K1908307-004.08	CAS_salt_010711 (CAS_salt_010711)	4	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)	4	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
21	Sample	K1908311-001.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
22	Sample	K1908311-001.08 ms	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
23	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
24	Sample	K1908311-002.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
25	Sample	K1908311-003.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
26	Sample	K1908311-004.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
27	Sample	K1908311-005.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
28	Sample	K1908366-001.08	CAS_salt_010711 (CAS_salt_010711)	4	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	K1908366-002.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
30	Sample	K1908366-003.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
31	Sample	K1908366-004.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
32	Sample	K1908366-005.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
33	Sample	K1908366-006.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
34	Sample	K1908388-001.01	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
35	Sample	K1908403-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1908379-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1908452-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K1908452-001.01 ms 2x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

Printed on: September 17, 2019 09:09:01

Page 1

09/18/19
Fusion1

Schedule: 09142019

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	K1908452-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K1908452-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K1908452-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	K1908452-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	K1908452-006.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K1908353-001.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K1908353-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	K1908439-001.01 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
48	Sample	K1908439-001.01 ms 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
50	Sample	K1908439-002.01 4x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
51	Sample	K1908439-003.01 4x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	K1908439-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	K1908439-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
54	Sample	K1908439-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	K1908439-007.01 10x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	K1908440-001.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
57	Sample	K1908440-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
58	Sample	MB4	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
59	Sample	K1908440-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
60	Sample	K1908440-004.01 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
61	Sample	K1908231-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
62	Sample	K1908231-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
63	Sample	K1908231-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
64	Sample	K1908231-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
65	Sample	K1908231-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
66	Sample	K1908231-006.01	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
67	Sample	K1908310-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
68	Sample	K1908310-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
69	Sample	K1908310-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
70	Sample	K1908068-006.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
71	Sample	K1908068-008.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
72	Sample	K1908068-005.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
73	Sample	K1908068-007.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
74	Sample	K1908068-007.01 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
75	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

Fusion Report - 09142019 Saturday, September 14, 2019 05:16 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/09/17 09:09 -
Tuesday

Report Summary Information

Company Location: Gen Chem Lab
 Schedule Name: 09142019
 Instrument Name: Fusion1
 Report Version: 1 of 1
 Report Creation by Operators (schedule version): Fusion1 (Fusion1) (v2)
 Fusion1 (Fusion1) (v3)
 Fusion1 (Fusion1) (v4)
 Fusion1 (Fusion1) (v6)
 Fusion1 (Fusion1) (v7)

Engine 1.1.5.1
 Version:
 Firmware 1.2.0696
 Version:
 Connection: RS232 COM1

Comment:

Report Results

09/18/19
[Signature]

Sample Type: Clean From Schedule Version 2

Pos	Analysis Type	Sample ID	Start Time
♦ (clean)		Clean	2019/09/14 17:16

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.62	15.08	3.46	49.69	05:24
2	TC Clean	5.40	8.74	3.34	50.07	04:06
3	TC Clean	2.81	6.37	3.56	50.08	03:54
4	TC Clean	2.15	5.64	3.49	50.06	03:56

Sample Type: Clean From Schedule Version 3

Pos	Analysis Type	Sample ID	Start Time
♦ (clean)		Clean	2019/09/14 17:52

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.02	13.57	3.55	49.64	05:21
2	TC Clean	7.04	10.61	3.57	50.07	04:03
3	TC Clean	3.14	6.69	3.56	50.10	03:47

4	TC Clean	1.98	5.58	3.60	50.08	03:49
---	----------	------	------	------	-------	-------

Sample Type: Clean From Schedule Version 4

Pos	Analysis Type	Sample ID			Start Time	
◆ (clean)		Clean			2019/09/14 18:14	
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	9.96	13.50	3.54	49.67	05:11
2	TC Clean	5.29	8.85	3.57	50.11	04:04
3	TC Clean	3.31	7.06	3.74	50.12	03:55
4	TC Clean	2.57	5.93	3.36	50.13	03:53

Sample Type: Blank (Creating v1295) From Schedule Version 6

Pos	Analysis Type	Sample ID			Start Time	
◆ (blank)		Reagent/Acid Blank			2019/09/14 18:57	
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.09	13.40	3.31	49.76	05:22
2	TC Clean	7.62	11.09	3.47	50.11	04:04
3	TC Clean	2.84	6.34	3.50	50.11	03:48
4	TC Clean	1.88	5.29	3.41	50.08	03:46
5	Reagent Blank	4.11	7.71	3.60	50.07	05:07
6	Acid Blank	1.43	4.80	3.37	49.71	05:29

Sample Type: Sample From Schedule Version 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
◆ D	TOC	RB	0.3743 ppm	0.0000 ppm	0.0000%	2019/09/14 19:31		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3743	3.7427	11.33	15.13	3.80	50.16	10:32
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 8.7905 (IC) (v1295)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.3939 ppm (PASS)	0.0000 ppm	0%	2019/09/14 19:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.3939	243.9392	175.05	178.56	3.51	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 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/14 20:00

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.80	11.45	3.64	50.13	10:32

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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/14 20:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.00	10.55	3.55	50.10	10:27
2	TOC	0.0000	0.0000	7.33	10.91	3.58	50.10	10:25
3	TOC	0.0000	0.0000	6.81	10.43	3.62	50.08	10:30
4	TOC	0.0000	0.0000	6.52	10.16	3.65	50.10	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 7

Concentration	Min / Max

Pos	BAT	(ppm)	Dil	Sample ID	(% dev)	Result	Std. Dev.	RSD	Start Time
♦ C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.9504 ppm (PASS)	0.0496 ppm	0.20%	2019/09/14 21:11

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.9641	249.6405	178.92	182.21	3.29	50.13	10:26
C	TOC	25.0 ppm	2	24.8771	248.7713	178.33	181.83	3.50	50.11	10:28
C	TOC	25.0 ppm	3	24.9742	249.7422	178.99	182.51	3.52	50.10	10:30
C	TOC	25.0 ppm	4	24.9860	249.8600	179.07	182.67	3.60	50.10	10:26

<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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 2	TOC	ICS	0.4650 ppm	0.0000 ppm	0.0000%	2019/09/14 22:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4650	4.6501	11.95	15.51	3.57	50.09	10:29

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7905 (IC) (v1295)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 3	TOC	K1908230-002.08	0.4387 ppm	0.0157 ppm	3.5700%	2019/09/14 22:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4316	4.3157	11.72	15.32	3.60	50.11	10:28
2	TOC	0.4493	4.4925	11.84	15.35	3.51	50.12	10:27
3	TOC	0.4201	4.2008	11.64	15.17	3.53	50.09	10:27
4	TOC	0.4538	4.5382	11.87	15.40	3.53	50.10	10:29

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7905 (IC) (v1295)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 4	TOC	K1908230-003.08	0.1423 ppm	0.0276 ppm	19.3700%	2019/09/14 23:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1559	1.5594	9.85	13.25	3.40	50.11	10:26
2	TOC	0.1010	1.0099	9.48	13.19	3.71	50.08	10:25
3	TOC	0.1574	1.5741	9.86	13.41	3.55	50.08	10:28
4	TOC	0.1549	1.5491	9.84	13.47	3.63	50.09	10:28

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
5	TOC	K1908230-004.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/15 00:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.79	12.40	3.61	50.10	10:29
2	TOC	0.0000	0.0000	8.56	12.11	3.55	50.11	10:29
3	TOC	0.0000	0.0000	8.54	12.23	3.69	50.08	10:25
4	TOC	0.0000	0.0000	8.54	12.18	3.64	50.05	10:28

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **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	K1908230-005.08	0.5578 ppm	0.0167 ppm	2.9900%	2019/09/15 01:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5519	5.5193	12.54	16.09	3.55	50.01	10:28
2	TOC	0.5382	5.3823	12.44	15.99	3.55	50.01	10:27
3	TOC	0.5774	5.7742	12.71	16.21	3.50	49.99	10:29
4	TOC	0.5634	5.6342	12.61	16.16	3.54	50.00	10:31

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **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	K1908230-006.08	0.0166 ppm	0.0172 ppm	103.7500%	2019/09/15 02:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0248	0.2482	8.96	12.61	3.65	50.00	10:28
2	TOC	0.0000	0.0000	8.76	12.45	3.68	49.99	10:28
3	TOC	0.0048	0.0479	8.82	12.31	3.49	50.00	10:28
4	TOC	0.0368	0.3676	9.04	12.45	3.41	50.01	10:32

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **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	K1908234-002.08	0.3329 ppm	0.0239 ppm	7.1900%	2019/09/15 03:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2991	2.9913	10.82	14.21	3.39	50.04	10:30
2	TOC	0.3374	3.3744	11.08	14.54	3.46	50.05	10:27

3	TOC	0.3396	3.3965	11.10	14.70	3.61	50.04	10:28
4	TOC	0.3556	3.5556	11.20	14.70	3.50	50.04	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7905 (IC) (v1295)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
9	TOC	K1908234-003.08	0.6573 ppm	0.0129 ppm	1.9600%	2019/09/15 03:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6611	6.6110	13.28	16.81	3.54	50.06	10:28
2	TOC	0.6414	6.4136	13.14	16.63	3.49	50.07	10:27
3	TOC	0.6721	6.7215	13.35	16.89	3.54	50.07	10:29
4	TOC	0.6545	6.5447	13.23	16.74	3.50	50.10	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7905 (IC) (v1295)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.4381 ppm (PASS)	0.0000 ppm	0%	2019/09/15 04:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4381	244.3812	175.35	178.83	3.48	50.08	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 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/15 05:06

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.36	10.07	3.71	50.08	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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
10	TOC	K1908234-004.08	0.6173 ppm	0.0249 ppm	4.0400%	2019/09/15 05:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6170	6.1705	12.98	16.63	3.65	50.09	10:31
2	TOC	0.6386	6.3856	13.13	16.64	3.51	50.10	10:28
3	TOC	0.6313	6.3134	13.08	16.56	3.49	50.11	10:24
4	TOC	0.5824	5.8243	12.74	16.32	3.57	50.10	10:26

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
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	K1908234-005.08	0.0565 ppm	0.0430 ppm	76.0100%	2019/09/15 06:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0549	0.5488	9.16	12.67	3.50	50.12	10:30
2	TOC	0.0431	0.4309	9.08	12.64	3.56	50.12	10:27
3	TOC	0.0129	0.1289	8.88	12.48	3.60	50.12	10:26
4	TOC	0.1153	1.1528	9.57	13.22	3.65	50.12	10:29

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
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	K1908234-006.08	1.4833 ppm	0.0363 ppm	2.4500%	2019/09/15 07:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4372	14.3718	18.55	22.05	3.50	50.14	10:27
2	TOC	1.5204	15.2042	19.11	22.67	3.56	50.13	10:29
3	TOC	1.5023	15.0230	18.99	22.47	3.48	50.13	10:28
4	TOC	1.4734	14.7342	18.79	22.28	3.48	50.15	10:24

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
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	K1908234-008.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/15 08:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.14	10.73	3.60	50.16	10:27
2	TOC	0.0000	0.0000	7.15	10.70	3.55	50.16	10:27
3	TOC	0.0000	0.0000	7.15	10.57	3.42	50.15	10:31
4	TOC	0.0000	0.0000	6.93	10.56	3.63	50.15	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **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	K1908307-001.24	3.1634 ppm	0.0466 ppm	1.4700%	2019/09/15 09:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1779	31.7791	30.36	33.89	3.53	50.17	10:25
2	TOC	3.0954	30.9541	29.80	33.47	3.67	50.16	10:26
3	TOC	3.1792	31.7924	30.37	33.80	3.43	50.17	10:28
4	TOC	3.2012	32.0119	30.52	34.07	3.55	50.17	10:28

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **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	K1908307-001.24 ms	29.3556 ppm	0.1536 ppm	0.5200%	2019/09/15 09:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.5382	295.3819	209.29	212.75	3.46	50.19	10:25
2	TOC	29.2050	292.0495	207.03	210.60	3.57	50.15	10:29
3	TOC	29.4240	294.2402	208.52	212.15	3.63	50.16	10:29
4	TOC	29.2552	292.5519	207.37	210.88	3.51	50.16	10:24

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
16	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/15 10:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.24	10.78	3.55	50.17	10:32

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **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	K1908307-002.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/15 11:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.36	12.05	3.69	50.18	10:29
2	TOC	0.0000	0.0000	8.16	11.58	3.42	50.18	10:28
3	TOC	0.0000	0.0000	8.06	11.48	3.42	50.19	10:23
4	TOC	0.0000	0.0000	8.36	11.96	3.60	50.17	10:26

Dilution **Blank Contribution** **Method** **Calibration**

1:10 (TC) 8.7905 (IC) CAS_salt_010711 CAS_salt_010711
(v1295) (v4) (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
18	TOC	K1908307-003.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/15 12:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.36	11.94	3.57	50.18	10:26
2	TOC	0.0000	0.0000	8.32	11.90	3.59	50.18	10:30
3	TOC	0.0000	0.0000	8.38	11.93	3.55	50.15	10:30
4	TOC	0.0000	0.0000	8.00	11.56	3.56	50.15	10:26

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
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	K1908307-004.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/15 13:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.21	10.69	3.47	50.16	10:27
2	TOC	0.0000	0.0000	7.65	11.11	3.45	50.16	10:24
3	TOC	0.0000	0.0000	7.10	10.77	3.66	50.14	10:27
4	TOC	0.0000	0.0000	7.18	10.67	3.49	50.14	10:27

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.1258 ppm (PASS)	0.0000 ppm	0%	2019/09/15 13:56

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1258	241.2580	173.23	176.72	3.49	50.12	10:33

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 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:1	[TOC] CCB [0]	0 / infinity	0.0000	0.0000	0%	2019/09/15 14:11

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.95	9.55	3.60	50.14	10:31
Completion State		Success Action		Method		Calibration		STD Conc - Pos D		
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		0 ppmC		

Sample Type: Sample From Schedule Version 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/15 14:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.33	8.89	3.56	50.13	10:25
2	TOC	0.0000	0.0000	5.58	9.13	3.55	50.12	10:28
3	TOC	0.0000	0.0000	5.11	8.77	3.66	50.11	10:24
4	TOC	0.0000	0.0000	5.52	8.99	3.47	50.14	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7905 (IC) (v1295)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.6045 ppm (PASS)	0.0998 ppm	0.41%	2019/09/15 15:21

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.6629	246.6293	176.87	180.58	3.70	50.14	10:27
C	TOC	25.0 ppm	2	24.6612	246.6116	176.86	180.50	3.64	50.12	10:25
C	TOC	25.0 ppm	3	24.6382	246.3818	176.70	180.31	3.61	50.14	10:30
C	TOC	25.0 ppm	4	24.4558	244.5580	175.47	179.12	3.66	50.14	10:24

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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
21	TOC	K1908311-001.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/15 16:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.60	12.12	3.52	50.15	10:29
2	TOC	0.0000	0.0000	7.74	11.18	3.44	50.15	10:29
3	TOC	0.0000	0.0000	7.24	10.90	3.67	50.15	10:26
4	TOC	0.0000	0.0000	7.52	11.07	3.55	50.16	10:29

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **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	K1908311-001.08 ms	25.7899 ppm	0.2331 ppm	0.9000%	2019/09/15 17:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.9078	259.0778	184.65	188.23	3.57	50.16	10:31
2	TOC	25.4455	254.4549	181.51	185.09	3.58	50.15	10:30
3	TOC	25.9523	259.5227	184.95	188.48	3.53	50.16	10:27
4	TOC	25.8542	258.5416	184.29	187.88	3.59	50.14	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **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	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/15 18:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.34	9.91	3.57	50.16	10:30

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **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	K1908311-002.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/15 18:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.37	11.99	3.63	50.17	10:29
2	TOC	0.0000	0.0000	8.36	11.86	3.51	50.16	10:28
3	TOC	0.0000	0.0000	7.98	11.64	3.66	50.16	10:26
4	TOC	0.0000	0.0000	8.04	11.62	3.59	50.16	10:28

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
25	TOC	K1908311-003.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/15 19:19

Rep	Base	Adjusted	Baseline	Pressure	Run
-----	------	----------	----------	----------	-----

#	Analysis Type	ppm	µg	(Abs)	NDIR (Abs)	(Abs)	(psig)	Time
1	TOC	0.0000	0.0000	7.70	11.27	3.57	50.17	10:31
2	TOC	0.0000	0.0000	7.70	11.23	3.53	50.16	10:26
3	TOC	0.0000	0.0000	7.29	10.92	3.63	50.18	10:25
4	TOC	0.0000	0.0000	7.74	11.21	3.46	50.19	10:28

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **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	K1908311-004.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/15 20:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.41	10.98	3.58	50.20	10:27
2	TOC	0.0000	0.0000	7.55	11.26	3.72	50.18	10:24
3	TOC	0.0000	0.0000	7.62	11.17	3.55	50.18	10:30
4	TOC	0.0000	0.0000	7.43	11.07	3.64	50.20	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **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	K1908311-005.08	9.2286 ppm	0.1088 ppm	1.1800%	2019/09/15 21:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.0660	90.6600	70.33	73.94	3.61	50.20	10:28
2	TOC	9.2929	92.9288	71.87	75.43	3.56	50.20	10:25
3	TOC	9.2839	92.8389	71.81	75.28	3.47	50.20	10:27
4	TOC	9.2718	92.7181	71.73	75.31	3.59	50.20	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **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	K1908366-001.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/15 22:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.46	10.97	3.50	50.19	10:32
2	TOC	0.0000	0.0000	7.01	10.49	3.49	50.21	10:28
3	TOC	0.0000	0.0000	6.86	10.35	3.50	50.22	10:28
4	TOC	0.0000	0.0000	6.65	10.15	3.50	50.24	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.8715 ppm (PASS)	0.0000 ppm	0%	2019/09/15 23:01

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8715	238.7153	171.50	174.91	3.41	50.24	10:33

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 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/15 23:16

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.45	8.98	3.53	50.24	10:28

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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 29	TOC	K1908366-002.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/15 23:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.49	9.95	3.47	50.24	10:29
2	TOC	0.0000	0.0000	6.55	10.05	3.50	50.24	10:27
3	TOC	0.0000	0.0000	6.49	9.98	3.49	50.26	10:26
4	TOC	0.0000	0.0000	6.34	9.86	3.52	50.25	10:25

Dilution 1:10	Blank Contribution (TC) 8.7905 (IC) (v1295)	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	K1908366-003.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/16 00:26

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

1	TOC	0.0000	0.0000	6.57	10.07	3.50	50.26	10:32
2	TOC	0.0000	0.0000	6.90	10.34	3.44	50.25	10:28
3	TOC	0.0000	0.0000	6.77	10.20	3.43	50.29	10:31
4	TOC	0.0000	0.0000	6.64	10.27	3.63	50.27	10:26

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
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	K1908366-004.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/16 01:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.05	10.56	3.51	50.31	10:26
2	TOC	0.0000	0.0000	7.00	10.53	3.53	50.30	10:26
3	TOC	0.0000	0.0000	6.95	10.53	3.58	50.29	10:26
4	TOC	0.0000	0.0000	7.08	10.70	3.62	50.24	10:28

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
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	K1908366-005.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/16 02:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.94	10.50	3.56	50.20	10:29
2	TOC	0.0000	0.0000	6.95	10.50	3.55	50.22	10:26
3	TOC	0.0000	0.0000	6.98	10.58	3.60	50.26	10:24
4	TOC	0.0000	0.0000	6.82	10.45	3.63	50.28	10:26

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
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	K1908366-006.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/16 03:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.27	9.78	3.51	50.30	10:30
2	TOC	0.0000	0.0000	6.17	9.81	3.64	50.31	10:28
3	TOC	0.0000	0.0000	6.29	9.80	3.51	50.32	10:27
4	TOC	0.0000	0.0000	6.30	9.81	3.52	50.33	10:25

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
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	K1908388-001.01	1.4950 ppm	0.0165 ppm	1.1000%	2019/09/16 04:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4958	14.9581	18.94	22.50	3.55	50.34	10:26
2	TOC	1.4996	14.9964	18.97	22.48	3.51	50.33	10:27
3	TOC	1.5120	15.1202	19.05	22.57	3.52	50.32	10:29
4	TOC	1.4725	14.7254	18.79	22.37	3.59	50.33	10:29

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
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	K1908403-001.02	3.0074 ppm	0.0139 ppm	0.4600%	2019/09/16 05:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9976	29.9759	29.14	32.73	3.59	50.35	10:29
2	TOC	3.0172	30.1719	29.27	32.78	3.51	50.34	10:30

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
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	K1908379-001.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/16 05:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.51	11.99	3.48	50.35	10:28
2	TOC	0.0000	0.0000	8.36	11.85	3.49	50.33	10:29

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
37	TOC	K1908452-001.01	14.5666 ppm	0.6052 ppm	4.1500%	2019/09/16 06:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.9946	149.9461	110.57	114.08	3.51	50.37	10:28
2	TOC	14.1387	141.3868	104.76	108.31	3.54	50.35	10:24

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
38	TOC	K1908452-001.01 ms 2x	32.8223 ppm	0.0000 ppm	0.0000%	2019/09/16 06:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	32.8223	328.2225	231.59	235.14	3.55	50.38	10:29

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7905 (IC) (v1295)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.3057 ppm (PASS)	0.0000 ppm	0%	2019/09/16 06:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.3057	243.0568	174.45	178.10	3.65	50.38	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 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/16 06:58

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.21	9.86	3.64	50.37	10:34

<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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/16 07:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.27	8.87	3.60	50.35	10:31

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7905 (IC) (v1295)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS

From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

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)	24.6339 ppm (PASS)	0.0000 ppm	0%	2019/09/16 07:27

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.6339	246.3391	176.68	180.31	3.63	50.36	10:30

<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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◊	40	TOC	K1908452-002.01	3.3501 ppm	0.0983 ppm	2.9400%	2019/09/16 07:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.4197	34.1967	32.00	35.67	3.67	50.36	10:27
2	TOC	3.2806	32.8060	31.06	34.54	3.48	50.35	10:26

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7905 (IC) (v1295)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◊	41	TOC	K1908452-003.01	85.4208 ppm	0.7825 ppm	0.9200%	2019/09/16 08:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	84.8675	848.6749	584.87	588.38	3.52	50.36	10:30
2	TOC	85.9742	859.7416	592.38	596.29	3.91	50.34	10:26

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7905 (IC) (v1295)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◊	42	TOC	K1908452-004.01	83.8667 ppm	0.0616 ppm	0.0700%	2019/09/16 08:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	83.8231	838.2314	577.78	581.64	3.86	50.32	10:27
2	TOC	83.9102	839.1020	578.37	582.43	4.06	50.33	10:26

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7905 (IC) (v1295)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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

43	TOC	K1908452-005.01	106.4911 ppm	2.7567 ppm	2.5900%	2019/09/16 09:07
----	-----	-----------------	--------------	------------	---------	------------------

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	108.4403	1084.4032	744.88	748.73	3.86	50.28	10:28
2	TOC	104.5418	1045.4179	718.41	723.40	4.98	50.27	10:29

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
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	K1908452-006.02	25.7725 ppm	3.2007 ppm	12.4200%	2019/09/16 09:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.0357	280.3567	199.10	203.53	4.43	50.28	10:31
2	TOC	23.5093	235.0926	168.37	172.12	3.75	50.27	10:27

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
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	K1908353-001.01 100x	9.0972 ppm	0.5523 ppm	6.0700%	2019/09/16 10:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.4878	94.8778	73.19	77.08	3.88	50.27	10:28
2	TOC	8.7067	87.0669	67.89	71.71	3.82	50.24	10:28

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
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	K1908353-002.01 100x	7.5460 ppm	0.1838 ppm	2.4400%	2019/09/16 10:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.6759	76.7589	60.89	64.47	3.57	50.24	10:24
2	TOC	7.4160	74.1602	59.13	62.66	3.53	50.23	10:28

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
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	K1908439-001.01 20x	0.7709 ppm	0.1123 ppm	14.5700%	2019/09/16 10:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8503	8.5026	14.56	18.31	3.75	50.19	10:27
2	TOC	0.6914	6.9145	13.48	17.08	3.60	50.18	10:27

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7905 (IC) (v1295)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◊ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.2463 ppm (PASS)	0.0000 ppm	0%	2019/09/16 11:27

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2463	242.4631	174.04	177.52	3.48	50.18	10:30

<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 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◊ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/16 11:42

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.52	11.17	3.64	50.16	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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 48	TOC	K1908439-001.01 ms 20x	27.3254 ppm	0.1475 ppm	0.5400%	2019/09/16 11:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.2211	272.2114	193.57	197.08	3.51	50.14	10:29
2	TOC	27.4297	274.2975	194.98	198.52	3.54	50.18	10:27

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7905 (IC) (v1295)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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

49	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/16 12:25
----	-----	----	------------	------------	---------	------------------

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.77	10.22	3.45	50.15	10:25
2	TOC	0.0000	0.0000	6.05	9.50	3.44	50.17	10:29

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
50	TOC	K1908439-002.01 4x	1.9915 ppm	0.0672 ppm	3.3700%	2019/09/16 12:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9440	19.4396	21.99	25.32	3.34	50.15	10:31
2	TOC	2.0390	20.3898	22.63	25.99	3.36	50.18	10:26

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
51	TOC	K1908439-003.01 4x	1.9365 ppm	0.0799 ppm	4.1300%	2019/09/16 13:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9930	19.9302	22.32	25.73	3.41	50.18	10:27
2	TOC	1.8800	18.8002	21.55	24.98	3.43	50.19	10:22

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
52	TOC	K1908439-004.01	0.2955 ppm	0.0047 ppm	1.5900%	2019/09/16 13:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2988	2.9884	10.82	14.19	3.37	50.21	10:31
2	TOC	0.2922	2.9221	10.77	13.92	3.15	50.19	10:25

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
53	TOC	K1908439-005.01	0.1813 ppm	0.0123 ppm	6.7800%	2019/09/16 14:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1900	1.8997	10.08	13.58	3.50	50.16	10:30
2	TOC	0.1726	1.7258	9.96	13.42	3.46	50.15	10:23

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
54	TOC	K1908439-006.01	0.5070 ppm	0.0277 ppm	5.4700%	2019/09/16 14:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4874	4.8741	12.10	15.62	3.52	50.09	10:29
2	TOC	0.5266	5.2659	12.36	15.86	3.49	50.16	10:29

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
55	TOC	K1908439-007.01 10x	0.5404 ppm	0.0191 ppm	3.5300%	2019/09/16 15:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5269	5.2689	12.37	15.85	3.48	50.15	10:27
2	TOC	0.5538	5.5385	12.55	15.97	3.42	50.11	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
56	TOC	K1908440-001.01 100x	14.8113 ppm	0.1020 ppm	0.6900%	2019/09/16 15:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.7392	147.3915	108.84	112.22	3.38	50.08	10:29
2	TOC	14.8834	148.8338	109.82	113.41	3.60	50.13	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **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	K1908440-002.01 100x	2.3915 ppm	0.1121 ppm	4.6900%	2019/09/16 16:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4708	24.7078	25.56	29.02	3.46	50.12	10:30
2	TOC	2.3123	23.1226	24.49	27.98	3.49	50.08	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **Method** CAS_salt_010711 (v4) **Calibration** 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)	23.8001 ppm (PASS)	0.0000 ppm	0%	2019/09/16 16:37

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8001	238.0008	171.02	174.57	3.56	50.13	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 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/16 16:52

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.03	8.62	3.59	50.12	10:32

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

Sample Type: Sample From Schedule Version 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/16 17:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.49	7.96	3.48	50.14	10:25
2	TOC	0.0000	0.0000	4.91	8.34	3.43	50.14	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7905 (IC) (v1295)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.5197 ppm (PASS)	0.1044 ppm	0.43%	2019/09/16 17:35

Base

Pos	Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.4459	244.4593	175.40	178.84	3.44	50.13	10:28
C	TOC	25.0 ppm	2	24.5935	245.9354	176.40	180.04	3.63	50.16	10:30

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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
59	TOC	K1908440-003.01	1.8175 ppm	0.0366 ppm	2.0100%	2019/09/16 18:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8433	18.4334	21.30	24.95	3.64	50.18	10:26
2	TOC	1.7916	17.9163	20.95	24.60	3.65	50.18	10:26

Dilution 1:10	Blank Contribution (TC) 8.7905 (IC) (v1295)	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	K1908440-004.01 20x	6.2537 ppm	0.0792 ppm	1.2700%	2019/09/16 18:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.1977	61.9768	50.86	54.46	3.60	50.15	10:31
2	TOC	6.3096	63.0964	51.62	55.13	3.51	50.12	10:26

Dilution 1:10	Blank Contribution (TC) 8.7905 (IC) (v1295)	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	K1908231-001.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/16 19:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.05	11.54	3.49	50.18	10:25
2	TOC	0.0000	0.0000	7.92	11.45	3.53	50.16	10:31

Dilution 1:10	Blank Contribution (TC) 8.7905 (IC) (v1295)	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	K1908231-002.01	0.2949 ppm	0.0152 ppm	5.1600%	2019/09/16 19:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3056	3.0561	10.86	14.38	3.51	50.13	10:25

2	TOC	0.2841	2.8411	10.72	14.21	3.49	50.12	10:29
---	-----	--------	--------	-------	-------	------	-------	-------

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
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	K1908231-003.01	0.1560 ppm	0.0286 ppm	18.3600%	2019/09/16 19:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1358	1.3575	9.71	13.13	3.42	50.11	10:31
2	TOC	0.1763	1.7627	9.99	13.31	3.33	50.12	10:30

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
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	K1908231-004.01	0.0996 ppm	0.0099 ppm	9.9400%	2019/09/16 20:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1066	1.0659	9.51	12.98	3.46	50.10	10:27
2	TOC	0.0926	0.9259	9.42	13.00	3.58	50.09	10:27

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
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	K1908231-005.01	0.3738 ppm	0.0420 ppm	11.2300%	2019/09/16 20:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4034	4.0344	11.53	15.11	3.58	50.12	10:29
2	TOC	0.3441	3.4407	11.13	14.75	3.62	50.13	10:29

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
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	K1908231-006.01	0.1168 ppm	0.0005 ppm	0.4500%	2019/09/16 21:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1172	1.1719	9.59	13.08	3.50	50.12	10:26
2	TOC	0.1165	1.1646	9.58	12.96	3.38	50.15	10:25

Dilution 1:10
Blank Contribution (TC) 8.7905 (IC) (v1295)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.6243 ppm (PASS)	0.0000 ppm	0%	2019/09/16 21:48

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6243	236.2432	169.82	173.20	3.38	50.16	10:34

<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 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/16 22:03

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.00	8.54	3.54	50.17	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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 67	TOC	K1908310-001.01	2.3632 ppm	0.0430 ppm	1.8200%	2019/09/16 22:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3327	23.3274	24.62	28.20	3.58	50.18	10:28
2	TOC	2.3936	23.9358	25.04	28.65	3.61	50.18	10:24

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.7905 (IC) (v1295)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 68	TOC	K1908310-002.01	3.1367 ppm	0.0481 ppm	1.5300%	2019/09/16 22:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1026	31.0263	29.85	33.39	3.54	50.20	10:28
2	TOC	3.1707	31.7070	30.31	33.72	3.40	50.19	10:29

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **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	K1908310-003.01	0.3804 ppm	0.0570 ppm	14.9800%	2019/09/16 23:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4207	4.2067	11.65	15.13	3.48	50.21	10:25
2	TOC	0.3401	3.4009	11.10	14.64	3.54	50.20	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **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	K1908068-006.03	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/16 23:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.17	10.68	3.51	50.23	10:28
2	TOC	0.0000	0.0000	6.91	10.44	3.53	50.22	10:24

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
71	TOC	K1908068-008.03	2.2419 ppm	0.0276 ppm	1.2300%	2019/09/17 00:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2614	22.6144	24.14	27.73	3.59	50.22	10:29
2	TOC	2.2224	22.2240	23.88	27.57	3.70	50.24	10:26

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **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	K1908068-005.01 doc	1.9395 ppm	0.2038 ppm	10.5100%	2019/09/17 00:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0836	20.8362	22.93	26.56	3.63	50.23	10:27
2	TOC	1.7955	17.9546	20.98	24.56	3.58	50.24	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.7905 (IC) (v1295) **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	K1908068-007.01 doc	23.2457 ppm	1.6476 ppm	7.0900%	2019/09/17 01:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	24.4107	244.1072	174.49	178.06	3.57	50.23	10:30
2	TOC	22.0807	220.8070	158.67	162.37	3.70	50.22	10:26
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7905 (IC) (v1295)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
◊ 74	TOC	K1908068-007.01 ms doc	47.5734 ppm	0.0000 ppm	0.0000%	2019/09/17 01:35		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	47.5734	475.7341	331.72	335.36	3.65	50.22	10:29
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7905 (IC) (v1295)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
◊ 75	TOC	RB	0.9369 ppm	0.0000 ppm	0.0000%	2019/09/17 01:50		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9369	9.3688	15.15	18.78	3.63	50.25	10:33
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>	<u>Calibration</u>			
1:10		(TC) 8.7905 (IC) (v1295)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
◊ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.6967 ppm (PASS)	0.0000 ppm	0%	2019/09/17 02:04	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6967	236.9666	170.31	173.94	3.63	50.24	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 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◊ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm	0.0000 ppm	0%	2019/09/17 02:19

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.06	9.69	3.63	50.25	10:31
Completion State		Success Action		Method		Calibration		STD Conc - Pos D		
Success - Criteria met.		Do Nothing		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		0 ppmC		

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1294	2.0193	1.4690	0.0000	0.0000	0.0000	2019/09/12 13:47	Fusion1 (Fusion1)
v1295	1.3713	1.4290	0.0000	0.0000	0.0000	2019/09/14 19:31	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	ICSpargeRinseVolume	12.0 ml
UVReactorPrerinse	Off	BaselineStabilizeTime	0.70 min
UVReactorPrerinseVolume	5.0	DetectorPressureFlow	150 ml/min
NumberOfUVReactorPrerinses	1	SyringeSpeedWaste	10
ICSpargeTime	1.00 mins	SyringeSpeedAcid	7
DetectorSweepFlow	500 ml/min	SyringeSpeedReagent	7
PreSpargeTime	2.00 mins	SyringeSpeedDIWater	7
SystemFlow	500 ml/min	NDIRPressurization	60 psig
		SyringeSpeedSampleDispense	5
		SyringeSpeedSampleAspirate	4
		SyringeSpeedUVDispense	5
		SyringeSpeedUVAspirate	5
		SyringeSpeedICDispense	5
		SyringeSpeedICAspirate	5
		NDIRPressureStabilize	1.75 min
		SampleMixing	Off
		SampleMixingCycles	1
		SampleMixingVolume	10.0
		LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date
----------------	-----------	------------	--------	------

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/09/17 02:35

StarLIMS Run: 651372, 651373, 651374, 651375, 651376
 Analysis: DOC/TOC
 Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-79K 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-77J 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-80K

21 % H3PO4: 11-GEN-05-80L

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By: <i>BCD</i>	Date Analyzed: <i>9/19/19</i>
Reviewed By: <i>Henry</i>	Date Reviewed: <i>09/18/19</i>



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

October 04, 2019

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

Work Order: **HS19090804**

Laboratory Results for: **Longhorn GW Treatment Plant - GWTP Weekly Effluent**

Dear Marcia,

ALS Environmental received 2 sample(s) on Sep 18, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

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

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager



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

September 27, 2019

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

Work Order: **HS19090847**

Laboratory Results for: **Groundwater Treatment Plant Bi-Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Sep 18, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

ALS Houston, US

Date: 27-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
Work Order: HS19090847

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19090847-01	LH18/24-SP650_091719	Water		17-Sep-2019 14:00	18-Sep-2019 09:00	<input type="checkbox"/>
HS19090847-02	Trip Blank	Water		17-Sep-2019 00:00	18-Sep-2019 09:00	<input type="checkbox"/>

ALS Houston, US

Date: 27-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
Work Order: HS19090847

CASE NARRATIVE

GCMS Volatiles by Method SW8260**Batch ID: R347016****Sample ID: LH18/24-SP650_091719 (HS19090847-01MS)**

- MS/MSD recovered above upper control limits for 1,2,3-Trichloropropane

WetChemistry by Method SW9056**Batch ID: R346978**

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

ALS Houston, US

Date: 27-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Bi-Weekly Samples
 Sample ID: LH18/24-SP650_091719
 Collection Date: 17-Sep-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19090847
 Lab ID:HS19090847-01
 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	25-Sep-2019 13:25
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:25
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	25-Sep-2019 13:25
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:25
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:25
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	25-Sep-2019 13:25
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	25-Sep-2019 13:25
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	25-Sep-2019 13:25
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:25
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:25
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	25-Sep-2019 13:25
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:25
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	25-Sep-2019 13:25
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	25-Sep-2019 13:25
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	25-Sep-2019 13:25
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:25
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	25-Sep-2019 13:25
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	25-Sep-2019 13:25
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	25-Sep-2019 13:25
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	25-Sep-2019 13:25
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	25-Sep-2019 13:25
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:25
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	25-Sep-2019 13:25
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:25
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:25
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	25-Sep-2019 13:25
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	25-Sep-2019 13:25
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	25-Sep-2019 13:25
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	25-Sep-2019 13:25
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:25

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

ALS Houston, US

Date: 27-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Bi-Weekly Samples
 Sample ID: LH18/24-SP650_091719
 Collection Date: 17-Sep-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19090847
 Lab ID:HS19090847-01
 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	25-Sep-2019 13:25	
cis-1,2-Dichloroethene	2.1		0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	25-Sep-2019 13:25	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	25-Sep-2019 13:25	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	25-Sep-2019 13:25	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
Trichloroethene	1.0		0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:25	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>92.7</i>			0	<i>81-118</i>	%REC	1	25-Sep-2019 13:25	
<i>Surr: 4-Bromofluorobenzene</i>	<i>104</i>			0	<i>85-114</i>	%REC	1	25-Sep-2019 13:25	
<i>Surr: Dibromofluoromethane</i>	<i>95.7</i>			0	<i>80-119</i>	%REC	1	25-Sep-2019 13:25	
<i>Surr: Toluene-d8</i>	<i>101</i>			0	<i>89-112</i>	%REC	1	25-Sep-2019 13:25	
ANIONS BY SW9056A		Method:SW9056						Analyst: KMU	
Chloride	606		2.00	5.00	5.00	mg/L	10	26-Sep-2019 04:51	
Sulfate	214		2.00	5.00	5.00	mg/L	10	26-Sep-2019 04:51	

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

ALS Houston, US

Date: 27-Sep-19

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Bi-Weekly Samples
 Sample ID: Trip Blank
 Collection Date: 17-Sep-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19090847
 Lab ID:HS19090847-02
 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	25-Sep-2019 13:01
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:01
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	25-Sep-2019 13:01
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:01
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:01
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	25-Sep-2019 13:01
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	25-Sep-2019 13:01
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	25-Sep-2019 13:01
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:01
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:01
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	25-Sep-2019 13:01
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:01
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	25-Sep-2019 13:01
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	25-Sep-2019 13:01
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	25-Sep-2019 13:01
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:01
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	25-Sep-2019 13:01
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	25-Sep-2019 13:01
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	25-Sep-2019 13:01
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	25-Sep-2019 13:01
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	25-Sep-2019 13:01
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	25-Sep-2019 13:01
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:01

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

ALS Houston, US

Date: 27-Sep-19

Client: Bhat Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Bi-Weekly Samples
 Sample ID: Trip Blank
 Collection Date: 17-Sep-2019 00:00

ANALYTICAL REPORT
 WorkOrder:HS19090847
 Lab ID:HS19090847-02
 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	25-Sep-2019 13:01
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:01
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	25-Sep-2019 13:01
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	25-Sep-2019 13:01
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	25-Sep-2019 13:01
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	25-Sep-2019 13:01
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:01
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:01
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	25-Sep-2019 13:01
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	25-Sep-2019 13:01
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>91.2</i>			<i>0</i>	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>25-Sep-2019 13:01</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>103</i>			<i>0</i>	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>25-Sep-2019 13:01</i>
<i>Surr: Dibromofluoromethane</i>	<i>94.3</i>			<i>0</i>	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>25-Sep-2019 13:01</i>
<i>Surr: Toluene-d8</i>	<i>98.6</i>			<i>0</i>	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>25-Sep-2019 13:01</i>

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

ALS Houston, US

Date: 27-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090847

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R346978 (0)		Test Name : ANIONS BY SW9056A			Matrix: Water	
HS19090847-01	LH18/24-SP650_091719	17 Sep 2019 14:00			26 Sep 2019 04:51	10
Batch ID: R347016 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19090847-01	LH18/24-SP650_091719	17 Sep 2019 14:00			25 Sep 2019 13:25	1
HS19090847-02	Trip Blank	17 Sep 2019 00:00			25 Sep 2019 13:01	1

ALS Houston, US

Date: 27-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090847

QC BATCH REPORT

Batch ID: R347016 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-190925	Units: UG/L			Analysis Date: 25-Sep-2019 12:37					
Client ID:	Run ID: VOA6_347016	SeqNo: 5269438	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	44.75	1.0	50	0	89.5	81 - 118				
Surr: 4-Bromofluorobenzene	51.44	1.0	50	0	103	85 - 114				
Surr: Dibromofluoromethane	46.53	1.0	50	0	93.1	80 - 119				
Surr: Toluene-d8	50.44	1.0	50	0	101	89 - 112				

ALS Houston, US

Date: 27-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090847

QC BATCH REPORT

Batch ID: R347016 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-190925	Units: UG/L			Analysis Date: 25-Sep-2019 11:49					
Client ID:	Run ID: VOA6_347016	SeqNo: 5269437	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.65	1.0	20	0	93.2	78 - 124				
1,1,1-Trichloroethane	17.78	1.0	20	0	88.9	74 - 131				
1,1,2,2-Tetrachloroethane	19.94	1.0	20	0	99.7	71 - 121				
1,1,2-Trichloroethane	20.5	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	18.37	1.0	20	0	91.8	77 - 125				
1,1-Dichloroethene	18.3	1.0	20	0	91.5	71 - 131				
1,1-Dichloropropene	17.59	1.0	20	0	87.9	78 - 125				
1,2,3-Trichlorobenzene	17.78	1.0	20	0	88.9	69 - 129				
1,2,3-Trichloropropane	19.96	1.0	20	0	99.8	73 - 122				
1,2,4-Trichlorobenzene	17.88	1.0	20	0	89.4	69 - 130				
1,2,4-Trimethylbenzene	18.16	1.0	20	0	90.8	76 - 124				
1,2-Dibromo-3-chloropropane	18.96	1.0	20	0	94.8	62 - 128				
1,2-Dibromoethane	19.21	1.0	20	0	96.1	77 - 121				
1,2-Dichlorobenzene	19.48	1.0	20	0	97.4	80 - 119				
1,2-Dichloroethane	19.2	1.0	20	0	96.0	73 - 128				
1,2-Dichloropropane	19.25	1.0	20	0	96.3	78 - 122				
1,3,5-Trimethylbenzene	17.48	1.0	20	0	87.4	75 - 124				
1,3-Dichlorobenzene	18.86	1.0	20	0	94.3	80 - 119				
1,3-Dichloropropane	19.33	1.0	20	0	96.6	80 - 119				
1,4-Dichlorobenzene	18.77	1.0	20	0	93.8	79 - 118				
2,2-Dichloropropane	19.18	1.0	20	0	95.9	60 - 139				
2-Butanone	40.51	2.0	40	0	101	56 - 143				
2-Chlorotoluene	18.14	1.0	20	0	90.7	79 - 122				
2-Hexanone	40.11	2.0	40	0	100	57 - 139				
4-Chlorotoluene	18.48	1.0	20	0	92.4	78 - 122				
4-Isopropyltoluene	16.65	1.0	20	0	83.3	77 - 127				
4-Methyl-2-pentanone	38.72	2.0	40	0	96.8	67 - 130				
Acetone	44.13	2.0	40	0	110	39 - 160				
Benzene	18.59	1.0	20	0	92.9	79 - 120				
Bromobenzene	18.18	1.0	20	0	90.9	80 - 120				
Bromochloromethane	19.27	1.0	20	0	96.4	78 - 123				
Bromodichloromethane	19.34	1.0	20	0	96.7	79 - 125				
Bromoform	19.86	1.0	20	0	99.3	66 - 130				
Bromomethane	19.43	1.0	20	0	97.2	53 - 141				

ALS Houston, US

Date: 27-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090847

QC BATCH REPORT

Batch ID: R347016 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-190925	Units: UG/L			Analysis Date: 25-Sep-2019 11:49					
Client ID:	Run ID: VOA6_347016	SeqNo: 5269437	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	36.33	2.0	40	0	90.8	64 - 133				
Carbon tetrachloride	16.89	1.0	20	0	84.5	72 - 136				
Chlorobenzene	19.7	1.0	20	0	98.5	82 - 118				
Chloroethane	21.49	1.0	20	0	107	60 - 138				
Chloroform	18.51	1.0	20	0	92.5	79 - 124				
Chloromethane	20.19	1.0	20	0	101	50 - 139				
cis-1,2-Dichloroethene	18.83	1.0	20	0	94.1	78 - 123				
cis-1,3-Dichloropropene	19.6	1.0	20	0	98.0	75 - 124				
Dibromochloromethane	19.23	1.0	20	0	96.1	74 - 126				
Dibromomethane	19.32	1.0	20	0	96.6	79 - 123				
Dichlorodifluoromethane	18.12	1.0	20	0	90.6	32 - 152				
Ethylbenzene	18.85	1.0	20	0	94.3	79 - 121				
Hexachlorobutadiene	16.12	1.0	20	0	80.6	66 - 134				
Isopropylbenzene	17.93	1.0	20	0	89.7	72 - 131				
m,p-Xylene	37.84	2.0	40	0	94.6	80 - 121				
Methylene chloride	20.03	2.0	20	0	100	74 - 124				
Naphthalene	18.47	1.0	20	0	92.4	61 - 128				
n-Butylbenzene	16.43	1.0	20	0	82.2	75 - 128				
n-Propylbenzene	17.14	1.0	20	0	85.7	76 - 126				
o-Xylene	19.44	1.0	20	0	97.2	78 - 122				
sec-Butylbenzene	16.27	1.0	20	0	81.4	77 - 126				
Styrene	18.85	1.0	20	0	94.3	78 - 123				
tert-Butylbenzene	16.92	1.0	20	0	84.6	78 - 124				
Tetrachloroethene	16.9	1.0	20	0	84.5	74 - 129				
Toluene	19.76	1.0	20	0	98.8	80 - 121				
trans-1,2-Dichloroethene	18.77	1.0	20	0	93.8	75 - 124				
trans-1,3-Dichloropropene	19.48	1.0	20	0	97.4	73 - 127				
Trichloroethene	17.97	1.0	20	0	89.9	79 - 123				
Trichlorofluoromethane	17.49	1.0	20	0	87.5	65 - 141				
Vinyl chloride	17.8	1.0	20	0	89.0	58 - 137				
Surr: 1,2-Dichloroethane-d4	51.58	1.0	50	0	103	81 - 118				
Surr: 4-Bromofluorobenzene	53.54	1.0	50	0	107	85 - 114				
Surr: Dibromofluoromethane	52.18	1.0	50	0	104	80 - 119				
Surr: Toluene-d8	47.71	1.0	50	0	95.4	89 - 112				

ALS Houston, US

Date: 27-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090847

QC BATCH REPORT

Batch ID: R347016 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS		Sample ID: HS19090847-01MS		Units: UG/L		Analysis Date: 25-Sep-2019 15:26				
Client ID: LH18/24-SP650_091719		Run ID: VOA6_347016		SeqNo: 5269445		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,1,1,2-Tetrachloroethane	18.65	1.0	20	0	93.2	78 - 124				
1,1,1-Trichloroethane	17.37	1.0	20	0	86.8	74 - 131				
1,1,2,2-Tetrachloroethane	20.3	1.0	20	0	101	71 - 121				
1,1,2-Trichloroethane	19.48	1.0	20	0	97.4	80 - 119				
1,1-Dichloroethane	16.83	1.0	20	0	84.2	77 - 125				
1,1-Dichloroethene	17.22	1.0	20	0	86.1	71 - 131				
1,1-Dichloropropene	18.43	1.0	20	0	92.1	78 - 125				
1,2,3-Trichlorobenzene	20.63	1.0	20	0	103	69 - 129				
1,2,3-Trichloropropane	30.95	1.0	20	0	155	73 - 122			S	
1,2,4-Trichlorobenzene	20.85	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	20.98	1.0	20	0	105	76 - 124				
1,2-Dibromo-3-chloropropane	18.83	1.0	20	0	94.2	62 - 128				
1,2-Dibromoethane	18.31	1.0	20	0	91.5	77 - 121				
1,2-Dichlorobenzene	20.67	1.0	20	0	103	80 - 119				
1,2-Dichloroethane	17.76	1.0	20	0	88.8	73 - 128				
1,2-Dichloropropane	17.87	1.0	20	0	89.4	78 - 122				
1,3,5-Trimethylbenzene	21.31	1.0	20	0	107	75 - 124				
1,3-Dichlorobenzene	20.7	1.0	20	0	103	80 - 119				
1,3-Dichloropropane	18.26	1.0	20	0	91.3	80 - 119				
1,4-Dichlorobenzene	20.47	1.0	20	0	102	79 - 118				
2,2-Dichloropropane	18.05	1.0	20	0	90.3	60 - 139				
2-Butanone	33.26	2.0	40	0	83.1	56 - 143				
2-Chlorotoluene	20.8	1.0	20	0	104	79 - 122				
2-Hexanone	36.3	2.0	40	0	90.7	57 - 139				
4-Chlorotoluene	21.08	1.0	20	0	105	78 - 122				
4-Isopropyltoluene	21.57	1.0	20	0	108	77 - 127				
4-Methyl-2-pentanone	36.97	2.0	40	0	92.4	67 - 130				
Acetone	31.68	2.0	40	0	79.2	39 - 160				
Benzene	17.84	1.0	20	0	89.2	79 - 120				
Bromobenzene	19.17	1.0	20	0	95.8	80 - 120				
Bromochloromethane	17.35	1.0	20	0	86.8	78 - 123				
Bromodichloromethane	17.69	1.0	20	0	88.5	79 - 125				
Bromoform	18.83	1.0	20	0	94.1	66 - 130				
Bromomethane	15.92	1.0	20	0	79.6	53 - 141				

ALS Houston, US

Date: 27-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090847

QC BATCH REPORT

Batch ID: R347016 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS		Sample ID: HS19090847-01MS		Units: UG/L		Analysis Date: 25-Sep-2019 15:26				
Client ID: LH18/24-SP650_091719		Run ID: VOA6_347016		SeqNo: 5269445		PrepDate:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Carbon disulfide	32.8	2.0	40	0	82.0	64 - 133				
Carbon tetrachloride	18.37	1.0	20	0	91.9	72 - 136				
Chlorobenzene	19.89	1.0	20	0	99.5	82 - 118				
Chloroethane	16.52	1.0	20	0	82.6	60 - 138				
Chloroform	16.99	1.0	20	0	85.0	79 - 124				
Chloromethane	14.22	1.0	20	0	71.1	50 - 139				
cis-1,2-Dichloroethene	19.9	1.0	20	2.121	88.9	78 - 123				
cis-1,3-Dichloropropene	17.88	1.0	20	0	89.4	75 - 124				
Dibromochloromethane	18.4	1.0	20	0	92.0	74 - 126				
Dibromomethane	17.4	1.0	20	0	87.0	79 - 123				
Dichlorodifluoromethane	9.257	1.0	20	0	46.3	32 - 152				
Ethylbenzene	20.36	1.0	20	0	102	79 - 121				
Hexachlorobutadiene	22.02	1.0	20	0	110	66 - 134				
Isopropylbenzene	21.01	1.0	20	0	105	72 - 131				
m,p-Xylene	41.07	2.0	40	0	103	80 - 121				
Methylene chloride	16.8	2.0	20	0	84.0	74 - 124				
Naphthalene	20	1.0	20	0	100.0	61 - 128				
n-Butylbenzene	22.13	1.0	20	0	111	75 - 128				
n-Propylbenzene	21.14	1.0	20	0	106	76 - 126				
o-Xylene	20.6	1.0	20	0	103	78 - 122				
sec-Butylbenzene	21.79	1.0	20	0	109	77 - 126				
Styrene	18.65	1.0	20	0	93.2	78 - 123				
tert-Butylbenzene	21.74	1.0	20	0	109	78 - 124				
Tetrachloroethene	19.45	1.0	20	0	97.2	74 - 129				
Toluene	20.08	1.0	20	0	100	80 - 121				
trans-1,2-Dichloroethene	17.19	1.0	20	0	85.9	75 - 124				
trans-1,3-Dichloropropene	17.74	1.0	20	0	88.7	73 - 127				
Trichloroethene	19.82	1.0	20	1.026	94.0	79 - 123				
Trichlorofluoromethane	16.7	1.0	20	0	83.5	65 - 141				
Vinyl chloride	14.35	1.0	20	0	71.7	58 - 137				
Surr: 1,2-Dichloroethane-d4	45.47	1.0	50	0	90.9	81 - 118				
Surr: 4-Bromofluorobenzene	50.55	1.0	50	0	101	85 - 114				
Surr: Dibromofluoromethane	46.94	1.0	50	0	93.9	80 - 119				
Surr: Toluene-d8	49.26	1.0	50	0	98.5	89 - 112				

ALS Houston, US

Date: 27-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090847

QC BATCH REPORT

Batch ID: R347016 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19090847-01MSD	Units: UG/L			Analysis Date: 25-Sep-2019 15:50					
Client ID: LH18/24-SP650_091719	Run ID: VOA6_347016	SeqNo: 5269446	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.63	1.0	20	0	88.1	78 - 124	18.65	5.62	20	
1,1,1-Trichloroethane	16.53	1.0	20	0	82.7	74 - 131	17.37	4.95	20	
1,1,2,2-Tetrachloroethane	18.78	1.0	20	0	93.9	71 - 121	20.3	7.78	20	
1,1,2-Trichloroethane	18.64	1.0	20	0	93.2	80 - 119	19.48	4.39	20	
1,1-Dichloroethane	15.8	1.0	20	0	79.0	77 - 125	16.83	6.35	20	
1,1-Dichloroethene	15.96	1.0	20	0	79.8	71 - 131	17.22	7.58	20	
1,1-Dichloropropene	17.38	1.0	20	0	86.9	78 - 125	18.43	5.86	20	
1,2,3-Trichlorobenzene	19.36	1.0	20	0	96.8	69 - 129	20.63	6.35	20	
1,2,3-Trichloropropane	28.37	1.0	20	0	142	73 - 122	30.95	8.7	20	S
1,2,4-Trichlorobenzene	19.02	1.0	20	0	95.1	69 - 130	20.85	9.19	20	
1,2,4-Trimethylbenzene	18.85	1.0	20	0	94.2	76 - 124	20.98	10.7	20	
1,2-Dibromo-3-chloropropane	18.06	1.0	20	0	90.3	62 - 128	18.83	4.17	20	
1,2-Dibromoethane	17.58	1.0	20	0	87.9	77 - 121	18.31	4.07	20	
1,2-Dichlorobenzene	18.65	1.0	20	0	93.3	80 - 119	20.67	10.3	20	
1,2-Dichloroethane	17.06	1.0	20	0	85.3	73 - 128	17.76	4.01	20	
1,2-Dichloropropane	17.33	1.0	20	0	86.7	78 - 122	17.87	3.06	20	
1,3,5-Trimethylbenzene	18.88	1.0	20	0	94.4	75 - 124	21.31	12.1	20	
1,3-Dichlorobenzene	18.62	1.0	20	0	93.1	80 - 119	20.7	10.6	20	
1,3-Dichloropropane	17.58	1.0	20	0	87.9	80 - 119	18.26	3.81	20	
1,4-Dichlorobenzene	18.23	1.0	20	0	91.1	79 - 118	20.47	11.6	20	
2,2-Dichloropropane	17.1	1.0	20	0	85.5	60 - 139	18.05	5.4	20	
2-Butanone	33.22	2.0	40	0	83.0	56 - 143	33.26	0.121	20	
2-Chlorotoluene	18.67	1.0	20	0	93.3	79 - 122	20.8	10.8	20	
2-Hexanone	36.68	2.0	40	0	91.7	57 - 139	36.3	1.06	20	
4-Chlorotoluene	18.75	1.0	20	0	93.7	78 - 122	21.08	11.7	20	
4-Isopropyltoluene	18.93	1.0	20	0	94.6	77 - 127	21.57	13.1	20	
4-Methyl-2-pentanone	36.08	2.0	40	0	90.2	67 - 130	36.97	2.46	20	
Acetone	31.85	2.0	40	0	79.6	39 - 160	31.68	0.518	20	
Benzene	16.76	1.0	20	0	83.8	79 - 120	17.84	6.25	20	
Bromobenzene	17.4	1.0	20	0	87.0	80 - 120	19.17	9.66	20	
Bromochloromethane	16.6	1.0	20	0	83.0	78 - 123	17.35	4.42	20	
Bromodichloromethane	16.89	1.0	20	0	84.5	79 - 125	17.69	4.63	20	
Bromoform	18.29	1.0	20	0	91.5	66 - 130	18.83	2.89	20	
Bromomethane	14.12	1.0	20	0	70.6	53 - 141	15.92	12	20	

ALS Houston, US

Date: 27-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090847

QC BATCH REPORT

Batch ID: R347016 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19090847-01MSD	Units: UG/L			Analysis Date: 25-Sep-2019 15:50					
Client ID: LH18/24-SP650_091719	Run ID: VOA6_347016	SeqNo: 5269446	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	30.32	2.0	40	0	75.8	64 - 133	32.8	7.86	20	
Carbon tetrachloride	17.25	1.0	20	0	86.3	72 - 136	18.37	6.28	20	
Chlorobenzene	18.46	1.0	20	0	92.3	82 - 118	19.89	7.47	20	
Chloroethane	16.1	1.0	20	0	80.5	60 - 138	16.52	2.57	20	
Chloroform	16.09	1.0	20	0	80.5	79 - 124	16.99	5.44	20	
Chloromethane	13.93	1.0	20	0	69.6	50 - 139	14.22	2.03	20	
cis-1,2-Dichloroethene	18.34	1.0	20	2.121	81.1	78 - 123	19.9	8.14	20	
cis-1,3-Dichloropropene	17.03	1.0	20	0	85.2	75 - 124	17.88	4.88	20	
Dibromochloromethane	17.68	1.0	20	0	88.4	74 - 126	18.4	4.02	20	
Dibromomethane	16.7	1.0	20	0	83.5	79 - 123	17.4	4.08	20	
Dichlorodifluoromethane	8.574	1.0	20	0	42.9	32 - 152	9.257	7.67	20	
Ethylbenzene	19.28	1.0	20	0	96.4	79 - 121	20.36	5.46	20	
Hexachlorobutadiene	18.92	1.0	20	0	94.6	66 - 134	22.02	15.2	20	
Isopropylbenzene	19.55	1.0	20	0	97.7	72 - 131	21.01	7.23	20	
m,p-Xylene	37.76	2.0	40	0	94.4	80 - 121	41.07	8.41	20	
Methylene chloride	16.12	2.0	20	0	80.6	74 - 124	16.8	4.15	20	
Naphthalene	19.1	1.0	20	0	95.5	61 - 128	20	4.58	20	
n-Butylbenzene	19.13	1.0	20	0	95.6	75 - 128	22.13	14.6	20	
n-Propylbenzene	18.79	1.0	20	0	94.0	76 - 126	21.14	11.7	20	
o-Xylene	19.08	1.0	20	0	95.4	78 - 122	20.6	7.62	20	
sec-Butylbenzene	19.3	1.0	20	0	96.5	77 - 126	21.79	12.1	20	
Styrene	17.43	1.0	20	0	87.2	78 - 123	18.65	6.74	20	
tert-Butylbenzene	19.15	1.0	20	0	95.8	78 - 124	21.74	12.7	20	
Tetrachloroethene	17.96	1.0	20	0	89.8	74 - 129	19.45	7.96	20	
Toluene	18.82	1.0	20	0	94.1	80 - 121	20.08	6.46	20	
trans-1,2-Dichloroethene	16.31	1.0	20	0	81.5	75 - 124	17.19	5.23	20	
trans-1,3-Dichloropropene	17.05	1.0	20	0	85.3	73 - 127	17.74	3.92	20	
Trichloroethene	18.29	1.0	20	1.026	86.3	79 - 123	19.82	8.06	20	
Trichlorofluoromethane	15.48	1.0	20	0	77.4	65 - 141	16.7	7.59	20	
Vinyl chloride	13.44	1.0	20	0	67.2	58 - 137	14.35	6.54	20	
Surr: 1,2-Dichloroethane-d4	45.03	1.0	50	0	90.1	81 - 118	45.47	0.978	20	
Surr: 4-Bromofluorobenzene	52.22	1.0	50	0	104	85 - 114	50.55	3.25	20	
Surr: Dibromofluoromethane	47.19	1.0	50	0	94.4	80 - 119	46.94	0.529	20	
Surr: Toluene-d8	48.77	1.0	50	0	97.5	89 - 112	49.26	1	20	

ALS Houston, US

Date: 27-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090847

QC BATCH REPORT**Batch ID:** R347016 (0)**Instrument:** VOA6**Method:** VOLATILES ORGANICS BY METHOD
8260C

The following samples were analyzed in this batch: HS19090847-01 HS19090847-02

ALS Houston, US

Date: 27-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090847

QC BATCH REPORT

Batch ID: R346978 (0)		Instrument: ICS-Integrion		Method: ANIONS BY SW9056A						
MBLK	Sample ID: WBLKW2-092519	Units: mg/L			Analysis Date: 26-Sep-2019 00:25					
Client ID:	Run ID: ICS-Integrion_346978	SeqNo: 5268869		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	0.500	0.500							U	
Sulfate	0.500	0.500							U	
LCS	Sample ID: WLCSW2-092519	Units: mg/L			Analysis Date: 26-Sep-2019 00:42					
Client ID:	Run ID: ICS-Integrion_346978	SeqNo: 5268870		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	19.87	0.500	20	0	99.3	80 - 120				
Sulfate	20.25	0.500	20	0	101	80 - 120				
LCSD	Sample ID: WLCSDW2-092519	Units: mg/L			Analysis Date: 26-Sep-2019 00:58					
Client ID:	Run ID: ICS-Integrion_346978	SeqNo: 5268871		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	19.76	0.500	20	0	98.8	80 - 120	19.87	0.565	20	
Sulfate	20.08	0.500	20	0	100	80 - 120	20.25	0.834	20	
MS	Sample ID: HS19090511-02MS	Units: mg/L			Analysis Date: 26-Sep-2019 01:48					
Client ID:	Run ID: ICS-Integrion_346978	SeqNo: 5268874		PrepDate:			DF: 20			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	1085	10.0	200	901.8	91.5	80 - 120			O	
Sulfate	1377	10.0	200	1197	90.1	80 - 120			O	
MSD	Sample ID: HS19090511-02MSD	Units: mg/L			Analysis Date: 26-Sep-2019 02:05					
Client ID:	Run ID: ICS-Integrion_346978	SeqNo: 5268875		PrepDate:			DF: 20			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	1078	10.0	200	901.8	88.0	80 - 120	1085	0.649	20 O	
Sulfate	1365	10.0	200	1197	84.3	80 - 120	1377	0.841	20 O	

The following samples were analyzed in this batch:

ALS Houston, US

Date: 27-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
WorkOrder: HS19090847

**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	2019-141	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US

Date: 27-Sep-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Bi-Weekly Samples
Work Order: HS19090847

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19090847-01	LH18/24-SP650_091719	Login	9/18/2019 5:51:53 PM	AC	WET389
HS19090847-01	LH18/24-SP650_091719	Login	9/18/2019 5:51:53 PM	AC	VOA053
HS19090847-02	Trip Blank	Login	9/18/2019 5:51:53 PM	AC	VOA053

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19090847

Date/Time Received: **18-Sep-2019 09:00**
 Received by: **AC**

Checklist completed by: Asad Chaudhry 18-Sep-2019
 eSignature Date

Reviewed by: RJ Modashia 18-Sep-2019
 eSignature Date

Matrices: **GW, Water**

Carrier name: **FedEx Priority Overnight**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes No Not Present
- Chain of custody present? Yes No 1 Page(s)
- Chain of custody signed when relinquished and received? Yes No COC IDs:N/A
- Samplers name present on COC? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s): 2.0c C/UC IR 25
 Cooler(s)/Kit(s): 43470
 Date/Time sample(s) sent to storage: 09/18/2019 18:00

- 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:



1608 13th Avenue South, Suite 300
 Birmingham Alabama 35205
 Tel: 205-918-4000
 Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: _____


Facility/Base I.D.: LHAAP Sample Analysis Requested ⁽¹⁾ Quality Assurance Samples ⁽²⁾

Project/Site Name: LHAAP / GWTP Bi-weekly Effluent
 Client Name: _____
 Collected by: Scott Beisinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (3)	Sample Number (4)	Sample Matrix (4)	Number of containers	VOC		CHLORIDE		SULFATE		Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
<u>LHA24-SPLSD-091719</u>		<u>17 Sep 2019</u>	<u>1400</u>	<u>-</u>	<u>N</u>	<u>WG</u>	<u>4</u>	<u>4</u>	<u>X</u>	<u>X</u>								
<u>Trip Blank</u>		<u>17 Sep 2019</u>		<u>-</u>	<u>TB</u>	<u>W</u>	<u>2</u>	<u>2</u>	<u>X</u>									

HS1909847

Bhate Environmental Associates, Inc.
 Groundwater Treatment Plant Bi-Weekly Samples




COMMENTS: STANDARDIZED TRFT

Custody Transfers Prior to Receipt by Laboratory		Sample Delivery Details / Laboratory Receipt	
Relinquished By (Signed): <u>Scott Beisinger</u>	Date: <u>9/17/19</u> Time: <u>1430</u>	Received by (signed): <u>AC</u>	Date: <u>9/18/19</u> Time: <u>09:00</u>
Delivered Directly to Lab: _____ Shipped: _____ No: _____		Method of Shipment: _____	
Fed: _____ Ek: _____ Airbill: _____ Number: _____		Analytical Lab: <u>ALS 10450 Stancliff Rd, Suite 210 Houston, TX 77099 (281) 530-8656</u>	
Lab Recipient: <u>ATTN: SONIA WEST</u>		Delivery Date/Time: _____	

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)
 2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)
 3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)
 4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks
 5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.
 6.) Quality assurance samples are assigned by date (ddmmvy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

TEMP DL
2.0
1A X 25
CIFJ
43470

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5866 Fax. +1 281 530 5887	CUSTODY SEAL		Seal Broken By: GM
	Date: 9/17/19	Time: 1430	Date: 09/18/19
	Name: Scott Beesinger		
	Company: SEGRA		

43470

Must Deliver Next Business Day
Time and Temperature Sensitive!



43470

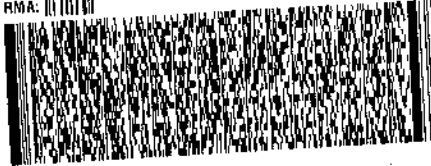
ORIGIN ID: SGRA (903) 930-6193
 SCOTT BEESINGER
 BHATE ENVIRONMENTAL ASSOCIATES
 1203-B EAST GRAND AVE. PH8202
 MARSHALL, TX 75670
 UNITED STATES US

SHIP DATE: 04SEP19
 ACTWGT: 1.00 LB HAN
 QAD: 300159/CAF3211
 DIRS: 25x14x14 IN

TO CLIENT SERVICES
 ALS LABORATORY GROUP
 10450 STANCLIFF ROAD
 SUITE 210
 HOUSTON TX 77099

(281) 530-6868
 REF: WEST PLUME - BO 67405 - CG

RMA: 111111



FedEx Express



FedEx
 TRK# 4809 7837 5338
 (0221)

WED - 18 SEP 10:30A
 PRIORITY OVERNIGHT

AB SGRA

77099

TX-US IAH



ALS Houston, US

Date: 04-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
Work Order: HS19090804

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19090804-01	LH18/24-SP650_091719	Groundwater		17-Sep-2019 14:00	18-Sep-2019 09:00	<input type="checkbox"/>
HS19090804-02	LH18/24-SP650_091719_AIX	Groundwater		17-Sep-2019 14:00	18-Sep-2019 09:00	<input type="checkbox"/>

ALS Houston, US

Date: 04-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
Work Order: HS19090804

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: R346676

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

WetChemistry by Method E365.3

Batch ID: R346655

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

ALS Houston, US

Date: 04-Oct-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
 Sample ID: LH18/24-SP650_091719
 Collection Date: 17-Sep-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19090804
 Lab ID:HS19090804-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)								Analyst: RG
Nitrogen, Ammonia (As N)	6.1		0.20	0.20	0.20	mg/L	1	20-Sep-2019 15:30
ORTHO PHOSPHATE (PO4) AS P BY E365.3								Analyst: KVL
Phosphorus, Total Orthophosphate (As P)	1.90		0.100	0.250	0.250	mg/L	10	18-Sep-2019 14:50
SUBCONTRACT ANALYSIS - TOC ANALYSIS								Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 11:55

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

ALS Houston, US

Date: 04-Oct-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
 Sample ID: LH18/24-SP650_091719_AIX
 Collection Date: 17-Sep-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19090804
 Lab ID:HS19090804-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA		Analyst: SUB				
Subcontract Analysis	See Attached		0	0		NA	1	02-Oct-2019 16:54

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

ALS Houston, US

Date: 04-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: HS19090804

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R346655 (0)		Test Name : ORTHO PHOSPHATE (PO4) AS P BY E365.3			Matrix: Groundwater	
HS19090804-01	LH18/24-SP650_091719	17 Sep 2019 14:00			18 Sep 2019 14:50	10
Batch ID: R346676 (0)		Test Name : AMMONIA AS N BY E350.3(ISE)			Matrix: Groundwater	
HS19090804-01	LH18/24-SP650_091719	17 Sep 2019 14:00			20 Sep 2019 15:30	1
Batch ID: R347481 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Groundwater	
HS19090804-02	LH18/24-SP650_091719_AIX	17 Sep 2019 14:00			02 Oct 2019 16:54	1
Batch ID: R347625 (0)		Test Name : SUBCONTRACT ANALYSIS - TOC ANALYSIS			Matrix: Groundwater	
HS19090804-01	LH18/24-SP650_091719	17 Sep 2019 14:00			04 Oct 2019 11:55	1

ALS Houston, US

Date: 04-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: HS19090804

QC BATCH REPORT

Batch ID:	R346655 (0)	Instrument:	UV-2450	Method:	ORTHO PHOSPHATE (PO4) AS P BY E365.3					
MBLK	Sample ID: MBLK-R346655	Units: mg/L		Analysis Date: 18-Sep-2019 14:50						
Client ID:	Run ID: UV-2450_346655	SeqNo: 5261693		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-R346655	Units: mg/L		Analysis Date: 18-Sep-2019 14:50						
Client ID:	Run ID: UV-2450_346655	SeqNo: 5261692		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)	0.245	0.0250	0.25	0	98.0	85 - 115				
MS	Sample ID: HS19090804-01MS	Units: mg/L		Analysis Date: 18-Sep-2019 14:50						
Client ID: LH18/24-SP650_091719	Run ID: UV-2450_346655	SeqNo: 5261695		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)	4.37	0.250	2.5	1.9	98.8	80 - 120				
MSD	Sample ID: HS19090804-01MSD	Units: mg/L		Analysis Date: 18-Sep-2019 14:50						
Client ID: LH18/24-SP650_091719	Run ID: UV-2450_346655	SeqNo: 5261694		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)	4.39	0.250	2.5	1.9	99.6	80 - 120	4.37	0.457	20	

The following samples were analyzed in this batch:

ALS Houston, US

Date: 04-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: HS19090804

QC BATCH REPORT

Batch ID: R346676 (0)		Instrument: WetChem_HS		Method: AMMONIA AS N BY E350.3(ISE)					
MBLK	Sample ID: MBLK-R346676	Units: mg/L		Analysis Date: 20-Sep-2019 15:30					
Client ID:	Run ID: WetChem_HS_346676	SeqNo: 5262154		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)	0.20	0.20						U	
LCS	Sample ID: LCS-R346676	Units: mg/L		Analysis Date: 20-Sep-2019 15:30					
Client ID:	Run ID: WetChem_HS_346676	SeqNo: 5262153		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)	10.15	0.20	10	0	102	80 - 120			
MS	Sample ID: HS19090747-01MS	Units: mg/L		Analysis Date: 20-Sep-2019 15:30					
Client ID:	Run ID: WetChem_HS_346676	SeqNo: 5262156		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)	10.51	0.20	10	0.435	101	80 - 120			
MSD	Sample ID: HS19090747-01MSD	Units: mg/L		Analysis Date: 20-Sep-2019 15:30					
Client ID:	Run ID: WetChem_HS_346676	SeqNo: 5262155		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)	10.42	0.20	10	0.435	99.8	80 - 120	10.51	0.917 20	

The following samples were analyzed in this batch: HS19090804-01

ALS Houston, US

Date: 04-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: **HS19090804**

**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	2019-141	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US

Date: 04-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
Work Order: HS19090804

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19090804-01	LH18/24-SP650_091719	Login	9/18/2019 10:33:35 AM	AC	WET102
HS19090804-01	LH18/24-SP650_091719	Login	9/18/2019 10:33:35 AM	AC	WET102
HS19090804-01	LH18/24-SP650_091719	Login	9/18/2019 10:33:35 AM	AC	Sub
HS19090804-02	LH18/24-SP650_091719_AIX	Login	9/18/2019 10:33:35 AM	AC	Sub

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19090804

Date/Time Received: **18-Sep-2019 09:00**
 Received by: **AC**

Checklist completed by: Asad Chaudhry 18-Sep-2019
 eSignature Date

Reviewed by: RJ Modashia 18-Sep-2019
 eSignature Date

Matrices: **GW**

Carrier name: **FedEx Priority Overnight**

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on shipping container/cooler? Yes No Not Present
- Custody seals intact on sample bottles? Yes No Not Present
- VOA/TX1005/TX1006 Solids in hermetically sealed vials? Yes No Not Present
- Chain of custody present? Yes No 1 Page(s)
- Chain of custody signed when relinquished and received? Yes No COC IDs:N/A
- Samplers name present on COC? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s):

2.0c C/UC	IR 25
-----------	-------

Cooler(s)/Kit(s):

43470

Date/Time sample(s) sent to storage:

09/18/2019 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:

--



1608 13th Avenue South, Suite 300
 Birmingham Alabama 35205
 Tel: 205-918-4000
 Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____
 Project/Phase No: NWO1312.0150

HS19090804

Bhate Environmental Associates, Inc.
 Longhorn GW Treatment Plant - GWTP Weekly Efflu



Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / GWTP WEEKLY EFFLUENT

Client Name:

Collected by: Scott Beesing

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (1)	Sample Number (4)	Sample Matrix (1)	Number of Containers	TOC	Ammonia-N	ORTHOPHOSPHATE	PERCHLORATE
<u>LHAAP-SPL650-091719</u>		<u>07 Sep 2019</u>	<u>1400</u>		<u>N</u>		<u>WG</u>	<u>4</u>	<u>X</u>	<u>X</u>	<u>X</u>	
<u>LHAAP-SPL650-091719-A-EX</u>		<u>17 Sep 2019</u>	<u>1400</u>		<u>N</u>		<u>WG</u>	<u>1</u>			<u>X</u>	


Sample Analysis Requested (6)	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID

COMMENTS: STANDARD TAT

Relinquished By (Signed) <u>Scott Beesing</u> Date <u>9/17/19</u> Time <u>1430</u>		Received by (Signed) <u>AC</u> Date <u>9/18/19</u> Time <u>09.20</u>		Sample Delivery Details / Laboratory Receipt Delivered Directly to Lab: _____ Shipped _____ No.: _____ Method of Shipment: _____ Fed _____ Ex _____ Airbill _____ Number: _____ Analytical Lab: <u>ALS 10450 Stancliff Rd, Suite 210 Houston, TX 77099 (281) 530-5656</u> ATTN: <u>SONIA WEST</u> Lab Recipient: _____ Delivery Date/Time: _____	
--	--	--	--	---	--

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)
 2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)
 3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)
 4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks
 5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.
 6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

13 of 190 43470 TEMP USE 2.0
10/25

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5867	CUSTODY SEAL		Seal Broken By: <i>GM</i>
	Date: <i>9/17/19</i>	Time: <i>1430</i>	Date:
	Name: <i>Scott Beesiner</i>	Company: <i>SGRA</i>	Date: <i>09/18/19</i>

43470



Must Deliver Next Business Day
Time and Temperature Sensitive!

43470

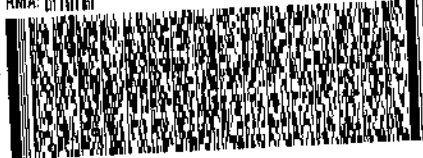
ORIGIN ID:SGRA (803) 930-6193
 SCOTT BEESINER
 BHATE ENVIRONMENTAL ASSOCIATES
 1203-B EAST GRAND AVE. PMB202
 MARSHALL, TX 75670
 UNITED STATES US

SHIP DATE: 04SEP19
 ACTWT: 1.00 LB MAN
 CAD: 300130/DAFE9211
 DIMS: 26x14x14 IN

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099

(281) 530-5666
 REF: WEST PLUME - BO 67405 - CG

RMA: 01191161



FedEx
 TRK# 4809 7837 5338
 0221

WED - 18 SEP 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

October 01, 2019

Analytical Report for Service Request No: K1908707

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

RE: ALS Houston DOD TOC / HS19090804

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory September 19, 2019. For your reference, these analyses have been assigned our service request number **K1908707**.

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)636-1 068
www.alsglobal.com



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

Service Request: K1908707
Date Received: 09/19/2019

CASE NARRATIVE

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

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 09/19/2019. 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 Dovejoy

Date 10/01/2019



Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

K1908707



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: 12184

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:

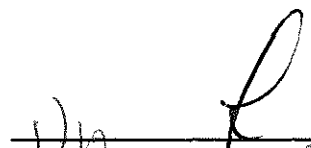
INVOICE INFORMATION:

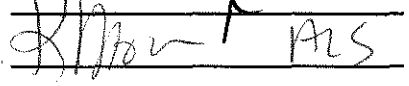
Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19090804
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19090804-01	LH18/24-SP650_091719	Groundwater	17 Sep 2019 14:00
TOC Analysis for DOD Level IV			02 Oct 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: 

Received By:  ALS

Cooler ID(s): _____

Date/Time: 9/18/19 1800

Date/Time: 9/19/19 0930

Temperature(s): _____



PC KL

Cooler Receipt and Preservation Form

Client ALS Houston Service Request K19 08707
 Received: 9/19/19 Opened: 9/19/19 By: [Signature] Unloaded: 9/19/19 By: [Signature]

- Samples were received via? USPS **Fed Ex** UPS DHL PDX Courier Hand Delivered
- Samples were received in: (circle) **Cooler** Box Envelope Other NA
- 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
<u>-0.3</u>	<u>-0.1</u>	<u>0.7</u>	<u>0.9</u>	<u>10.2</u>	<u>396</u>	<u>12184</u>	<u>125102896353</u>		

- Packing material: Inserts **Baggies** Bubble Wrap Gel Packs **Wet Ice** Dry Ice Sleeves
- Were custody papers properly filled out (ink, signed, etc.)? NA Y N
- 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
- Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
- Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
- Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
- Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
- Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
- Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____



General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

Analytical Report

Client: ALS Environmental - US
Project: ALS Houston DOD TOC/HS19090804
Sample Matrix: Water
Analysis Method: SM 5310 C
Prep Method: None

Service Request: K1908707
Date Collected: 09/17/19
Date Received: 09/19/19
Units: mg/L
Basis: NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_091719	K1908707-001	1.14	0.50	0.20	0.07	1	09/29/19 01:39	
Method Blank	K1908707-MB	ND U	0.50	0.20	0.07	1	09/28/19 23:46	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: ALS Houston DOD TOC/HS19090804
Sample Matrix: Water

Service Request: K1908707
Date Collected: 09/17/19
Date Received: 09/19/19
Date Analyzed: 09/29/19

Replicate Sample Summary
General Chemistry Parameters

Sample Name: LH18/24-SP650_091719
Lab Code: K1908707-001

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 K1908707-001DUP Result</u>	<u>Average</u>	<u>RPD</u>	<u>RPD Limit</u>
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	1.14	1.18	1.16	4	10

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

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

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

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: ALS Houston DOD TOC/HS19090804
Sample Matrix: Water

Service Request: K1908707
Date Analyzed: 09/29/19
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: 653373

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1908707-LCS	24.4	25.0	98	83-117

Client: ALS Environmental - US
Project: ALS Houston DOD TOC/HS19090804

Service Request: K1908707

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	653373	KQ1913973-01	09/28/19 14:30	25.0	24.5	98	90-110
CCV2	653373	KQ1913973-02	09/28/19 18:33	25.0	24.1	97	90-110
CCV3	653373	KQ1913973-03	09/28/19 23:17	25.0	23.9	96	90-110
CCV4	653373	KQ1913973-04	09/29/19 04:00	25.0	23.5	94	90-110
CCV5	653373	KQ1913973-25	09/29/19 12:37	25.0	23.7	95	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: ALS Houston DOD TOC/HS19090804

Service Request:K1908707

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	653373	KQ1913973-05	09/28/19 14:45	0.50	0.20	0.07	ND	U
CCB2	653373	KQ1913973-06	09/28/19 18:47	0.50	0.20	0.07	ND	U
CCB3	653373	KQ1913973-07	09/28/19 23:31	0.50	0.20	0.07	ND	U
CCB4	653373	KQ1913973-08	09/29/19 04:14	0.50	0.20	0.07	ND	U
CCB5	653373	KQ1913973-26	09/29/19 12:52	0.50	0.20	0.07	ND	U



Raw Data

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



General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

8714, 8802
 Original
 Work Request # () T1901580, K1908491, 8525, 8546, 8565, 8683, 8707, 8754
 Tier: IV II III II I II IV II
 Date Analyzed: 9/10/11/19 10/1/11/19 DOC: 653372 9004
 Analyst: AB for BCD Run # TOC: 653373 IV
 Analysis: TOC/DOC 653375

**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:

10. K1908683-1 / dup RPD is 11%
 - sample concentration is less than 5x MRL
 17. T1901580 was due 9/30/19
 K1908525 was due 10/1/19
 K1908546 was due 9/30/19

Final Approved by: Freeley Date: 10/01/19 DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 653372 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
KQ1913972-01	Carbon, Dissolved Organic CCV (DOC)			Water	24.45 mg/L	10 mL	24.5 mg/L	1					9/28/19 14:30:00	N	IV
KQ1913972-02	Carbon, Dissolved Organic CCV (DOC)			Water	24.15 mg/L	10 mL	24.1 mg/L	1					9/28/19 18:33:00	N	IV
KQ1913972-03	Carbon, Dissolved Organic CCV (DOC)			Water	23.92 mg/L	10 mL	23.9 mg/L	1					9/28/19 23:17:00	N	IV
KQ1913972-04	Carbon, Dissolved Organic CCB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/28/19 14:45:00	N	IV
KQ1913972-05	Carbon, Dissolved Organic CCB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/28/19 18:47:00	N	IV
KQ1913972-06	Carbon, Dissolved Organic CCB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/28/19 23:31:00	N	IV
KQ1913972-07	Carbon, Dissolved Organic MB (DOC)			Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/28/19 14:59:00	N	IV
KQ1913972-08	Carbon, Dissolved Organic LCS (DOC)			Water	25.08 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		9/28/19 15:14:00	N	IV
KQ1913972-09	Carbon, Dissolved Organic MS (DOC)		T1901580-097	Water	29.96 mg/L	10 mL	30.0 mg/L	1	0.07	0.50	106		9/28/19 17:08:00	N	IV
KQ1913972-10	Carbon, Dissolved Organic DUP (DOC)		T1901580-097	Water	3.54 mg/L	10 mL	3.54 mg/L	1	0.07	0.50	<1		9/28/19 16:40:00	N	IV
KQ1913972-11	Carbon, Dissolved Organic DUP (DOC)		T1901580-098	Water	3.39 mg/L	10 mL	3.39 mg/L	1	0.07	0.50	1		9/28/19 17:37:00	N	IV
KQ1913972-12	Carbon, Dissolved Organic DUP (DOC)		T1901580-099	Water	3.38 mg/L	10 mL	3.38 mg/L	1	0.07	0.50	<1		9/28/19 18:05:00	N	IV
KQ1913972-13	Carbon, Dissolved Organic DUP (DOC)		T1901580-100	Water	2.43 mg/L	10 mL	2.43 mg/L	1	0.07	0.50	5		9/28/19 19:02:00	N	IV
KQ1913972-14	Carbon, Dissolved Organic DUP (DOC)		T1901580-101	Water	3.35 mg/L	10 mL	3.35 mg/L	1	0.07	0.50	1		9/28/19 19:30:00	N	IV
KQ1913972-15	Carbon, Dissolved Organic DUP (DOC)		T1901580-102	Water	2.95 mg/L	10 mL	2.95 mg/L	1	0.07	0.50	2		9/28/19 19:58:00	N	IV
KQ1913972-16	Carbon, Dissolved Organic DUP (DOC)		T1901580-103	Water	3.41 mg/L	10 mL	3.41 mg/L	1	0.07	0.50	1		9/28/19 20:26:00	N	IV
KQ1913972-17	Carbon, Dissolved Organic DUP (DOC)		T1901580-104	Water	3.41 mg/L	10 mL	3.41 mg/L	1	0.07	0.50	1		9/28/19 20:55:00	N	IV
T1901580-097	Carbon, Dissolved Organic N/A (DOC)			Water	3.54 mg/L	10 mL	3.54 mg/L	1	0.07	0.50			9/28/19 16:40:00	N	IV
T1901580-098	Carbon, Dissolved Organic N/A (DOC)			Water	3.43 mg/L	10 mL	3.43 mg/L	1	0.07	0.50			9/28/19 17:37:00	N	IV
T1901580-099	Carbon, Dissolved Organic N/A (DOC)			Water	3.39 mg/L	10 mL	3.39 mg/L	1	0.07	0.50			9/28/19 18:05:00	N	IV
T1901580-100	Carbon, Dissolved Organic N/A (DOC)			Water	2.54 mg/L	10 mL	2.54 mg/L	1	0.07	0.50			9/28/19 19:02:00	N	IV
T1901580-101	Carbon, Dissolved Organic N/A (DOC)			Water	3.31 mg/L	10 mL	3.31 mg/L	1	0.07	0.50			9/28/19 19:30:00	N	IV
T1901580-102	Carbon, Dissolved Organic N/A (DOC)			Water	2.90 mg/L	10 mL	2.90 mg/L	1	0.07	0.50			9/28/19 19:58:00	N	IV

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

10/01/19
FreezeAB BC BCD
10/1/19

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 653372 Method/Testcode: SM 5310 C/TOC D

<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>
T1901580-103	Carbon, Dissolved Organic (DOC)	N/A		Water	3.36 mg/L	10 mL	3.36 mg/L	1	0.07	0.50			9/28/19 20:26:00	N	IV
T1901580-104	Carbon, Dissolved Organic (DOC)	N/A		Water	3.36 mg/L	10 mL	3.36 mg/L	1	0.07	0.50			9/28/19 20:55:00	N	IV

35 of 190

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

Printed 10/1/19 10:05

Results Summary

0.8 for BCD
10/1/19

Page 2 of 2

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 653373 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
K1908491-003	Carbon, Total Organic	N/A		Water	6.14 mg/L	10 mL	614 mg/L	100	7	50			9/29/19 02:35:00	N	II
K1908491-004	Carbon, Total Organic	N/A		Water	4.83 mg/L	10 mL	483 mg/L	100	7	50			9/29/19 03:03:00	N	II
K1908491-005	Carbon, Total Organic	N/A		Water	4.60 mg/L	10 mL	460 mg/L	100	7	50			9/29/19 03:32:00	N	II
K1908525-009	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/28/19 21:23:00	N	III
K1908546-001	Carbon, Total Organic	N/A		Water	3.11 mg/L	10 mL	3.11 mg/L	1	0.07	0.50			9/28/19 22:06:00	N	II
K1908546-002	Carbon, Total Organic	N/A		Water	1.63 mg/L	10 mL	1.63 mg/L	1	0.07	0.50			9/28/19 22:20:00	N	II
K1908565-001	Carbon, Total Organic	N/A		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/28/19 15:43:00	N	I
K1908565-002	Carbon, Total Organic	N/A		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/28/19 16:11:00	N	I
K1908683-001	Carbon, Total Organic	N/A		Water	1.30 mg/L	10 mL	1.30 mg/L	1	0.07	0.50			9/29/19 00:15:00	N	II
K1908683-002	Carbon, Total Organic	N/A		Water	1.97 mg/L	10 mL	1.97 mg/L	1	0.07	0.50			9/29/19 00:43:00	N	II
K1908707-001	Carbon, Total Organic	N/A		Water	1.14 mg/L	10 mL	1.14 mg/L	1	0.07	0.50			9/29/19 01:39:00	N	IV
K1908754-001	Carbon, Total Organic	N/A		Water	1.35 mg/L	10 mL	1.35 mg/L	1	0.07	0.50			9/29/19 04:29:00	N	II
K1909004-001	Carbon, Total Organic	N/A		Water	1.19 mg/L	10 mL	1.19 mg/L	1	0.07	0.50			9/29/19 02:07:00	N	IV
KQ1913973-01	Carbon, Total Organic	CCV		Reagent Water	24.45 mg/L	10 mL	24.5 mg/L	1					9/28/19 14:30:00	N	I
KQ1913973-02	Carbon, Total Organic	CCV		Reagent Water	24.15 mg/L	10 mL	24.1 mg/L	1					9/28/19 18:33:00	N	I
KQ1913973-03	Carbon, Total Organic	CCV		Reagent Water	23.92 mg/L	10 mL	23.9 mg/L	1					9/28/19 23:17:00	N	I
KQ1913973-04	Carbon, Total Organic	CCV		Reagent Water	23.54 mg/L	10 mL	23.5 mg/L	1					9/29/19 04:00:00	N	I
KQ1913973-05	Carbon, Total Organic	CCB		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/28/19 14:45:00	N	I
KQ1913973-06	Carbon, Total Organic	CCB		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/28/19 18:47:00	N	I
KQ1913973-07	Carbon, Total Organic	CCB		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/28/19 23:31:00	N	I
KQ1913973-08	Carbon, Total Organic	CCB		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/29/19 04:14:00	N	I
KQ1913973-09	Carbon, Total Organic	MB		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/28/19 23:46:00	N	I
KQ1913973-10	Carbon, Total Organic	LCS		Reagent Water	24.39 mg/L	10 mL	24.4 mg/L	1	0.07	0.50	98		9/29/19 00:01:00	N	I
KQ1913973-11	Carbon, Total Organic	MS	K1908525-009	Water	25.07 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		9/28/19 21:51:00	N	III
KQ1913973-12	Carbon, Total Organic	DUP	K1908565-001	Reagent Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	9/28/19 15:43:00	N	I
KQ1913973-13	Carbon, Total Organic	DUP	K1908565-002	Reagent Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	9/28/19 16:11:00	N	I
KQ1913973-14	Carbon, Total Organic	DUP	K1908525-009	Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	9/28/19 21:23:00	N	III
KQ1913973-15	Carbon, Total Organic	DUP	K1908546-001	Water	3.12 mg/L	10 mL	3.12 mg/L	1	0.07	0.50		<1	9/28/19 22:06:00	N	II
KQ1913973-16	Carbon, Total Organic	DUP	K1908546-002	Water	1.67 mg/L	10 mL	1.67 mg/L	1	0.07	0.50		2	9/28/19 22:20:00	N	II

36 of 190

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

10/01/19
[Handwritten Signature]

OB for BCD
 10/1/19

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 653373 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>
KQ1913973-17	Carbon, Total Organic	DUP	K1908683-001	Water	1.17 mg/L	10 mL	1.17 mg/L	1	0.07	0.50		11*	9/29/19 00:15:00	N	II
KQ1913973-18	Carbon, Total Organic	DUP	K1908683-002	Water	2.02 mg/L	10 mL	2.02 mg/L	1	0.07	0.50		2	9/29/19 00:43:00	N	II
KQ1913973-19	Carbon, Total Organic	DUP	K1908707-001	Water	1.18 mg/L	10 mL	1.18 mg/L	1	0.07	0.50		4	9/29/19 01:39:00	N	IV
KQ1913973-20	Carbon, Total Organic	DUP	K1909004-001	Water	1.14 mg/L	10 mL	1.14 mg/L	1	0.07	0.50		4	9/29/19 02:07:00	N	IV
KQ1913973-21	Carbon, Total Organic	DUP	K1908491-003	Water	6.20 mg/L	10 mL	620 mg/L	100	7	50		<1	9/29/19 02:35:00	N	II
KQ1913973-22	Carbon, Total Organic	DUP	K1908491-004	Water	4.77 mg/L	10 mL	477 mg/L	100	7	50		1	9/29/19 03:03:00	N	II
KQ1913973-23	Carbon, Total Organic	DUP	K1908491-005	Water	4.60 mg/L	10 mL	460 mg/L	100	7	50		<1	9/29/19 03:32:00	N	II
KQ1913973-24	Carbon, Total Organic	DUP	K1908754-001	Water	1.38 mg/L	10 mL	1.38 mg/L	1	0.07	0.50		2	9/29/19 04:29:00	N	II
KQ1913973-25	Carbon, Total Organic	CCV		Reagent Water	23.67 mg/L	10 mL	23.7 mg/L	1					9/29/19 12:37:00	N	I
KQ1913973-26	Carbon, Total Organic	CCB		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			9/29/19 12:52:00	N	I

37 of 190

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

AB for BCD
10/1/19

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 653374 Method/Testcode: 9060A/TOC D

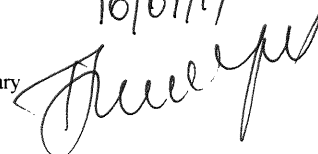
Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1908714-022	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	2.01 mg/L	10 mL	2.01 mg/L	1		0.50			9/29/19 04:57:00	N	IV
K1908714-023	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	9.11 mg/L	10 mL	9.11 mg/L	1		0.50			9/29/19 07:03:00	N	IV
K1908714-024	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	0.60 mg/L	10 mL	0.60 mg/L	1		0.50			9/29/19 07:59:00	N	IV
K1908714-026	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	4.50 mg/L	10 mL	4.50 mg/L	1		0.50			9/29/19 08:54:00	N	IV
K1908714-027	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	1.17 mg/L	10 mL	1.17 mg/L	1		0.50			9/29/19 09:50:00	N	IV
K1908802-001	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	4.08 mg/L	10 mL	4.08 mg/L	1		0.50			9/29/19 10:46:00	N	IV
K1908802-002	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	7.87 mg/L	10 mL	7.87 mg/L	1		0.50			9/29/19 11:42:00	N	IV
K1908802-003	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	1.00 mg/L	10 mL	1.00 mg/L	1		0.50			9/29/19 14:58:00	N	IV
K1908802-004	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	0.67 mg/L	10 mL	0.67 mg/L	1		0.50			9/29/19 15:54:00	N	IV
K1908802-005	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	0.69 mg/L	10 mL	0.69 mg/L	1		0.50			9/29/19 16:50:00	N	IV
K1908802-008	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	0.60 mg/L	10 mL	0.60 mg/L	1		0.50			9/29/19 17:46:00	N	IV
K1908802-009	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	3.75 mg/L	10 mL	3.75 mg/L	1		0.50			9/29/19 18:41:00	N	IV
K1908802-011	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	0.77 mg/L	10 mL	0.77 mg/L	1		0.50			9/29/19 19:37:00	N	IV
K1908802-014	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	0.83 mg/L	10 mL	0.83 mg/L	1		0.50			9/29/19 20:32:00	N	IV
K1908802-015	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	0.82 mg/L	10 mL	0.82 mg/L	1		0.50			9/29/19 21:28:00	N	IV
K1908802-017	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	0.75 mg/L	10 mL	0.75 mg/L	1		0.50			9/29/19 22:53:00	N	IV
K1908802-018	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	1.08 mg/L	10 mL	1.08 mg/L	1		0.50			9/29/19 23:49:00	N	IV
K1908802-019	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	0.48 mg/L	10 mL	0.50 mg/L U	1		0.50			9/30/19 00:45:00	N	IV
K1908802-020	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	0.50 mg/L	10 mL	0.50 mg/L	1		0.50			9/30/19 01:40:00	N	IV
K1908802-022	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	1.36 mg/L	10 mL	1.36 mg/L	1		0.50			9/30/19 02:36:00	N	IV
KQ1913974-01	Carbon, Dissolved Organic (DOC)	CCV		Pore Water	23.54 mg/L	10 mL	23.5 mg/L	1					9/29/19 04:00:00	N	IV
KQ1913974-02	Carbon, Dissolved Organic (DOC)	CCV		Pore Water	23.67 mg/L	10 mL	23.7 mg/L	1					9/29/19 12:37:00	N	IV
KQ1913974-03	Carbon, Dissolved Organic (DOC)	CCV		Pore Water	23.09 mg/L	10 mL	23.1 mg/L	1					9/29/19 22:24:00	N	IV

38 of 190

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

Printed 10/1/19 11:01

Results Summary

10/01/19


AS for BCO
 10/1/19

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 653374 Method/Testcode: 9060A/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
KQ1913974-04	Carbon, Dissolved Organic (DOC)	CCV		Pore Water	22.84 mg/L	10 mL	22.8 mg/L	1					9/30/19 07:29:00	N	IV
KQ1913974-05	Carbon, Dissolved Organic (DOC)	CCB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L	U 1		0.50			9/29/19 04:14:00	N	IV
KQ1913974-06	Carbon, Dissolved Organic (DOC)	CCB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L	U 1		0.50			9/29/19 12:52:00	N	IV
KQ1913974-07	Carbon, Dissolved Organic (DOC)	CCB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L	U 1		0.50			9/29/19 22:38:00	N	IV
KQ1913974-08	Carbon, Dissolved Organic (DOC)	CCB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L	U 1		0.50			9/30/19 07:44:00	N	IV
KQ1913974-09	Carbon, Dissolved Organic (DOC)	MB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L	U 1		0.50			9/29/19 13:06:00	N	IV
KQ1913974-10	Carbon, Dissolved Organic (DOC)	LCS		Pore Water	24.32 mg/L	10 mL	24.3 mg/L	1		0.50	97		9/29/19 14:02:00	N	IV
KQ1913974-11	Carbon, Dissolved Organic (DOC)	MS	K1908714-022	Pore Water	24.82 mg/L	10 mL	99.3 mg/L	4		2.0	97		9/29/19 05:53:00	N	IV
KQ1913974-12	Carbon, Dissolved Organic (DOC)	MS	K1908714-022	Pore Water	25.07 mg/L	10 mL	100 mg/L	4		2.0	98		9/29/19 05:53:00	N	IV
KQ1913974-13	Carbon, Dissolved Organic (DOC)	MS	K1908714-022	Pore Water	25.08 mg/L	10 mL	100 mg/L	4		2.0	98		9/29/19 05:53:00	N	IV
KQ1913974-14	Carbon, Dissolved Organic (DOC)	MS	K1908714-022	Pore Water	24.97 mg/L	10 mL	99.9 mg/L	4		2.0	98		9/29/19 05:53:00	N	IV
KQ1913974-15	Carbon, Dissolved Organic (DOC)	DUP	K1908714-022	Pore Water	2.15 mg/L	10 mL	2.15 mg/L	1		0.50		7	9/29/19 04:57:00	N	IV
KQ1913974-16	Carbon, Dissolved Organic (DOC)	TRP	K1908714-022	Pore Water	2.21 mg/L	10 mL	2.21 mg/L	1		0.50		5	9/29/19 04:57:00	N	IV
KQ1913974-17	Carbon, Dissolved Organic (DOC)	QUAD	K1908714-022	Pore Water	2.27 mg/L	10 mL	2.27 mg/L	1		0.50		5	9/29/19 04:57:00	N	IV
KQ1913974-18	Carbon, Dissolved Organic (DOC)	DUP	K1908714-023	Pore Water	9.08 mg/L	10 mL	9.08 mg/L	1		0.50		<1	9/29/19 07:03:00	N	IV
KQ1913974-19	Carbon, Dissolved Organic (DOC)	TRP	K1908714-023	Pore Water	9.10 mg/L	10 mL	9.10 mg/L	1		0.50		<1	9/29/19 07:03:00	N	IV
KQ1913974-20	Carbon, Dissolved Organic (DOC)	QUAD	K1908714-023	Pore Water	9.12 mg/L	10 mL	9.12 mg/L	1		0.50		<1	9/29/19 07:03:00	N	IV
KQ1913974-21	Carbon, Dissolved Organic (DOC)	DUP	K1908714-024	Pore Water	0.55 mg/L	10 mL	0.55 mg/L	1		0.50		9	9/29/19 07:59:00	N	IV
KQ1913974-22	Carbon, Dissolved Organic (DOC)	TRP	K1908714-024	Pore Water	0.56 mg/L	10 mL	0.56 mg/L	1		0.50		5	9/29/19 07:59:00	N	IV
KQ1913974-23	Carbon, Dissolved Organic (DOC)	QUAD	K1908714-024	Pore Water	0.52 mg/L	10 mL	0.52 mg/L	1		0.50		6	9/29/19 07:59:00	N	IV
KQ1913974-24	Carbon, Dissolved Organic (DOC)	DUP	K1908714-026	Pore Water	4.46 mg/L	10 mL	4.46 mg/L	1		0.50		<1	9/29/19 08:54:00	N	IV
KQ1913974-25	Carbon, Dissolved Organic (DOC)	TRP	K1908714-026	Pore Water	4.47 mg/L	10 mL	4.47 mg/L	1		0.50		<1	9/29/19 08:54:00	N	IV
KQ1913974-26	Carbon, Dissolved Organic (DOC)	QUAD	K1908714-026	Pore Water	4.54 mg/L	10 mL	4.54 mg/L	1		0.50		<1	9/29/19 08:54:00	N	IV

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

AB for BCD
10/1/19

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 653374 Method/Testcode: 9060A/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
KQ1913974-27	Carbon, Dissolved Organic (DOC)	DUP	K1908714-027	Pore Water	1.15 mg/L	10 mL	1.15 mg/L	1		0.50		2	9/29/19 09:50:00	N	IV
KQ1913974-28	Carbon, Dissolved Organic (DOC)	TRP	K1908714-027	Pore Water	1.14 mg/L	10 mL	1.14 mg/L	1		0.50		1	9/29/19 09:50:00	N	IV
KQ1913974-29	Carbon, Dissolved Organic (DOC)	QUAD	K1908714-027	Pore Water	1.12 mg/L	10 mL	1.12 mg/L	1		0.50		2	9/29/19 09:50:00	N	IV
KQ1913974-30	Carbon, Dissolved Organic (DOC)	DUP	K1908802-001	Pore Water	4.08 mg/L	10 mL	4.08 mg/L	1		0.50		<1	9/29/19 10:46:00	N	IV
KQ1913974-31	Carbon, Dissolved Organic (DOC)	TRP	K1908802-001	Pore Water	4.16 mg/L	10 mL	4.16 mg/L	1		0.50		1	9/29/19 10:46:00	N	IV
KQ1913974-32	Carbon, Dissolved Organic (DOC)	QUAD	K1908802-001	Pore Water	4.18 mg/L	10 mL	4.18 mg/L	1		0.50		1	9/29/19 10:46:00	N	IV
KQ1913974-33	Carbon, Dissolved Organic (DOC)	DUP	K1908802-002	Pore Water	7.90 mg/L	10 mL	7.90 mg/L	1		0.50		<1	9/29/19 11:42:00	N	IV
KQ1913974-34	Carbon, Dissolved Organic (DOC)	TRP	K1908802-002	Pore Water	7.95 mg/L	10 mL	7.95 mg/L	1		0.50		<1	9/29/19 11:42:00	N	IV
KQ1913974-35	Carbon, Dissolved Organic (DOC)	QUAD	K1908802-002	Pore Water	8.00 mg/L	10 mL	8.00 mg/L	1		0.50		<1	9/29/19 11:42:00	N	IV
KQ1913974-36	Carbon, Dissolved Organic (DOC)	DUP	K1908802-003	Pore Water	0.97 mg/L	10 mL	0.97 mg/L	1		0.50		4	9/29/19 14:58:00	N	IV
KQ1913974-37	Carbon, Dissolved Organic (DOC)	TRP	K1908802-003	Pore Water	0.95 mg/L	10 mL	0.95 mg/L	1		0.50		3	9/29/19 14:58:00	N	IV
KQ1913974-38	Carbon, Dissolved Organic (DOC)	QUAD	K1908802-003	Pore Water	0.94 mg/L	10 mL	0.94 mg/L	1		0.50		3	9/29/19 14:58:00	N	IV
KQ1913974-39	Carbon, Dissolved Organic (DOC)	DUP	K1908802-004	Pore Water	0.66 mg/L	10 mL	0.66 mg/L	1		0.50		1	9/29/19 15:54:00	N	IV
KQ1913974-40	Carbon, Dissolved Organic (DOC)	TRP	K1908802-004	Pore Water	0.73 mg/L	10 mL	0.73 mg/L	1		0.50		5	9/29/19 15:54:00	N	IV
KQ1913974-41	Carbon, Dissolved Organic (DOC)	QUAD	K1908802-004	Pore Water	0.72 mg/L	10 mL	0.72 mg/L	1		0.50		5	9/29/19 15:54:00	N	IV
KQ1913974-42	Carbon, Dissolved Organic (DOC)	DUP	K1908802-005	Pore Water	0.71 mg/L	10 mL	0.71 mg/L	1		0.50		3	9/29/19 16:50:00	N	IV
KQ1913974-43	Carbon, Dissolved Organic (DOC)	TRP	K1908802-005	Pore Water	0.71 mg/L	10 mL	0.71 mg/L	1		0.50		2	9/29/19 16:50:00	N	IV
KQ1913974-44	Carbon, Dissolved Organic (DOC)	QUAD	K1908802-005	Pore Water	0.65 mg/L	10 mL	0.65 mg/L	1		0.50		4	9/29/19 16:50:00	N	IV
KQ1913974-45	Carbon, Dissolved Organic (DOC)	DUP	K1908802-008	Pore Water	0.58 mg/L	10 mL	0.58 mg/L	1		0.50		4	9/29/19 17:46:00	N	IV
KQ1913974-46	Carbon, Dissolved Organic (DOC)	TRP	K1908802-008	Pore Water	0.62 mg/L	10 mL	0.62 mg/L	1		0.50		4	9/29/19 17:46:00	N	IV
KQ1913974-47	Carbon, Dissolved Organic (DOC)	QUAD	K1908802-008	Pore Water	0.60 mg/L	10 mL	0.60 mg/L	1		0.50		3	9/29/19 17:46:00	N	IV
KQ1913974-48	Carbon, Dissolved Organic (DOC)	DUP	K1908802-009	Pore Water	3.80 mg/L	10 mL	3.80 mg/L	1		0.50		2	9/29/19 18:41:00	N	IV
KQ1913974-49	Carbon, Dissolved Organic (DOC)	TRP	K1908802-009	Pore Water	3.85 mg/L	10 mL	3.85 mg/L	1		0.50		1	9/29/19 18:41:00	N	IV

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

QB for BCD
10/1/19

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 653374 Method/Testcode: 9060A/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
KQ1913974-50	Carbon, Dissolved Organic (DOC)	QUAD	K1908802-009	Pore Water	3.81 mg/L	10 mL	3.81 mg/L	1		0.50		1	9/29/19 18:41:00	N	IV
KQ1913974-51	Carbon, Dissolved Organic (DOC)	DUP	K1908802-011	Pore Water	0.76 mg/L	10 mL	0.76 mg/L	1		0.50		2	9/29/19 19:37:00	N	IV
KQ1913974-52	Carbon, Dissolved Organic (DOC)	TRP	K1908802-011	Pore Water	0.74 mg/L	10 mL	0.74 mg/L	1		0.50		2	9/29/19 19:37:00	N	IV
KQ1913974-53	Carbon, Dissolved Organic (DOC)	QUAD	K1908802-011	Pore Water	0.73 mg/L	10 mL	0.73 mg/L	1		0.50		2	9/29/19 19:37:00	N	IV
KQ1913974-54	Carbon, Dissolved Organic (DOC)	DUP	K1908802-014	Pore Water	0.80 mg/L	10 mL	0.80 mg/L	1		0.50		4	9/29/19 20:32:00	N	IV
KQ1913974-55	Carbon, Dissolved Organic (DOC)	TRP	K1908802-014	Pore Water	0.83 mg/L	10 mL	0.83 mg/L	1		0.50		2	9/29/19 20:32:00	N	IV
KQ1913974-56	Carbon, Dissolved Organic (DOC)	QUAD	K1908802-014	Pore Water	0.83 mg/L	10 mL	0.83 mg/L	1		0.50		2	9/29/19 20:32:00	N	IV
KQ1913974-57	Carbon, Dissolved Organic (DOC)	DUP	K1908802-015	Pore Water	0.88 mg/L	10 mL	0.88 mg/L	1		0.50		6	9/29/19 21:28:00	N	IV
KQ1913974-58	Carbon, Dissolved Organic (DOC)	TRP	K1908802-015	Pore Water	0.85 mg/L	10 mL	0.85 mg/L	1		0.50		3	9/29/19 21:28:00	N	IV
KQ1913974-59	Carbon, Dissolved Organic (DOC)	QUAD	K1908802-015	Pore Water	0.81 mg/L	10 mL	0.81 mg/L	1		0.50		3	9/29/19 21:28:00	N	IV
KQ1913974-60	Carbon, Dissolved Organic (DOC)	DUP	K1908802-017	Pore Water	0.74 mg/L	10 mL	0.74 mg/L	1		0.50		<1	9/29/19 22:53:00	N	IV
KQ1913974-61	Carbon, Dissolved Organic (DOC)	TRP	K1908802-017	Pore Water	0.74 mg/L	10 mL	0.74 mg/L	1		0.50		<1	9/29/19 22:53:00	N	IV
KQ1913974-62	Carbon, Dissolved Organic (DOC)	QUAD	K1908802-017	Pore Water	0.70 mg/L	10 mL	0.70 mg/L	1		0.50		3	9/29/19 22:53:00	N	IV
KQ1913974-63	Carbon, Dissolved Organic (DOC)	DUP	K1908802-018	Pore Water	1.13 mg/L	10 mL	1.13 mg/L	1		0.50		5	9/29/19 23:49:00	N	IV
KQ1913974-64	Carbon, Dissolved Organic (DOC)	TRP	K1908802-018	Pore Water	1.09 mg/L	10 mL	1.09 mg/L	1		0.50		3	9/29/19 23:49:00	N	IV
KQ1913974-65	Carbon, Dissolved Organic (DOC)	QUAD	K1908802-018	Pore Water	1.10 mg/L	10 mL	1.10 mg/L	1		0.50		2	9/29/19 23:49:00	N	IV
KQ1913974-66	Carbon, Dissolved Organic (DOC)	DUP	K1908802-019	Pore Water	0.48 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	9/30/19 00:45:00	N	IV
KQ1913974-67	Carbon, Dissolved Organic (DOC)	TRP	K1908802-019	Pore Water	0.51 mg/L	10 mL	0.51 mg/L	1		0.50		NC	9/30/19 00:45:00	N	IV
KQ1913974-68	Carbon, Dissolved Organic (DOC)	QUAD	K1908802-019	Pore Water	0.51 mg/L	10 mL	0.51 mg/L	1		0.50		NC	9/30/19 00:45:00	N	IV
KQ1913974-69	Carbon, Dissolved Organic (DOC)	DUP	K1908802-020	Pore Water	0.53 mg/L	10 mL	0.53 mg/L	1		0.50		5	9/30/19 01:40:00	N	IV
KQ1913974-70	Carbon, Dissolved Organic (DOC)	TRP	K1908802-020	Pore Water	0.52 mg/L	10 mL	0.52 mg/L	1		0.50		3	9/30/19 01:40:00	N	IV
KQ1913974-71	Carbon, Dissolved Organic (DOC)	QUAD	K1908802-020	Pore Water	0.55 mg/L	10 mL	0.55 mg/L	1		0.50		4	9/30/19 01:40:00	N	IV
KQ1913974-72	Carbon, Dissolved Organic (DOC)	DUP	K1908802-022	Pore Water	1.43 mg/L	10 mL	1.43 mg/L	1		0.50		5	9/30/19 02:36:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 653374 Method/Testcode: 9060A/TOC D

<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>
KQ1913974-73	Carbon, Dissolved Organic (DOC)	TRP	K1908802-022	Pore Water	1.41 mg/L	10 mL	1.41 mg/L	1		0.50		3	9/30/19 02:36:00	N	IV
KQ1913974-74	Carbon, Dissolved Organic (DOC)	QUAD	K1908802-022	Pore Water	1.41 mg/L	10 mL	1.41 mg/L	1		0.50		2	9/30/19 02:36:00	N	IV
KQ1913974-75	Carbon, Dissolved Organic (DOC)	MB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			9/29/19 13:06:00	N	IV
KQ1913974-76	Carbon, Dissolved Organic (DOC)	MB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			9/29/19 13:06:00	N	IV
KQ1913974-77	Carbon, Dissolved Organic (DOC)	MB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			9/29/19 13:06:00	N	IV
KQ1913974-78	Carbon, Dissolved Organic (DOC)	LCS		Pore Water	24.06 mg/L	10 mL	24.1 mg/L	1		0.50	96		9/29/19 14:02:00	N	IV
KQ1913974-79	Carbon, Dissolved Organic (DOC)	LCS		Pore Water	24.11 mg/L	10 mL	24.1 mg/L	1		0.50	96		9/29/19 14:02:00	N	IV
KQ1913974-80	Carbon, Dissolved Organic (DOC)	LCS		Pore Water	24.23 mg/L	10 mL	24.2 mg/L	1		0.50	97		9/29/19 14:02:00	N	IV

42 of 190

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

AB for BCD
10/1/19

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 653375 Method/Testcode: 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1908714-022	Carbon, Total Organic (TOC)	N/A		Pore Water	2.40 mg/L	10 mL	2.40 mg/L	1		0.50			9/30/19 03:32:00	N	IV
K1908714-023	Carbon, Total Organic (TOC)	N/A		Pore Water	9.05 mg/L	10 mL	9.05 mg/L	1		0.50			9/30/19 05:38:00	N	IV
K1908714-024	Carbon, Total Organic (TOC)	N/A		Pore Water	0.50 mg/L	10 mL	0.50 mg/L	1		0.50			9/30/19 06:34:00	N	IV
K1908714-026	Carbon, Total Organic (TOC)	N/A		Pore Water	4.52 mg/L	10 mL	4.52 mg/L	1		0.50			9/30/19 09:50:00	N	IV
K1908714-027	Carbon, Total Organic (TOC)	N/A		Pore Water	1.00 mg/L	10 mL	1.00 mg/L	1		0.50			9/30/19 10:46:00	N	IV
K1908714-029	Carbon, Total Organic (TOC)	N/A		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			9/30/19 11:42:00	N	IV
K1908802-001	Carbon, Total Organic (TOC)	N/A		Pore Water	3.96 mg/L	10 mL	3.96 mg/L	1		0.50			9/30/19 12:38:00	N	IV
K1908802-002	Carbon, Total Organic (TOC)	N/A		Pore Water	7.91 mg/L	10 mL	7.91 mg/L	1		0.50			9/30/19 13:33:00	N	IV
K1908802-003	Carbon, Total Organic (TOC)	N/A		Pore Water	0.90 mg/L	10 mL	0.90 mg/L	1		0.50			9/30/19 14:29:00	N	IV
K1908802-004	Carbon, Total Organic (TOC)	N/A		Pore Water	0.56 mg/L	10 mL	0.56 mg/L	1		0.50			9/30/19 15:25:00	N	IV
K1908802-005	Carbon, Total Organic (TOC)	N/A		Pore Water	0.62 mg/L	10 mL	0.62 mg/L	1		0.50			9/30/19 16:20:00	N	IV
K1908802-008	Carbon, Total Organic (TOC)	N/A		Pore Water	0.59 mg/L	10 mL	0.59 mg/L	1		0.50			9/30/19 17:46:00	N	IV
K1908802-009	Carbon, Total Organic (TOC)	N/A		Pore Water	3.85 mg/L	10 mL	3.85 mg/L	1		0.50			9/30/19 18:42:00	N	IV
K1908802-010	Carbon, Total Organic (TOC)	N/A		Water	1.43 mg/L	10 mL	1.43 mg/L	1		0.50			9/30/19 19:37:00	N	IV
K1908802-011	Carbon, Total Organic (TOC)	N/A		Pore Water	0.69 mg/L	10 mL	0.69 mg/L	1		0.50			9/30/19 20:33:00	N	IV
K1908802-013	Carbon, Total Organic (TOC)	N/A		Pore Water	0.37 mg/L	10 mL	0.50 mg/L U	1		0.50			9/30/19 21:29:00	N	IV
K1908802-015	Carbon, Total Organic (TOC)	N/A		Pore Water	0.64 mg/L	10 mL	0.64 mg/L	1		0.50			9/30/19 22:24:00	N	IV
K1908802-017	Carbon, Total Organic (TOC)	N/A		Pore Water	0.67 mg/L	10 mL	0.67 mg/L	1		0.50			9/30/19 23:20:00	N	IV
K1908802-018	Carbon, Total Organic (TOC)	N/A		Pore Water	0.86 mg/L	10 mL	0.86 mg/L	1		0.50			10/1/19 00:16:00	N	IV
K1908802-019	Carbon, Total Organic (TOC)	N/A		Pore Water	0.44 mg/L	10 mL	0.50 mg/L U	1		0.50			10/1/19 01:11:00	N	IV
KQ1913975-01	Carbon, Total Organic (TOC)	CCV		Pore Water	23.09 mg/L	10 mL	23.1 mg/L	1					9/29/19 22:24:00	N	IV
KQ1913975-02	Carbon, Total Organic (TOC)	CCV		Pore Water	22.84 mg/L	10 mL	22.8 mg/L	1					9/30/19 07:29:00	N	IV
KQ1913975-03	Carbon, Total Organic (TOC)	CCV		Pore Water	23.68 mg/L	10 mL	23.7 mg/L	1					9/30/19 17:16:00	N	IV

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

Printed 10/1/19 11:21

Results Summary

10/01/19
[Handwritten Signature]

AB for BCD
 10/1/19

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 653375 Method/Testcode: 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1913975-04	Carbon, Total Organic (TOC)	CCV		Pore Water	22.84 mg/L	10 mL	22.8 mg/L	1					10/1/19 02:07:00	N	IV
KQ1913975-05	Carbon, Total Organic (TOC)	CCB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L	U 1		0.50			9/29/19 22:38:00	N	IV
KQ1913975-06	Carbon, Total Organic (TOC)	CCB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L	U 1		0.50			9/30/19 07:44:00	N	IV
KQ1913975-07	Carbon, Total Organic (TOC)	CCB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L	U 1		0.50			9/30/19 17:31:00	N	IV
KQ1913975-08	Carbon, Total Organic (TOC)	CCB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L	U 1		0.50			10/1/19 02:22:00	N	IV
KQ1913975-09	Carbon, Total Organic (TOC)	MB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L	U 1		0.50			9/30/19 07:59:00	N	IV
KQ1913975-10	Carbon, Total Organic (TOC)	LCS		Pore Water	23.28 mg/L	10 mL	23.3 mg/L	1		0.50	93		9/30/19 08:54:00	N	IV
KQ1913975-11	Carbon, Total Organic (TOC)	MB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L	U 1		0.50			9/30/19 07:59:00	N	IV
KQ1913975-12	Carbon, Total Organic (TOC)	MB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L	U 1		0.50			9/30/19 07:59:00	N	IV
KQ1913975-13	Carbon, Total Organic (TOC)	MB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L	U 1		0.50			9/30/19 07:59:00	N	IV
KQ1913975-14	Carbon, Total Organic (TOC)	LCS		Pore Water	23.42 mg/L	10 mL	23.4 mg/L	1		0.50	94		9/30/19 08:54:00	N	IV
KQ1913975-15	Carbon, Total Organic (TOC)	LCS		Pore Water	23.37 mg/L	10 mL	23.4 mg/L	1		0.50	93		9/30/19 08:54:00	N	IV
KQ1913975-16	Carbon, Total Organic (TOC)	LCS		Pore Water	23.38 mg/L	10 mL	23.4 mg/L	1		0.50	94		9/30/19 08:54:00	N	IV
KQ1913975-17	Carbon, Total Organic (TOC)	MS	K1908714-022	Pore Water	24.93 mg/L	10 mL	99.7 mg/L	4		2.0	97		9/30/19 04:28:00	N	IV
KQ1913975-18	Carbon, Total Organic (TOC)	MS	K1908714-022	Pore Water	25.04 mg/L	10 mL	100 mg/L	4		2.0	98		9/30/19 04:28:00	N	IV
KQ1913975-19	Carbon, Total Organic (TOC)	MS	K1908714-022	Pore Water	25.03 mg/L	10 mL	100 mg/L	4		2.0	98		9/30/19 04:28:00	N	IV
KQ1913975-20	Carbon, Total Organic (TOC)	MS	K1908714-022	Pore Water	25.12 mg/L	10 mL	100 mg/L	4		2.0	98		9/30/19 04:28:00	N	IV
KQ1913975-21	Carbon, Total Organic (TOC)	DUP	K1908714-022	Pore Water	2.76 mg/L	10 mL	2.76 mg/L	1		0.50		14	9/30/19 03:32:00	N	IV
KQ1913975-22	Carbon, Total Organic (TOC)	TRP	K1908714-022	Pore Water	2.87 mg/L	10 mL	2.87 mg/L	1		0.50		9	9/30/19 03:32:00	N	IV
KQ1913975-23	Carbon, Total Organic (TOC)	QUAD	K1908714-022	Pore Water	2.91 mg/L	10 mL	2.91 mg/L	1		0.50		8	9/30/19 03:32:00	N	IV
KQ1913975-24	Carbon, Total Organic (TOC)	DUP	K1908714-023	Pore Water	8.94 mg/L	10 mL	8.94 mg/L	1		0.50		1	9/30/19 05:38:00	N	IV
KQ1913975-25	Carbon, Total Organic (TOC)	TRP	K1908714-023	Pore Water	9.00 mg/L	10 mL	9.00 mg/L	1		0.50		<1	9/30/19 05:38:00	N	IV
KQ1913975-26	Carbon, Total Organic (TOC)	QUAD	K1908714-023	Pore Water	9.02 mg/L	10 mL	9.02 mg/L	1		0.50		<1	9/30/19 05:38:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 653375 Method/Testcode: 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1913975-27	Carbon, Total Organic (TOC)	DUP	K1908714-024	Pore Water	0.43 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	9/30/19 06:34:00	N	IV
KQ1913975-28	Carbon, Total Organic (TOC)	TRP	K1908714-024	Pore Water	0.41 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	9/30/19 06:34:00	N	IV
KQ1913975-29	Carbon, Total Organic (TOC)	QUAD	K1908714-024	Pore Water	0.38 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	9/30/19 06:34:00	N	IV
KQ1913975-30	Carbon, Total Organic (TOC)	DUP	K1908714-026	Pore Water	4.38 mg/L	10 mL	4.38 mg/L	1		0.50		3	9/30/19 09:50:00	N	IV
KQ1913975-31	Carbon, Total Organic (TOC)	TRP	K1908714-026	Pore Water	4.48 mg/L	10 mL	4.48 mg/L	1		0.50		2	9/30/19 09:50:00	N	IV
KQ1913975-32	Carbon, Total Organic (TOC)	QUAD	K1908714-026	Pore Water	4.48 mg/L	10 mL	4.48 mg/L	1		0.50		1	9/30/19 09:50:00	N	IV
KQ1913975-33	Carbon, Total Organic (TOC)	DUP	K1908714-027	Pore Water	1.04 mg/L	10 mL	1.04 mg/L	1		0.50		4	9/30/19 10:46:00	N	IV
KQ1913975-34	Carbon, Total Organic (TOC)	TRP	K1908714-027	Pore Water	1.02 mg/L	10 mL	1.02 mg/L	1		0.50		2	9/30/19 10:46:00	N	IV
KQ1913975-35	Carbon, Total Organic (TOC)	QUAD	K1908714-027	Pore Water	1.03 mg/L	10 mL	1.03 mg/L	1		0.50		2	9/30/19 10:46:00	N	IV
KQ1913975-36	Carbon, Total Organic (TOC)	DUP	K1908714-029	Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	9/30/19 11:42:00	N	IV
KQ1913975-37	Carbon, Total Organic (TOC)	TRP	K1908714-029	Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	9/30/19 11:42:00	N	IV
KQ1913975-38	Carbon, Total Organic (TOC)	QUAD	K1908714-029	Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	9/30/19 11:42:00	N	IV
KQ1913975-39	Carbon, Total Organic (TOC)	DUP	K1908802-001	Pore Water	4.04 mg/L	10 mL	4.04 mg/L	1		0.50		2	9/30/19 12:38:00	N	IV
KQ1913975-40	Carbon, Total Organic (TOC)	TRP	K1908802-001	Pore Water	4.07 mg/L	10 mL	4.07 mg/L	1		0.50		1	9/30/19 12:38:00	N	IV
KQ1913975-41	Carbon, Total Organic (TOC)	QUAD	K1908802-001	Pore Water	4.08 mg/L	10 mL	4.08 mg/L	1		0.50		1	9/30/19 12:38:00	N	IV
KQ1913975-42	Carbon, Total Organic (TOC)	DUP	K1908802-002	Pore Water	7.93 mg/L	10 mL	7.93 mg/L	1		0.50		<1	9/30/19 13:33:00	N	IV
KQ1913975-43	Carbon, Total Organic (TOC)	TRP	K1908802-002	Pore Water	7.97 mg/L	10 mL	7.97 mg/L	1		0.50		<1	9/30/19 13:33:00	N	IV
KQ1913975-44	Carbon, Total Organic (TOC)	QUAD	K1908802-002	Pore Water	7.96 mg/L	10 mL	7.96 mg/L	1		0.50		<1	9/30/19 13:33:00	N	IV
KQ1913975-45	Carbon, Total Organic (TOC)	DUP	K1908802-003	Pore Water	0.93 mg/L	10 mL	0.93 mg/L	1		0.50		4	9/30/19 14:29:00	N	IV
KQ1913975-46	Carbon, Total Organic (TOC)	TRP	K1908802-003	Pore Water	0.90 mg/L	10 mL	0.90 mg/L	1		0.50		2	9/30/19 14:29:00	N	IV
KQ1913975-47	Carbon, Total Organic (TOC)	QUAD	K1908802-003	Pore Water	0.92 mg/L	10 mL	0.92 mg/L	1		0.50		2	9/30/19 14:29:00	N	IV
KQ1913975-48	Carbon, Total Organic (TOC)	DUP	K1908802-004	Pore Water	0.59 mg/L	10 mL	0.59 mg/L	1		0.50		5	9/30/19 15:25:00	N	IV
KQ1913975-49	Carbon, Total Organic (TOC)	TRP	K1908802-004	Pore Water	0.53 mg/L	10 mL	0.53 mg/L	1		0.50		5	9/30/19 15:25:00	N	IV

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

AG for BCD
10/1/19

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 653375 Method/Testcode: 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1913975-50	Carbon, Total Organic (TOC)	QUAD	K1908802-004	Pore Water	0.54 mg/L	10 mL	0.54 mg/L	1		0.50		4	9/30/19 15:25:00	N	IV
KQ1913975-51	Carbon, Total Organic (TOC)	DUP	K1908802-005	Pore Water	0.58 mg/L	10 mL	0.58 mg/L	1		0.50		6	9/30/19 16:20:00	N	IV
KQ1913975-52	Carbon, Total Organic (TOC)	TRP	K1908802-005	Pore Water	0.56 mg/L	10 mL	0.56 mg/L	1		0.50		5	9/30/19 16:20:00	N	IV
KQ1913975-53	Carbon, Total Organic (TOC)	QUAD	K1908802-005	Pore Water	0.57 mg/L	10 mL	0.57 mg/L	1		0.50		4	9/30/19 16:20:00	N	IV
KQ1913975-54	Carbon, Total Organic (TOC)	DUP	K1908802-008	Pore Water	0.59 mg/L	10 mL	0.59 mg/L	1		0.50		<1	9/30/19 17:46:00	N	IV
KQ1913975-55	Carbon, Total Organic (TOC)	TRP	K1908802-008	Pore Water	0.57 mg/L	10 mL	0.57 mg/L	1		0.50		2	9/30/19 17:46:00	N	IV
KQ1913975-56	Carbon, Total Organic (TOC)	QUAD	K1908802-008	Pore Water	0.54 mg/L	10 mL	0.54 mg/L	1		0.50		4	9/30/19 17:46:00	N	IV
KQ1913975-57	Carbon, Total Organic (TOC)	DUP	K1908802-009	Pore Water	3.87 mg/L	10 mL	3.87 mg/L	1		0.50		<1	9/30/19 18:42:00	N	IV
KQ1913975-58	Carbon, Total Organic (TOC)	TRP	K1908802-009	Pore Water	3.85 mg/L	10 mL	3.85 mg/L	1		0.50		<1	9/30/19 18:42:00	N	IV
KQ1913975-59	Carbon, Total Organic (TOC)	QUAD	K1908802-009	Pore Water	3.90 mg/L	10 mL	3.90 mg/L	1		0.50		<1	9/30/19 18:42:00	N	IV
KQ1913975-60	Carbon, Total Organic (TOC)	DUP	K1908802-010	Water	1.49 mg/L	10 mL	1.49 mg/L	1		0.50		4	9/30/19 19:37:00	N	IV
KQ1913975-61	Carbon, Total Organic (TOC)	TRP	K1908802-010	Water	1.41 mg/L	10 mL	1.41 mg/L	1		0.50		3	9/30/19 19:37:00	N	IV
KQ1913975-62	Carbon, Total Organic (TOC)	QUAD	K1908802-010	Water	1.41 mg/L	10 mL	1.41 mg/L	1		0.50		3	9/30/19 19:37:00	N	IV
KQ1913975-63	Carbon, Total Organic (TOC)	DUP	K1908802-011	Pore Water	0.67 mg/L	10 mL	0.67 mg/L	1		0.50		3	9/30/19 20:33:00	N	IV
KQ1913975-64	Carbon, Total Organic (TOC)	TRP	K1908802-011	Pore Water	0.67 mg/L	10 mL	0.67 mg/L	1		0.50		2	9/30/19 20:33:00	N	IV
KQ1913975-65	Carbon, Total Organic (TOC)	QUAD	K1908802-011	Pore Water	0.65 mg/L	10 mL	0.65 mg/L	1		0.50		2	9/30/19 20:33:00	N	IV
KQ1913975-66	Carbon, Total Organic (TOC)	DUP	K1908802-013	Pore Water	0.41 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	9/30/19 21:29:00	N	IV
KQ1913975-67	Carbon, Total Organic (TOC)	TRP	K1908802-013	Pore Water	0.43 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	9/30/19 21:29:00	N	IV
KQ1913975-68	Carbon, Total Organic (TOC)	QUAD	K1908802-013	Pore Water	0.40 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	9/30/19 21:29:00	N	IV
KQ1913975-69	Carbon, Total Organic (TOC)	DUP	K1908802-015	Pore Water	0.69 mg/L	10 mL	0.69 mg/L	1		0.50		7	9/30/19 22:24:00	N	IV
KQ1913975-70	Carbon, Total Organic (TOC)	TRP	K1908802-015	Pore Water	0.67 mg/L	10 mL	0.67 mg/L	1		0.50		3	9/30/19 22:24:00	N	IV
KQ1913975-71	Carbon, Total Organic (TOC)	QUAD	K1908802-015	Pore Water	0.65 mg/L	10 mL	0.65 mg/L	1		0.50		3	9/30/19 22:24:00	N	IV
KQ1913975-72	Carbon, Total Organic (TOC)	DUP	K1908802-017	Pore Water	0.67 mg/L	10 mL	0.67 mg/L	1		0.50		1	9/30/19 23:20:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 653375 Method/Testcode: 9060A/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>
KQ1913975-73	Carbon, Total Organic (TOC)	TRP	K1908802-017	Pore Water	0.68 mg/L	10 mL	0.68 mg/L	1		0.50		<1	9/30/19 23:20:00	N	IV
KQ1913975-74	Carbon, Total Organic (TOC)	QUAD	K1908802-017	Pore Water	0.64 mg/L	10 mL	0.64 mg/L	1		0.50		3	9/30/19 23:20:00	N	IV
KQ1913975-75	Carbon, Total Organic (TOC)	DUP	K1908802-018	Pore Water	0.88 mg/L	10 mL	0.88 mg/L	1		0.50		2	10/1/19 00:16:00	N	IV
KQ1913975-76	Carbon, Total Organic (TOC)	TRP	K1908802-018	Pore Water	0.93 mg/L	10 mL	0.93 mg/L	1		0.50		4	10/1/19 00:16:00	N	IV
KQ1913975-77	Carbon, Total Organic (TOC)	QUAD	K1908802-018	Pore Water	0.88 mg/L	10 mL	0.88 mg/L	1		0.50		3	10/1/19 00:16:00	N	IV
KQ1913975-78	Carbon, Total Organic (TOC)	DUP	K1908802-019	Pore Water	0.44 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	10/1/19 01:11:00	N	IV
KQ1913975-79	Carbon, Total Organic (TOC)	TRP	K1908802-019	Pore Water	0.48 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	10/1/19 01:11:00	N	IV
KQ1913975-80	Carbon, Total Organic (TOC)	QUAD	K1908802-019	Pore Water	0.47 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	10/1/19 01:11:00	N	IV

47 of 190

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

Printed 10/1/19 11:21

Results Summary

AB for BCD
10/1/19

Page 5 of 5

DOC: 653372,
653374
TOC: 653373,
653375

Schedule: 09282019

Version: 7

Instrument: Fusion1

Last Saved by: Fusion1 (Fusion1)

Last Saved on: 2019/09/28 14:04 - Saturday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Done
(Clean)	Clean	Clean		1	True	Done
(Clean)	Clean	Clean		1	True	Done
(Blank)	Blank	Reagent/Acid Blank		1	True	Running
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Pending
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	K1908565-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1908565-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	T1901580-097.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
6	Sample	T1901580-097.04 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
7	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
8	Sample	T1901580-098.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	T1901580-099.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	T1901580-100.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	T1901580-101.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	T1901580-102.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	T1901580-103.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	T1901580-104.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1908525-009.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1908525-009.02 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
17	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
18	Sample	K1908546-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1908546-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	K1908683-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1908683-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1908707-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1909004-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1908491-003.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1908491-004.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1908491-005.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1908754-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1908714-022.09 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
31	Sample	K1908714-022.09 ms 4x doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
32	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
33	Sample	K1908714-023.09 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
34	Sample	K1908714-024.09 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
35	Sample	K1908714-026.09 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
36	Sample	K1908714-027.09 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
37	Sample	K1908802-001.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
38	Sample	K1908802-002.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

Printed on: September 28, 2019 14:06:46

Page 1

48 of 190 10/01/19
Hewlett

Schedule: 09282019

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)	4	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
40	Sample	K1908802-003.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
41	Sample	K1908802-004.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
42	Sample	K1908802-005.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
43	Sample	K1908802-008.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
44	Sample	K1908802-009.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
45	Sample	K1908802-011.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
46	Sample	K1908802-014.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
47	Sample	K1908802-015.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	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	K1908802-017.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
49	Sample	K1908802-018.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
50	Sample	K1908802-019.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
51	Sample	K1908802-020.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
52	Sample	K1908802-022.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
53	Sample	K1908714-022.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
54	Sample	K1908714-022.08 ms 4x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
55	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
56	Sample	K1908714-023.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
57	Sample	K1908714-024.08	CAS_salt_010711 (CAS_salt_010711)	4	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)	4	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
59	Sample	K1908714-026.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
60	Sample	K1908714-027.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
61	Sample	K1908714-029.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
62	Sample	K1908802-001.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
63	Sample	K1908802-002.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
64	Sample	K1908802-003.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
65	Sample	K1908802-004.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
66	Sample	K1908802-005.03	CAS_salt_010711 (CAS_salt_010711)	4	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	K1908802-008.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
68	Sample	K1908802-009.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
69	Sample	K1908802-010.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
70	Sample	K1908802-011.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
71	Sample	K1908802-013.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
72	Sample	K1908802-015.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
73	Sample	K1908802-017.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
74	Sample	K1908802-018.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
75	Sample	K1908802-019.03	CAS_salt_010711 (CAS_salt_010711)	4	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	

Schedule: 09282019

Version: 7

Instrument: Fusion1

Last Saved by: Fusion1 (Fusion1)

Last Saved on: 2019/09/28 14:04 - Saturday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1908565-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1908565-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	T1901580-097.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
6	Sample	T1901580-097.04 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
7	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
8	Sample	T1901580-098.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	T1901580-099.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	T1901580-100.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	T1901580-101.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	T1901580-102.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	T1901580-103.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	T1901580-104.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1908525-009.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1908525-009.02 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
17	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
18	Sample	K1908546-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1908546-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	K1908683-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1908683-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1908707-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1909004-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1908491-003.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1908491-004.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1908491-005.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1908754-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1908714-022.09 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
31	Sample	K1908714-022.09 ms 4x doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
32	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
33	Sample	K1908714-023.09 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
34	Sample	K1908714-024.09 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
35	Sample	K1908714-026.09 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
36	Sample	K1908714-027.09 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
37	Sample	K1908802-001.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
38	Sample	K1908802-002.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

Printed on: October 1, 2019 09:46:07

Page 1

10/01/19


Schedule: 09282019

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)	4	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
40	Sample	K1908802-003.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
41	Sample	K1908802-004.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
42	Sample	K1908802-005.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
43	Sample	K1908802-008.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
44	Sample	K1908802-009.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
45	Sample	K1908802-011.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
46	Sample	K1908802-014.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
47	Sample	K1908802-015.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	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	K1908802-017.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
49	Sample	K1908802-018.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
50	Sample	K1908802-019.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
51	Sample	K1908802-020.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
52	Sample	K1908802-022.04 doc	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
53	Sample	K1908714-022.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
54	Sample	K1908714-022.08 ms 4x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
55	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
56	Sample	K1908714-023.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
57	Sample	K1908714-024.08	CAS_salt_010711 (CAS_salt_010711)	4	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)	4	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
59	Sample	K1908714-026.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
60	Sample	K1908714-027.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
61	Sample	K1908714-029.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
62	Sample	K1908802-001.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
63	Sample	K1908802-002.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
64	Sample	K1908802-003.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
65	Sample	K1908802-004.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
66	Sample	K1908802-005.03	CAS_salt_010711 (CAS_salt_010711)	4	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	K1908802-008.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
68	Sample	K1908802-009.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
69	Sample	K1908802-010.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
70	Sample	K1908802-011.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
71	Sample	K1908802-013.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
72	Sample	K1908802-015.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
73	Sample	K1908802-017.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
74	Sample	K1908802-018.03	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
75	Sample	K1908802-019.03	CAS_salt_010711 (CAS_salt_010711)	4	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 - 09282019

Saturday, September 28, 2019 12:01 PM

(View - Repts, Unused Repts, Meta-Data, Signature, History)
Printed on 2019/10/01 09:46 - Tuesday

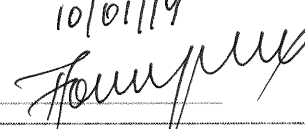
Report Summary Information

Company Location: Gen Chem Lab
 Schedule Name: 09282019
 Instrument Name: Fusion1
 Report Version: 1 of 1
 Report Creation by Operators (schedule version): Fusion1 (Fusion1) (v2)
 Fusion1 (Fusion1) (v3)
 Fusion1 (Fusion1) (v5)
 Fusion1 (Fusion1) (v6)
 Fusion1 (Fusion1) (v7)

Engine 1.1.5.1
 Version:
 Firmware 1.2.0696
 Version:
 Connection: RS232 COM1

Comment:

Report Results

10/01/19


Sample Type: Clean From Schedule Version 2

Pos	Analysis Type	Sample ID	Start Time
◆ (clean)		Clean	2019/09/28 12:01

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.19	15.92	3.73	49.84	05:24
2	TC Clean	6.36	10.01	3.65	50.23	04:02
3	TC Clean	2.60	6.22	3.62	50.31	03:46
4	TC Clean	1.70	5.38	3.68	50.29	03:47

Sample Type: Clean From Schedule Version 3

Pos	Analysis Type	Sample ID	Start Time
◆ (clean)		Clean	2019/09/28 12:36

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.77	14.18	3.42	49.89	05:10
2	TC Clean	8.79	12.05	3.26	50.18	04:03
3	TC Clean	6.35	9.83	3.48	50.25	03:48

4	TC Clean	3.76	7.30	3.54	50.27	03:56
---	----------	------	------	------	-------	-------

Sample Type: Clean From Schedule Version 5

Pos	Analysis Type	Sample ID	Start Time
♦ (clean)		Clean	2019/09/28 12:59

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.42	14.05	3.63	49.56	05:20
2	TC Clean	9.36	13.06	3.70	50.16	04:02
3	TC Clean	4.96	8.55	3.59	50.27	03:57
4	TC Clean	2.72	6.22	3.50	50.26	03:55

Sample Type: Blank (Creating v1300) From Schedule Version 6

Pos	Analysis Type	Sample ID	Start Time
♦ (blank)		Reagent/Acid Blank	2019/09/28 13:42

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	10.59	14.02	3.43	49.80	05:19
2	TC Clean	8.52	11.95	3.42	50.11	04:02
3	TC Clean	3.33	6.95	3.62	50.16	03:47
4	TC Clean	2.12	5.54	3.42	50.22	03:44
5	Reagent Blank	5.24	8.83	3.59	50.13	05:03
6	Acid Blank	1.29	4.83	3.54	49.86	05:30

Sample Type: Sample From Schedule Version 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ D	TOC	RB	0.4730 ppm	0.0000 ppm	0.0000%	2019/09/28 14:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4730	4.7299	12.08	15.66	3.58	50.30	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8654 (IC) (v1300)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.4545 ppm (PASS)	0.0000 ppm	0%	2019/09/28 14:30

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4545	244.5447	175.46	179.08	3.62	50.29	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 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/28 14:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.38	12.09	3.71	50.30	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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/28 14:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.81	11.44	3.63	50.32	10:34

Dilution 1:10
Blank Contribution (TC) 8.8654 (IC) (v1300)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	25.0753 ppm (PASS)	0.0000 ppm	0%	2019/09/28 15:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.0753	250.7528	179.67	183.23	3.55	50.30	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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
2	TOC	ICS	0.2501 ppm	0.0000 ppm	0.0000%	2019/09/28 15:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2501	2.5009	10.56	14.23	3.66	50.30	10:31

Dilution **Blank Contribution** **Method** **Calibration**
 1:10 (TC) 8.8654 (IC) (v1300) CAS_salt_010711 (v4) CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
3	TOC	K1908565-001.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/28 15:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.58	11.26	3.69	50.29	10:29
2	TOC	0.0000	0.0000	7.41	11.00	3.59	50.27	10:26

Dilution **Blank Contribution** **Method** **Calibration**
 1:10 (TC) 8.8654 (IC) (v1300) CAS_salt_010711 (v4) CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
4	TOC	K1908565-002.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/28 16:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.02	10.62	3.60	50.29	10:28
2	TOC	0.0000	0.0000	7.67	11.32	3.65	50.28	10:30

Dilution **Blank Contribution** **Method** **Calibration**
 1:10 (TC) 8.8654 (IC) (v1300) CAS_salt_010711 (v4) CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
5	TOC	T1901580-097.04 doc	3.5395 ppm	0.0058 ppm	0.1600%	2019/09/28 16:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5353	35.3533	32.86	36.21	3.34	50.27	10:27
2	TOC	3.5436	35.4358	32.92	36.49	3.57	50.28	10:28

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **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	T1901580-097.04 ms doc	29.9600 ppm	0.0000 ppm	0.0000%	2019/09/28 17:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.9600	299.5999	212.23	215.66	3.43	50.26	10:31

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **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	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/28 17:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.17	11.65	3.48	50.24	10:30

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **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	T1901580-098.04 doc	3.4118 ppm	0.0286 ppm	0.8400%	2019/09/28 17:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.4321	34.3206	32.16	35.43	3.27	50.26	10:29
2	TOC	3.3915	33.9155	31.89	35.44	3.55	50.26	10:24

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **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	T1901580-099.04 doc	3.3888 ppm	0.0070 ppm	0.2100%	2019/09/28 18:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3938	33.9376	31.90	35.31	3.41	50.25	10:30
2	TOC	3.3839	33.8389	31.83	35.40	3.57	50.27	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 7

Pos	BAT	Concentration	Dil	Sample ID	Min / Max	Result	Std. Dev.	RSD	Start Time
-----	-----	---------------	-----	-----------	-----------	--------	-----------	-----	------------

		(ppm)		(% dev)						
♦	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.1483 ppm (PASS)	0.0000 ppm	0%	2019/09/28 18:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1483	241.4834	173.38	176.96	3.58	50.28	10:30

<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 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
♦	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/28 18:47

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.59	11.12	3.53	50.30	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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
♦	10	TOC	T1901580-100.04 doc	2.4845 ppm	0.0829 ppm	3.3400%	2019/09/28 19:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5431	25.4313	26.13	29.79	3.66	50.30	10:31
2	TOC	2.4259	24.2586	25.33	28.94	3.61	50.30	10:26

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.8654 (IC) (v1300)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
♦	11	TOC	T1901580-101.04 doc	3.3329 ppm	0.0285 ppm	0.8600%	2019/09/28 19:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3127	33.1273	31.35	34.97	3.62	50.34	10:24
2	TOC	3.3531	33.5310	31.63	35.15	3.53	50.36	10:29

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.8654 (IC)	CAS_salt_010711	CAS_salt_010711

(v1300)

(v4)

(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
12	TOC	T1901580-102.04 doc	2.9232 ppm	0.0321 ppm	1.1000%	2019/09/28 19:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9005	29.0053	28.55	31.99	3.44	50.37	10:27
2	TOC	2.9459	29.4590	28.86	32.36	3.49	50.40	10:29

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **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	T1901580-103.04 doc	3.3879 ppm	0.0334 ppm	0.9900%	2019/09/28 20:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3643	33.6429	31.70	35.28	3.58	50.41	10:29
2	TOC	3.4116	34.1158	32.02	35.57	3.55	50.43	10:31

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **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	T1901580-104.04 doc	2.9933 ppm	0.0016 ppm	0.0500%	2019/09/28 20:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9944	29.9437	29.19	32.78	3.59	50.45	10:30
2	TOC	2.9922	29.9216	29.18	32.89	3.71	50.46	10:26

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **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	K1908525-009.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/28 21:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.26	10.88	3.62	50.48	10:32
2	TOC	0.0000	0.0000	7.40	10.98	3.58	50.49	10:28

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
16	TOC	K1908525-009.02 ms	25.0660 ppm	0.0000 ppm	0.0000%	2019/09/28 21:51

Rep	Base	ppm	µg	Adjusted	NDIR (Abs)	Baseline	Pressure	Run
-----	------	-----	----	----------	------------	----------	----------	-----

#	Analysis Type			(Abs)		(Abs)	(psig)	Time
1	TOC	25.0660	250.6602	179.01	182.61	3.59	50.50	10:30

Dilution 1:10
Blank Contribution (TC) 8.8654 (IC) (v1300)
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	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/28 22:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.43	11.11	3.67	50.54	10:33

Dilution 1:10
Blank Contribution (TC) 8.8654 (IC) (v1300)
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	K1908546-001.01	3.1128 ppm	0.0052 ppm	0.1700%	2019/09/28 22:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1091	31.0914	29.97	33.54	3.57	50.54	10:30
2	TOC	3.1165	31.1650	30.02	33.56	3.54	50.55	10:27

Dilution 1:10
Blank Contribution (TC) 8.8654 (IC) (v1300)
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	K1908546-002.01	1.6535 ppm	0.0289 ppm	1.7500%	2019/09/28 22:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6331	16.3314	19.95	23.34	3.39	50.57	10:30
2	TOC	1.6739	16.7394	20.23	23.70	3.47	50.57	10:27

Dilution 1:10
Blank Contribution (TC) 8.8654 (IC) (v1300)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.9163 ppm (PASS)	0.0000 ppm	0%	2019/09/28 23:17

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9163	239.1631	171.80	175.48	3.67	50.58	10:34

<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 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/28 23:31

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.13	10.65	3.51	50.59	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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/28 23:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.25	9.82	3.57	50.61	10:31

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.8654 (IC) (v1300)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS

From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.3882 ppm (PASS)	0.0000 ppm	0%	2019/09/29 00:01

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.3882	243.8818	175.01	178.50	3.49	50.60	10:31

<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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
21	TOC	K1908683-001.01	1.2332 ppm	0.0922 ppm	7.4800%	2019/09/29 00:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2984	12.9842	17.68	21.23	3.55	50.61	10:29
2	TOC	1.1680	11.6805	16.79	20.43	3.64	50.60	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **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	K1908683-002.01	1.9951 ppm	0.0313 ppm	1.5700%	2019/09/29 00:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9730	19.7300	22.26	25.92	3.66	50.58	10:28
2	TOC	2.0172	20.1720	22.56	26.05	3.49	50.54	10:24

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **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	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/29 01:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.99	9.67	3.68	50.50	10:29
2	TOC	0.0000	0.0000	6.19	9.74	3.55	50.49	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **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	K1908707-001.01	1.1622 ppm	0.0303 ppm	2.6100%	2019/09/29 01:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1408	11.4079	16.61	20.06	3.45	50.49	10:26
2	TOC	1.1837	11.8366	16.90	20.37	3.47	50.48	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
25	TOC	K1909004-001.01	1.1686 ppm	0.0335 ppm	2.8700%	2019/09/29 02:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1924	11.9235	16.96	20.41	3.45	50.48	10:30

2	TOC	1.1449	11.4492	16.64	20.28	3.64	50.47	10:26
---	-----	--------	---------	-------	-------	------	-------	-------

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **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	K1908491-003.01 100x	6.1668 ppm	0.0399 ppm	0.6500%	2019/09/29 02:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.1386	61.3863	50.53	54.19	3.66	50.55	10:27
2	TOC	6.1950	61.9505	50.92	54.49	3.58	50.48	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **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	K1908491-004.01 100x	4.8006 ppm	0.0439 ppm	0.9100%	2019/09/29 03:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.8316	48.3160	41.66	45.40	3.74	50.51	10:27
2	TOC	4.7696	47.6958	41.24	44.88	3.64	50.53	10:24

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **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	K1908491-005.01 100x	4.5981 ppm	0.0017 ppm	0.0400%	2019/09/29 03:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.5993	45.9928	40.08	43.61	3.52	50.55	10:28
2	TOC	4.5969	45.9692	40.07	43.68	3.61	50.55	10:24

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.5411 ppm (PASS)	0.0000 ppm	0%	2019/09/29 04:00

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.5411	235.4109	169.26	172.83	3.58	50.54	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 7

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%	2019/09/29 04:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.96	10.49	3.53	50.57	10:34

<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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 29	TOC	K1908754-001.01	1.3679 ppm	0.0216 ppm	1.5800%	2019/09/29 04:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3526	13.5264	18.05	21.74	3.69	50.60	10:26
2	TOC	1.3831	13.8313	18.25	21.85	3.60	50.61	10:30

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.8654 (IC) (v1300)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 30	TOC	K1908714-022.09 doc	2.1610 ppm	0.1135 ppm	5.2500%	2019/09/29 04:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0088	20.0880	22.50	26.11	3.60	50.61	10:31
2	TOC	2.1485	21.4846	23.45	26.98	3.53	50.65	10:27
3	TOC	2.2134	22.1343	23.89	27.49	3.60	50.63	10:25
4	TOC	2.2732	22.7324	24.30	27.82	3.53	50.61	10:29

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.8654 (IC) (v1300)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 31	TOC	K1908714-022.09 ms 4x doc	24.9857 ppm	0.1246 ppm	0.5000%	2019/09/29 05:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	24.9650	249.6495	178.33	181.93	3.61	50.63	10:25
2	TOC	25.0775	250.7751	179.09	182.83	3.74	50.62	10:27
3	TOC	25.0827	250.8266	179.12	182.77	3.65	50.63	10:27
4	TOC	24.8175	248.1749	177.32	181.08	3.76	50.65	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **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	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/29 06:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.83	11.43	3.60	50.65	10:32

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **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	K1908714-023.09 doc	9.1032 ppm	0.0162 ppm	0.1800%	2019/09/29 07:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.1086	91.0860	70.69	74.31	3.62	50.64	10:27
2	TOC	9.0812	90.8120	70.51	74.15	3.64	50.66	10:28
3	TOC	9.1033	91.0329	70.66	74.35	3.69	50.67	10:28
4	TOC	9.1198	91.1979	70.77	74.41	3.64	50.67	10:26

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **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	K1908714-024.09 doc	0.5584 ppm	0.0322 ppm	5.7700%	2019/09/29 07:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6006	6.0057	12.94	16.53	3.59	50.68	10:27
2	TOC	0.5505	5.5048	12.60	16.22	3.62	50.68	10:28
3	TOC	0.5599	5.5991	12.67	16.30	3.63	50.67	10:28
4	TOC	0.5228	5.2278	12.41	15.88	3.47	50.66	10:30

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **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	K1908714-026.09 doc	4.4932 ppm	0.0342 ppm	0.7600%	2019/09/29 08:54

Rep	Base	Adjusted	Baseline	Pressure	Run
-----	------	----------	----------	----------	-----

#	Analysis Type	ppm	µg	(Abs)	NDIR (Abs)	(Abs)	(psig)	Time
1	TOC	4.4995	44.9954	39.41	42.82	3.42	50.67	10:30
2	TOC	4.4624	44.6242	39.16	42.71	3.56	50.67	10:28
3	TOC	4.4721	44.7214	39.22	42.90	3.67	50.66	10:31
4	TOC	4.5387	45.3873	39.67	43.22	3.55	50.66	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **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	K1908714-027.09 doc	1.1416 ppm	0.0208 ppm	1.8200%	2019/09/29 09:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1670	11.6701	16.79	20.40	3.61	50.68	10:28
2	TOC	1.1458	11.4580	16.64	20.24	3.60	50.67	10:27
3	TOC	1.1368	11.3681	16.58	20.23	3.65	50.66	10:28
4	TOC	1.1169	11.1693	16.45	20.06	3.61	50.66	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
37	TOC	K1908802-001.04 doc	4.1264 ppm	0.0500 ppm	1.2100%	2019/09/29 10:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.0834	40.8336	36.58	40.28	3.70	50.66	10:30
2	TOC	4.0840	40.8395	36.59	40.11	3.52	50.64	10:30
3	TOC	4.1594	41.5938	37.10	40.73	3.63	50.65	10:28
4	TOC	4.1790	41.7897	37.23	40.95	3.72	50.64	10:24

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
38	TOC	K1908802-002.04 doc	7.9303 ppm	0.0575 ppm	0.7300%	2019/09/29 11:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.8655	78.6551	62.26	65.80	3.54	50.64	10:28
2	TOC	7.9047	79.0470	62.52	66.18	3.65	50.62	10:29
3	TOC	7.9535	79.5346	62.85	66.64	3.79	50.70	10:23
4	TOC	7.9977	79.9766	63.15	66.89	3.73	50.63	10:25

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◊ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.6660 ppm (PASS)	0.0000 ppm	0%	2019/09/29 12:37

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6660	236.6602	170.11	173.63	3.52	50.61	10:30

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 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◊ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/29 12:52

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.76	10.37	3.60	50.60	10:32

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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/29 13:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.96	9.51	3.55	50.61	10:29
2	TOC	0.0000	0.0000	6.34	10.00	3.66	50.59	10:27
3	TOC	0.0000	0.0000	5.80	9.43	3.63	50.59	10:28
4	TOC	0.0000	0.0000	6.23	9.55	3.33	50.58	10:25

Dilution 1:10
Blank Contribution (TC) 8.8654 (IC) (v1300)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS

From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◊									

C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.1799 ppm (PASS)	0.1223 ppm	0.51%	2019/09/29 14:02	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.3247	243.2468	174.58	178.00	3.43	50.58	10:27
C	TOC	25.0 ppm	2	24.0557	240.5568	172.75	176.37	3.62	50.58	10:27
C	TOC	25.0 ppm	3	24.1052	241.0518	173.09	176.77	3.69	50.58	10:28
C	TOC	25.0 ppm	4	24.2339	242.3393	173.96	177.71	3.75	50.57	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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
40	TOC	K1908802-003.04 doc	0.9652 ppm	0.0272 ppm	2.8200%	2019/09/29 14:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0030	10.0305	15.67	19.13	3.45	50.57	10:28
2	TOC	0.9653	9.6533	15.42	19.00	3.58	50.56	10:25
3	TOC	0.9516	9.5163	15.32	18.95	3.62	50.58	10:30
4	TOC	0.9407	9.4073	15.25	18.93	3.68	50.55	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8654 (IC) (v1300)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
41	TOC	K1908802-004.04 doc	0.6956 ppm	0.0325 ppm	4.6700%	2019/09/29 15:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6717	6.7172	13.42	17.11	3.68	50.56	10:26
2	TOC	0.6638	6.6377	13.37	17.02	3.65	50.56	10:28
3	TOC	0.7268	7.2682	13.80	17.34	3.54	50.56	10:30
4	TOC	0.7202	7.2019	13.75	17.33	3.57	50.54	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8654 (IC) (v1300)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
42	TOC	K1908802-005.04 doc	0.6900 ppm	0.0253 ppm	3.6700%	2019/09/29 16:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6887	6.8867	13.54	17.14	3.60	50.54	10:29
2	TOC	0.7088	7.0885	13.68	17.30	3.63	50.54	10:29

3	TOC	0.7077	7.0767	13.67	17.17	3.50	50.55	10:27
4	TOC	0.6546	6.5464	13.31	16.92	3.61	50.56	10:28

Dilution 1:10
Blank Contribution (TC) 8.8654 (IC) (v1300)
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	K1908802-008.04 doc	0.5987 ppm	0.0174 ppm	2.9000%	2019/09/29 17:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5989	5.9895	12.93	16.51	3.58	50.59	10:27
2	TOC	0.5774	5.7744	12.78	16.43	3.65	50.59	10:25
3	TOC	0.6200	6.2002	13.07	16.64	3.57	50.58	10:25
4	TOC	0.5985	5.9851	12.93	16.52	3.59	50.61	10:24

Dilution 1:10
Blank Contribution (TC) 8.8654 (IC) (v1300)
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	K1908802-009.04 doc	3.8040 ppm	0.0438 ppm	1.1500%	2019/09/29 18:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.7457	37.4571	34.29	37.96	3.67	50.61	10:29
2	TOC	3.8048	38.0478	34.69	38.29	3.59	50.62	10:29
3	TOC	3.8516	38.5163	35.01	38.47	3.46	50.63	10:28
4	TOC	3.8139	38.1391	34.75	38.37	3.62	50.62	10:26

Dilution 1:10
Blank Contribution (TC) 8.8654 (IC) (v1300)
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	K1908802-011.04 doc	0.7525 ppm	0.0185 ppm	2.4600%	2019/09/29 19:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7743	7.7426	14.12	17.65	3.52	50.65	10:30
2	TOC	0.7595	7.5953	14.02	17.57	3.55	50.65	10:24
3	TOC	0.7449	7.4494	13.92	17.55	3.62	50.68	10:25
4	TOC	0.7314	7.3139	13.83	17.45	3.62	50.69	10:26

Dilution 1:10
Blank Contribution (TC) 8.8654 (IC) (v1300)
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	K1908802-014.04 doc	0.8208 ppm	0.0164 ppm	2.0000%	2019/09/29 20:32

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

1	TOC	0.8280	8.2803	14.49	18.17	3.68	50.71	10:29
2	TOC	0.7964	7.9636	14.27	17.86	3.58	50.71	10:29
3	TOC	0.8267	8.2671	14.48	18.12	3.64	50.73	10:25
4	TOC	0.8320	8.3201	14.51	17.94	3.43	50.73	10:30

Dilution 1:10
Blank Contribution (TC) 8.8654 (IC) (v1300)
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	K1908802-015.04 doc	0.8409 ppm	0.0286 ppm	3.4000%	2019/09/29 21:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8246	8.2464	14.46	18.10	3.64	50.77	10:26
2	TOC	0.8777	8.7768	14.82	18.37	3.55	50.75	10:28
3	TOC	0.8484	8.4836	14.62	17.99	3.37	50.79	10:28
4	TOC	0.8130	8.1300	14.38	17.93	3.54	50.81	10:26

Dilution 1:10
Blank Contribution (TC) 8.8654 (IC) (v1300)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.0947 ppm (PASS)	0.0000 ppm	0%	2019/09/29 22:24

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.0947	230.9471	166.23	169.88	3.66	50.84	10:33

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 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/29 22:38

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.64	9.32	3.68	50.85	10:31

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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
48	TOC	K1908802-017.04 doc	0.7321 ppm	0.0239 ppm	3.2700%	2019/09/29 22:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7461	7.4612	13.93	17.48	3.55	50.85	10:29
2	TOC	0.7446	7.4465	13.92	17.45	3.53	50.87	10:27
3	TOC	0.7413	7.4126	13.90	17.60	3.71	50.88	10:26
4	TOC	0.6963	6.9633	13.59	17.20	3.60	50.88	10:25

Dilution

1:10

Blank Contribution(TC) 8.8654 (IC)
(v1300)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
49	TOC	K1908802-018.04 doc	1.1014 ppm	0.0232 ppm	2.1100%	2019/09/29 23:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0780	10.7803	16.18	19.75	3.57	50.91	10:30
2	TOC	1.1328	11.3284	16.56	19.95	3.40	50.90	10:31
3	TOC	1.0922	10.9218	16.28	19.73	3.45	50.92	10:28
4	TOC	1.1026	11.0264	16.35	19.78	3.43	50.91	10:29

Dilution

1:10

Blank Contribution(TC) 8.8654 (IC)
(v1300)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
50	TOC	K1908802-019.04 doc	0.4967 ppm	0.0174 ppm	3.5000%	2019/09/30 00:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4812	4.8124	12.13	15.67	3.53	50.91	10:30
2	TOC	0.4821	4.8212	12.14	15.77	3.63	50.90	10:24
3	TOC	0.5131	5.1306	12.35	15.79	3.45	50.93	10:29
4	TOC	0.5104	5.1041	12.33	15.87	3.54	50.95	10:28

Dilution

1:10

Blank Contribution(TC) 8.8654 (IC)
(v1300)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
51	TOC	K1908802-020.04 doc	0.5235 ppm	0.0193 ppm	3.6800%	2019/09/30 01:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5004	5.0039	12.26	15.78	3.52	50.96	10:29

2	TOC	0.5287	5.2868	12.45	16.05	3.60	50.95	10:30
3	TOC	0.5185	5.1851	12.39	15.89	3.50	50.99	10:29
4	TOC	0.5465	5.4650	12.58	16.16	3.59	50.97	10:30

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
52	TOC	K1908802-022.04 doc	1.4025 ppm	0.0300 ppm	2.1400%	2019/09/30 02:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3615	13.6148	18.11	21.68	3.58	51.00	10:27
2	TOC	1.4337	14.3366	18.60	22.14	3.54	51.03	10:26
3	TOC	1.4079	14.0788	18.42	21.95	3.53	51.03	10:29
4	TOC	1.4070	14.0700	18.42	21.99	3.57	51.04	10:26

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
53	TOC	K1908714-022.08	2.7362 ppm	0.2302 ppm	8.4100%	2019/09/30 03:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4038	24.0377	25.18	28.89	3.70	51.04	10:28
2	TOC	2.7628	27.6279	27.62	31.01	3.39	51.04	10:27
3	TOC	2.8664	28.6635	28.32	31.84	3.52	51.05	10:29
4	TOC	2.9119	29.1187	28.63	32.15	3.52	51.04	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
54	TOC	K1908714-022.08 ms 4x	25.0279 ppm	0.0798 ppm	0.3200%	2019/09/30 04:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.1201	251.2008	179.38	183.00	3.62	51.05	10:31
2	TOC	25.0293	250.2933	178.76	182.32	3.56	51.04	10:28
3	TOC	25.0370	250.3699	178.82	182.57	3.76	51.04	10:24
4	TOC	24.9253	249.2532	178.06	181.67	3.61	51.03	10:27

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
55	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/30 05:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.74	10.29	3.55	51.07	10:32

Dilution 1:10
Blank Contribution (TC) 8.8654 (IC) (v1300)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
56	TOC	K1908714-023.08	9.0020 ppm	0.0441 ppm	0.4900%	2019/09/30 05:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.0472	90.4717	70.28	73.90	3.63	51.05	10:28
2	TOC	8.9424	89.4242	69.57	73.11	3.55	51.06	10:30
3	TOC	9.0005	90.0047	69.96	73.63	3.67	51.06	10:29
4	TOC	9.0178	90.1785	70.08	73.83	3.75	51.08	10:29

Dilution 1:10
Blank Contribution (TC) 8.8654 (IC) (v1300)
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	K1908714-024.08	0.4320 ppm	0.0507 ppm	11.7500%	2019/09/30 06:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5025	5.0245	12.28	15.88	3.60	51.08	10:28
2	TOC	0.4298	4.2982	11.78	15.33	3.55	51.08	10:26
3	TOC	0.4124	4.1244	11.66	15.30	3.64	51.09	10:29
4	TOC	0.3833	3.8327	11.47	15.11	3.65	51.18	10:29

Dilution 1:10
Blank Contribution (TC) 8.8654 (IC) (v1300)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	22.8404 ppm (PASS)	0.0000 ppm	0%	2019/09/30 07:29

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	22.8404	228.4043	164.50	168.07	3.57	51.09	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 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◊ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/30 07:44

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.62	9.30	3.67	51.07	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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/30 07:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.75	8.43	3.68	51.07	10:27
2	TOC	0.0000	0.0000	5.35	9.01	3.66	51.08	10:25
3	TOC	0.0000	0.0000	4.96	8.66	3.70	51.07	10:27
4	TOC	0.0000	0.0000	4.80	8.54	3.74	51.04	10:30

Dilution 1:10
Blank Contribution (TC) 8.8654 (IC) (v1300)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS

From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◊ C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	23.3622 ppm (PASS)	0.0567 ppm	0.24%	2019/09/30 08:54

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	23.2831	232.8313	167.51	171.16	3.65	51.05	10:27
C	TOC	25.0 ppm	2	23.4162	234.1616	168.41	171.98	3.57	51.04	10:27
C	TOC	25.0 ppm	3	23.3655	233.6548	168.07	171.75	3.69	51.02	10:26
C	TOC	25.0 ppm	4	23.3840	233.8404	168.19	171.80	3.61	51.00	10:26

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

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
59	TOC	K1908714-026.08	4.4625 ppm	0.0605 ppm	1.3600%	2019/09/30 09:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.5178	45.1781	39.53	43.16	3.63	50.99	10:27
2	TOC	4.3762	43.7624	38.57	42.25	3.68	50.97	10:27
3	TOC	4.4807	44.8069	39.28	42.82	3.54	50.96	10:26
4	TOC	4.4752	44.7523	39.24	42.72	3.48	50.93	10:32

Dilution

1:10

Blank Contribution(TC) 8.8654 (IC)
(v1300)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
60	TOC	K1908714-027.08	1.0228 ppm	0.0174 ppm	1.7000%	2019/09/30 10:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0000	9.9995	15.65	19.30	3.65	50.91	10:30
2	TOC	1.0416	10.4165	15.94	19.38	3.45	50.91	10:29
3	TOC	1.0218	10.2176	15.80	19.21	3.41	50.89	10:32
4	TOC	1.0278	10.2780	15.84	19.37	3.53	50.87	10:26

Dilution

1:10

Blank Contribution(TC) 8.8654 (IC)
(v1300)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
61	TOC	K1908714-029.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/09/30 11:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.10	9.68	3.58	50.85	10:26
2	TOC	0.0000	0.0000	6.11	9.61	3.51	50.84	10:28
3	TOC	0.0000	0.0000	6.11	9.66	3.55	50.84	10:31
4	TOC	0.0000	0.0000	6.16	9.50	3.35	50.83	10:29

Dilution

1:10

Blank Contribution(TC) 8.8654 (IC)
(v1300)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
62	TOC	K1908802-001.03	4.0381 ppm	0.0567 ppm	1.4000%	2019/09/30 12:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9571	39.5711	35.73	39.31	3.58	50.79	10:25
2	TOC	4.0418	40.4182	36.30	39.90	3.60	50.80	10:26
3	TOC	4.0697	40.6966	36.49	39.93	3.44	50.78	10:27
4	TOC	4.0837	40.8366	36.58	40.08	3.50	50.77	10:29

DilutionBlank ContributionMethodCalibration

1:10 (TC) 8.8654 (IC) CAS_salt_010711 CAS_salt_010711
(v1300) (v4) (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
63	TOC	K1908802-002.03	7.9429 ppm	0.0271 ppm	0.3400%	2019/09/30 13:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.9100	79.1000	62.56	66.07	3.52	50.75	10:31
2	TOC	7.9328	79.3284	62.71	66.38	3.67	50.73	10:29
3	TOC	7.9716	79.7158	62.98	66.41	3.44	50.70	10:28
4	TOC	7.9570	79.5700	62.88	66.41	3.53	50.67	10:28

Dilution 1:10 Blank Contribution (TC) 8.8654 (IC) (v1300) 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	K1908802-003.03	0.9130 ppm	0.0177 ppm	1.9400%	2019/09/30 14:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8979	8.9786	14.96	18.49	3.53	50.65	10:27
2	TOC	0.9331	9.3307	15.20	18.77	3.57	50.61	10:26
3	TOC	0.8983	8.9830	14.96	18.50	3.54	50.59	10:24
4	TOC	0.9226	9.2261	15.13	18.56	3.43	50.58	10:28

Dilution 1:10 Blank Contribution (TC) 8.8654 (IC) (v1300) 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	K1908802-004.03	0.5541 ppm	0.0231 ppm	4.1600%	2019/09/30 15:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5577	5.5770	12.65	16.12	3.47	50.57	10:26
2	TOC	0.5850	5.8495	12.84	16.31	3.47	50.57	10:27
3	TOC	0.5324	5.3236	12.48	16.04	3.56	50.57	10:27
4	TOC	0.5415	5.4149	12.54	16.10	3.56	50.56	10:28

Dilution 1:10 Blank Contribution (TC) 8.8654 (IC) (v1300) 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	K1908802-005.03	0.5819 ppm	0.0248 ppm	4.2700%	2019/09/30 16:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6175	6.1751	13.06	16.42	3.36	50.56	10:26
2	TOC	0.5804	5.8039	12.81	16.32	3.51	50.56	10:24
3	TOC	0.5642	5.6418	12.70	16.29	3.59	50.55	10:25

4	TOC	0.5657	5.6565	12.70	16.27	3.56	50.56	10:30
<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>		<u>Calibration</u>		
1:10		(TC) 8.8654 (IC) (v1300)		CAS_salt_010711 (v4)		CAS_salt_010711 (v30)		

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.6831 ppm (PASS)	0.0000 ppm	0%	2019/09/30 17:16

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.6831	236.8310	170.22	173.76	3.53	50.56	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 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/09/30 17:31

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.56	9.14	3.58	50.55	10:33

<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 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 67	TOC	K1908802-008.03	0.5729 ppm	0.0236 ppm	4.1200%	2019/09/30 17:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5913	5.9129	12.88	16.52	3.65	50.56	10:29
2	TOC	0.5901	5.9011	12.87	16.45	3.58	50.56	10:30
3	TOC	0.5695	5.6948	12.73	16.15	3.42	50.55	10:28
4	TOC	0.5409	5.4090	12.54	16.20	3.66	50.57	10:29

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 8.8654 (IC)	CAS_salt_010711	CAS_salt_010711

(v1300)

(v4)

(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
68	TOC	K1908802-009.03	3.8658 ppm	0.0240 ppm	0.6200%	2019/09/30 18:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.8482	38.4824	34.99	38.59	3.61	50.56	10:30
2	TOC	3.8665	38.6651	35.11	38.67	3.56	50.57	10:25
3	TOC	3.8490	38.4898	34.99	38.61	3.62	50.58	10:26
4	TOC	3.8995	38.9951	35.34	38.88	3.54	50.60	10:29

Dilution

1:10

Blank Contribution(TC) 8.8654 (IC)
(v1300)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
69	TOC	K1908802-010.03	1.4332 ppm	0.0359 ppm	2.5000%	2019/09/30 19:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4273	14.2733	18.55	22.16	3.61	50.62	10:28
2	TOC	1.4855	14.8552	18.95	22.52	3.57	50.64	10:27
3	TOC	1.4076	14.0759	18.42	22.14	3.72	50.65	10:24
4	TOC	1.4123	14.1230	18.45	22.05	3.60	50.68	10:29

Dilution

1:10

Blank Contribution(TC) 8.8654 (IC)
(v1300)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
70	TOC	K1908802-011.03	0.6701 ppm	0.0152 ppm	2.2600%	2019/09/30 20:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6894	6.8940	13.55	17.16	3.61	50.69	10:29
2	TOC	0.6720	6.7202	13.43	16.98	3.55	50.71	10:25
3	TOC	0.6661	6.6613	13.39	16.82	3.44	50.72	10:29
4	TOC	0.6529	6.5287	13.30	16.83	3.54	50.74	10:23

Dilution

1:10

Blank Contribution(TC) 8.8654 (IC)
(v1300)MethodCAS_salt_010711
(v4)CalibrationCAS_salt_010711
(v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
71	TOC	K1908802-013.03	0.4016 ppm	0.0235 ppm	5.8600%	2019/09/30 21:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3734	3.7340	11.40	15.11	3.71	50.75	10:25
2	TOC	0.4079	4.0787	11.63	15.03	3.40	50.77	10:27
3	TOC	0.4297	4.2968	11.78	15.17	3.38	50.78	10:28
4	TOC	0.3954	3.9535	11.55	15.11	3.56	50.81	10:30

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
72	TOC	K1908802-015.03	0.6605 ppm	0.0201 ppm	3.0500%	2019/09/30 22:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6428	6.4285	13.23	16.85	3.63	50.83	10:28
2	TOC	0.6863	6.8631	13.52	16.94	3.41	50.84	10:25
3	TOC	0.6666	6.6657	13.39	16.78	3.39	50.83	10:26
4	TOC	0.6462	6.4624	13.25	16.72	3.47	50.86	10:23

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **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	K1908802-017.03	0.6642 ppm	0.0170 ppm	2.5600%	2019/09/30 23:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6658	6.6583	13.38	16.87	3.48	50.88	10:28
2	TOC	0.6736	6.7364	13.44	17.04	3.60	50.89	10:31
3	TOC	0.6775	6.7747	13.46	17.06	3.59	50.89	10:24
4	TOC	0.6398	6.3976	13.21	16.74	3.54	50.91	10:26

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
74	TOC	K1908802-018.03	0.8862 ppm	0.0305 ppm	3.4400%	2019/10/01 00:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8621	8.6206	14.72	18.27	3.55	50.91	10:25
2	TOC	0.8758	8.7576	14.81	18.43	3.62	50.93	10:29
3	TOC	0.9309	9.3086	15.18	18.63	3.44	50.92	10:27
4	TOC	0.8762	8.7620	14.81	18.45	3.63	50.95	10:30

Dilution 1:10 **Blank Contribution** (TC) 8.8654 (IC) (v1300) **Method** CAS_salt_010711 (v4) **Calibration** CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
75	TOC	K1908802-019.03	0.4572 ppm	0.0202 ppm	4.4100%	2019/10/01 01:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4381	4.3807	11.84	15.43	3.59	50.96	10:28
2	TOC	0.4419	4.4191	11.86	15.46	3.59	50.97	10:28

3	TOC	0.4781	4.7815	12.11	15.47	3.36	50.97	10:28
4	TOC	0.4706	4.7063	12.06	15.50	3.44	50.97	10:24
Dilution		Blank Contribution		Method	Calibration			
1:10		(TC) 8.8654 (IC) (v1300)		CAS_salt_010711 (v4)	CAS_salt_010711 (v30)			

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	22.8422 ppm (PASS)	0.0000 ppm	0%	2019/10/01 02:07

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	22.8422	228.4220	164.51	168.00	3.49	50.99	10:30

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

Sample Type: Check Standard --> CCB From Schedule Version 7

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/01 02:22

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.09	8.59	3.50	51.00	10:27

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
v1299	1.0837	0.9200	0.0000	0.0000	0.0000	2019/09/26 14:18	Fusion1 (Fusion1)
v1300	1.7457	1.2940	0.0000	0.0000	0.0000	2019/09/28 14:15	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	2019/10/01 02:37



Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1927206; 1927207

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2294 (248518)

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

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

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 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 1927207002/07/10 were analyzed and reported from 1:10 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 675448) was less than 1/2 the CRDL. The recovery for the LCS (675449) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on sample 1927206001 (Client ID: LH18/24-SP650_091719_AIX). 3.0 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 – 675446) is reported from the analysis of the Laboratory Control Sample (LCS – 675449) 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) along with datafiles 20SEPD13/23. Field samples 1927207006/09 had positive results for perchlorate. However, because the 83/85 ion ratio failed, these results were not reported.

Thomas Bosch September 26, 2019
Analyst Date



ANALYTICAL REPORT

Report Date: October 01, 2019

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

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1927206**

Project ID: HS19090804

Purchase Order: HS19090804

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_091719_AIX	1927206001	09/17/19	09/21/19	



ANALYTICAL REPORT

Workorder: 34-1927206

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: LH18/24-SP650_091719_AIX	Sampling Site: NA	Collected: 09/17/2019				
Lab ID: 1927206001	Media: 125 mL Nalgene	Received: 09/21/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2294 (HBN: 248518) Analyzed: 09/25/2019 09:33	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 09/26/2019 12:48	/S/ Stephen Brose 10/01/2019 11:46

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123Phone: (801) 266-7700
Email: als@alst.com
Web: www.alst.com



ANALYTICAL REPORT

Workorder: 34-1927206

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

00952633

Analysis Information

Workorder: 1927206

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2294 (HBN: 248518)
Analyzed By: Thomas Bosch

Blank

LMB: 675448 Analyzed: 09/25/2019 09:19 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 675449 Analyzed: 09/25/2019 08:52 Dilution: 1 Units: ug/L					
Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	3.01	3.00	100	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1927206001 Analyzed: 09/25/2019 09:33 Dilution: 1 Units: ug/L			MS: 675450 Analyzed: 09/25/2019 09:47 Dilution: 1 Units: ug/L				MSD: 675451 Analyzed: 09/25/2019 10:01 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Perchlorate	ND	2.81	3	93.6	78.8 123.8	2.86	95.2	1.73	0.0 20.0	

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

Analyst	Peer Review
/S/ Thomas Bosch 09/26/2019 12:51	/S/ Stephen Brose 10/01/2019 11:46

Symbols and Definitions

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

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



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

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: Dept of Defense

COC ID: 12185

SUBCONTRACT TO:

1927206

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: HS19090804
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19090804-02	LH18/24-SP650_091719_AIX	Groundwater	17 Sep 2019 14:00
	SUB_Perch-6850		02 Oct 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: [Signature]
Received By: [Signature]
Cooler ID(s): 9890

Date/Time: 9/18/19 1800
Date/Time: 9/21/19 915
Temperature(s): 2°

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

A27206

Client Name: ALS Houston Project/Task/Site: _____

Date/Time of Receipt: 9/21/19 1915 Number of Coolers Received: 1

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	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH - 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 <u>1890</u>	<u>2</u> °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Meredith Plunsky Signature Meredith Plunsky Printed Name 9/21/2019 Date

CLIENT-RELATED INFORMATION

- | | | | |
|---|--|---|--|
| <input type="checkbox"/> Missing Cooler
<input type="checkbox"/> Cooler Conditions
<input type="checkbox"/> Missing Paperwork
<input type="checkbox"/> Missing/Incorrect Bottle Labels | <input type="checkbox"/> Missing Samples/Bottles
<input type="checkbox"/> Broken/Leaking Samples
<input type="checkbox"/> Incorrect Bottle Type
<input type="checkbox"/> Cooler Temperatures Out of Range | <input type="checkbox"/> Incorrect Preservation
<input type="checkbox"/> pH Criteria Not Met
<input type="checkbox"/> Residual Chlorine Present
<input type="checkbox"/> Head Space in Bottles | <input type="checkbox"/> Insufficient Sample Volume
<input type="checkbox"/> Chain of Custody Problems
<input type="checkbox"/> Other: |
|---|--|---|--|

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 # 159469-434 RITZ EXP 06/20 *

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

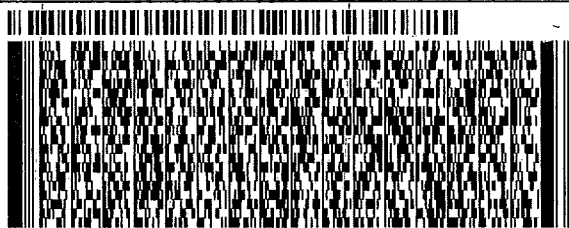
SHIP DATE: 20SEP19
ACTWGT: 41.45 LB
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN
BILL THIRD PARTY

TO **SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE**

SALT LAKE CITY UT 84123

(801) 266-7700

REF: HS19090804/860/962/964 - RJ



**FedEx
Express**



J11111806050100

TRK# 1251 0289 7452
0201

**SATURDAY 12:00P
PRIORITY OVERNIGHT**

XO BTFA

**84123
UT-US SLC**



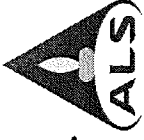


**ALS Environmental
CHAIN-OF-CUSTODY**

Project / Job / Task: HS19090804			Workorder ID: 1927206			Level: ENV_LVL4			Requested Analysis		
Client: ALS Environmental (Houston)			Account: 8101			Type: 125Poly					
Comments:						Preservatives					
						COOL					
						Containers					
						ID(s)					
						Count					
						A			1		
						Matrix			Water		
						Lab ID			1927206001		
						Sample ID			LH18/24-SP650_091719_AIX		
1			09/17/2019 14:00								
2											
3											
4											
5											
6											
7											
8											
9											
10											

EPA 6850.D.D.D QSM

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:
<i>Julie Warratt</i>	09/21/2019 09:15	ALS Sample Receiving	Storage LVL4 ANALYSIS				
<i>R.33.1</i>	09/24/19 16:00	<i>T. Burch</i>					



Batch Worklist

HBN: 248518



Instrument:

Status: WP

Created: 9/25/2019 07:49

Analyst: T. Bosch

Batch: ELMs/ 2294
 Rule: EPA 6850, DoD QSM Water

Workorder: 1927206 [ENV_LVL4]
 Workorder: 1927207 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	675445	CCV for HBN 248518 [ELMS/2294]				CCV	3		E685041C3Q	5311		10/3/2019	
2	675446	RLVS for HBN 248518 [ELMS/2294]				RLVS	3		E685041C3Q	5311		10/3/2019	
3	675447	ICS for HBN 248518 [ELMS/2294]				ICS	3		E6850..D3Q	5311		10/3/2019	
4	675448	LMB for HBN 248518 [ELMS/2294]				LMB	3		E6850Q413Q	5311		10/3/2019	
5	675449	LCS for HBN 248518 [ELMS/2294]				LCS	3		E6850Q413Q	5311		10/3/2019	
6	1927206001	LH18/24-SP650_091719_AIX				SAMPLE	3	1927206001-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
7	675450	LH18/24-SP650...(1927206001MS)				MS	3		E6850Q413Q	5311		10/3/2019	
8	675451	LH18/24-SP65...(1927206001MSD)				MSD	3		E6850Q413Q	5311		10/3/2019	
9	1927207001	16WW14-190916				SAMPLE	3	1927207001-A	E6850Q41.3	5480	10/14/2019	10/3/2019	
10	1927207002	16WW16-190916				SAMPLE	3	1927207002-A	E6850Q41.3	5480	10/14/2019	10/3/2019	
11	1927207003	16WW36-190916				SAMPLE	3	1927207003-A	E6850Q41.3	5480	10/14/2019	10/3/2019	
12	1927207004	16WW42-190916				SAMPLE	3	1927207004-A	E6850Q41.3	5480	10/14/2019	10/3/2019	
13	1927207005	16WW22-190917				SAMPLE	3	1927207005-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
14	1927207006	16WW41-190917				SAMPLE	3	1927207006-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
15	1927207007	16WW39-190917				SAMPLE	3	1927207007-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
16	1927207008	16WW56-190917				SAMPLE	3	1927207008-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
17	1927207009	16WW40-190917				SAMPLE	3	1927207009-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
18	675452	CCV for HBN 248518 [ELMS/2294]				CCV	3		E685041C3Q	5311		10/3/2019	
19	1927207010	16WW55-190917				SAMPLE	3	1927207010-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
20	1927207011	16WW43-190917				SAMPLE	3	1927207011-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
21	1927207012	16WW23-190917				SAMPLE	3	1927207012-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
22	1927207013	16WW24-190917				SAMPLE	3	1927207013-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
23	1927207014	16WW27-190917				SAMPLE	3	1927207014-A	E6850Q41.3	5480	10/15/2019	10/3/2019	
24	675453	CCV for HBN 248518 [ELMS/2294]				CCV	3		E685041C3Q	5311		10/3/2019	

92 of 100



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #()'s: 1927206 (001); 1927207 (001-14)
 ELMS Batch/HBN ID: 2294 (248518)
 Prep Date: 09/24/2019 Analysis Date: 09/25/2019 Analyst: T. Bosch
 Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
 Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\SEP\25SEP19D.s
 Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

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

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/5%ACN (B&J Lot DU461-US)/0.1% glacial acetic acid (JT-Baker Lot 122550).
 Eluent B1: 95% ACN (B&J Lot DU461-US)/5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 122550).

STANDARDS: Internal Standard Spiking Solution Horizon# 47863. Dilutions of Working Standards (Horizon: 49947/48) used for ICAL, CCV's, RLVS and ICS.

CALIBRATION CURVE: Used curve from 09/20/2019, sequence 20SEP19D.s Offline Quantitation Method: CLO4-DP3.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.

Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 8 Injection Volume: 30µL
 Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1 Run time: 12.0min.

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 3.0µL of QC Solution Horizon ID 47516 was used for LCS 675449; Target = 3.0µg/L. ASTM type II water was used for LMB 675448.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1927206001 (Client ID: LH18/24-SP650_091719_AIX). 3.0µl of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters. Field samples 1927207002/07/10 were analyzed and reported from 1:10 dilutions. The reporting limits have been adjusted accordingly. Field samples 1927207006/09 had positive results for perchlorate. However, because the 83/85 ion ratio failed, these results were not reported.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\SEP\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\248518-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATA\REVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 675446) is reported from the analysis of the Laboratory Control Sample (LCS – 675449) at a level of 3.0µg/L.
- 6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafiles 25SEP13/23.

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. 2294 HBN: 248518</u>		
Sample Set IDs if Applicable: <u>WU^S 1927206/1927207</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



S 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

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/NCSS 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



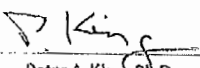
ISO Guide 34 Reference Material

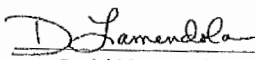
Product Number: ICC-013
Lot Number: CP-0860

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



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

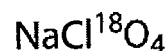
Catalog Number: OLM-7310-S

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 13485, ISO 14001, 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	
*	675445	CCV@25	Vial 71	1	Control	1	1.52149e6	7.621	25.90224
*	675449	QC@3.0	Vial 72	1	Control	2	2.08955e5	7.664	3.01179
*	675447	ICS@3.0	Vial 73	1	Control	3	1.50319e5	7.482	2.88825
*	675448	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1927206001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	675450	272061S	Vial 76	1	Sample	6	1.39320e5	7.385	2.80679
*	675451	272061D	Vial 77	1	Sample	7	1.44537e5	7.383	2.85574
*	1927207001		Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1927207002	10X	Vial 79	1	Sample	9	2.98854e6	7.478	460.20446
*	1927207003		Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1927207004		Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1927207005		Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1927207006		Vial 83	1	Sample	13	1.88187e6	6.100	31.07390
*	1927207007	10X	Vial 84	1	Sample	14	6.93117e5	7.335	133.87397
*	1927207008		Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1927207009		Vial 86	1	Sample	16	1.11064e5	6.770	2.02579
*	675452	CCV@25	Vial 71	1	Control	17	1.27962e6	7.772	24.90310
*	1927207010	10X	Vial 87	1	Sample	18	2.74935e6	7.426	477.50326
*	1927207011		Vial 88	1	Sample	19	0.00000	0.000	0.00000
*	1927207012		Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	1927207013		Vial 90	1	Sample	21	0.00000	0.000	0.00000
*	1927207014		Vial 91	1	Sample	22	0.00000	0.000	0.00000
*	1927207006	MS-25	Vial 61	1	Sample	23	2.73287e6	6.121	46.55394
*	675453	CCV@25	Vial 71	1	Control	24	1.22155e6	7.794	25.00337

N.R. NOT REPORTED/FAILS 83/85 ION RATIO

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
*	675445	CCV@25	Vial 71	1	Control	1	1.99964e5	7.645	5.00000
*	675449	QC@3.0	Vial 72	1	Control	2	2.55289e5	7.691	5.00000
*	675447	ICS@3.0	Vial 73	1	Control	3	1.91396e5	7.499	5.00000
*	675448	LMB	Vial 74	1	Control	4	2.07016e5	7.793	5.00000
*	1927206001		Vial 75	1	Sample	5	1.87714e5	7.354	5.00000
*	675450	272061S	Vial 76	1	Sample	6	1.82459e5	7.412	5.00000
*	675451	272061D	Vial 77	1	Sample	7	1.86097e5	7.399	5.00000
*	1927207001		Vial 78	1	Sample	8	1.65317e5	7.285	5.00000
*	1927207002	10X	Vial 79	1	Sample	9	2.03978e5	7.497	50.00000
*	1927207003		Vial 80	1	Sample	10	1.67627e5	6.803	5.00000
*	1927207004		Vial 81	1	Sample	11	1.77077e5	7.239	5.00000
*	1927207005		Vial 82	1	Sample	12	1.82948e5	7.234	5.00000
*	1927207006		Vial 83	1	Sample	13	2.01848e5	6.105	5.00000
*	1927207007	10X	Vial 84	1	Sample	14	1.85568e5	7.362	50.00000
*	1927207008		Vial 85	1	Sample	15	1.84103e5	7.282	5.00000
*	1927207009		Vial 86	1	Sample	16	2.00027e5	6.810	5.00000
*	675452	CCV@25	Vial 71	1	Control	17	1.75644e5	7.785	5.00000
*	1927207010	10X	Vial 87	1	Sample	18	1.79651e5	7.448	50.00000
*	1927207011		Vial 88	1	Sample	19	1.92432e5	7.645	5.00000
*	1927207012		Vial 89	1	Sample	20	1.72716e5	7.183	5.00000
*	1927207013		Vial 90	1	Sample	21	1.74006e5	7.201	5.00000
*	1927207014		Vial 91	1	Sample	22	1.67770e5	7.044	5.00000
*	1927207006	MS-25	Vial 61	1	Sample	23	1.84010e5	6.106	5.00000
*	675453	CCV@25	Vial 71	1	Control	24	1.66933e5	7.808	5.00000

TB 9.26.19

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
*	675445	CCV@25	Vial 71	1	Control	1	4.75826e5	7.629	26.51372
*	675449	QC@3.0	Vial 72	1	Control	2	6.60079e4	7.698	3.02994
*	675447	ICS@3.0	Vial 73	1	Control	3	5.41931e4	7.494	3.32936
*	675448	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	1927206001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	675450 272061S	Vial 76	1	Sample	6	4.84273e4	7.404	3.11348
*	675451 272061D	Vial 77	1	Sample	7	4.86841e4	7.381	3.06706
*	1927207001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1927207002 10X	Vial 79	1	Sample	9	8.89517e5	7.494	453.30278
*	1927207003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1927207004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1927207005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1927207006	Vial 83	1	Sample	13	4.80235e5	6.116	26.51007
*	1927207007 10X	Vial 84	1	Sample	14	2.18926e5	7.354	137.66095
*	1927207008	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1927207009	Vial 86	1	Sample	16	1.33981e4	6.772	6.69602e-1
*	675452 CCV@25	Vial 71	1	Control	17	3.93113e5	7.793	25.07225
*	1927207010 10X	Vial 87	1	Sample	18	8.19119e5	7.441	470.94700
*	1927207011	Vial 88	1	Sample	19	0.00000	0.000	0.00000
*	1927207012	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	1927207013	Vial 90	1	Sample	21	0.00000	0.000	0.00000
*	1927207014	Vial 91	1	Sample	22	0.00000	0.000	0.00000
*	1927207006 MS-25	Vial 61	1	Sample	23	7.47216e5	6.137	42.62658
*	675453 CCV@25	Vial 71	1	Control	24	3.69756e5	7.817	24.83520

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	675445	CCV@25	CLO4-AQN	1		Ctrl Samp
2	Vial 72	675449	QC@3.0	CLO4-AQN	1		Ctrl Samp
3	Vial 73	675447	ICS@3.0	CLO4-AQN	1		Ctrl Samp
4	Vial 74	675448	LMB	CLO4-AQN	1		Ctrl Samp
5	Vial 75	1927206001		CLO4-AQN	1		Sample
6	Vial 76	675450	272061S	CLO4-AQN	1		Sample
7	Vial 77	675451	272061D	CLO4-AQN	1		Sample
8	Vial 78	1927207001		CLO4-AQN	1		Sample
9	Vial 79	1927207002	10X	CLO4-AQN	1		Sample
10	Vial 80	1927207003		CLO4-AQN	1		Sample
11	Vial 81	1927207004		CLO4-AQN	1		Sample
12	Vial 82	1927207005		CLO4-AQN	1		Sample
13	Vial 83	1927207006		CLO4-AQN	1		Sample
14	Vial 84	1927207007	10X	CLO4-AQN	1		Sample
15	Vial 85	1927207008		CLO4-AQN	1		Sample
16	Vial 86	1927207009		CLO4-AQN	1		Sample
17	Vial 71	675452	CCV@25	CLO4-AQN	1		Ctrl Samp
18	Vial 87	1927207010	10X	CLO4-AQN	1		Sample
19	Vial 88	1927207011		CLO4-AQN	1		Sample
20	Vial 89	1927207012		CLO4-AQN	1		Sample
21	Vial 90	1927207013		CLO4-AQN	1		Sample
22	Vial 91	1927207014		CLO4-AQN	1		Sample
23	Vial 61	1927207006	MS-25	CLO4-AQN	1		Sample
24	Vial 71	675453	CCV@25	CLO4-AQN	1		Ctrl Samp

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD01.D

Sample Name: 675445 CCV@25

Injection Date: 9/25/2019 08:33:38

Seq Line: 1

Sample Name: 675445 CCV@25

Location: Vial 71

Acq Operator: TNB

Inj. No.: 1

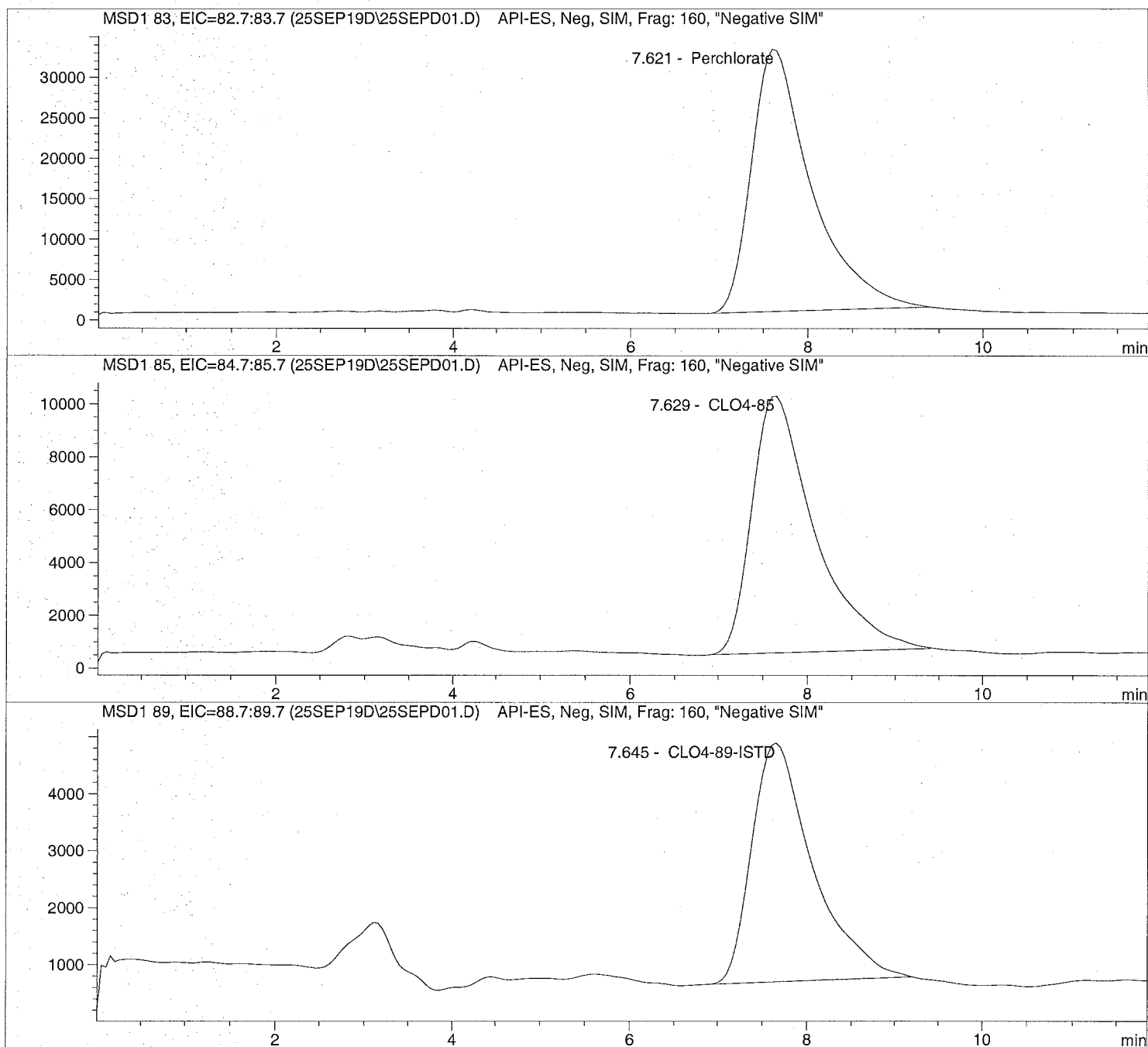
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD01.D Sample Name: 675445 CCV@25

Injection Date: 9/25/2019 08:33:38 Seq Line: 1
 Sample Name: 675445 CCV@25 Location: Vial 71
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

Sample Information

Sorted By: Signal
 Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
 Multiplier: 1.000000
 Dilution: 1.000000
 Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.621	PBA	1521492.5	25.9022	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.629	PBA	475825.5	26.5137	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.645	PBA	199964.0	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD02.D

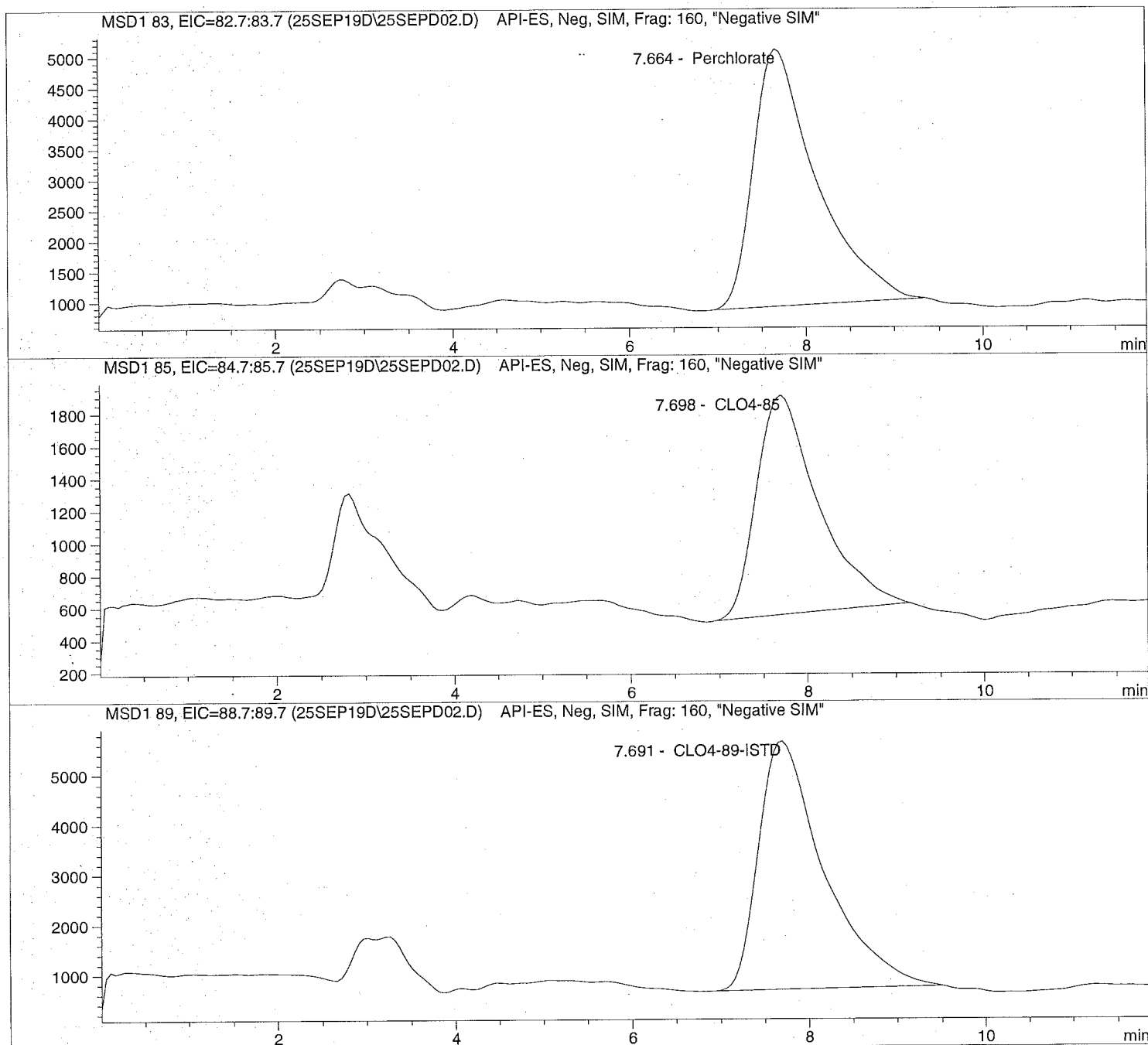
Sample Name: 675449 QC@3.0

Injection Date: 9/25/2019 08:52:05
Sample Name: 675449 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: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD02.D Sample Name: 675449 QC@3.0

=====
 Injection Date: 9/25/2019 08:52:05 Seq Line: 2
 Sample Name: 675449 QC@3.0 Location: Vial 72
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

=====
 Sample Information
 =====

Sorted By: Signal
 Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
 Multiplier: 1.000000
 Dilution: 1.000000
 Sample Amount: 3.000

=====
 LCMS Results
 =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.664	PBA	208955.0	3.0118	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.698	PBA	66007.9	3.0299	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.691	PBA	255289.4	5.0000	CLO4-89-ISTD

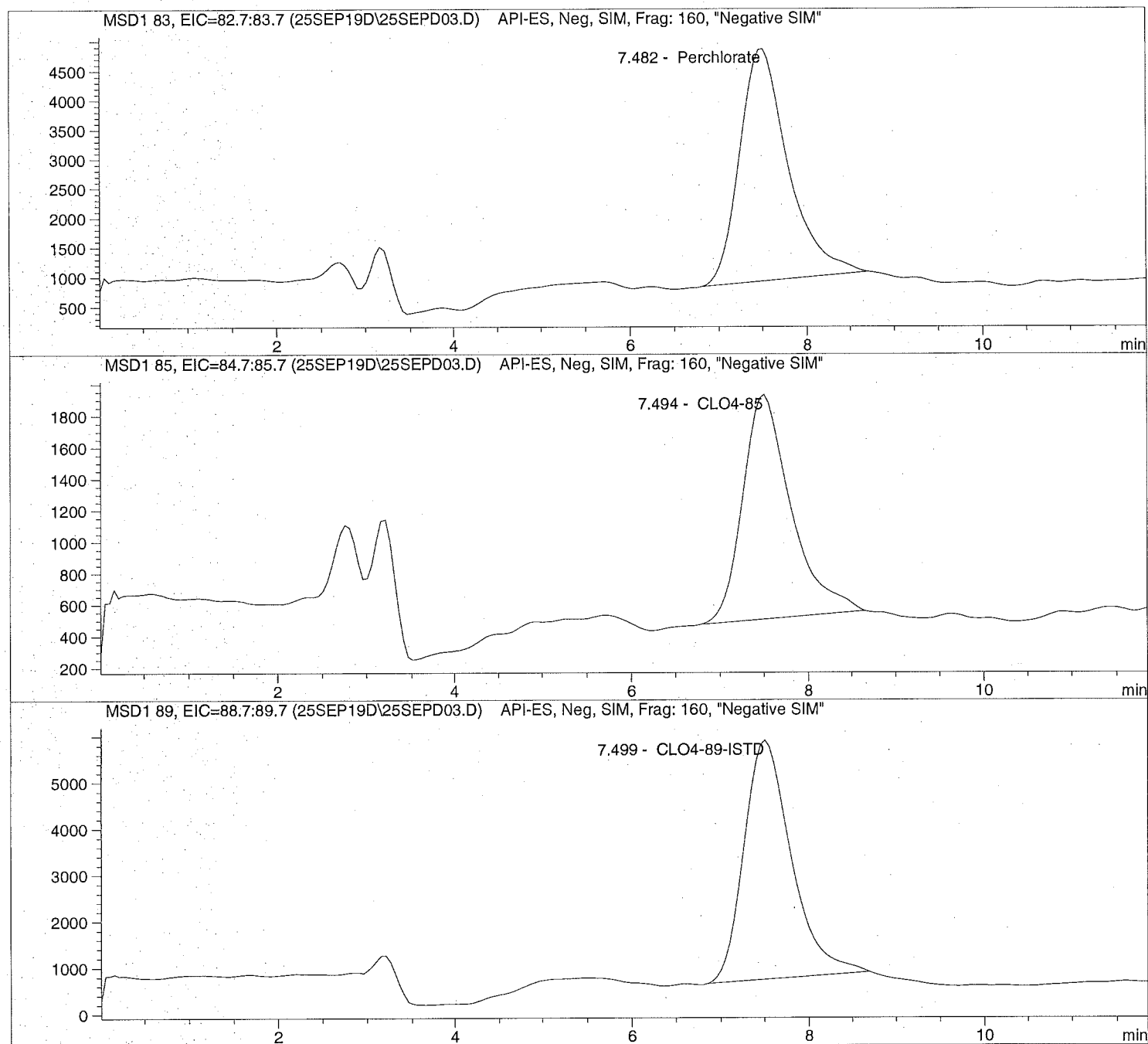
=====
 *** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD03.D Sample Name: 675447 ICS@3.0

=====
Injection Date: 9/25/2019 09:05:53 Seq Line: 3
Sample Name: 675447 ICS@3.0 Location: Vial 73
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 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\25SEP19D\25SEPD03.D Sample Name: 675447 ICS@3.0

```

=====
Injection Date: 9/25/2019 09:05:53 Seq Line: 3
Sample Name: 675447 ICS@3.0 Location: Vial 73
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 3.000

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.482	PBA	150319.5	2.8883	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.494	BBA	54193.1	3.3294	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.499	PBA	191395.7	5.0000	CLO4-89-ISTD

```

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

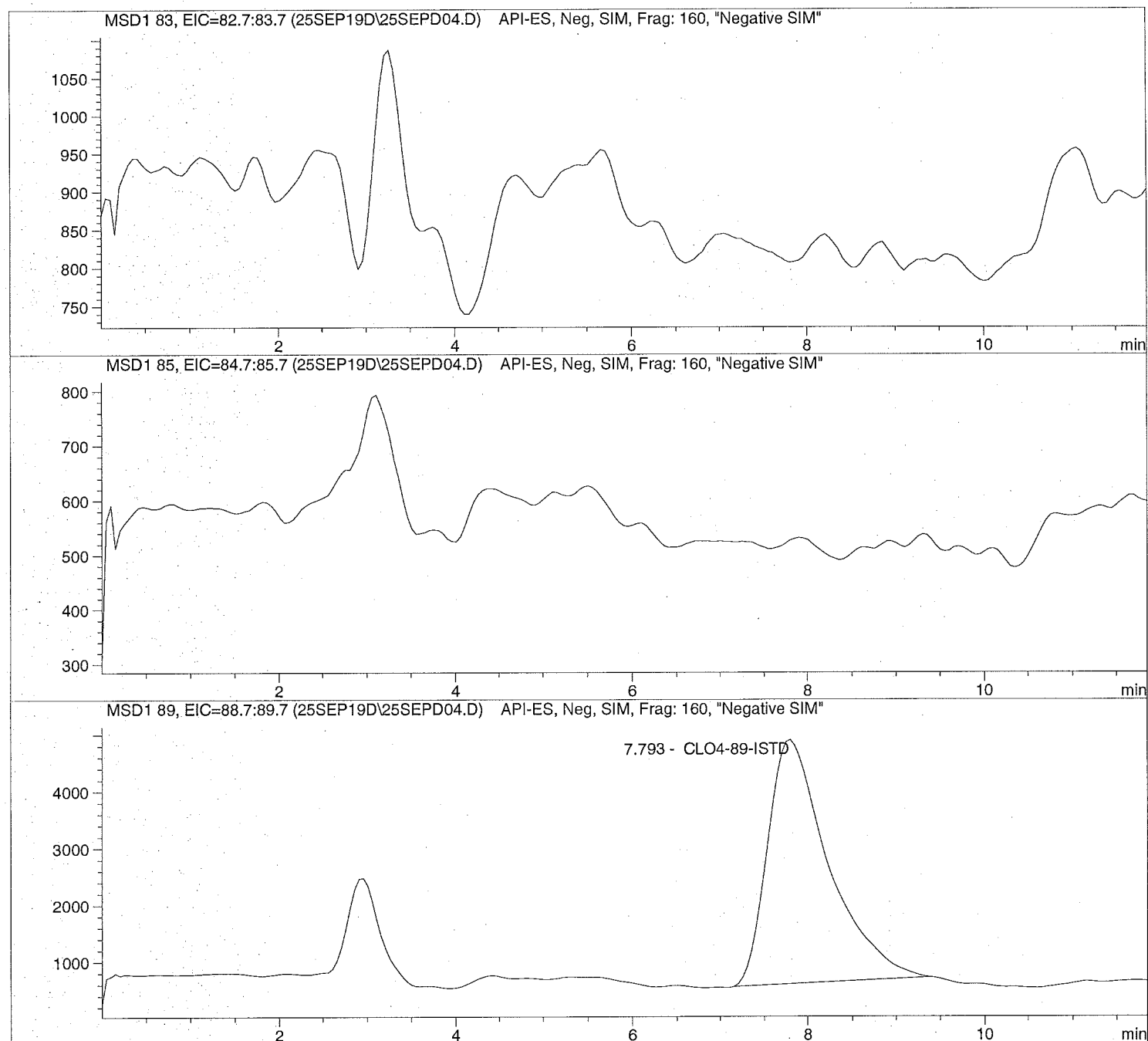
```

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD04.D Sample Name: 675448 LMB

=====
Injection Date: 9/25/2019 09:19:44 Seq Line: 4
Sample Name: 675448 LMB Location: Vial 74
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 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\25SEP19D\25SEPD04.D Sample Name: 675448 LMB

```

=====
Injection Date: 9/25/2019 09:19:44 Seq Line: 4
Sample Name: 675448 LMB Location: Vial 74
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl
  
```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11
  
```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	207016.0	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD05.D

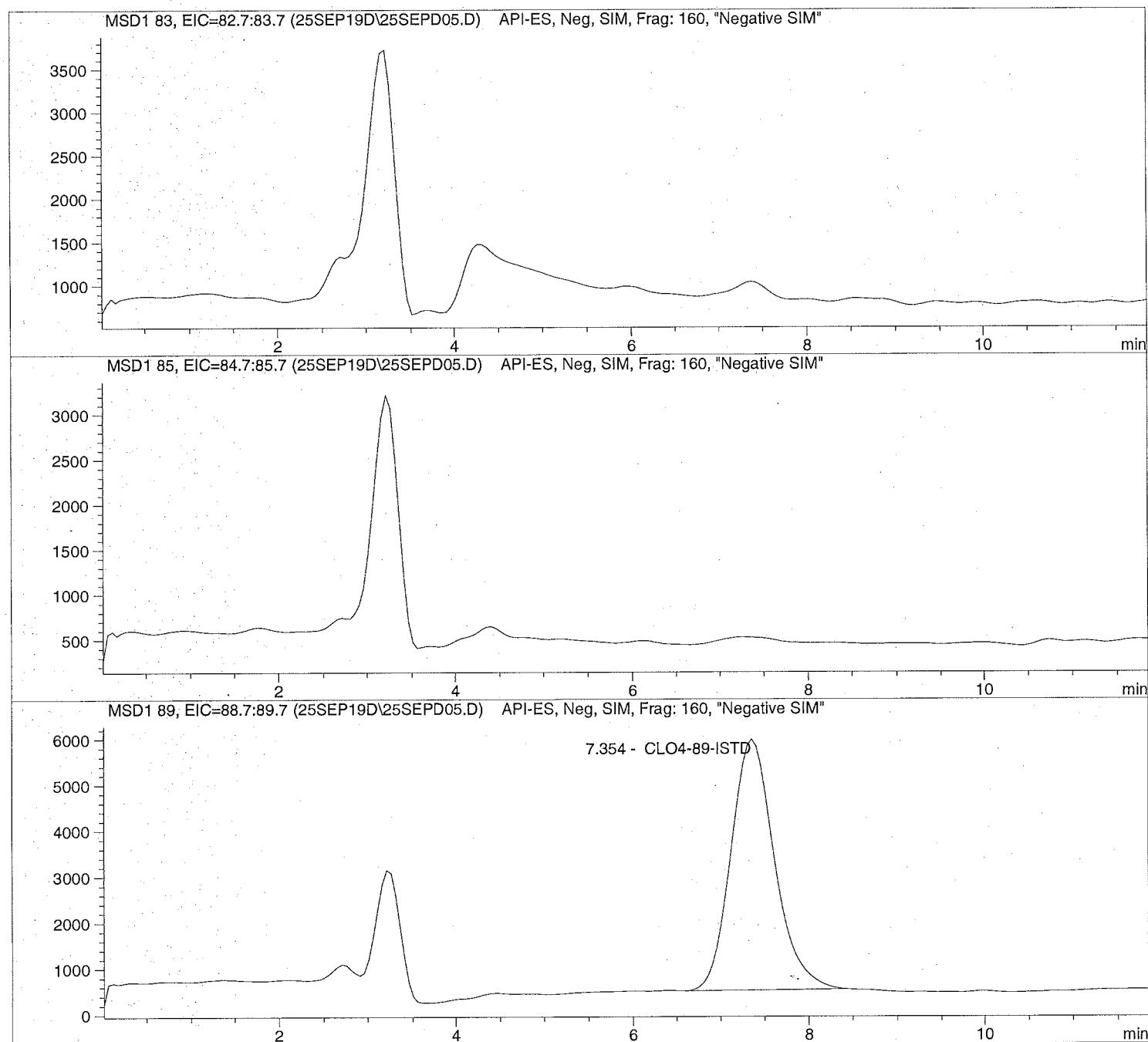
Sample Name: 1927206001

Injection Date: 9/25/2019 09:33:36
Sample Name: 1927206001
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 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEP05.D Sample Name: 1927206001

```

=====
Injection Date: 9/25/2019 09:33:36      Seq Line: 5
Sample Name: 1927206001                Location: Vial 75
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.354	PBA	187714.1	5.0000	CLO4-89-ISTD

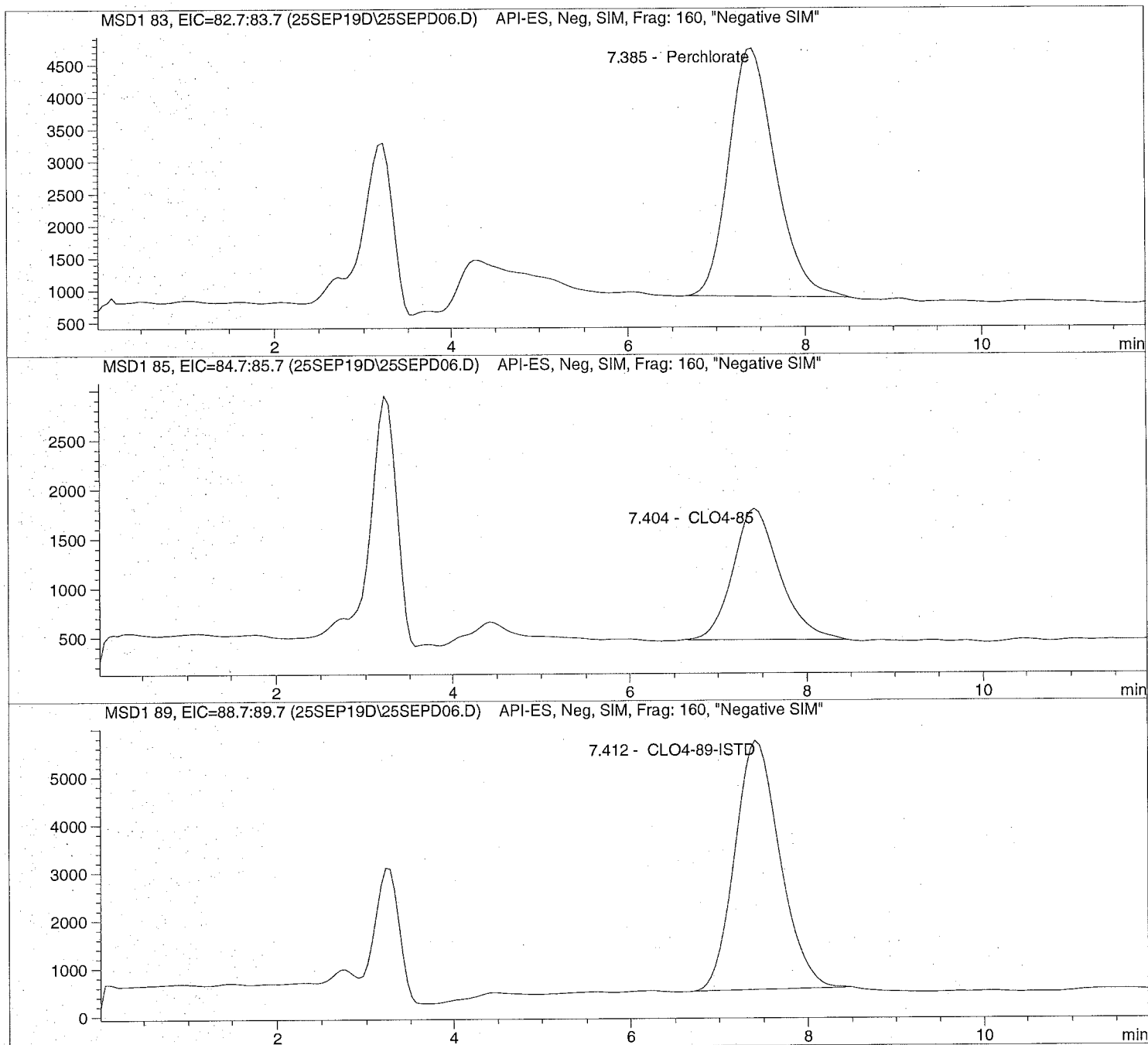
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD06.D Sample Name: 675450 272061S

Injection Date: 9/25/2019 09:47:24 Seq Line: 6
Sample Name: 675450 272061S Location: Vial 76
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD06.D Sample Name: 675450 272061S

=====
 Injection Date: 9/25/2019 09:47:24 Seq Line: 6
 Sample Name: 675450 272061S Location: Vial 76
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

=====
 Sample Information
 =====

Sorted By: Signal
 Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
 Multiplier: 1.000000
 Dilution: 1.000000
 Sample Amount: 0.000

=====
 LCMS Results
 =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.385	PBA	139320.0	2.8068	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.404	BBA	48427.3	3.1135	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.412	PBA	182458.8	5.0000	CLO4-89-ISTD

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

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD07.D

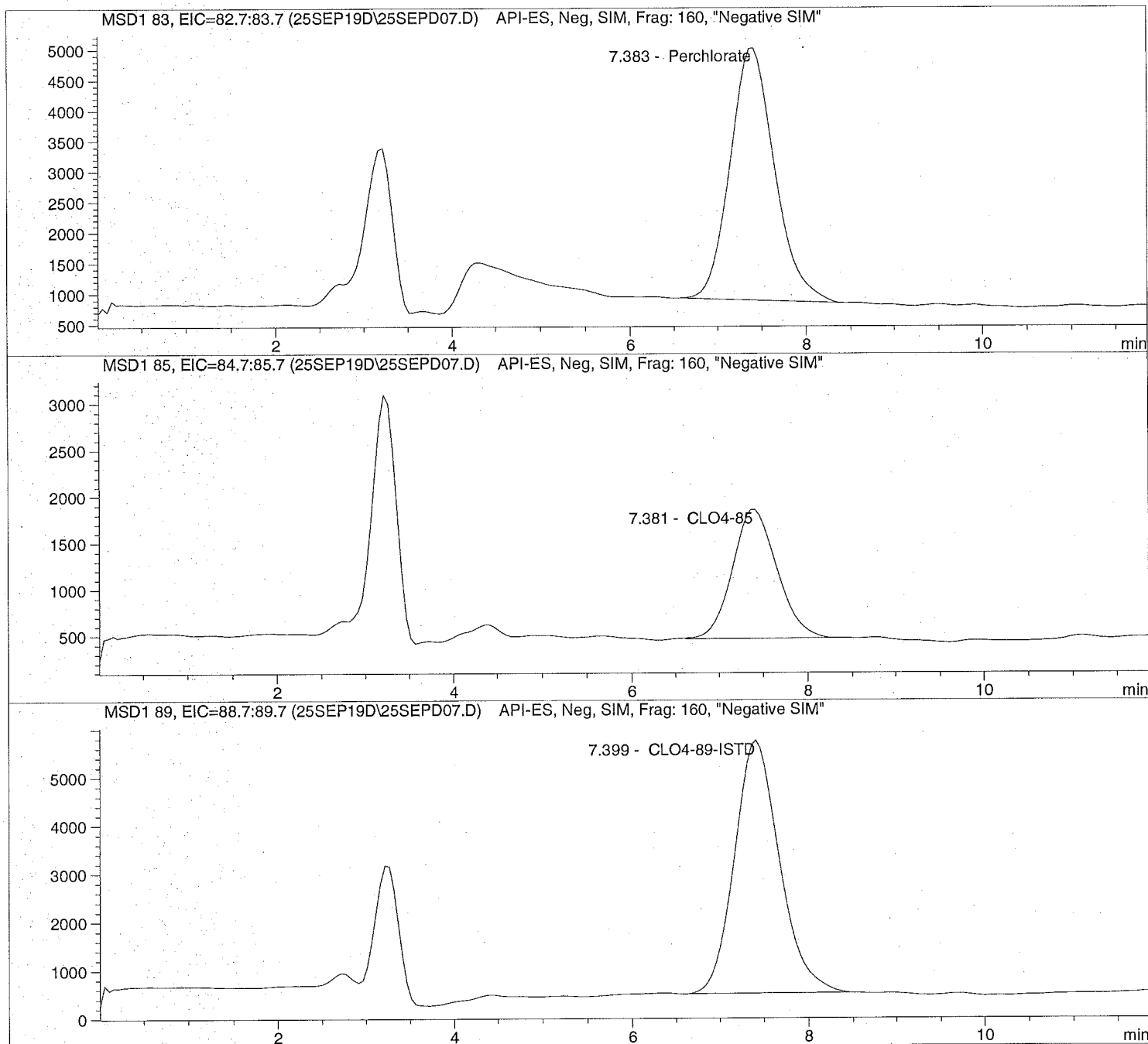
Sample Name: 675451 272061D

Injection Date: 9/25/2019 10:01:16
Sample Name: 675451 272061D
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: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD07.D Sample Name: 675451 272061D

```

=====
Injection Date: 9/25/2019 10:01:16      Seq Line:            7
Sample Name:    675451    272061D            Location:            Vial 77
Acq Operator:   TNB                        Inj. No.:            1
                                             Inj. Vol.:            30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:27:11
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:                    Signal
Calib. Data Modified:       Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:                  1.000000
Dilution:                    1.000000
Sample Amount:               0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.383	PBA	144537.4	2.8557	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.381	BBA	48684.1	3.0671	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.399	PBA	186097.0	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD08.D

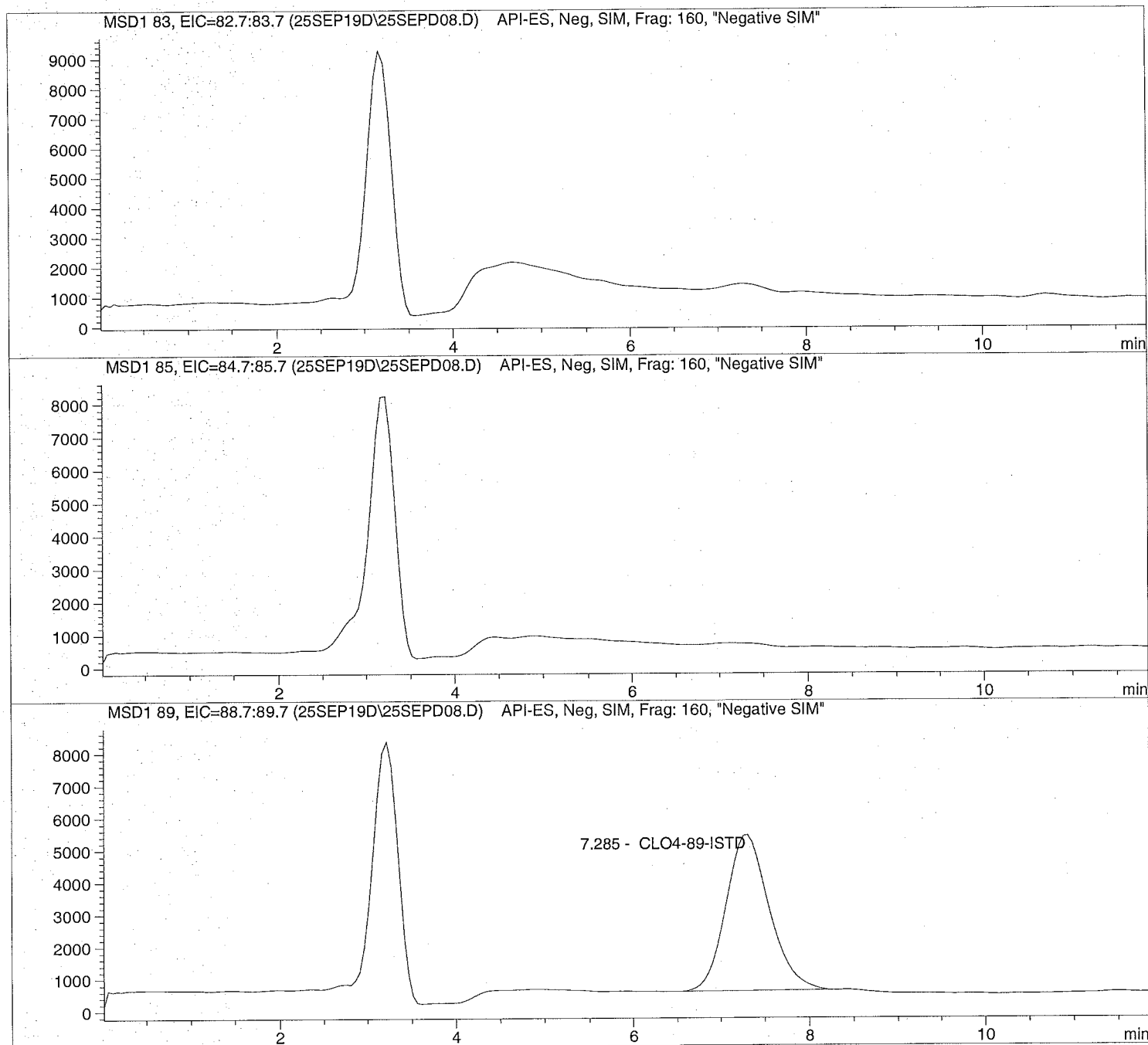
Sample Name: 1927207001

Injection Date: 9/25/2019 10:15:04
Sample Name: 1927207001
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: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD08.D Sample Name: 1927207001

```

=====
Injection Date:  9/25/2019  10:15:04      Seq Line:                    8
Sample Name:    1927207001                Location:                    Vial 78
Acq Operator:   TNB                        Inj. No.:                    1
                                          Inj. Vol.:                   30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019  12:27:11
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:                    Signal
Calib. Data Modified:       Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:                  1.000000
Dilution:                    1.000000
Sample Amount:                0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.285	PBA	165317.4	5.0000	CLO4-89-ISTD

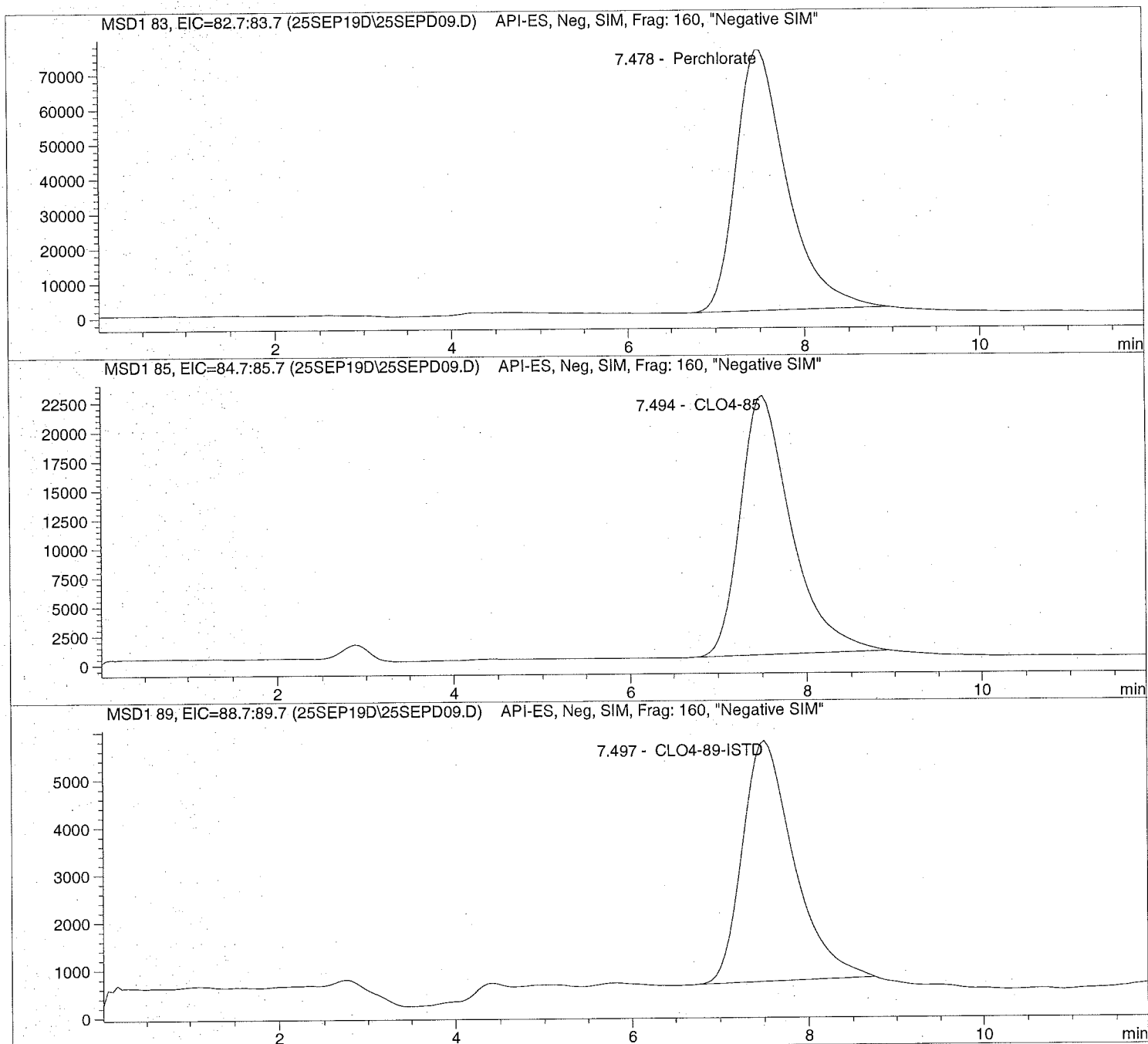
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD09.D Sample Name: 1927207002 10X

=====
Injection Date: 9/25/2019 10:28:51 Seq Line: 9
Sample Name: 1927207002 10X Location: Vial 79
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD09.D Sample Name: 1927207002 10X

```

=====
Injection Date:  9/25/2019  10:28:51          Seq Line:      9
Sample Name:    1927207002  10X              Location:      Vial 79
Acq Operator:   TNB                          Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019  12:27:11
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      10.000000
Sample Amount: 0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.478	PBA	2988541.8	460.2045	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.494	PBA	889516.5	453.3028	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.497	PBA	203977.8	50.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD10.D

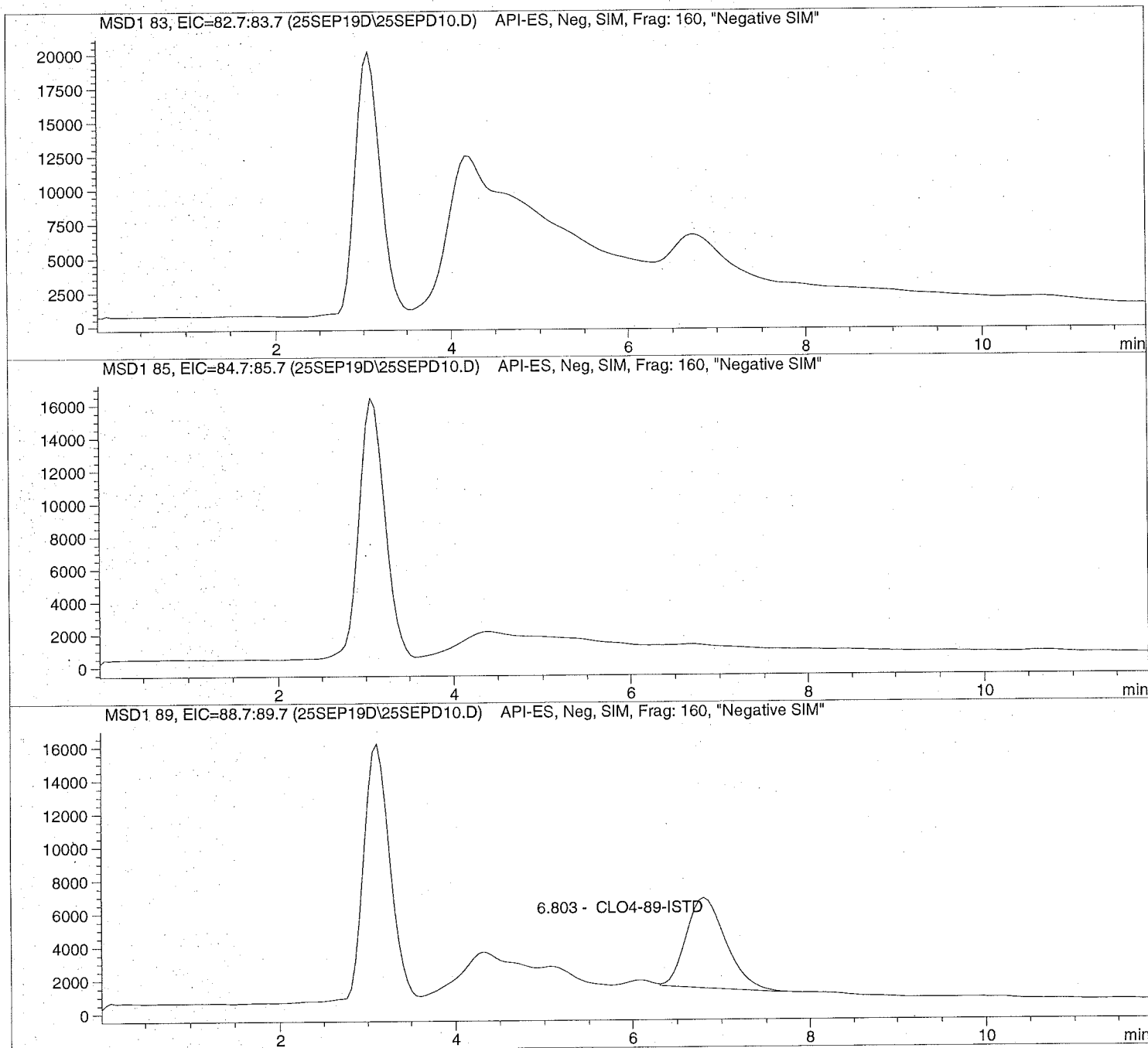
Sample Name: 1927207003

Injection Date: 9/25/2019 10:42:41
Sample Name: 1927207003
Acq Operator: TNB

Seq Line: 10
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 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD10.D Sample Name: 1927207003

```

=====
Injection Date: 9/25/2019 10:42:41      Seq Line: 10
Sample Name: 1927207003      Location: Vial 80
Acq Operator: TNB      Inj. No.: 1
                                 Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.803	BBA	167627.2	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD11.D

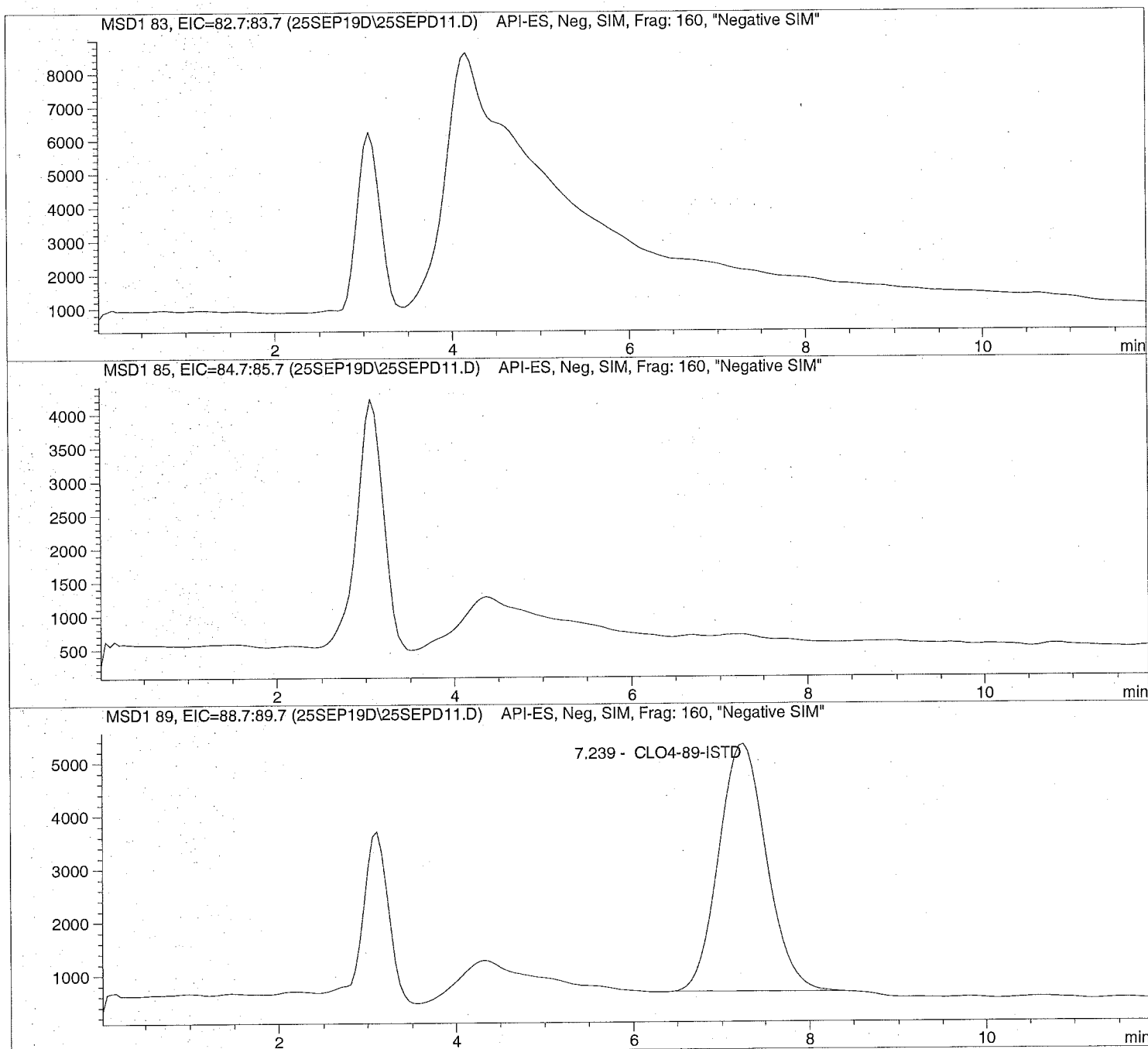
Sample Name: 1927207004

Injection Date: 9/25/2019 10:56:29
Sample Name: 1927207004
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD11.D Sample Name: 1927207004

```

=====
Injection Date: 9/25/2019 10:56:29 Seq Line: 11
Sample Name: 1927207004 Location: Vial 81
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl
  
```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11
  
```

Perchlorate analysis

Sample Information

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.239	PBA	177076.9	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD12.D

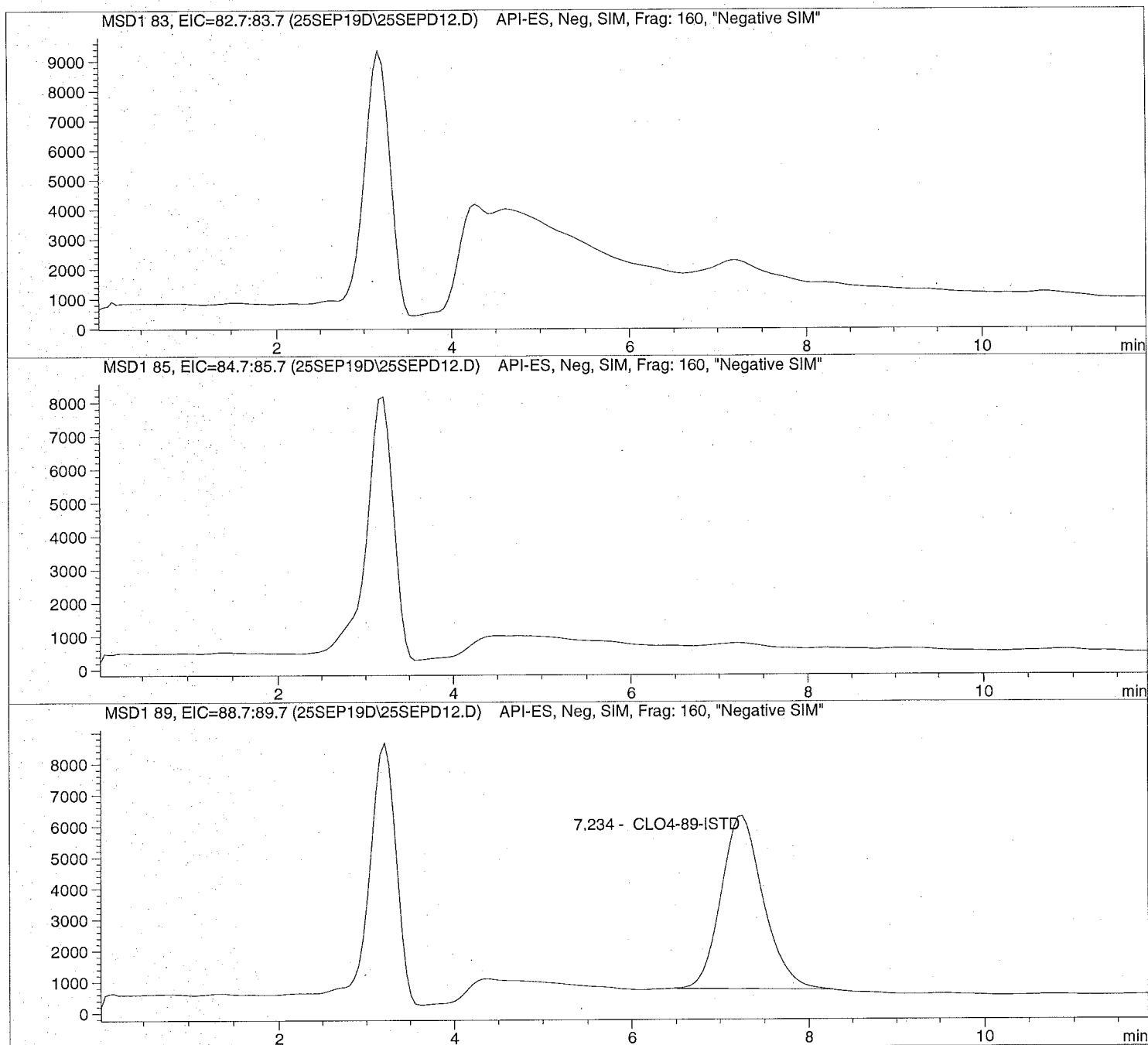
Sample Name: 1927207005

Injection Date: 9/25/2019 11:10:17
Sample Name: 1927207005
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: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD12.D Sample Name: 1927207005

```

=====
Injection Date: 9/25/2019 11:10:17      Seq Line:      12
Sample Name:    1927207005              Location:      Vial 82
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:27:11
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.234	BBA	182947.6	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD13.D

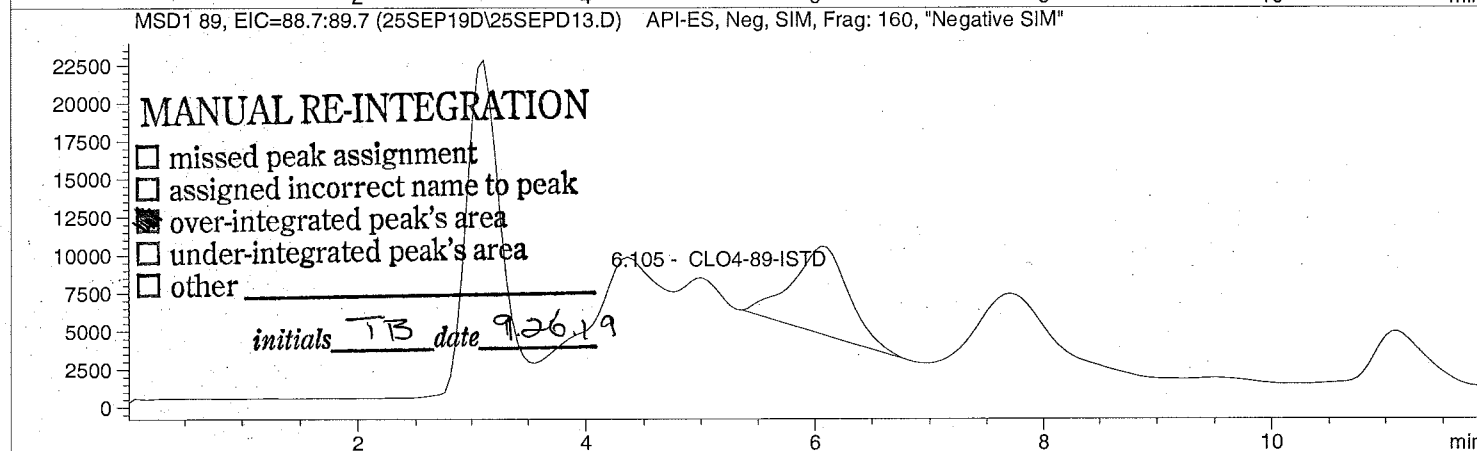
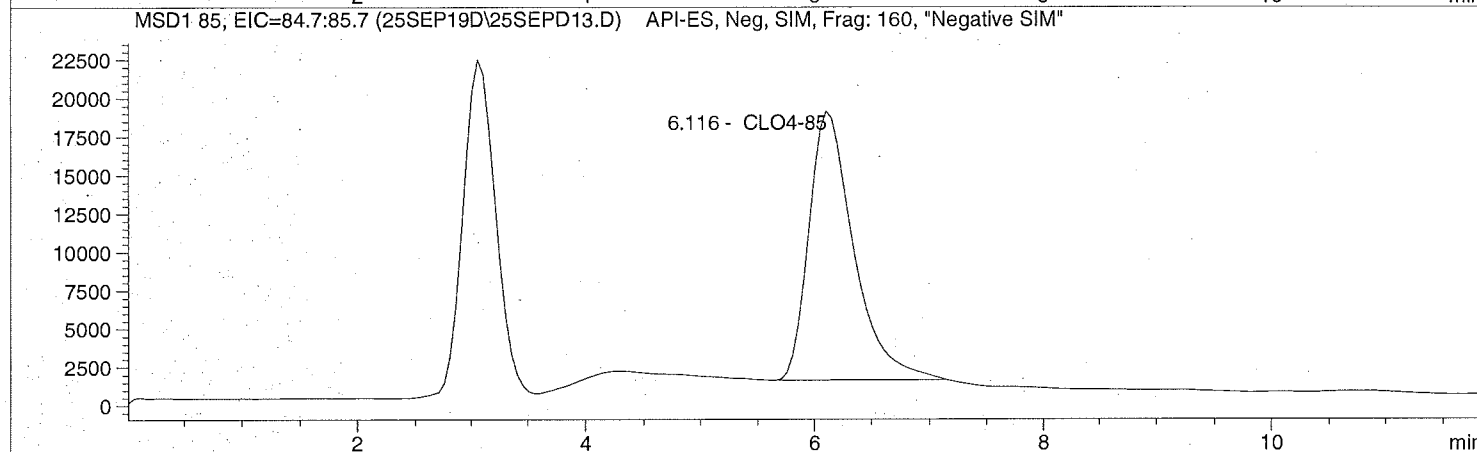
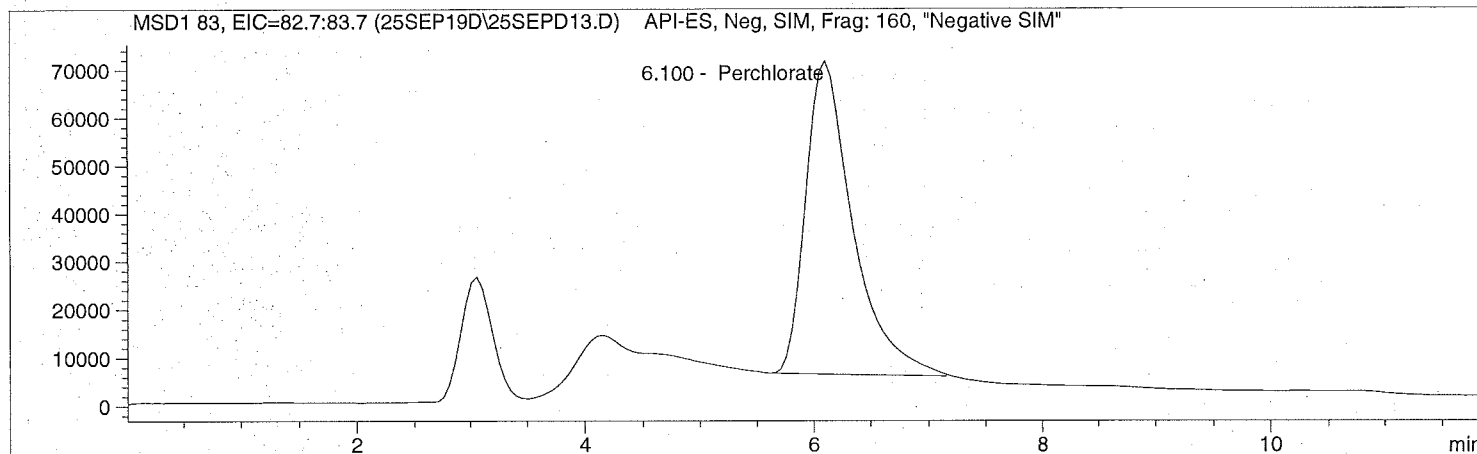
Sample Name: 1927207006

Injection Date: 9/25/2019 11:24:03
 Sample Name: 1927207006
 Acq Operator: TNB

Seq Line: 13
 Location: Vial 83
 Inj. No.: 1
 Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEP13.D Sample Name: 1927207006

```

=====
Injection Date: 9/25/2019 11:24:03      Seq Line:      13
Sample Name:    1927207006              Location:      Vial 83
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:27:11
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.100	BBA	1881866.3	31.0739	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.116	PBA	480234.9	26.5101	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.105	MM	201847.6	5.0000	CLO4-89-ISTD

```

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

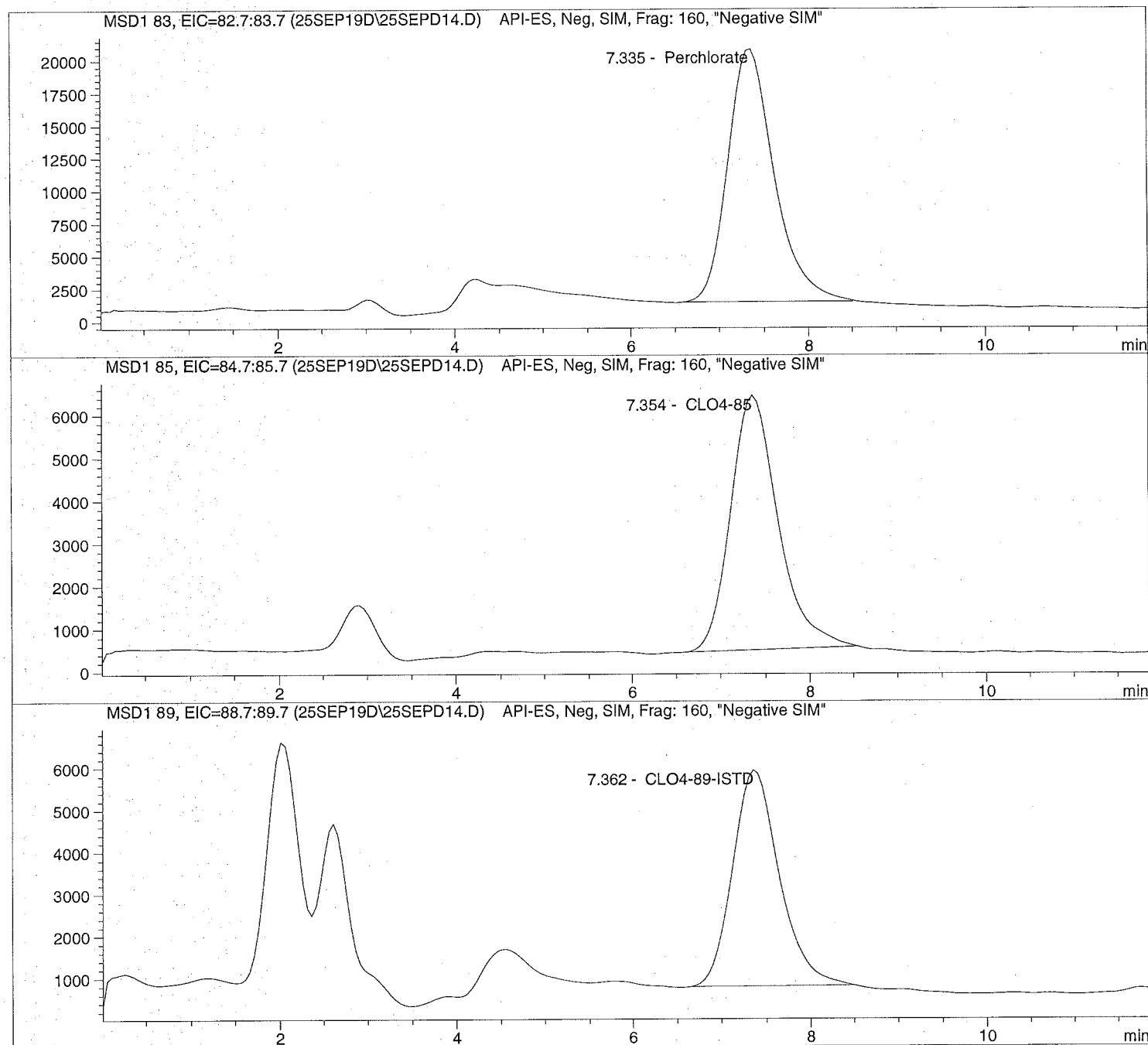
```

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD14.D Sample Name: 1927207007 10X

=====
Injection Date: 9/25/2019 11:37:52 Seq Line: 14
Sample Name: 1927207007 10X Location: Vial 84
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD14.D Sample Name: 1927207007 10X

=====
Injection Date: 9/25/2019 11:37:52 Seq Line: 14
Sample Name: 1927207007 10X Location: Vial 84
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

=====
Sample Information
=====

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 10.000000
Sample Amount: 0.000

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.335	PBA	693116.9	133.8740	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.354	PBA	218925.9	137.6610	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.362	PBA	185567.6	50.0000	CLO4-89-ISTD

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

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD15.D

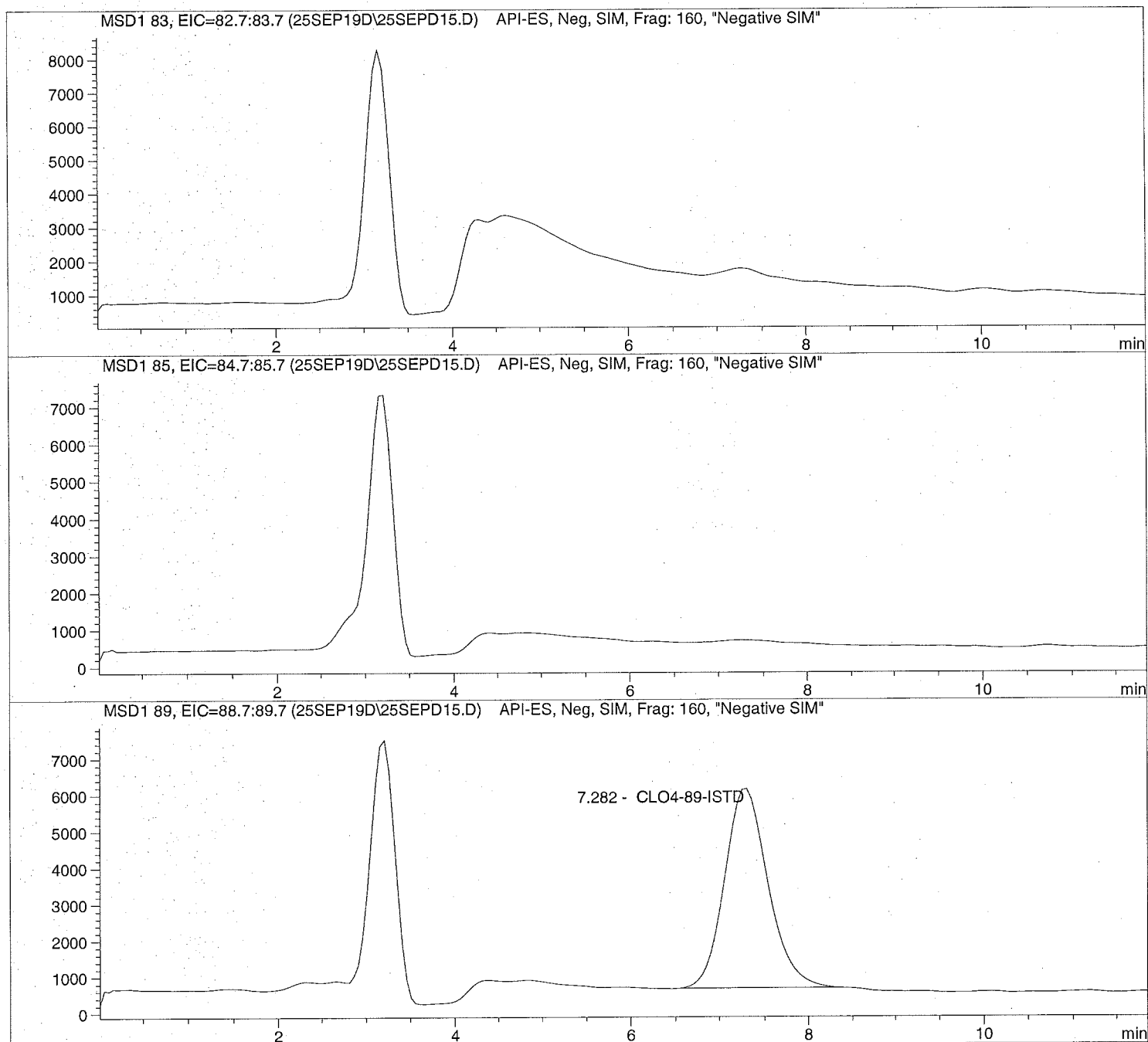
Sample Name: 1927207008

Injection Date: 9/25/2019 11:51:39
Sample Name: 1927207008
Acq Operator: TNB

Seq Line: 15
Location: Vial 85
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\25SEP19D\25SEPD15.D Sample Name: 1927207008

```

=====
Injection Date: 9/25/2019 11:51:39      Seq Line: 15
Sample Name: 1927207008      Location: Vial 85
Acq Operator: TNB      Inj. No.: 1
                                 Inj. Vol.: 30 µl

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

```

Perchlorate analysis

Sample Information

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.282	PBA	184103.5	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD16.D

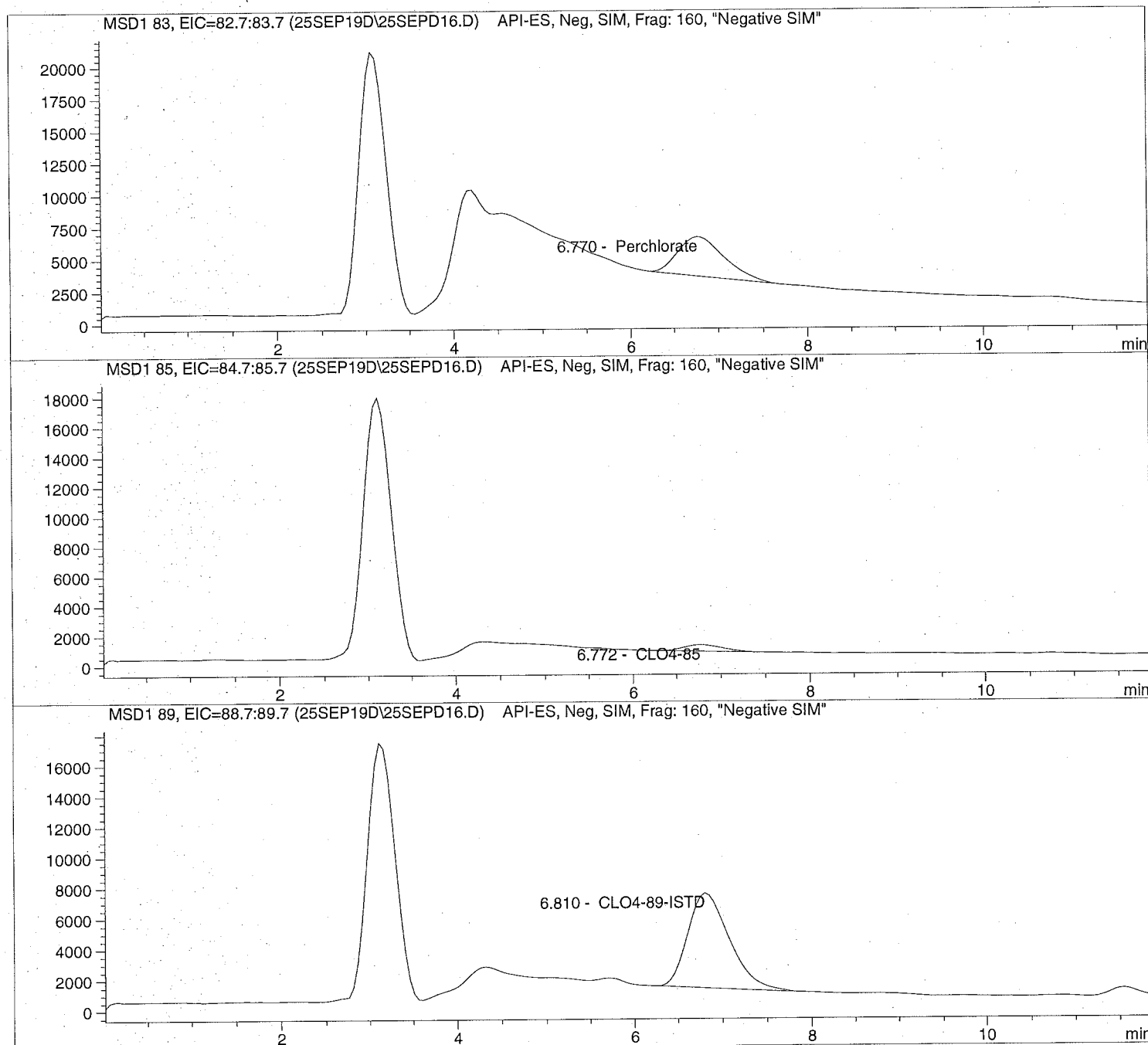
Sample Name: 1927207009

Injection Date: 9/25/2019 12:05:30
Sample Name: 1927207009
Acq Operator: TNB

Seq Line: 16
Location: Vial 86
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\25SEP19D\25SEPD16.D

Sample Name: 1927207009

```

=====
Injection Date: 9/25/2019 12:05:30      Seq Line:          16
Sample Name:   1927207009                Location:          Vial 86
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:27:11
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.770	BBA	111064.3	2.0258	Perchlorate

NOT REPORTED / RATIO FAILS CRITERIA (83/85)

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.772	PBA	13398.1	0.6696	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.810	PBA	200027.4	5.0000	CLO4-89-ISTD

```

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

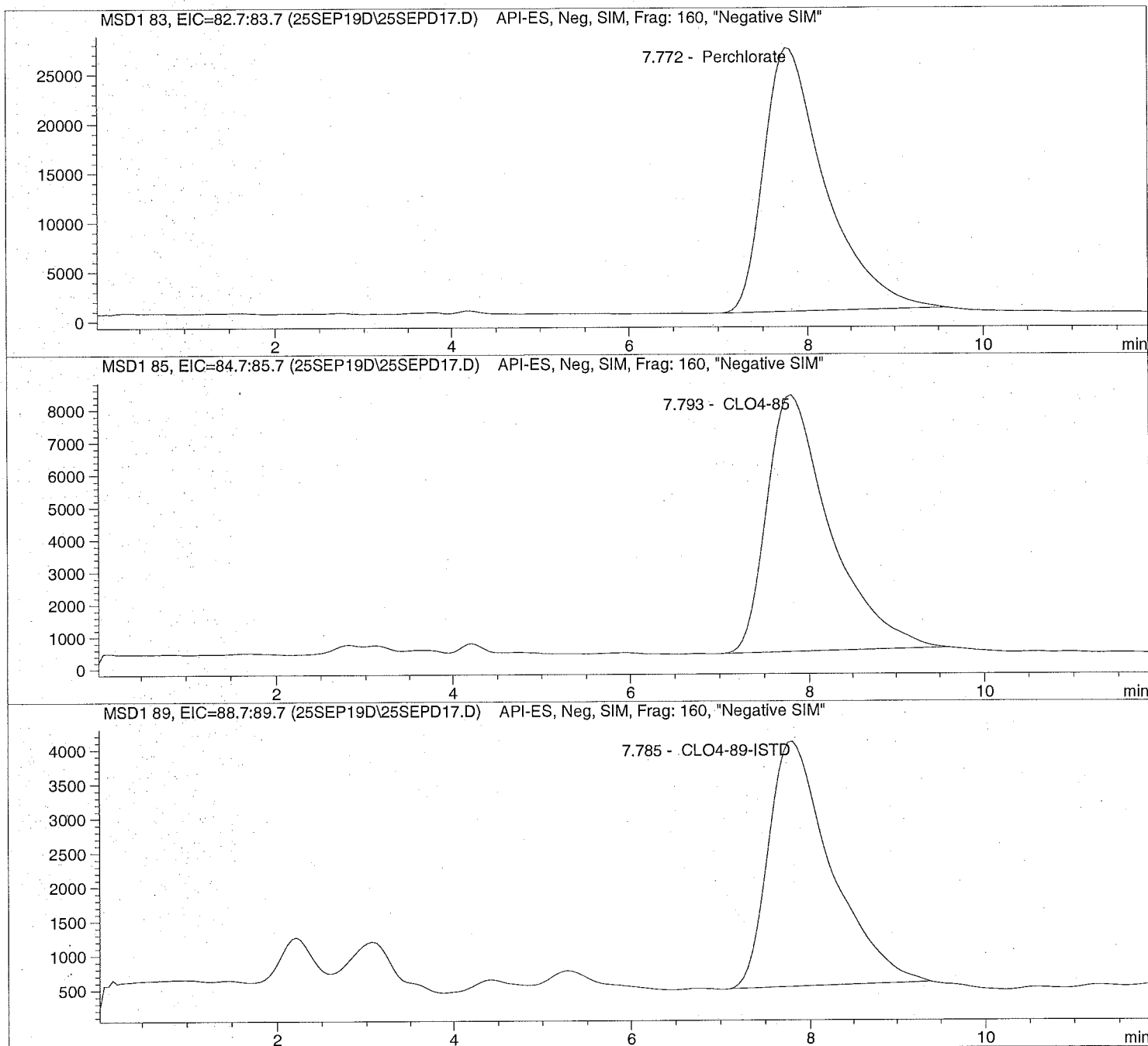
```


Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD17.D Sample Name: 675452 CCV@25

```
=====
Injection Date: 9/25/2019 12:19:18      Seq Line:      17
Sample Name:    675452   CCV@25          Location:      Vial 71
Acq Operator:   TNB                Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:27:11
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD17.D Sample Name: 675452 CCV@25

```

=====
Injection Date: 9/25/2019 12:19:18      Seq Line: 17
Sample Name: 675452 CCV@25             Location: Vial 71
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 30 µl

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.772	PBA	1279619.1	24.9031	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.793	PBA	393112.7	25.0723	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.785	PBA	175644.5	5.0000	CLO4-89-ISTD

```

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

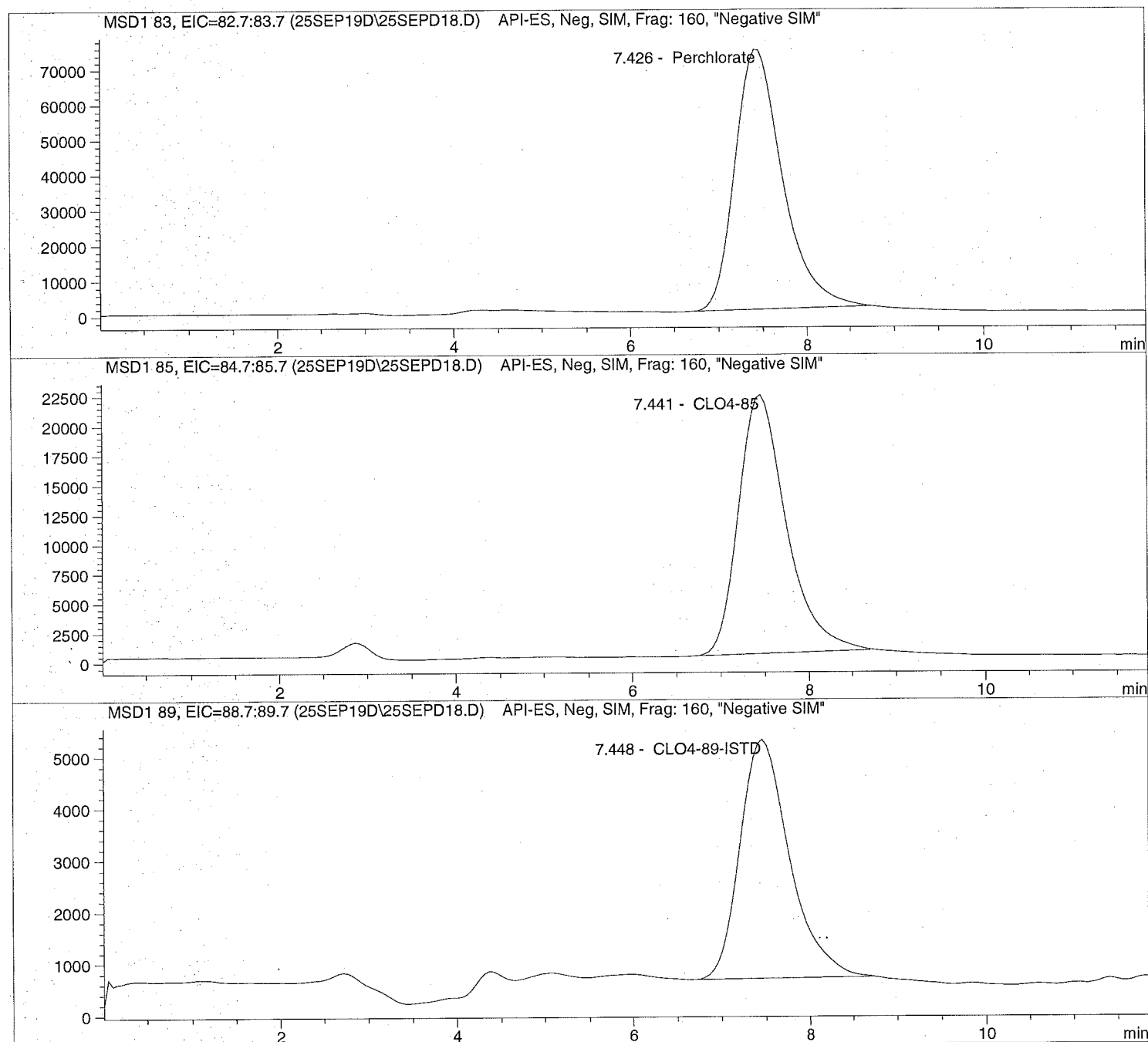
```

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD18.D Sample Name: 1927207010 10X

=====
Injection Date: 9/25/2019 12:34:51 Seq Line: 18
Sample Name: 1927207010 10X Location: Vial 87
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 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\25SEP19D\25SEPD18.D Sample Name: 1927207010 10X

```

=====
Injection Date: 9/25/2019 12:34:51      Seq Line: 18
Sample Name: 1927207010 10X            Location: Vial 87
Acq Operator: TNB                        Inj. No.: 1
                                          Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 10.000000
Sample Amount: 0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.426	PBA	2749347.5	477.5033	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.441	PBA	819118.9	470.9470	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.448	PBA	179651.3	50.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD19.D

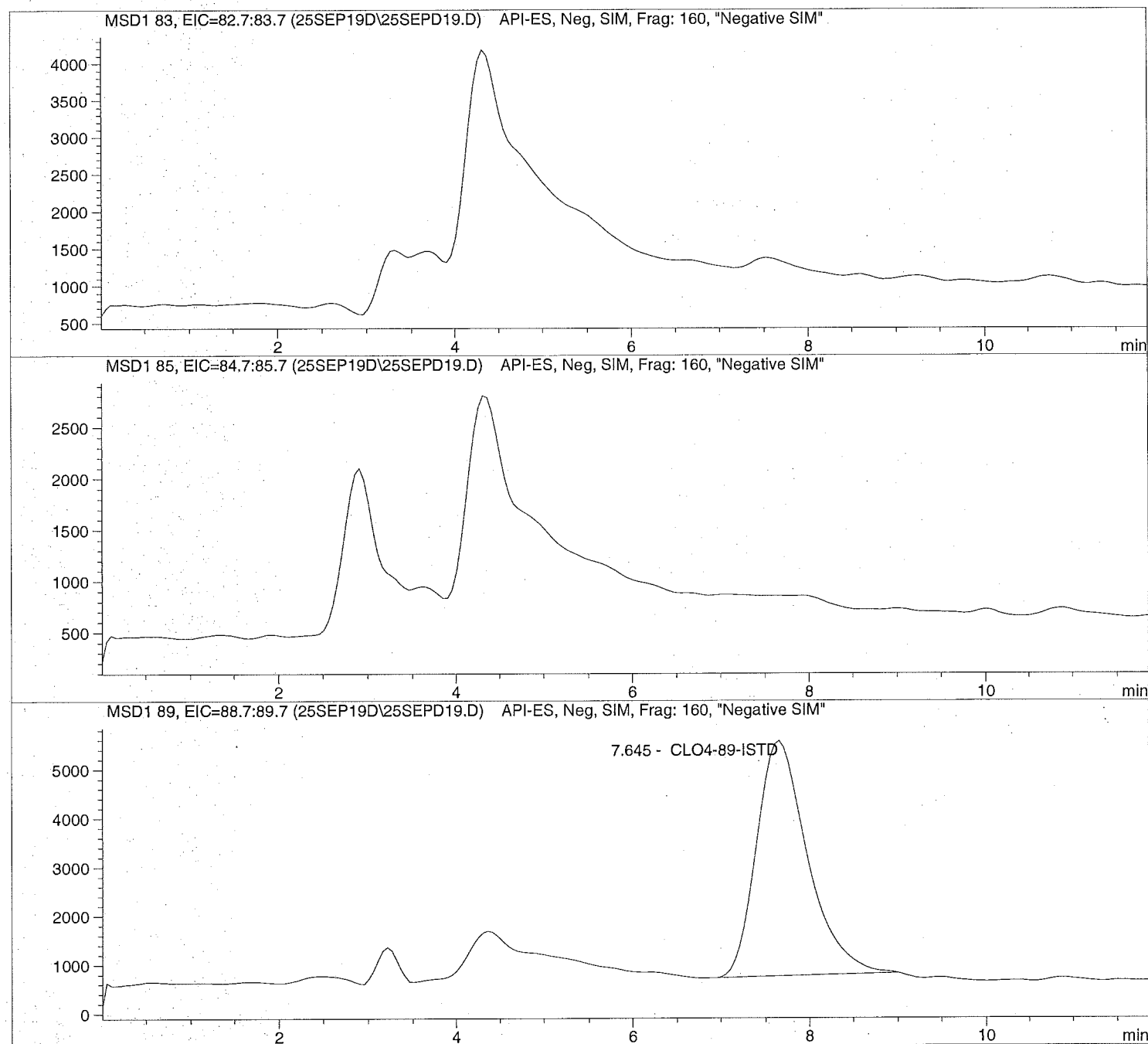
Sample Name: 1927207011

=====
Injection Date: 9/25/2019 12:48:38
Sample Name: 1927207011
Acq Operator: TNB

Seq Line: 19
Location: Vial 88
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\25SEP19D\25SEPD19.D Sample Name: 1927207011

```

=====
Injection Date: 9/25/2019 12:48:38      Seq Line: 19
Sample Name: 1927207011                Location: Vial 88
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.645	PBA	192431.6	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD20.D

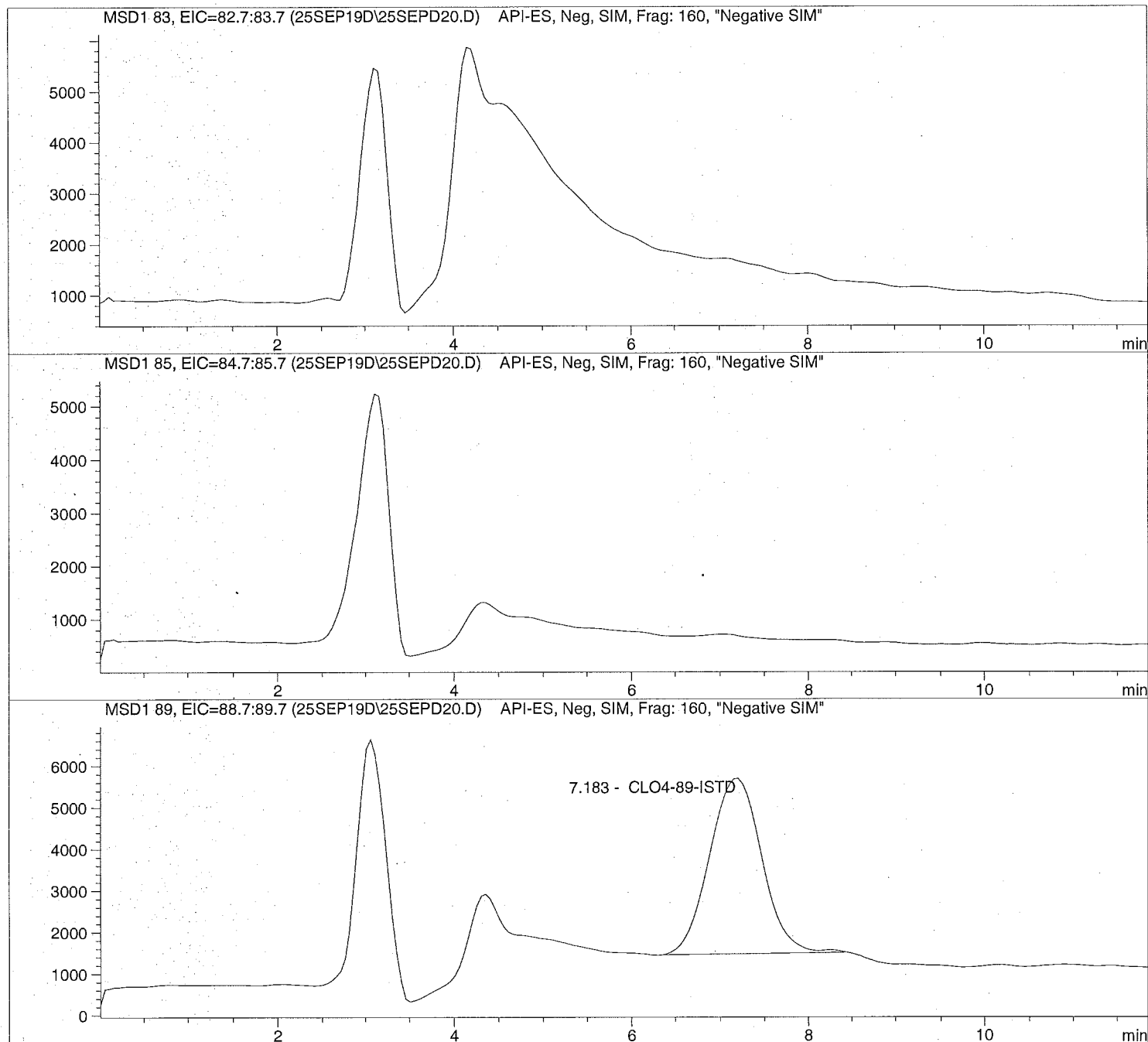
Sample Name: 1927207012

Injection Date: 9/25/2019 13:02:29
Sample Name: 1927207012
Acq Operator: TNB

Seq Line: 20
Location: Vial 89
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\25SEP19D\25SEPD20.D Sample Name: 1927207012

```

=====
Injection Date: 9/25/2019 13:02:29      Seq Line:          20
Sample Name:    1927207012              Location:          Vial 89
Acq Operator:   TNB                     Inj. No.:         1
                                           Inj. Vol.:        30 µl

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:27:11

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.183	PBA	172716.4	5.0000	CLO4-89-ISTD

```

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

```


Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD21.D

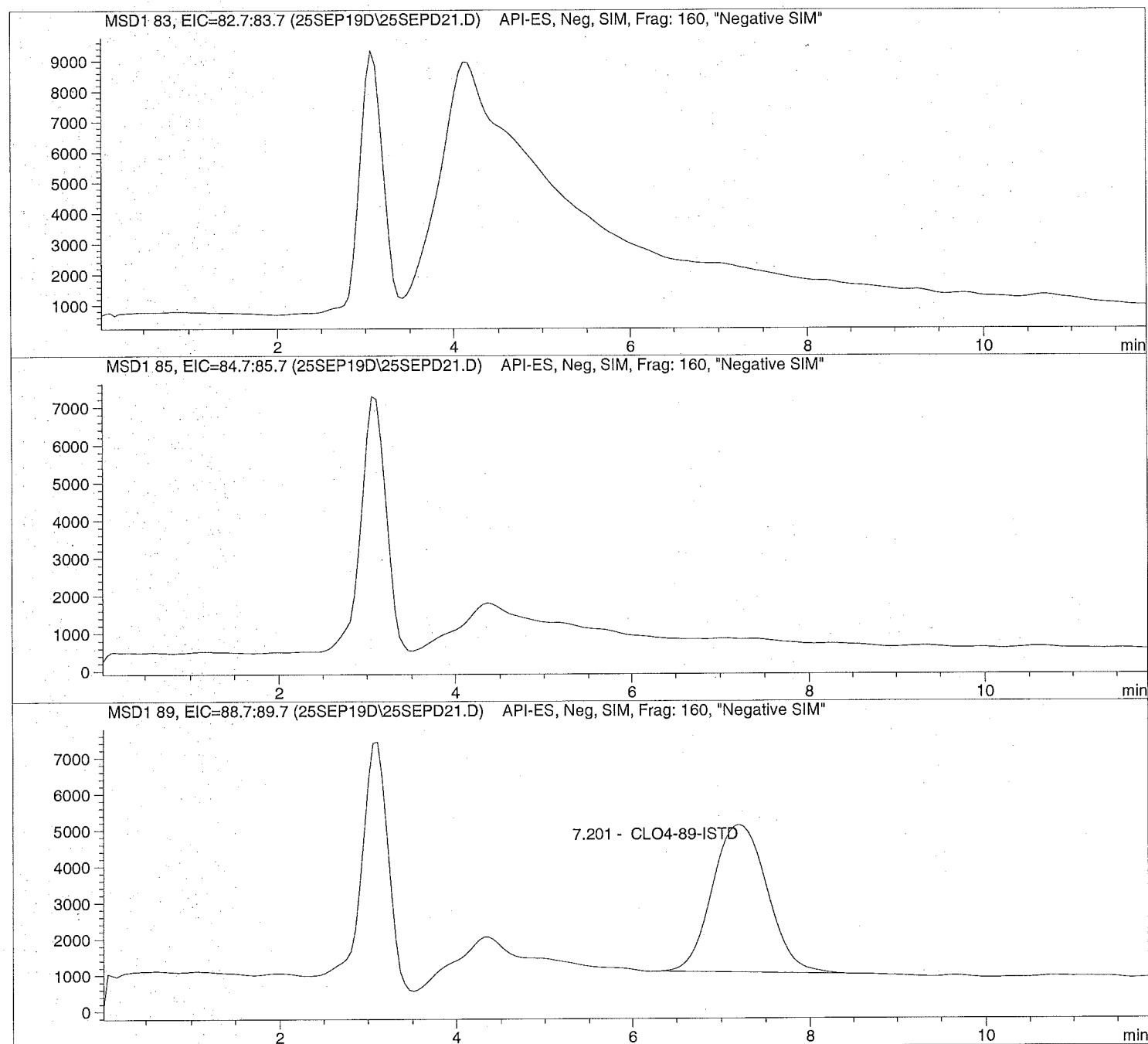
Sample Name: 1927207013

=====
Injection Date: 9/25/2019 13:16:17
Sample Name: 1927207013
Acq Operator: TNB

Seq Line: 21
Location: Vial 90
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD21.D Sample Name: 1927207013

```

=====
Injection Date: 9/25/2019 13:16:17      Seq Line: 21
Sample Name: 1927207013                Location: Vial 90
Acq Operator: TNB                      Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.201	PBA	174006.0	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD22.D

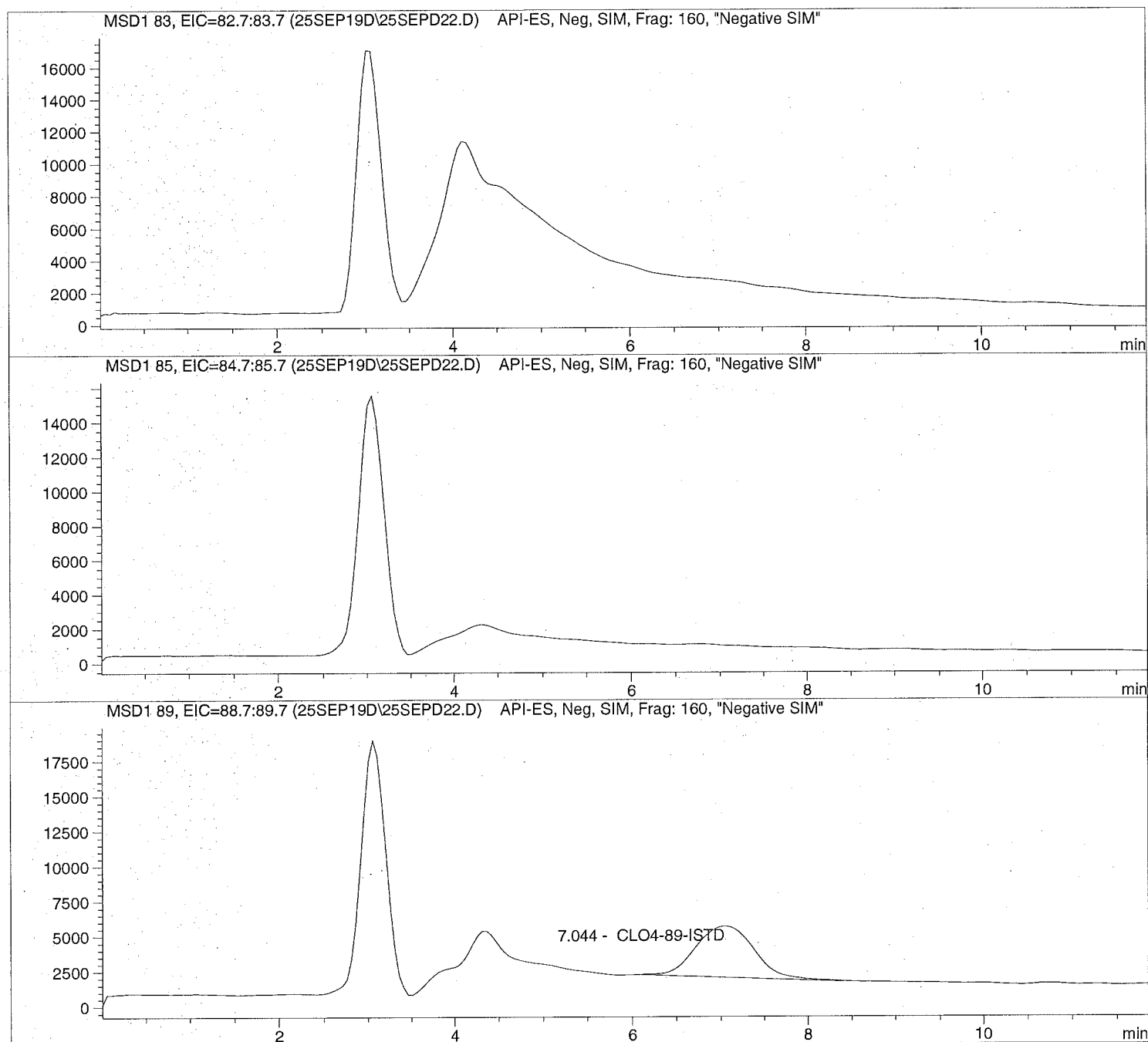
Sample Name: 1927207014

Injection Date: 9/25/2019 13:30:08
Sample Name: 1927207014
Acq Operator: TNB

Seq Line: 22
Location: Vial 91
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\25SEP19D\25SEPD22.D Sample Name: 1927207014

```

=====
Injection Date: 9/25/2019 13:30:08      Seq Line:      22
Sample Name:   1927207014              Location:     Vial 91
Acq Operator:  TNB                      Inj. No.:    1
                                           Inj. Vol.:   30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  9/23/2019 12:27:11
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.044	PBA	167770.5	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD23.D

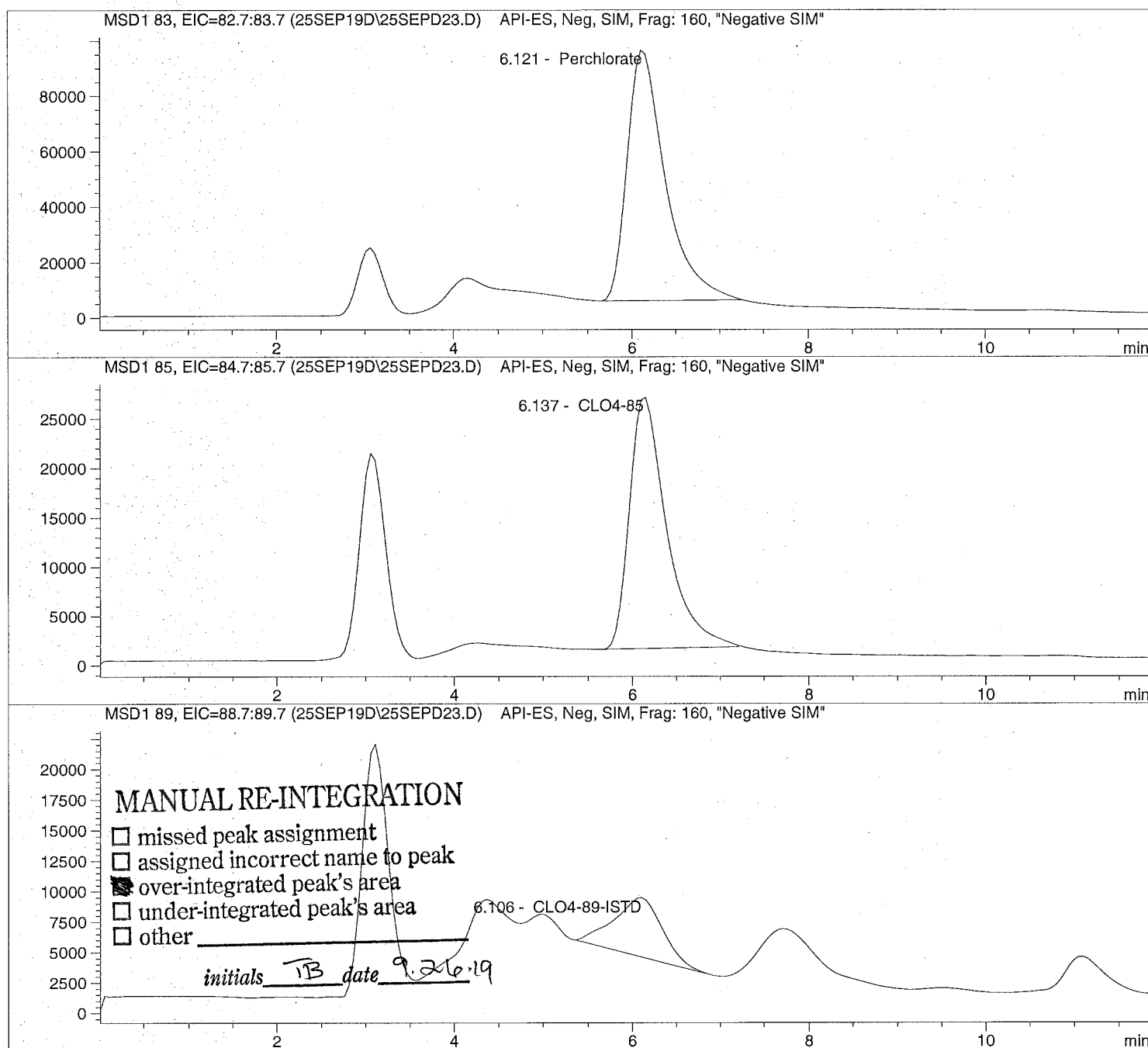
Sample Name: 1927207006 MS-25

Injection Date: 9/25/2019 13:43:55
 Sample Name: 1927207006 MS-25
 Acq Operator: TNB

Seq Line: 23
 Location: Vial 61
 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\25SEP19D\25SEPD23.D Sample Name: 1927207006 MS-25

```

=====
Injection Date: 9/25/2019 13:43:55      Seq Line: 23
Sample Name: 1927207006 MS-25          Location: Vial 61
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019, 00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.121	PBA	2732867.5	46.5539	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.137	PBA	747215.8	42.6266	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.106	MM	184009.8	5.0000	CLO4-89-ISTD

```

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

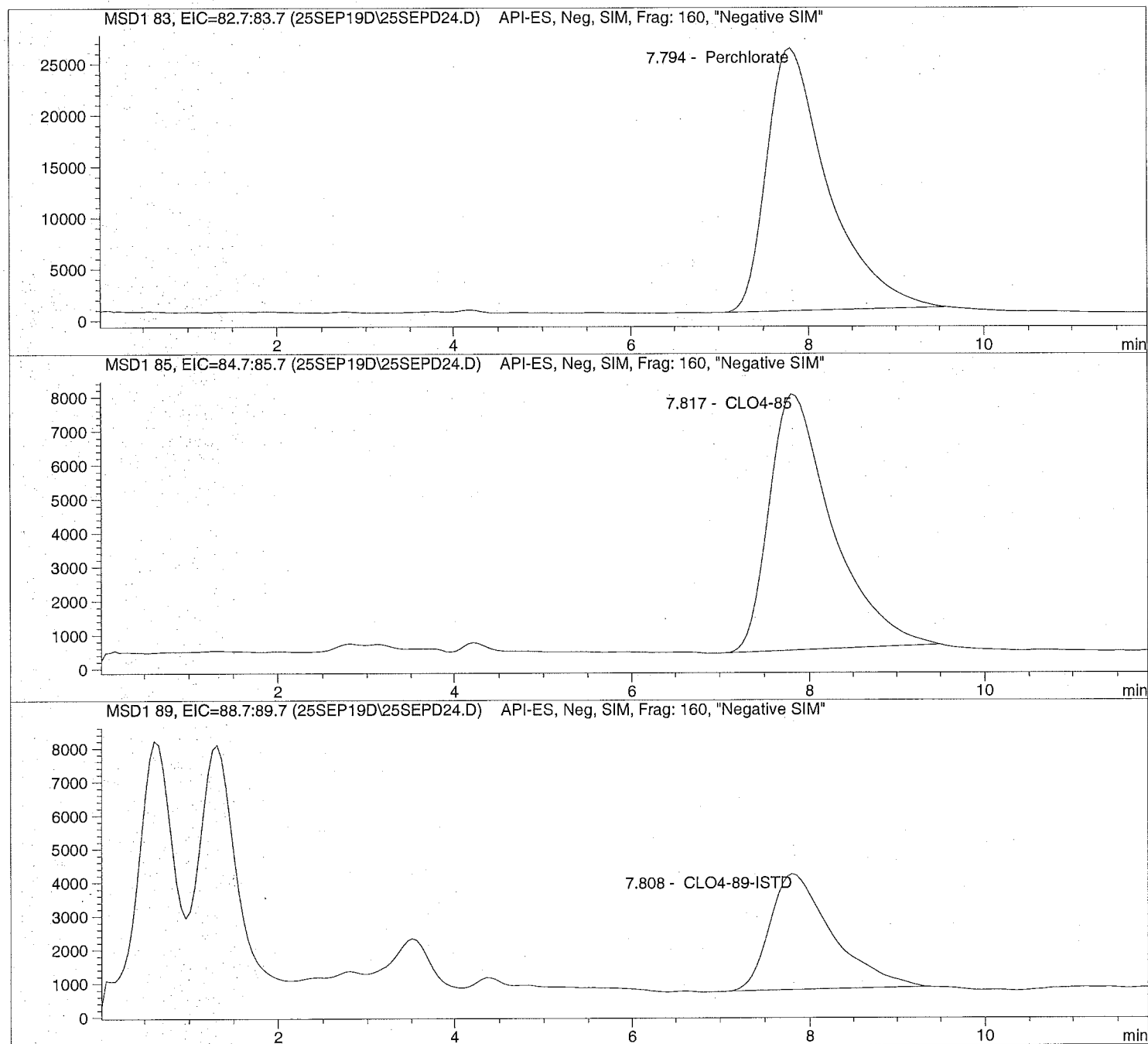
```

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD24.D Sample Name: 675453 CCV@25

=====
Injection Date: 9/25/2019 13:59:10 Seq Line: 24
Sample Name: 675453 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 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\25SEP19D\25SEPD24.D Sample Name: 675453 CCV@25

=====
Injection Date: 9/25/2019 13:59:10 Seq Line: 24
Sample Name: 675453 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis

=====
Sample Information
=====

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.794	PBA	1221554.3	25.0034	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.817	PBA	369755.7	24.8352	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.808	PBA	166932.8	5.0000	CLO4-89-ISTD

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



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

=====
 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		

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

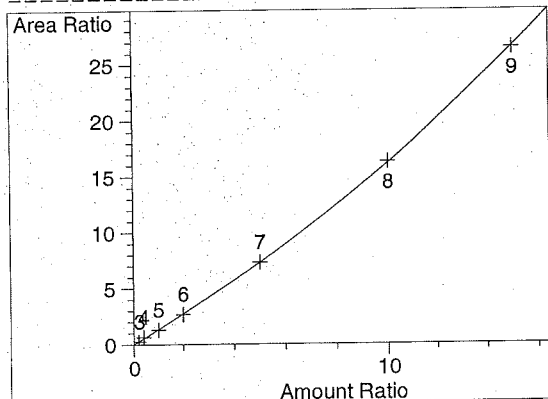
Time Window : From 3.581 min To 11.896 min
 Curve Type : Linear
 Origin : Included
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1
 Level 8 : 1
 Level 9 : 1

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

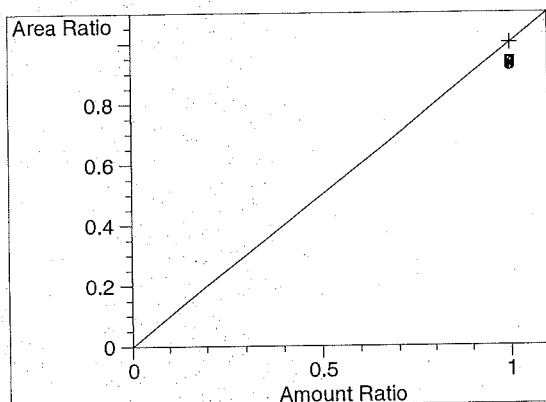
```
=====
                          Peak Sum Table
=====
```

```
***No Entries in table***
=====
```

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


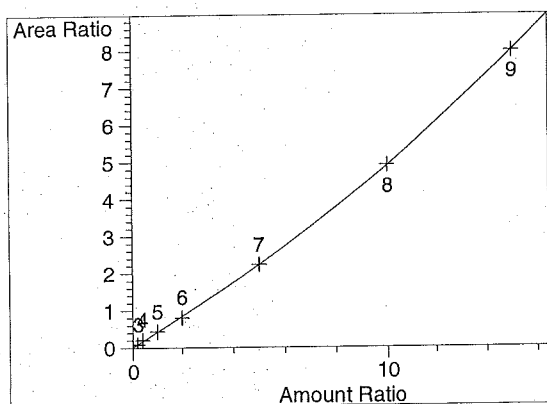
Perchlorate at exp. RT: 7.750
 MSD1 83, EIC=82.7:83.7
 Correlation: 0.99975
 Residual Std. Dev.: 0.10284
 Formula: $y = ax^2 + bx + c$
 a: 3.10463e-2
 b: 1.30369
 c: 2.19496e-2
 x: Amount Ratio
 y: Area Ratio

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\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

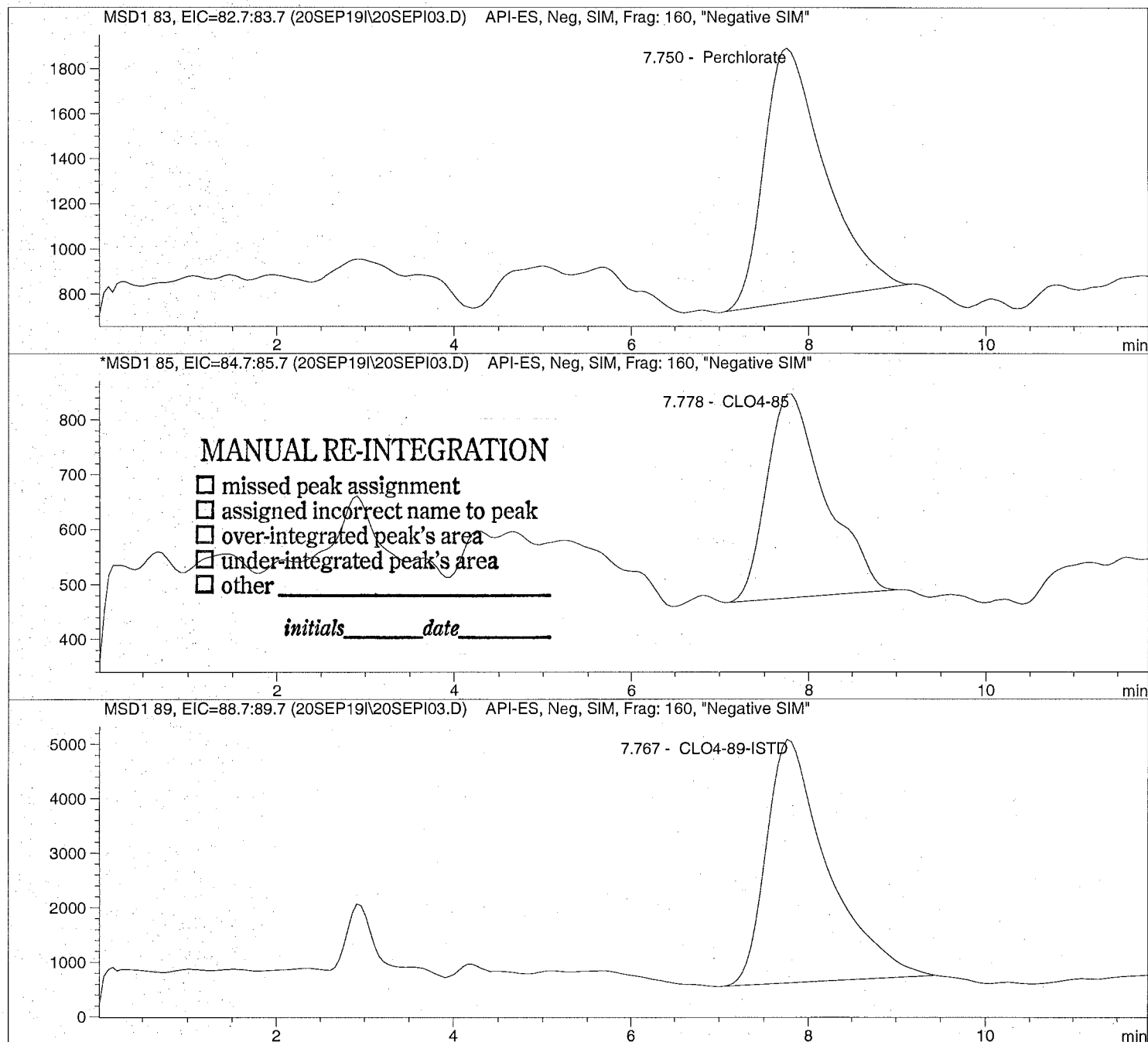
Inj. Vol.: 30 µl

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\20SEP19\20SEPI04.D

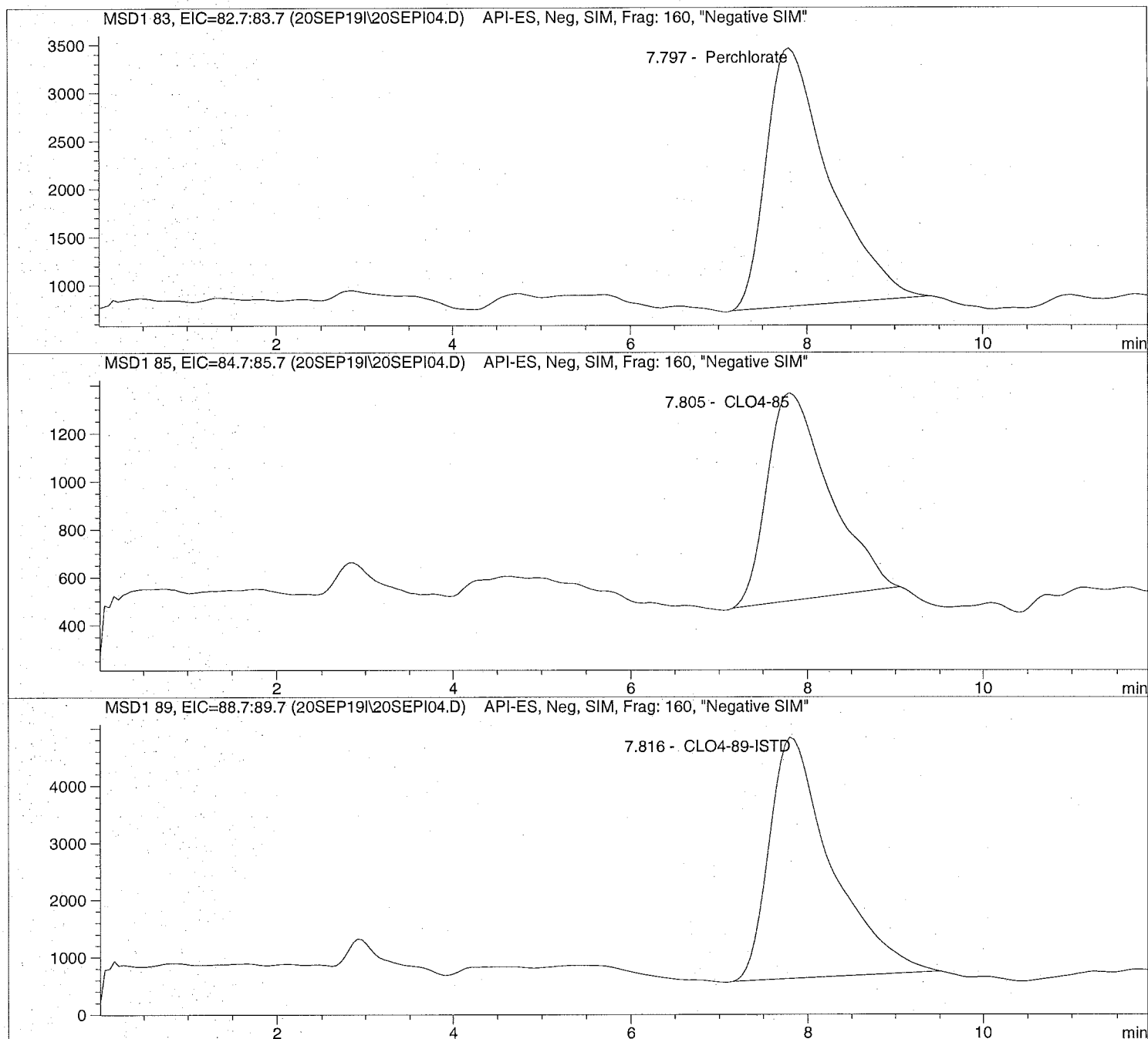
Sample Name: CLO4@ 2.0ug/L

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

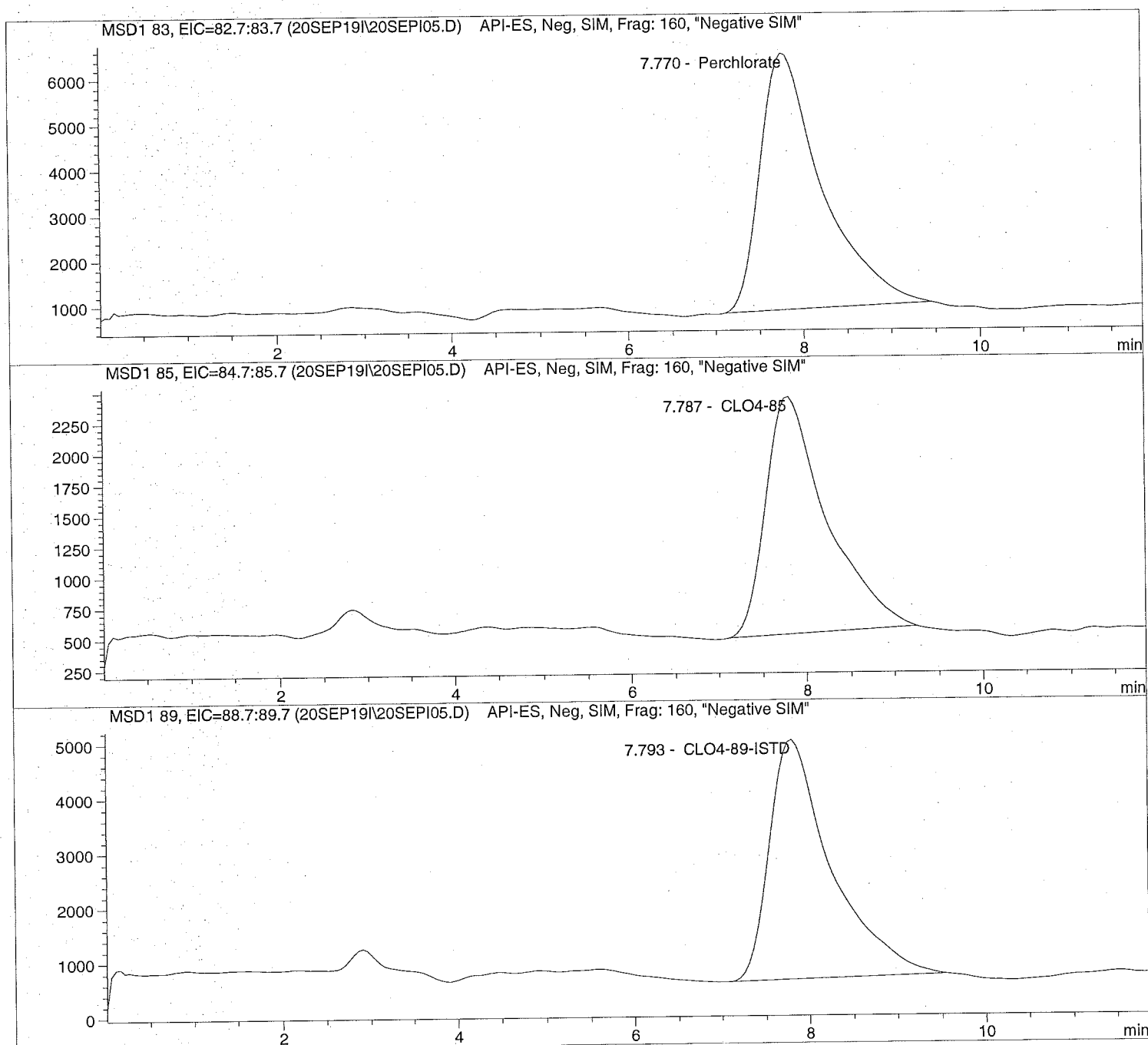
Sample Name: CLO4@ 5.0ug/L

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 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

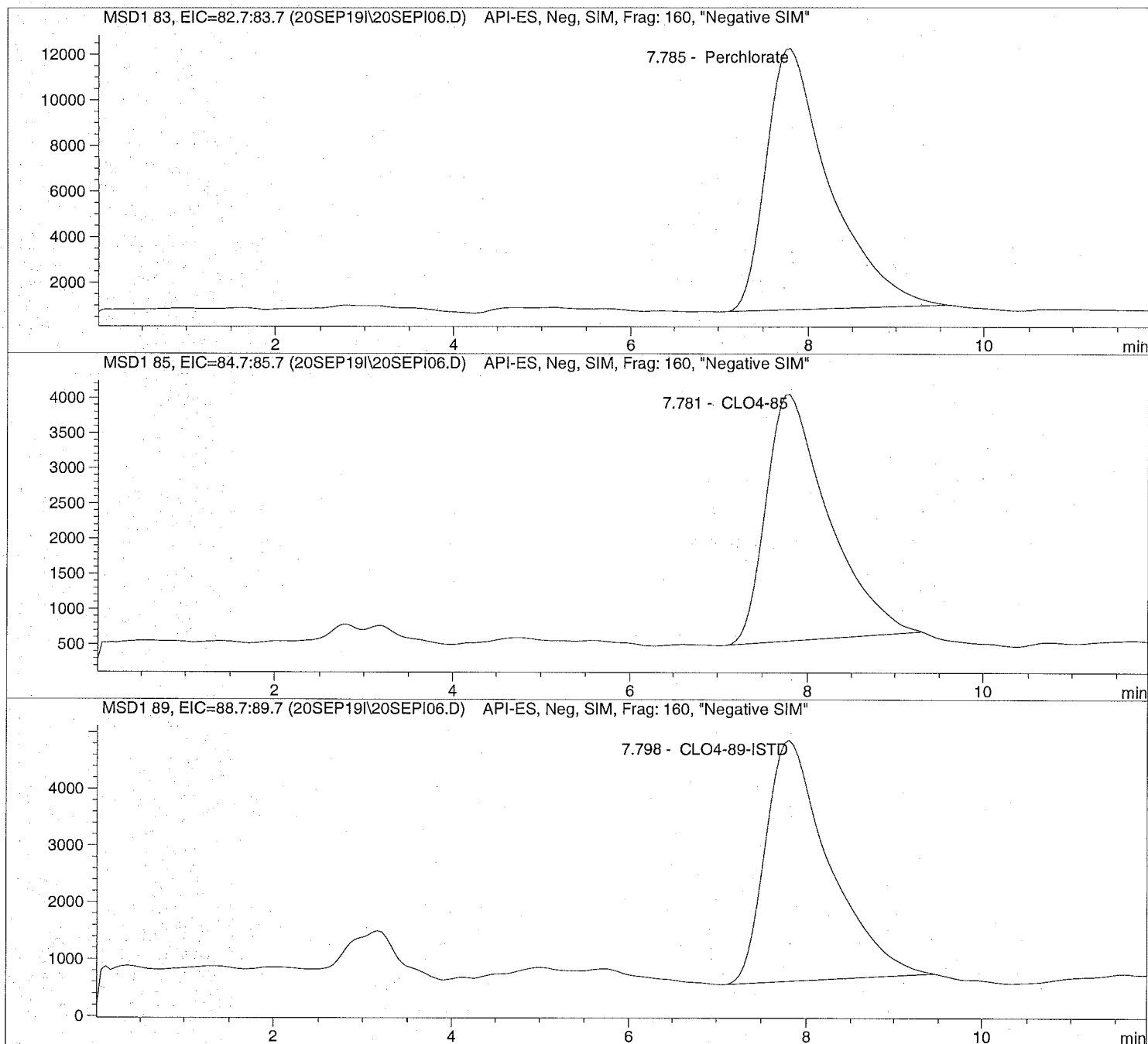
Sample Name: CLO4@ 10.ug/L

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

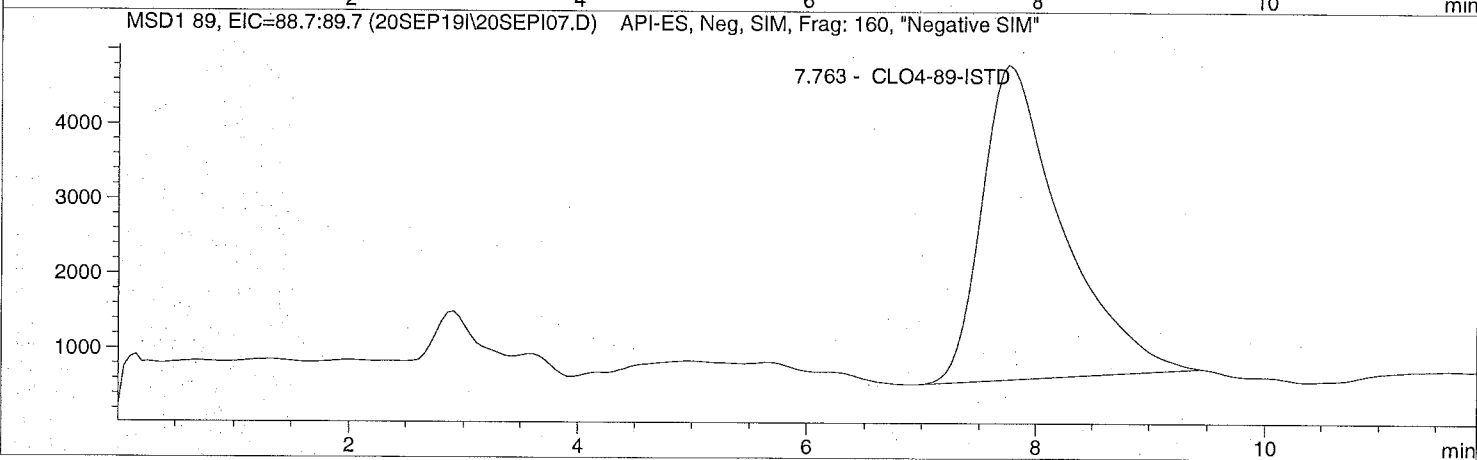
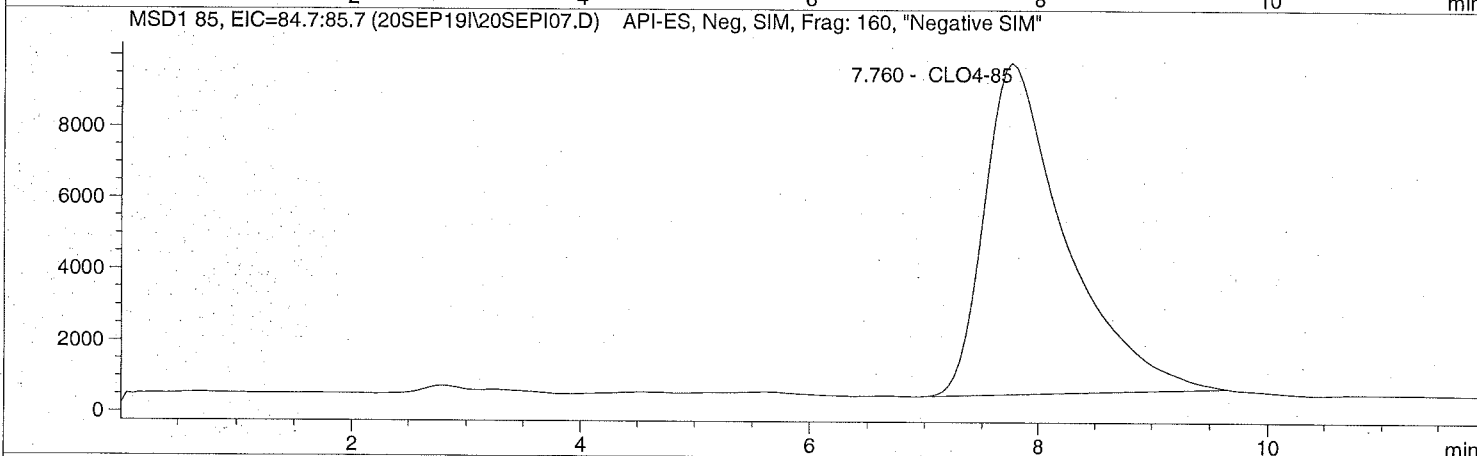
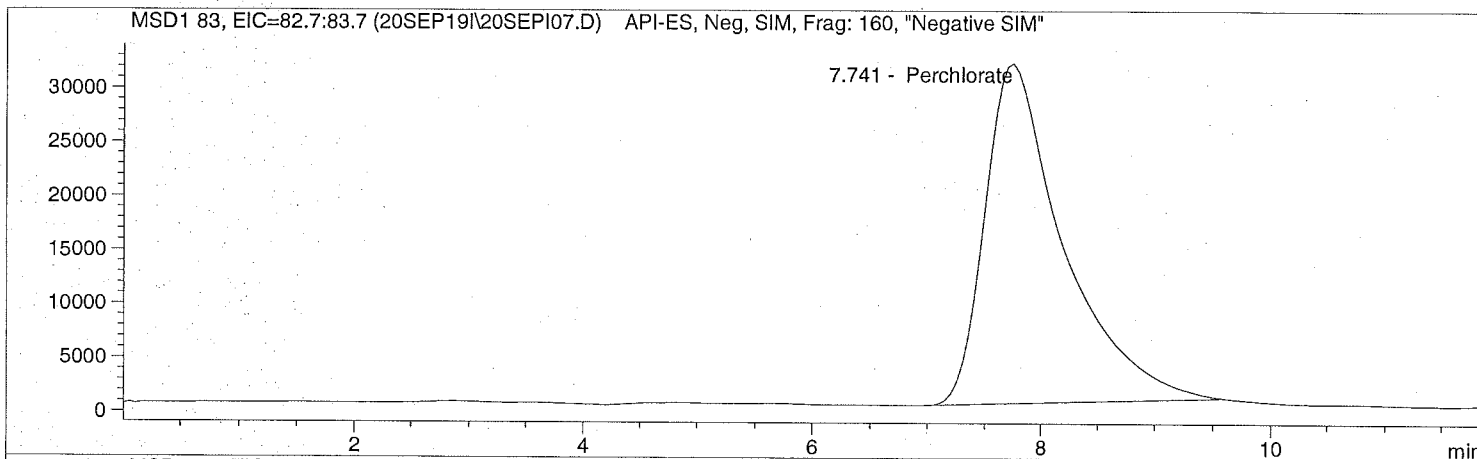
Inj. Vol.: 30 µl

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

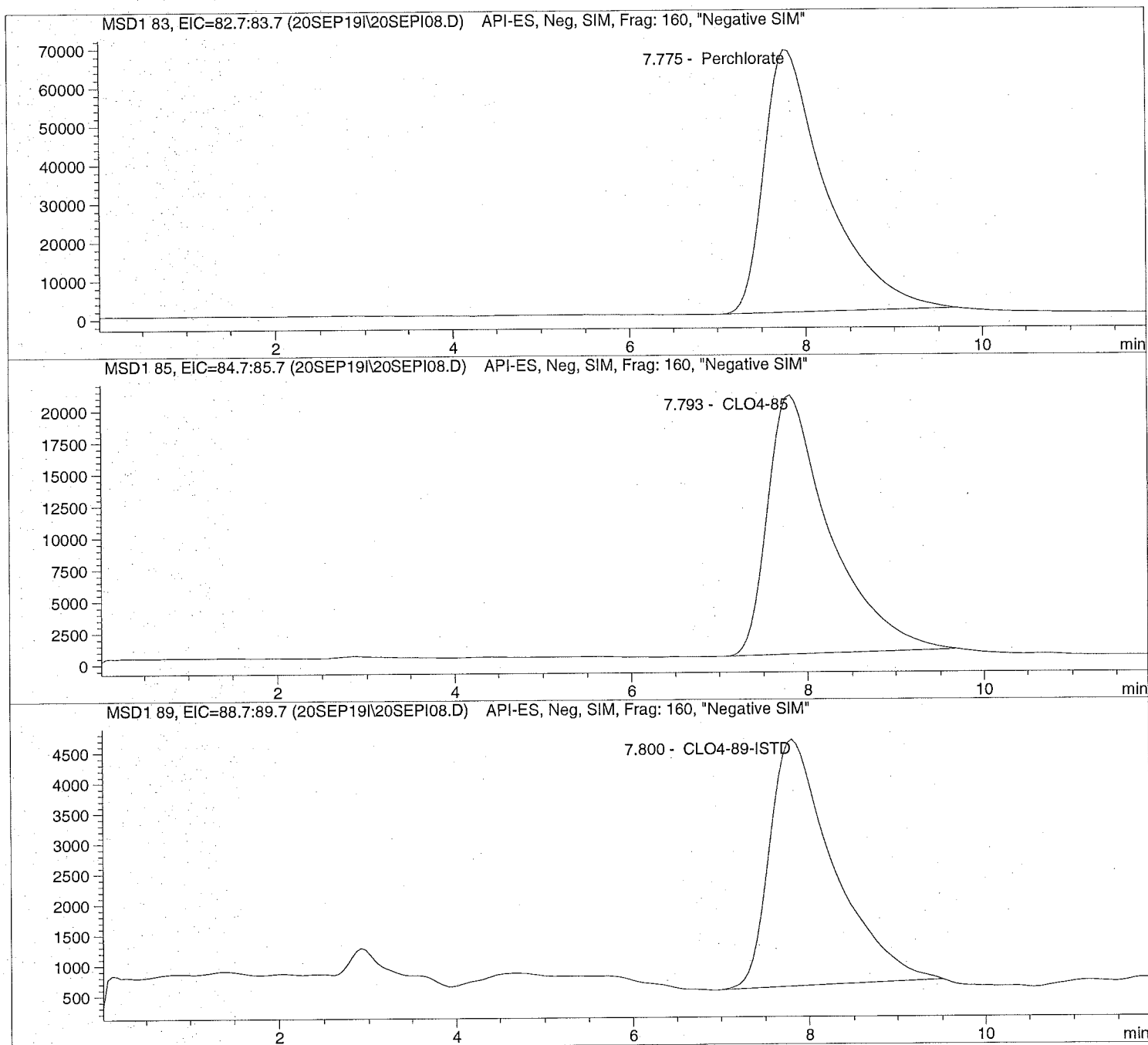
Sample Name: CLO4@ 50.ug/L

Injection Date: 9/20/2019 10:33:18
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

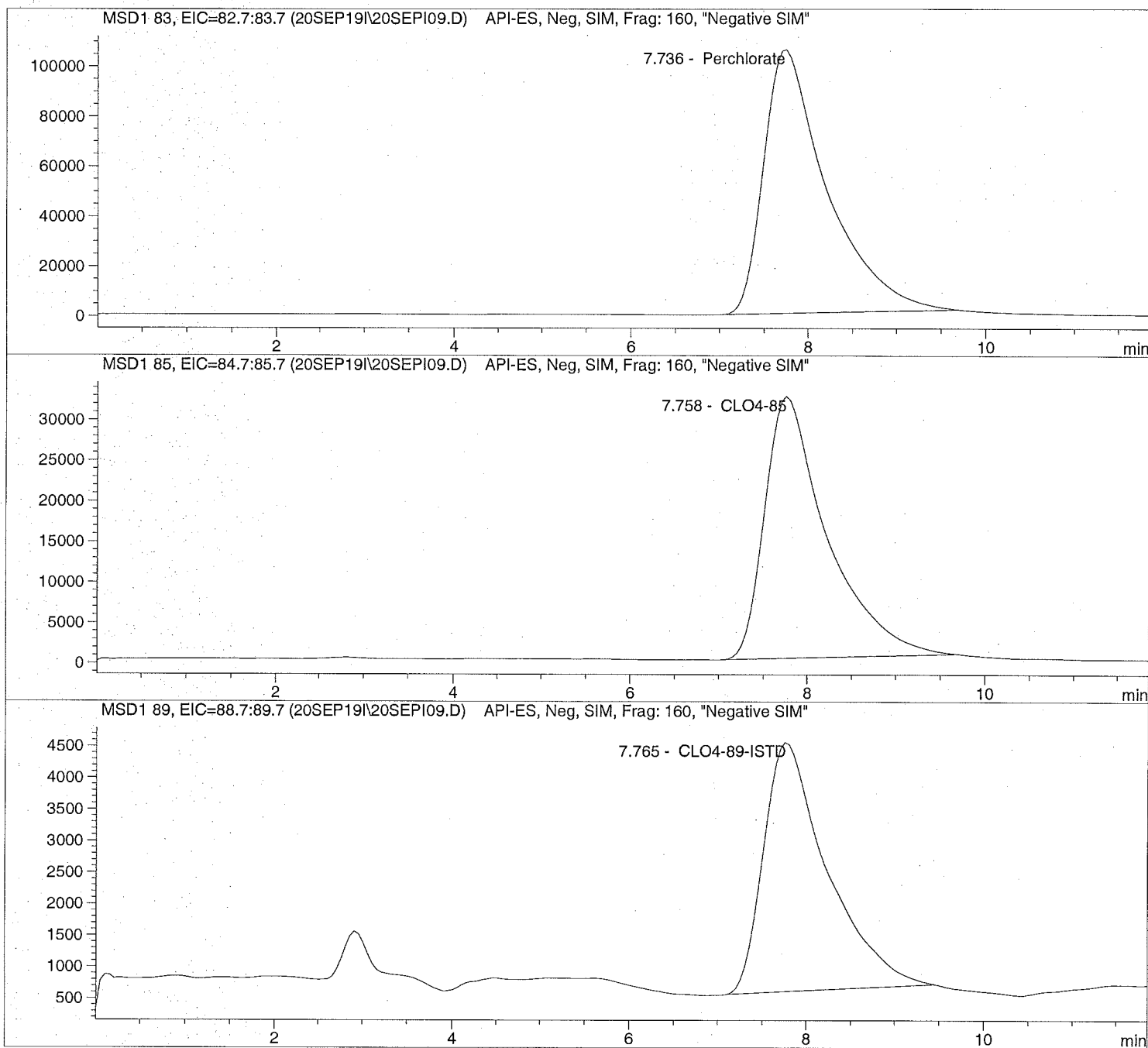
Inj. Vol.: 30 µl

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

Seq Line: 11

Sample Name: ICAL Verf@10ug/L

Location: Vial 80

Acq Operator: TNB

Inj. No.: 1

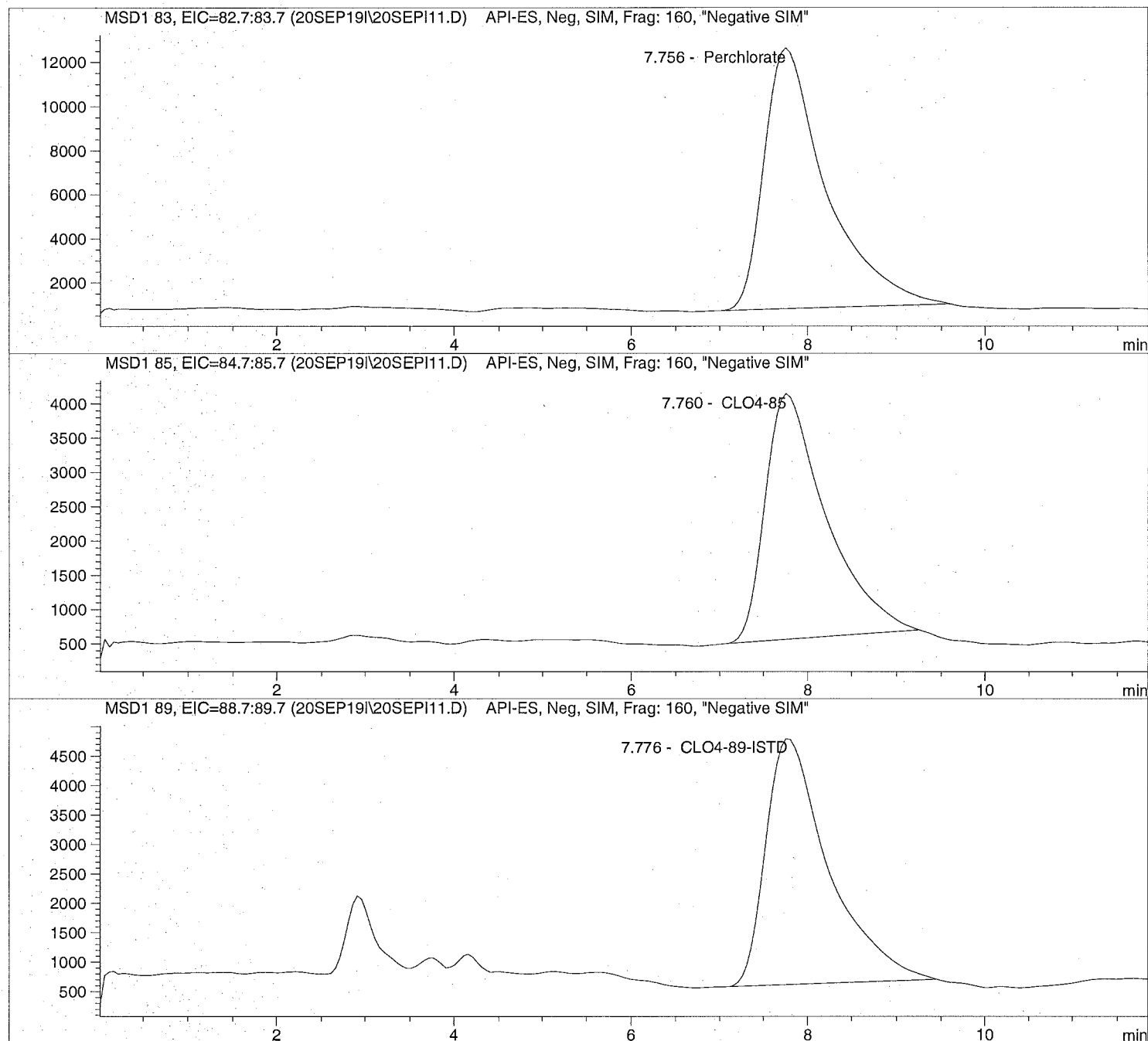
Inj. Vol.: 30 μ l

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

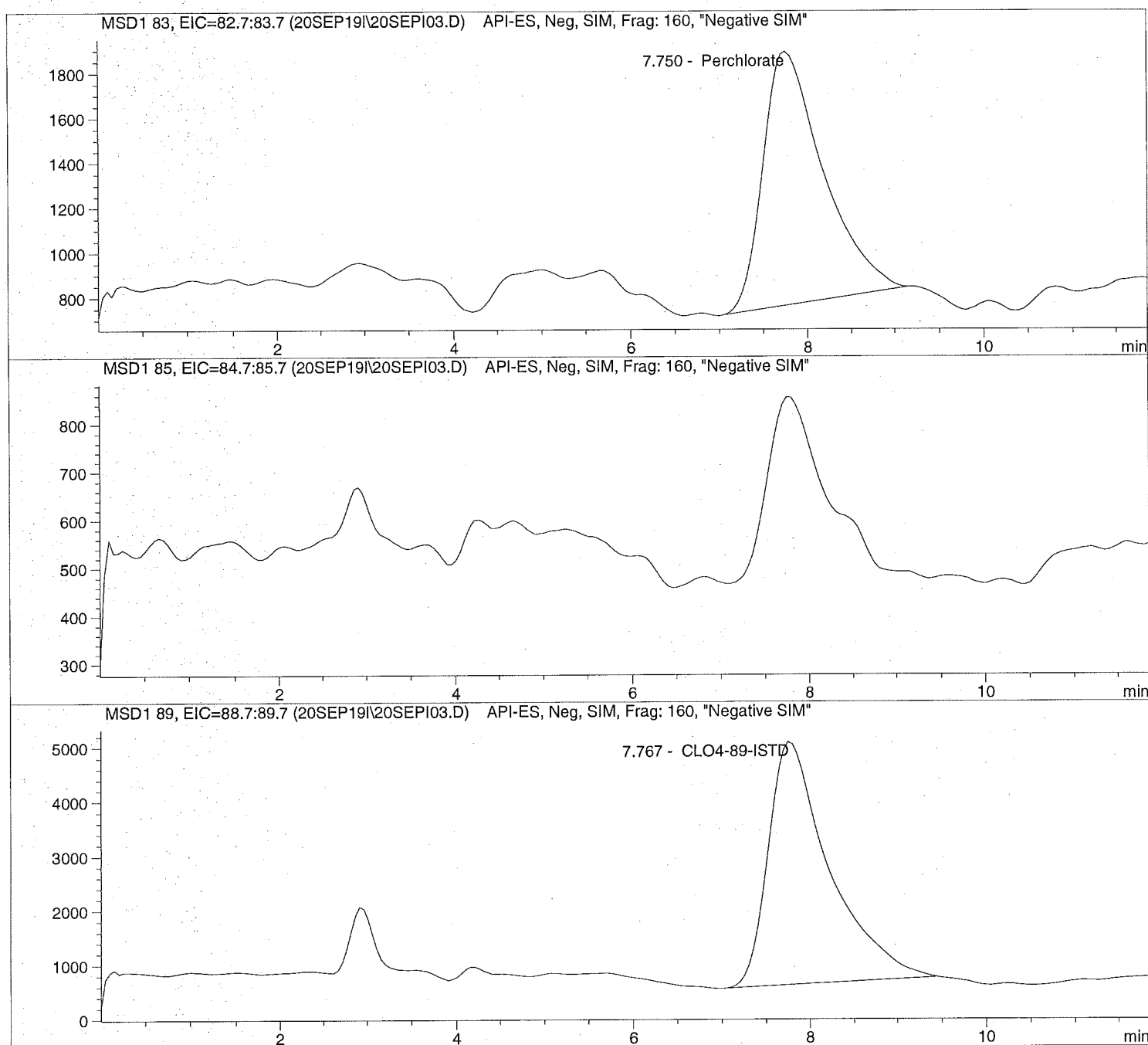
Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05
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

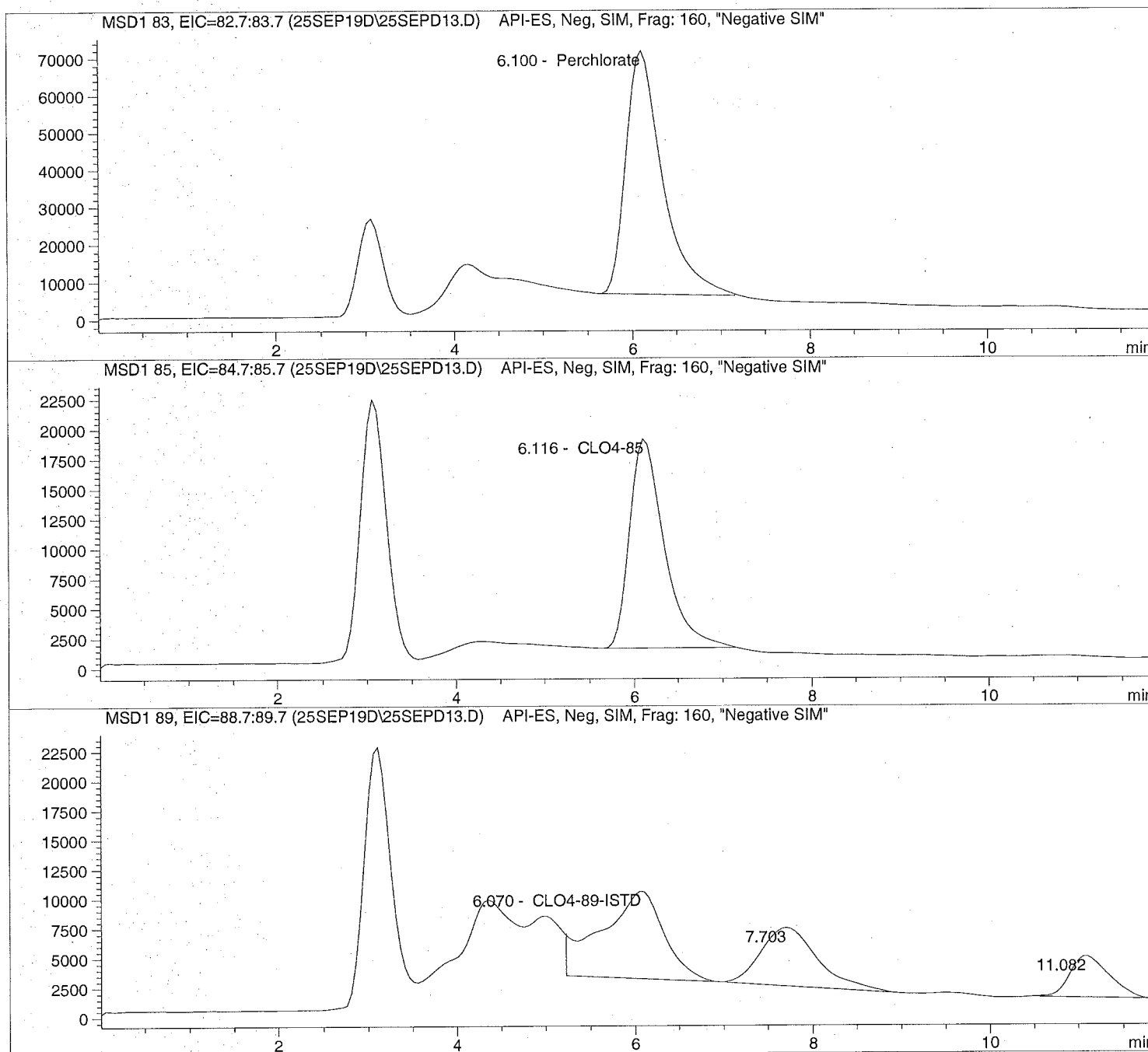
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD13.D Sample Name: 1927207006

```
=====
Injection Date: 9/25/2019 11:24:03 Seq Line: 13
Sample Name: 1927207006 Location: Vial 83
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD13.D Sample Name: 1927207006

=====
Injection Date: 9/25/2019 11:24:03 Seq Line: 13
Sample Name: 1927207006 Location: Vial 83
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 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

=====
Sample Information
=====

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.100	BBA	1881866.3	18.2810	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.116	PBA	480234.9	15.4085	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.070	BB	361652.6	5.0000	CLO4-89-ISTD
7.703	VBA	216336.8	0.0000	
11.082	PPA	106442.1	0.0000	

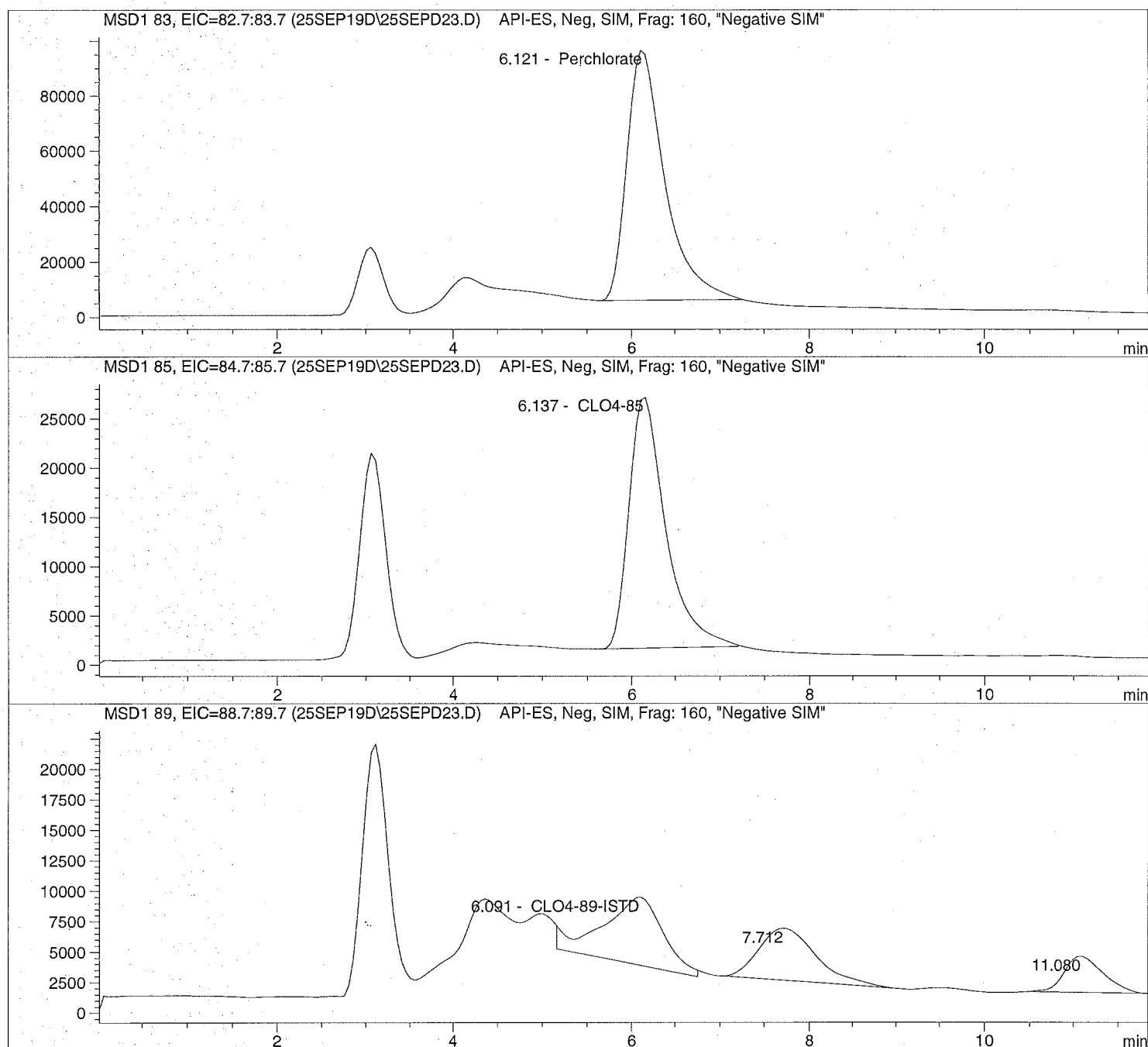
=====
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD23.D Sample Name: 1927207006 MS-25

=====
Injection Date: 9/25/2019 13:43:55 Seq Line: 23
Sample Name: 1927207006 MS-25 Location: Vial 61
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\25SEP19D\25SEPD23.D Sample Name: 1927207006 MS-25

```

=====
Injection Date: 9/25/2019 13:43:55      Seq Line:      23
Sample Name:    1927207006 MS-25        Location:      Vial 61
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:27:11
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.121	PBA	2732867.5	34.3055	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.137	PBA	747215.8	31.2167	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
6.091	BBA	262065.2	5.0000	CLO4-89-ISTD
7.712	PBA	189169.8	0.0000	
11.080	PBA	89782.7	0.0000	

```

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

```



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

October 11, 2019

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

Work Order: **HS19091201**

Laboratory Results for: **Longhorn GW Treatment Plant - GWTP Weekly Effluent**

Dear Marcia,

ALS Environmental received 2 sample(s) on Sep 25, 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 simple oval.

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US

Date: 11-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
Work Order: HS19091201

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19091201-01	LH18/24-SP650_092419	Groundwater		24-Sep-2019 14:00	25-Sep-2019 08:50	<input type="checkbox"/>
HS19091201-02	LH18/24-SP650_092419_AIX	Groundwater		24-Sep-2019 14:00	25-Sep-2019 08:50	<input type="checkbox"/>

ALS Houston, US

Date: 11-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
Work Order: HS19091201

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: R346962**

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

WetChemistry by Method E350.3**Batch ID: R346956**

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

ALS Houston, US

Date: 11-Oct-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
 Sample ID: LH18/24-SP650_092419
 Collection Date: 24-Sep-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19091201
 Lab ID:HS19091201-01
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)								Analyst: RG
Nitrogen, Ammonia (As N)	10		0.20	0.20	0.20	mg/L	1	25-Sep-2019 14:40
ORTHO PHOSPHATE (PO4) AS P BY E365.3								Analyst: KVL
Phosphorus, Total Orthophosphate (As P)	2.23		0.100	0.250	0.250	mg/L	10	25-Sep-2019 15:51
SUBCONTRACT ANALYSIS - TOC ANALYSIS								Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	10-Oct-2019 17:41

ALS Houston, US

Date: 11-Oct-19

Client: Bhate Environmental Associates, Inc.
 Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
 Sample ID: LH18/24-SP650_092419_AIX
 Collection Date: 24-Sep-2019 14:00

ANALYTICAL REPORT

WorkOrder:HS19091201
 Lab ID:HS19091201-02
 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		Method:NA		Analyst: SUB				
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41

ALS Houston, US

Date: 11-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: HS19091201

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R346956 (0)		Test Name : AMMONIA AS N BY E350.3(ISE)			Matrix: Groundwater	
HS19091201-01	LH18/24-SP650_092419	24 Sep 2019 14:00			25 Sep 2019 14:40	1
Batch ID: R346962 (0)		Test Name : ORTHO PHOSPHATE (PO4) AS P BY E365.3			Matrix: Groundwater	
HS19091201-01	LH18/24-SP650_092419	24 Sep 2019 14:00			25 Sep 2019 15:51	10
Batch ID: R347602 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Groundwater	
HS19091201-02	LH18/24-SP650_092419_AIX	24 Sep 2019 14:00			04 Oct 2019 09:41	1
Batch ID: R348078 (0)		Test Name : SUBCONTRACT ANALYSIS - TOC ANALYSIS			Matrix: Groundwater	
HS19091201-01	LH18/24-SP650_092419	24 Sep 2019 14:00			10 Oct 2019 17:41	1

ALS Houston, US

Date: 11-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: HS19091201

QC BATCH REPORT

Batch ID: R346956 (0)		Instrument: WetChem_HS		Method: AMMONIA AS N BY E350.3(ISE)					
MBLK	Sample ID: MBLK-R346956	Units: mg/L		Analysis Date: 25-Sep-2019 14:40					
Client ID:	Run ID: WetChem_HS_346956	SeqNo: 5268210	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)	0.20	0.20							U
LCS	Sample ID: LCS-R346956	Units: mg/L		Analysis Date: 25-Sep-2019 14:40					
Client ID:	Run ID: WetChem_HS_346956	SeqNo: 5268209	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)	10.15	0.20	10	0	102	80 - 120			
MS	Sample ID: HS19090989-01MS	Units: mg/L		Analysis Date: 25-Sep-2019 14:40					
Client ID:	Run ID: WetChem_HS_346956	SeqNo: 5268212	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)	12.3	0.20	10	2.675	96.2	80 - 120			
MSD	Sample ID: HS19090989-01MSD	Units: mg/L		Analysis Date: 25-Sep-2019 14:40					
Client ID:	Run ID: WetChem_HS_346956	SeqNo: 5268211	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)	12.15	0.20	10	2.675	94.7	80 - 120	12.3	1.2	20

The following samples were analyzed in this batch: HS19091201-01

ALS Houston, US

Date: 11-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: HS19091201

QC BATCH REPORT

Batch ID:	R346962 (0)	Instrument:	UV-2450	Method:	ORTHO PHOSPHATE (PO4) AS P BY E365.3					
MBLK	Sample ID: MBLK-R346962	Units: mg/L		Analysis Date: 25-Sep-2019 15:51						
Client ID:	Run ID: UV-2450_346962	SeqNo: 5268345		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-R346962	Units: mg/L		Analysis Date: 25-Sep-2019 15:51						
Client ID:	Run ID: UV-2450_346962	SeqNo: 5268344		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)	0.245	0.0250	0.25	0	98.0	85 - 115				
LCSD	Sample ID: LCSD-R346962	Units: mg/L		Analysis Date: 25-Sep-2019 15:51						
Client ID:	Run ID: UV-2450_346962	SeqNo: 5268343		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)	0.246	0.0250	0.25	0	98.4	85 - 115	0.245	0.407	20	
MS	Sample ID: HS19091201-01MS	Units: mg/L		Analysis Date: 25-Sep-2019 15:51						
Client ID: LH18/24-SP650_092419	Run ID: UV-2450_346962	SeqNo: 5268347		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)	4.63	0.250	2.5	2.23	96.0	80 - 120				
MSD	Sample ID: HS19091201-01MSD	Units: mg/L		Analysis Date: 25-Sep-2019 15:51						
Client ID: LH18/24-SP650_092419	Run ID: UV-2450_346962	SeqNo: 5268346		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)	4.62	0.250	2.5	2.23	95.6	80 - 120	4.63	0.216	20	

The following samples were analyzed in this batch: HS19091201-01

ALS Houston, US

Date: 11-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
WorkOrder: HS19091201

**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	2019-141	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US

Date: 11-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant - GWTP Weekly Effluent
Work Order: HS19091201

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19091201-01	LH18/24-SP650_092419	Login	9/25/2019 12:16:17 PM	JRM	WET380
HS19091201-01	LH18/24-SP650_092419	Login	9/25/2019 12:16:17 PM	JRM	WET380
HS19091201-01	LH18/24-SP650_092419	Login	9/25/2019 12:16:17 PM	JRM	Sub
HS19091201-02	LH18/24-SP650_092419_AIX	Login	9/25/2019 12:16:17 PM	JRM	Sub

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19091201

Date/Time Received: **25-Sep-2019 08:50**
 Received by: **JRM**

Checklist completed by: Jared R. Makan 25-Sep-2019
 eSignature Date

Reviewed by: RJ Modashia 25-Sep-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 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): 1.8c/1.8c UC/C IR25
 Cooler(s)/Kit(s): 5161
 Date/Time sample(s) sent to storage: 09/25/2019 12:20

- 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: 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			MS / MSD	No. OF CONTAINERS	AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE									
Prepared By: Scott Beesinger	P.O. Number														Field Sample I.D.	Sample Matrix	
LH18/24-SP650_092419	Water	09/24/19 / 14:00	2	X	X											H2SO4	
LH18/24-SP650_092419	Water	09/24/19 / 14:00	1			X										NONE	
LH18/24-SP650_092419_AIX	Water	09/24/19 / 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>	09/24/19	14:30									


For Lab Use Only									
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
<i>J. MANNAN</i>	9/25/19	08:50							

Remarks: *Cooler S161 Temp 1.8
1225 CFO.0*

HS19091201

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant - GWTP Weekly Effluent



 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: 9/24/19	Time: 14:30	Date: 09/25/19
5161	Name: Scott Beeziner	Company: ALS	

5161 SEP 25 2019

Must Deliver Next Business Day
Time and Temperature Sensitive!



5161

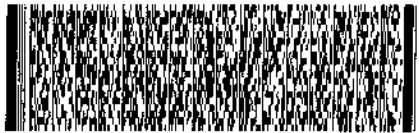
ORIGIN ID:SGRA (903) 930-5193
 SCOTT BEEZINER
 BHATE ENVIRONMENTAL ASSOCIATES
 1203-B EAST GRAND AVE. PMB202
 MARSHALL, TX 75670
 UNITED STATES US

SHIP DATE: 19JUL18
 ACTWT: 1.00 LB MAN
 CAD: 300130/CAFE3111
 DIMS: 26x14x14 IN

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
 10450 STANCLIFF ROAD
 SUITE 210
 HOUSTON TX 77099

(281) 530-5656
 REF: LHAAP 58 - RJ

RMA: 001111



FedEx
 TRK# 0221 4380 9530 9412

WED - 25 SEP 10:30A
 PRIORITY OVERNIGHT

AB SGRA

77099
 TX-US IAH





Case Narrative

Method: 6850

Analysis: Perchlorate

Analysis SOP: LC-MS-CLO4

ALS WO ID(s): 1927220; 1927568; 1927591;
1927596

Client: ALS Laboratories (Houston, TX)

Matrix: Water

ELMS Batch (HBN): 2298 (248917)

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

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

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 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 1927568001 was analyzed and reported from 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 676591) was less than 1/2 the CRDL. The recovery for the LCS (676592) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on samples 1927220005/06 (Client ID: 16WW58-190918). 3.0 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 – 676589) is reported from the analysis of the Laboratory Control Sample (LCS – 676592) 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) along with datafiles 01OCTD02/05/06. Samples 1927220001/02 failed the 50-150% method requirement for ISTD recoveries. These samples were re-prepped, re-analyzed and reported.

Thomas Bosch October 03, 2019
Analyst Date



ANALYTICAL REPORT

Report Date: October 03, 2019

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

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1927591**

Project ID: HS19091201

Purchase Order: HS19091201

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_092419_AIX	1927591001	09/24/19	09/26/19	



ANALYTICAL REPORT

Workorder: 34-1927591

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: LH18/24-SP650_092419_AIX	Sampling Site: NA	Collected: 09/24/2019				
Lab ID: 1927591001	Media: 125 mL Nalgene	Received: 09/26/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2298 (HBN: 248917) Analyzed: 10/01/2019 14:50	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 248917)

Field sample 1927568001 was analyzed and reported from 1:1,000 dilution. The reporting limit has been adjusted accordingly.

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

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 10/03/2019 09:55	/S/ Stephen Brose 10/03/2019 13:30

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123Phone: (801) 266-7700
Email: alsst.lab@ALSGlobal.com
Web: www.alssl.com



ANALYTICAL REPORT

Workorder: 34-1927591

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

00952756

Analysis Information

Workorder: 1927591

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2298 (HBN: 248917)
Analyzed By: Thomas Bosch

Blank

LMB: 676591 Analyzed: 10/01/2019 11:23 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 676592 Analyzed: 10/01/2019 10:56 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.01	3.00	100	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1927220004 Analyzed: 10/01/2019 12:19 Dilution: 1 Units: ug/L		MS: 1927220005 Analyzed: 10/01/2019 12:32 Dilution: 1 Units: ug/L			MSD: 1927220006 Analyzed: 10/01/2019 12:46 Dilution: 1 Units: ug/L				
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	2.94	3	97.8	78.8 123.8	2.93	97.7	0.157	0.0 20.0

Comments

Field sample 1927568001 was analyzed and reported from 1:1,000 dilution. The reporting limit has been adjusted accordingly.

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

Analyst	Peer Review
/S/ Thomas Bosch 10/03/2019 11:24	/S/ Stephen Brose 10/03/2019 13:30

Symbols and Definitions

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

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



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

Subcontract Chain of Custody

18698/#7

SAMPLING STATE: Dept of Defense

COC ID: 12229

SUBCONTRACT TO:

192791

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: HS19091201
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19091201-02	LH18/24-SP650_092419_AIX	Groundwater	24 Sep 2019 14:00
	SUB_Perch-6850		09 Oct 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: [Signature]
Received By: [Signature]
Cooler ID(s): _____

Date/Time: 9/25/19 18:00
Date/Time: 9/26/19 09:54
Temperature(s): _____

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston Project/Task/Site: 1927591
 Date/Time of Receipt: _____ Number of Coolers Received: _____

Condition of Coolers: Acceptable Unacceptable
 Cooler Custody Seals: Present Absent/NA
 Intact/Broken/NA
 Container Custody Seals: Present Absent NA
 Intact/Broken/NA
 Ice Present: Yes No/NA
Frozen Melted/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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 <u>9895</u>	<u>3</u> °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: JayLynn J Signature JayLynn Johnson Printed Name 9/26/19 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 # 159469-434 RTT2 EXP 05/20 **

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

SHIP DATE: 25SEP19
NET WT: 9.60 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN
BILL THIRD PARTY

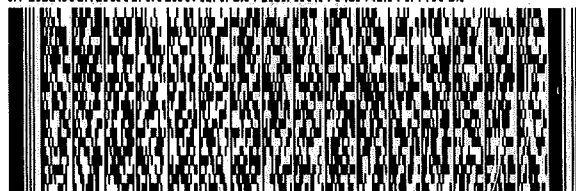
TO **SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE**

SALT LAKE CITY UT 84123

(801) 266-7700

REF: HS19091201/1233/1234 RJ

3401/4006/13155



**FedEx
Express**



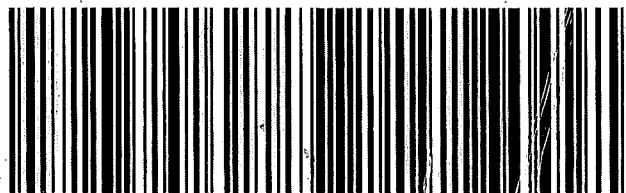
AN105090811181J

**THU - 26 SEP 3:00P
STANDARD OVERNIGHT**

TRK# 1251 0289 9683
0201

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: _____
Company: _____



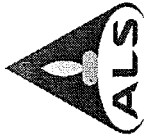
ALS Environmental CHAIN-OF-CUSTODY

00952760

Project / Job / Task: HS19091201		Split:	Workorder ID: 1927591	Level: ENV_LVL4		Requested Analysis				
Client: ALS Environmental (Houston)		Account: 8101		Type: 125Poly						
Comments:		Sample ID		Lab ID		QC		Matrix	EPA 6850, DoD QSM	
									Collect Date/Time	Sample ID
Item	1	09/24/2019 14:00	LH18/24-SP650_092419_AIX	1927591001		Water	A	1	A	
Item	2									
Item	3									
Item	4									
Item	5									
Item	6									
Item	7									
Item	8									
Item	9									
Item	10									

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY					SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY					
Relinquished By: (Signature)	Date / Time	Received By: (Signature)	ALS Sample Receiving	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
Wartha, Julie	09/26/2019 09:54	ALS Sample Receiving	6B	Storage Log analysis						
<i>John Dureddy</i>	10.1.19 07:50	T. Bosh								
R-33-1										

ALSCOCV3.1



Batch Worklist

Batch: ELMS/ 2298

Created: 10/1/2019 10:29

Instrument:

Rule: EPA 6850, DoD QSM Water

Analyst: T. Bosch

Status: WP

HBN: 248917



- Workorder: 1927220 [ENV_LVL4]
- Workorder: 1927568 [ENV_LVL4]
- Workorder: 1927591 [ENV_LVL4]
- Workorder: 1927596 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	676588	CCV for HBN 248917 [ELMS/2298]				CCV	3	E685041C3Q	5311	10/3/2019	10/3/2019	
2	676589	RLVS for HBN 248917 [ELMS/2298]				RLVS	3	E685041C3Q	5311	10/3/2019	10/3/2019	
3	676590	ICS for HBN 248917 [ELMS/2298]				ICS	3	E6850_D3Q	5311	10/3/2019	10/3/2019	
4	676591	LMB for HBN 248917 [ELMS/2298]				LMB	3	E6850Q413Q	5311	10/3/2019	10/3/2019	
5	676592	LCS for HBN 248917 [ELMS/2298]				LCS	3	E6850Q413Q	5311	10/3/2019	10/3/2019	
6	1927220001	16WW25-190919				SAMPLE	3	1927220001-A E6850Q41.3	5480	10/17/2019	10/3/2019	
7	1927220002	16WW25-190919-FD				FLDDUP	3	1927220002-A E6850Q41.3	5480	10/17/2019	10/3/2019	
8	1927220003	16WW49-190919				SAMPLE	3	1927220003-A E6850Q41.3	5480	10/17/2019	10/3/2019	
9	1927220004	16WW58-190918				SAMPLE	3	1927220004-A E6850Q41.3	5480	10/16/2019	10/3/2019	
10	1927220005	16WW58-190918MS				MS	3	1927220005-A E6850Q413Q	5480	10/3/2019	10/3/2019	
11	1927220006	16WW58-190918MSD				MSD	3	1927220006-A E6850Q413Q	5480	10/3/2019	10/3/2019	
12	1927220007	16WW58-190918-FD				FLDDUP	3	1927220007-A E6850Q41.3	5480	10/16/2019	10/3/2019	
13	1927220008	16WW51-190919				SAMPLE	3	1927220008-A E6850Q41.3	5480	10/16/2019	10/3/2019	
14	1927568001	LH18/24-SP140_092419				SAMPLE	3	1927568001-A E6850Q41.3	5480	10/22/2019	10/9/2019	
15	1927591001	LH18/24-SP650_092419_AIX				SAMPLE	3	1927591001-A E6850Q41.3	5480	10/22/2019	10/9/2019	
16	676593	CCV for HBN 248917 [ELMS/2298]				CCV	3	E685041C3Q	5311	10/3/2019	10/3/2019	
17	1927596001	LH18/24-SP650_092419				SAMPLE	3	1927596001-A E6850Q41.3	5480	10/22/2019	10/9/2019	
18	676594	CCV for HBN 248917 [ELMS/2298]				CCV	3	E685041C3Q	5311	10/3/2019	10/3/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #()'s: 1927220 (001-08); 1927568 (001); 1927591 (001); 1927596 (001)

ELMS Batch/HBN ID: 2296 (248804)

Prep Date: 09/30/2019 Analysis Date: 10/01/2019 Analyst: T. Bosch

Analyte: **Perchlorate** Matrix: **Water** Method: **6850**

Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\OCT\01OCT19D.s

Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

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

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/5%ACN (B&J Lot DU461-US)/0.1% glacial acetic acid (JT-Baker Lot 122550).
Eluent B1: 95% ACN (B&J Lot DU461-US)/5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 122550).

STANDARDS: Internal Standard Spiking Solution Horizon# 47863. Dilutions of Working Standards (Horizon: 49947/48) used for ICAL, CCV's, RLVS and ICS.

CALIBRATION CURVE: Used curve from 09/20/2019, sequence 20SEP19D.s Offline Quantitation Method: CLO4-DP3.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.

Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 8 Injection Volume: 30µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1 Run time: 12.0min.

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 3.0µL of QC Solution Horizon ID 47516 was used for LCS 676592; Target = 3.0µg/L. ASTM type II water was used for LMB 676591.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on samples 1927220005/06 (Client ID's: 16WW58-190918). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L. Field sample 1927568001 was analyzed and reported from 1:1,000 dilution. The reporting limit has been adjusted accordingly. Samples 1927220001/02 failed the 50-150% method requirement for ISTD recoveries. These samples were re-prepped, re-analyzed and reported.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\OCT\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\248917-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 676589) is reported from the analysis of the Laboratory Control Sample (LCS – 676592) at a level of 3.0µg/L.
- 6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafiles 01OCT19D02/05/06.

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

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

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS. 2298 HBN: 248917</u> <u>1927591 / 19275.96</u>		
Sample Set IDs if Applicable: <u>WV^S 1927220 / 1927568</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



AccuStandard®

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

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/NCCL 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

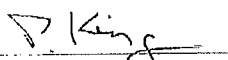


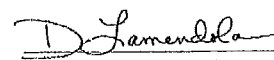
ISO Guide 34 Reference Material

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

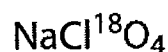
Catalog Number: OLM-7310-S

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	
#*	676588	CCV@25	Vial 71	1	Control	1	1.54525e6	7.598	25.01921
#*	676592	QC@3.0	Vial 72	1	Control	2	1.95090e5	7.638	3.01143
#*	676590	ICS@3.0	Vial 73	1	Control	3	1.58401e5	7.470	2.89276
#*	676591	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1927220001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
#*	1927220002		Vial 76	1	Sample	6	0.00000	0.000	0.00000
#*	1927220003		Vial 77	1	Sample	7	0.00000	0.000	0.00000
#*	1927220004		Vial 78	1	Sample	8	0.00000	0.000	0.00000
#*	1927220005	MS	Vial 79	1	Sample	9	1.24857e5	7.081	2.93501
#*	1927220006	MSD	Vial 80	1	Sample	10	1.25081e5	7.109	2.93042
#*	1927220007		Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1927220008		Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1927220001	RE	Vial 86	1	Sample	13	0.00000	0.000	0.00000
#*	1927220002	RE	Vial 87	1	Sample	14	0.00000	0.000	0.00000
#*	676593	CCV@25	Vial 71	1	Control	15	1.16163e6	7.635	24.36237
#*	1927568001	1K	Vial 83	1	Sample	16	7.34459e5	7.710	1.48902e4
#*	1927591001		Vial 84	1	Sample	17	0.00000	0.000	0.00000
#*	1927596001		Vial 85	1	Sample	18	0.00000	0.000	0.00000
#*	676594	CCV@25	Vial 71	1	Control	19	1.23687e6	7.622	25.30819

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
#*	676588	CCV@25	Vial 71	1	Control	1	2.11020e5	7.618	5.00000
#*	676592	QC@3.0	Vial 72	1	Control	2	2.38378e5	7.665	5.00000
#*	676590	ICS@3.0	Vial 73	1	Control	3	2.01376e5	7.487	5.00000
#*	676591	LMB	Vial 74	1	Control	4	2.07694e5	7.734	5.00000
#*	1927220001		Vial 75	1	Sample	5	4.33588e5	7.953	5.00000
#*	1927220002		Vial 76	1	Sample	6	4.80845e5	7.953	5.00000
#*	1927220003		Vial 77	1	Sample	7	1.29768e5	7.177	5.00000
#*	1927220004		Vial 78	1	Sample	8	1.55844e5	7.141	5.00000
#*	1927220005	MS	Vial 79	1	Sample	9	1.56479e5	7.113	5.00000
#*	1927220006	MSD	Vial 80	1	Sample	10	1.57002e5	7.138	5.00000
#*	1927220007		Vial 81	1	Sample	11	1.53526e5	7.105	5.00000
#*	1927220008		Vial 82	1	Sample	12	1.25991e5	7.173	5.00000
#*	1927220001	RE	Vial 86	1	Sample	13	2.84559e5	7.943	5.00000
#*	1927220002	RE	Vial 87	1	Sample	14	2.52777e5	7.981	5.00000
#*	676593	CCV@25	Vial 71	1	Control	15	1.63352e5	7.642	5.00000
#*	1927568001	1K	Vial 83	1	Sample	16	1.75719e5	7.734	5000.00000
#*	1927591001		Vial 84	1	Sample	17	1.54254e5	7.342	5.00000
#*	1927596001		Vial 85	1	Sample	18	1.53002e5	7.317	5.00000
#*	676594	CCV@25	Vial 71	1	Control	19	1.66780e5	7.660	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
#*	676588	CCV@25	Vial 71	1	Control	1	4.70692e5	7.614	24.99478
#*	676592	QC@3.0	Vial 72	1	Control	2	6.47386e4	7.668	3.18858
#*	676590	ICS@3.0	Vial 73	1	Control	3	5.51383e4	7.474	3.21571
#*	676591	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1927220001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
#*	1927220002		Vial 76	1	Sample	6	0.00000	0.000	0.00000
#*	1927220003		Vial 77	1	Sample	7	0.00000	0.000	0.00000
#*	1927220004		Vial 78	1	Sample	8	0.00000	0.000	0.00000
#*	1927220005	MS	Vial 79	1	Sample	9	4.29875e4	7.108	3.22679
#*	1927220006	MSD	Vial 80	1	Sample	10	4.26524e4	7.129	3.18966

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	1927220007	Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1927220008	Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1927220001 RE	Vial 86	1	Sample	13	0.00000	0.000	0.00000
#*	1927220002 RE	Vial 87	1	Sample	14	0.00000	0.000	0.00000
#*	676593 CCV@25	Vial 71	1	Control	15	3.50571e5	7.646	24.12639
#*	1927568001 1K	Vial 83	1	Sample	16	2.20256e5	7.727	1.45858e4
#*	1927591001	Vial 84	1	Sample	17	0.00000	0.000	0.00000
#*	1927596001	Vial 85	1	Sample	18	0.00000	0.000	0.00000
#*	676594 CCV@25	Vial 71	1	Control	19	3.71181e5	7.641	24.94374

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	==	=====	=====	=====
1	Vial 71	676588	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	676592	QC@3.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	676590	ICS@3.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	676591	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1927220001		CLO4-AQN	1	Sample	
6	Vial 76	1927220002		CLO4-AQN	1	Sample	
7	Vial 77	1927220003		CLO4-AQN	1	Sample	
8	Vial 78	1927220004		CLO4-AQN	1	Sample	
9	Vial 79	1927220005	MS	CLO4-AQN	1	Sample	
10	Vial 80	1927220006	MSD	CLO4-AQN	1	Sample	
11	Vial 81	1927220007		CLO4-AQN	1	Sample	
12	Vial 82	1927220008		CLO4-AQN	1	Sample	
13	Vial 86	1927220001	RE	CLO4-AQN	1	Sample	
14	Vial 87	1927220002	RE	CLO4-AQN	1	Sample	
15	Vial 71	676593	CCV@25	CLO4-AQN	1	Ctrl Samp	
16	Vial 83	1927568001	1K	CLO4-AQN	1	Sample	
17	Vial 84	1927591001		CLO4-AQN	1	Sample	
18	Vial 85	1927596001		CLO4-AQN	1	Sample	
19	Vial 71	676594	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD01.D

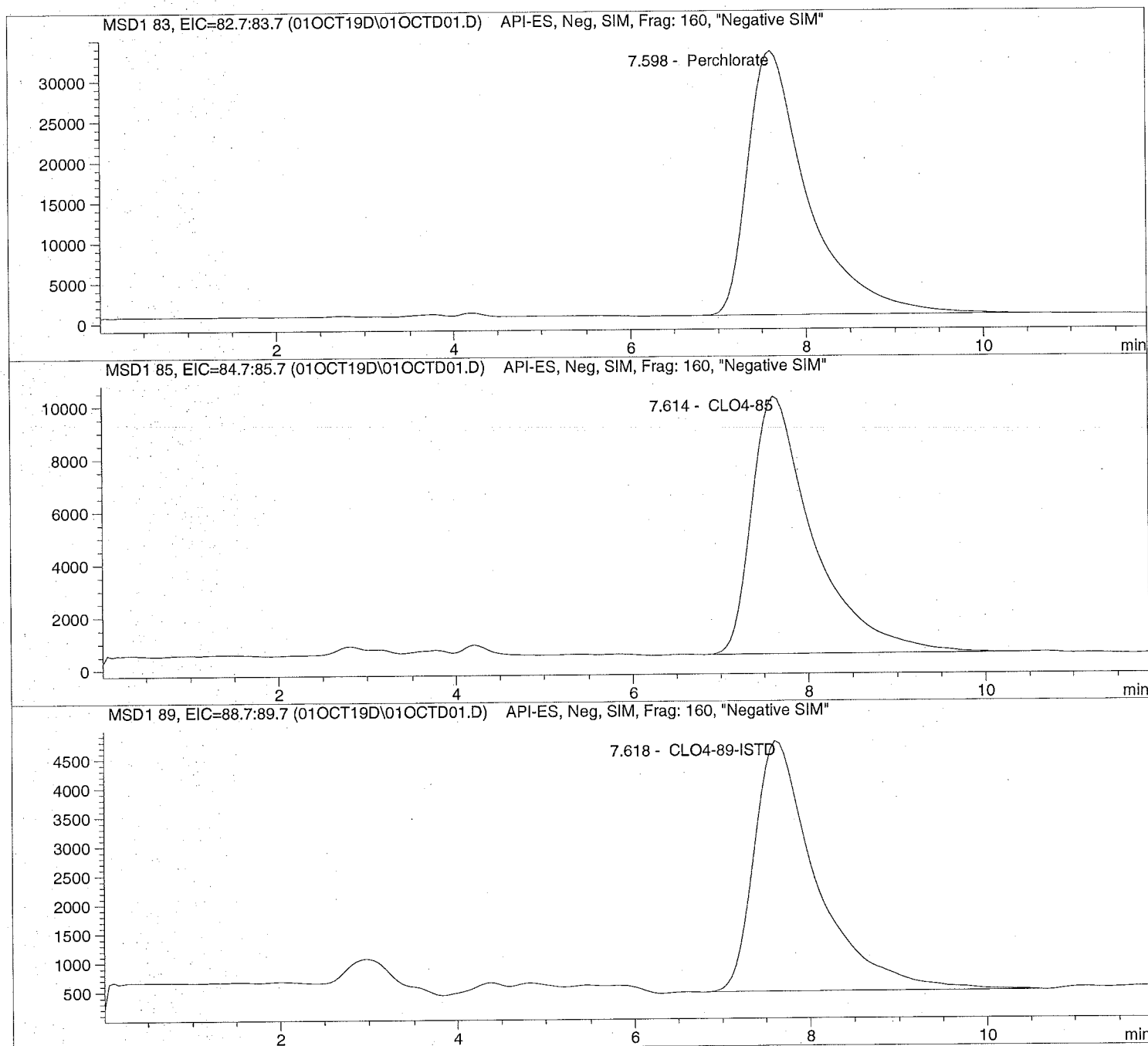
Sample Name: 676588 CCV@25

Injection Date: 10/01/2019 10:42:23
Sample Name: 676588 CCV@25
Acq Operator: TNB

Seq Line: 1
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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD01.D Sample Name: 676588 CCV@25

```
=====
Injection Date: 10/01/2019 10:42:23      Seq Line: 1
Sample Name: 676588    CCV@25      Location: Vial 71
Acq Operator: TNB      Inj. No.: 1
                                         Inj. Vol.: 30 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58
```

Perchlorate analysis

=====

Sample Information

=====

```
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000
```

=====

LCMS Results

=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.598	BB S	1545248.1	25.0192	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.614	BB S	470692.3	24.9948	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.618	PB S	211020.1	5.0000	CLO4-89-ISTD

=====

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD02.D

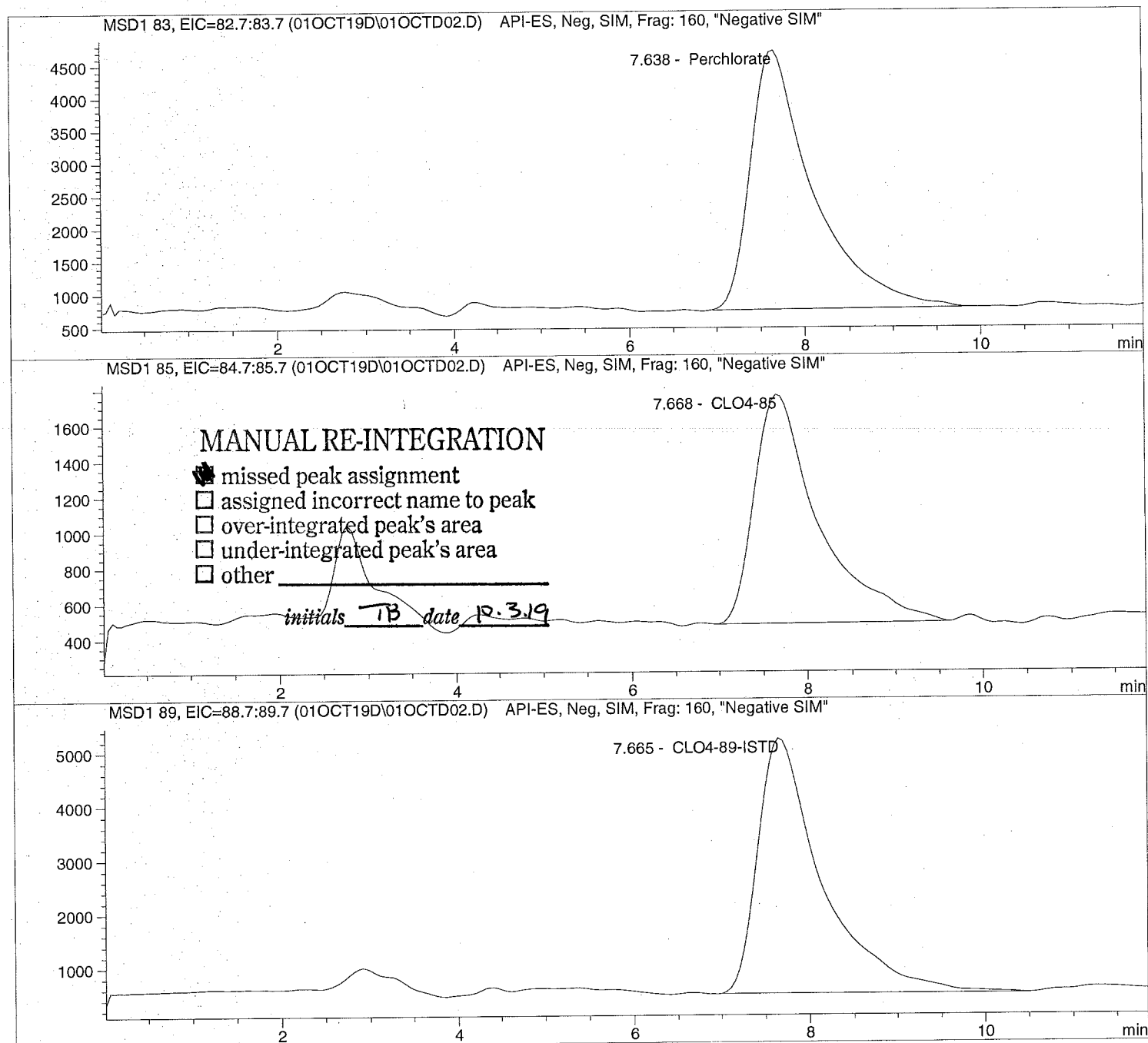
Sample Name: 676592 QC@3.0

Injection Date: 10/01/2019 10:56:09
 Sample Name: 676592 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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD02.D Sample Name: 676592 QC@3.0

=====
Injection Date: 10/01/2019 10:56:09 Seq Line: 2
Sample Name: 676592 QC@3.0 Location: Vial 72
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

=====
Sample Information
=====

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019, 00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 3.000

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.638	BB S	195089.7	3.0114	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.668	MM	64738.6	3.1886	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.665	PB S	238378.3	5.0000	CLO4-89-ISTD

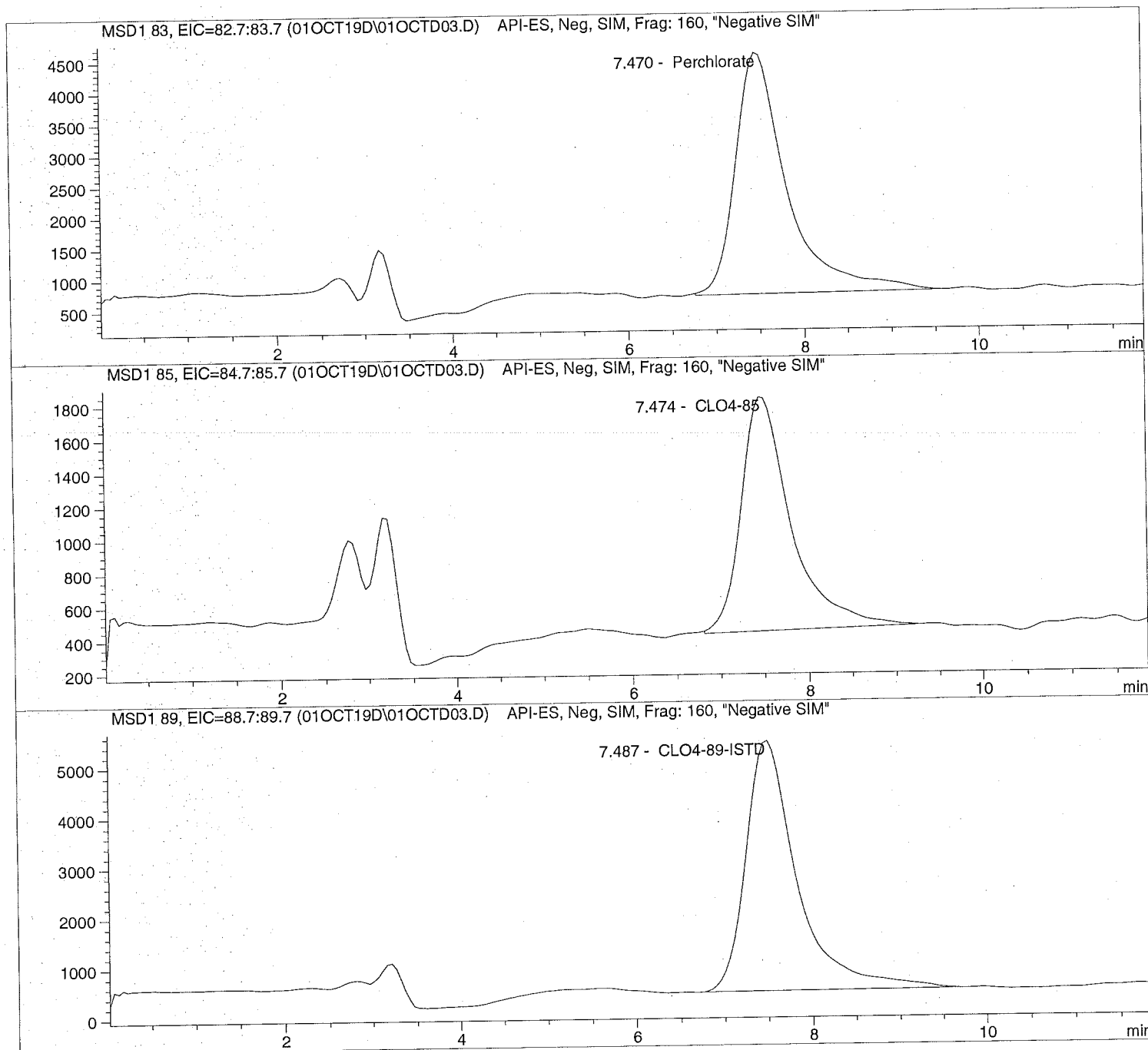
=====
*** End of Report ***
=====

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD03.D Sample Name: 676590 ICS@3.0

=====
Injection Date: 10/01/2019 11:09:58 Seq Line: 3
Sample Name: 676590 ICS@3.0 Location: Vial 73
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD03.D Sample Name: 676590 ICS@3.0

```

=====
Injection Date: 10/01/2019 11:09:58      Seq Line:          3
Sample Name:    676590 ICS@3.0           Location:         Vial 73
Acq Operator:   TNB                      Inj. No.:        1
                                           Inj. Vol.:       30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  3.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.470	BB S	158401.3	2.8928	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.474	BB S	55138.3	3.2157	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.487	PB S	201376.3	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD04.D

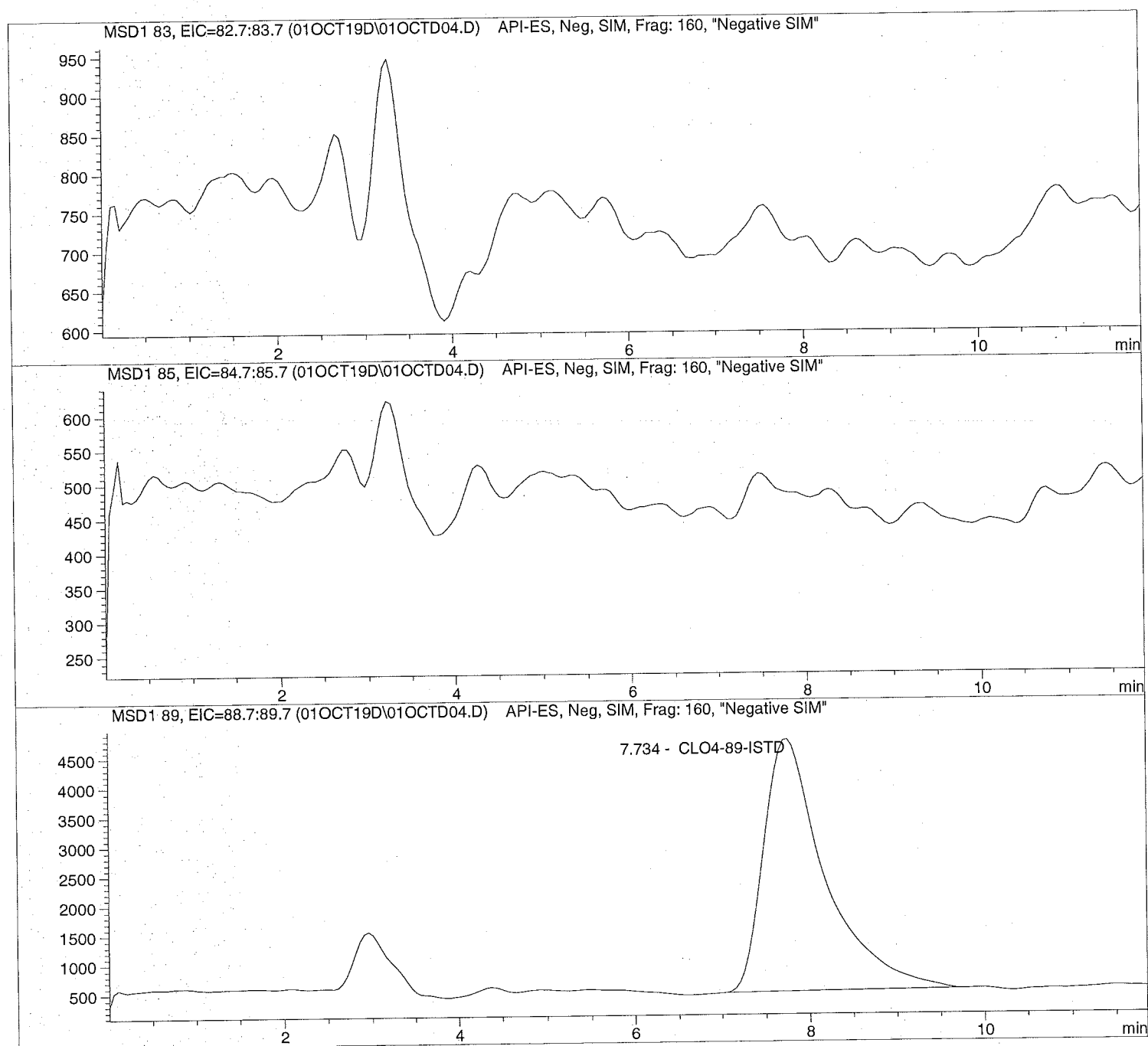
Sample Name: 676591 LMB

Injection Date: 10/01/2019 11:23:50
Sample Name: 676591 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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD04.D Sample Name: 676591 LMB

```

=====
Injection Date: 10/01/2019 11:23:50      Seq Line:                    4
Sample Name:    676591    LMB                        Location:                    Vial 74
Acq Operator:    TNB                                Inj. No.:                    1
                                                      Inj. Vol.:                    30 µl
=====

```

```

Acq. Method:        CLO4-AQN.M
Analysis Method:    C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:       10/2/2019 08:05:58
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:                    Signal
Calib. Data Modified:        Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:                  1.000000
Dilution:                    1.000000
Sample Amount:                0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.734	PB S	207693.8	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD05.D

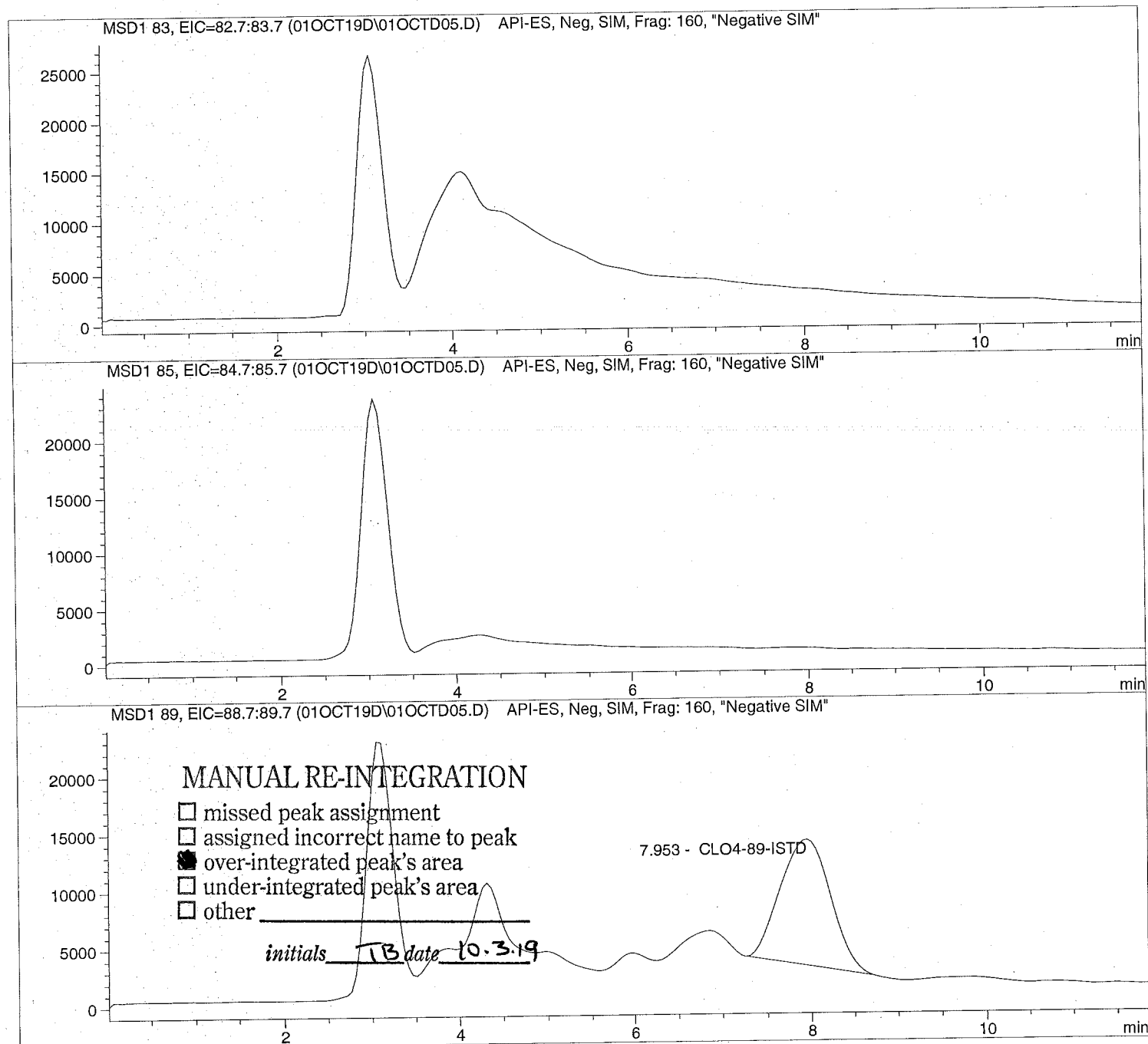
Sample Name: 1927220001

Injection Date: 10/01/2019 11:37:35
 Sample Name: 1927220001
 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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD05.D Sample Name: 1927220001

```

=====
Injection Date: 10/01/2019 11:37:35      Seq Line:          5
Sample Name:    1927220001                Location:         Vial 75
Acq Operator:   TNB                       Inj. No.:        1
                                           Inj. Vol.:       30 µl
  
```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
  
```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.953	MM	433588.3	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD06.D

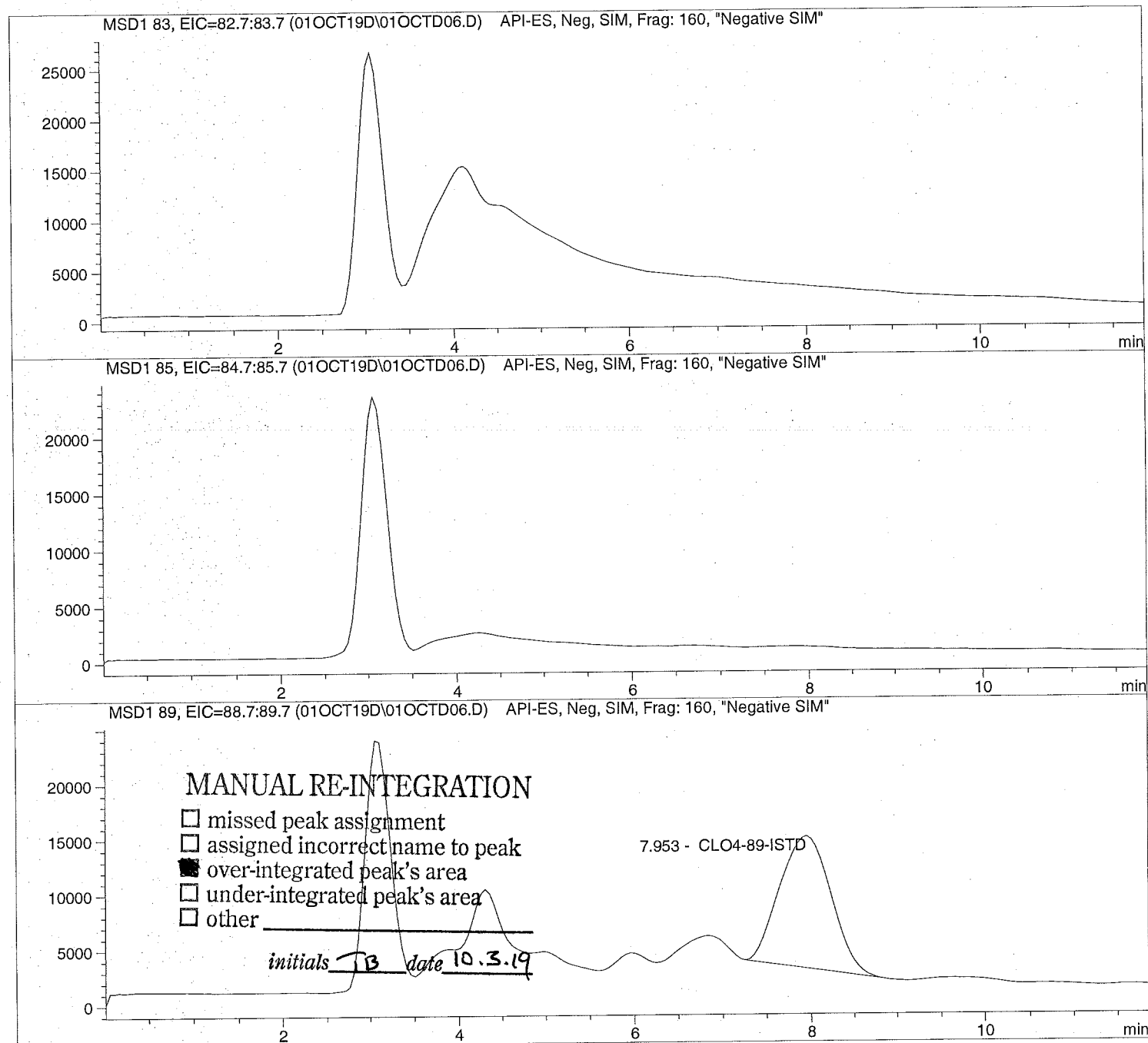
Sample Name: 1927220002

Injection Date: 10/01/2019 11:51:24
 Sample Name: 1927220002
 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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD06.D

Sample Name: 1927220002

```

=====
Injection Date: 10/01/2019 11:51:24      Seq Line: 6
Sample Name: 1927220002                  Location: Vial 76
Acq Operator: TNB                         Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019, 00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.953	MM	480844.6	5.0000	CLO4-89-ISTD

```

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

```

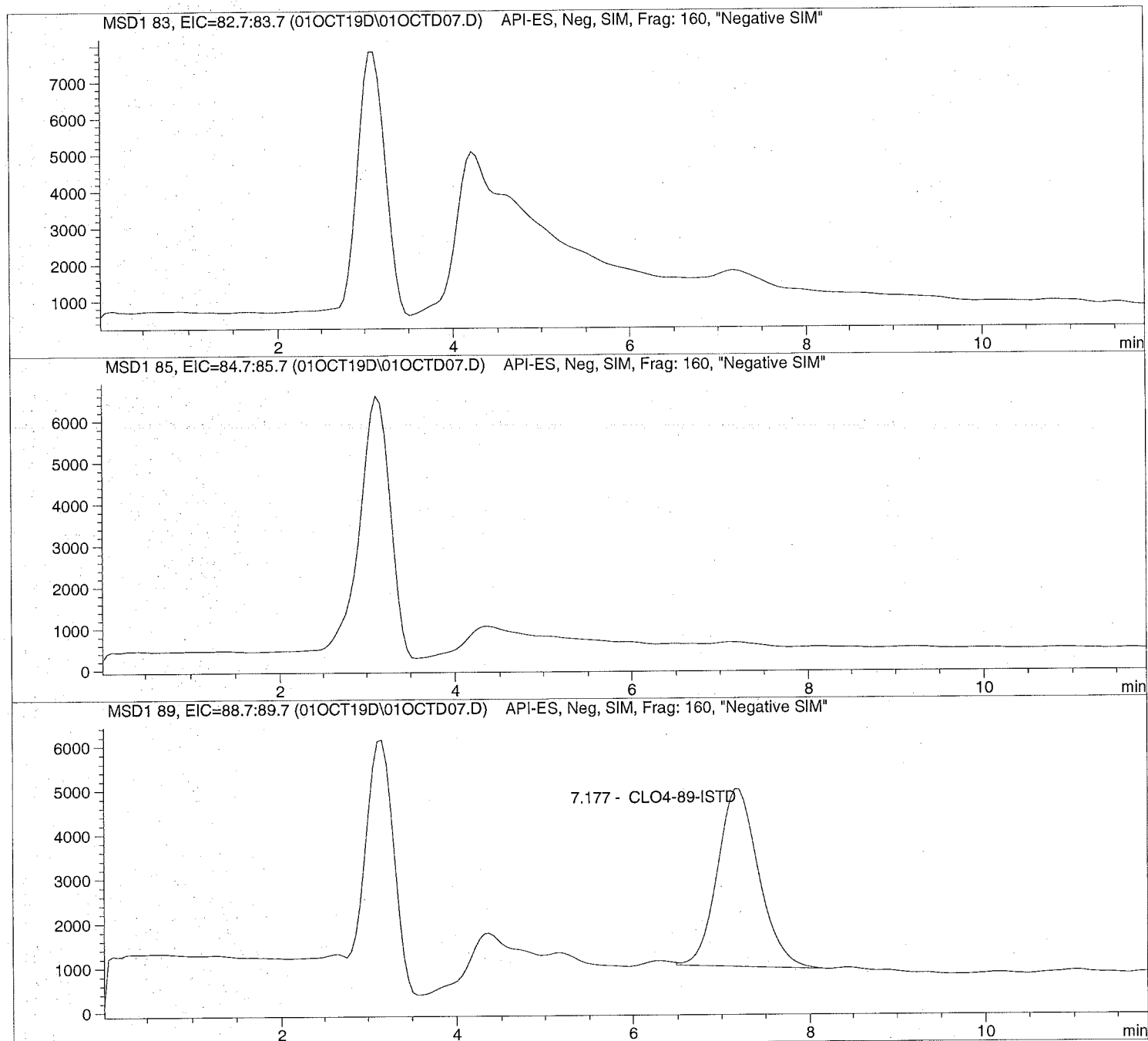
Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD07.D

Sample Name: 1927220003

=====
Injection Date: 10/01/2019 12:05:17
Sample Name: 1927220003
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: 10/2/2019 08:05:58

Perchlorate analysis
=====

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD07.D

Sample Name: 1927220003

```

=====
Injection Date: 10/01/2019 12:05:17      Seq Line: 7
Sample Name:    1927220003                Location:  Vial 77
Acq Operator:   TNB                       Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.177	BBA	129768.3	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD08.D

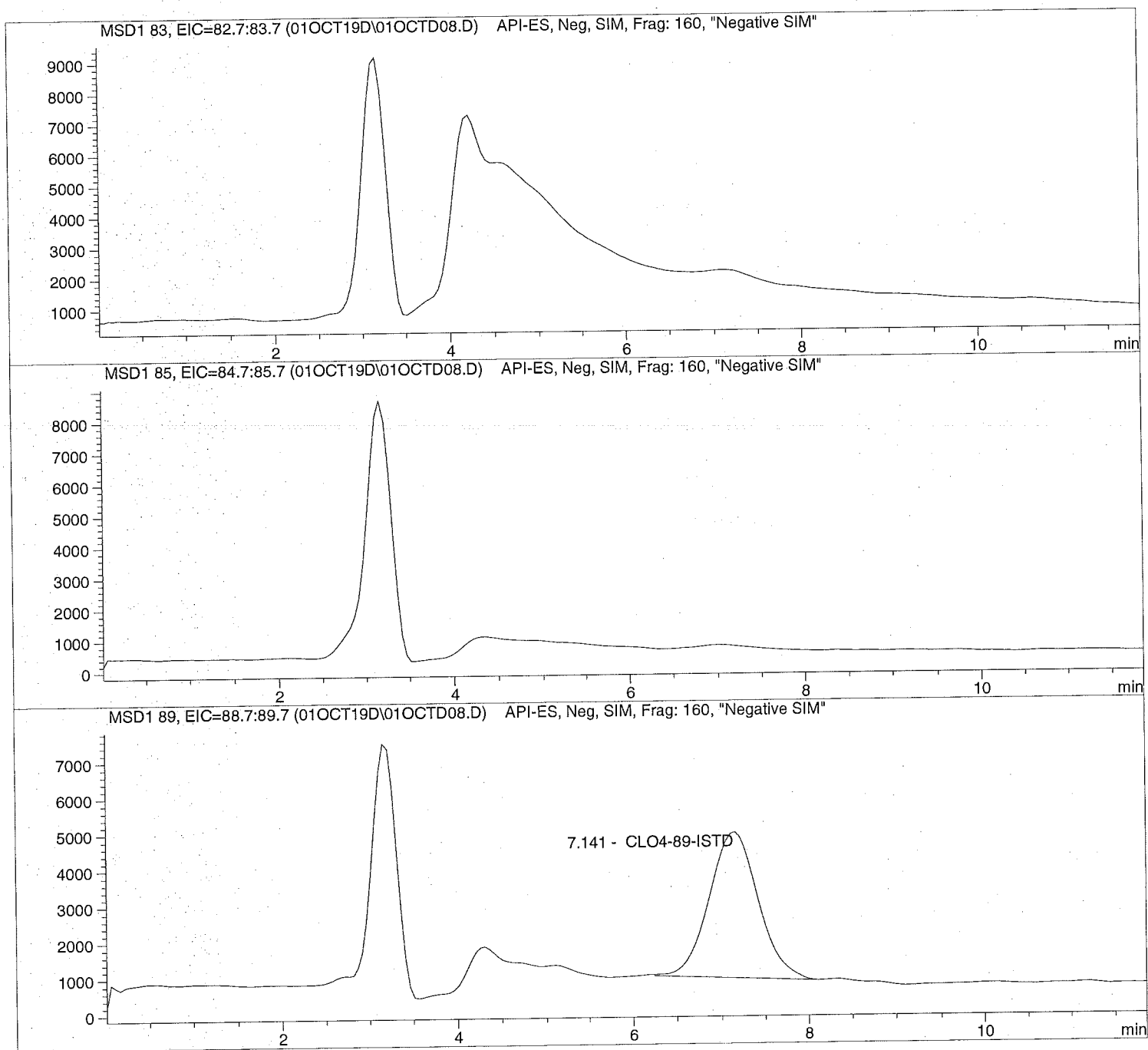
Sample Name: 1927220004

Injection Date: 10/01/2019 12:19:05
Sample Name: 1927220004
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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD08.D Sample Name: 1927220004

```

=====
Injection Date: 10/01/2019 12:19:05      Seq Line:                    8
Sample Name:    1927220004                Location:                Vial 78
Acq Operator:   TNB                        Inj. No.:                1
                                          Inj. Vol.:               30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
=====

```

Perchlorate analysis

Sample Information

```

Sorted By:                    Signal
Calib. Data Modified:      Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:                1.000000
Dilution:                   1.000000
Sample Amount:              0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.141	BBA	155843.6	5.0000	CLO4-89-ISTD

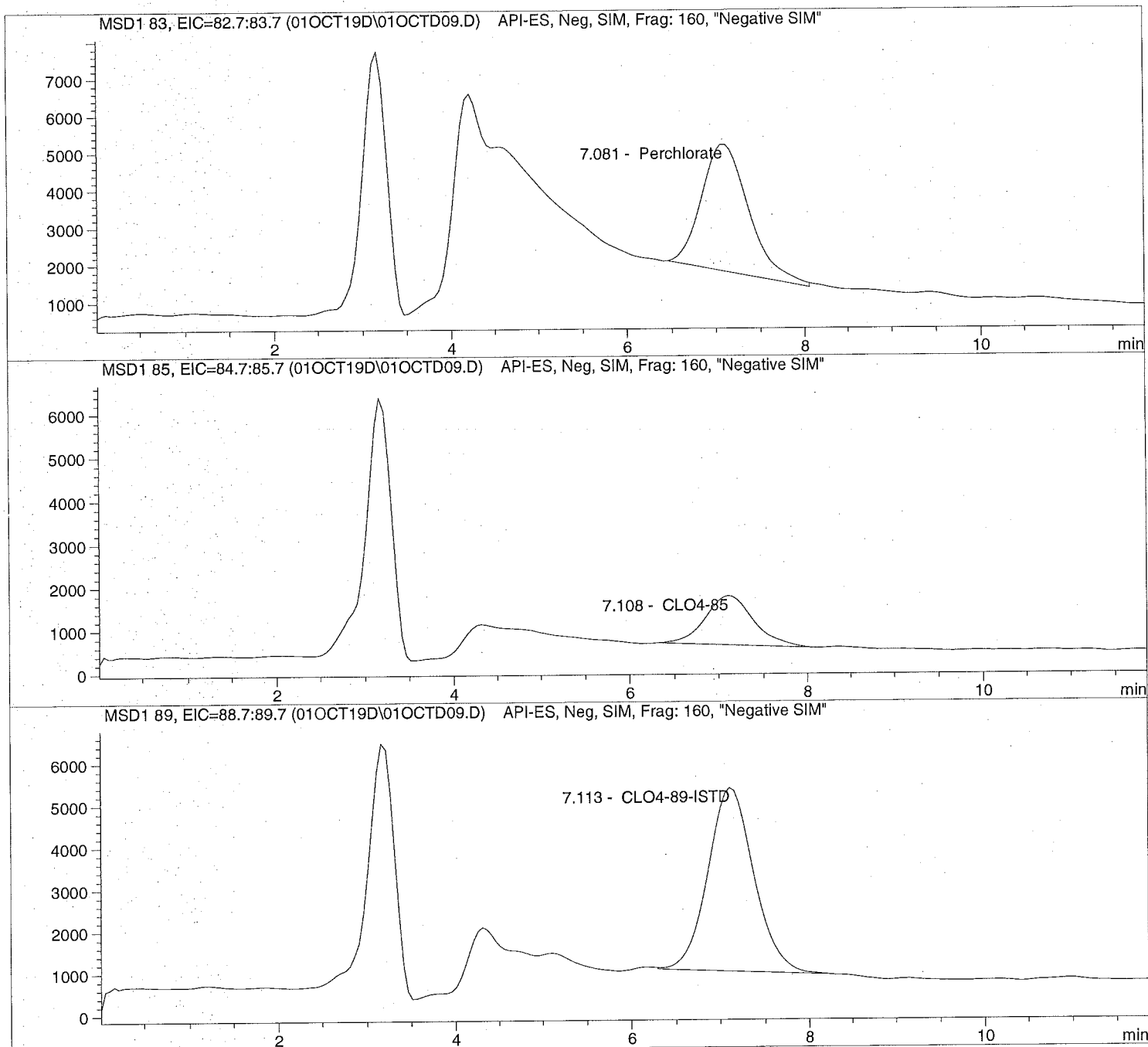
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD09.D Sample Name: 1927220005 MS

=====
Injection Date: 10/01/2019 12:32:51 Seq Line: 9
Sample Name: 1927220005 MS Location: Vial 79
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD09.D Sample Name: 1927220005 MS

```

=====
Injection Date: 10/01/2019 12:32:51      Seq Line:          9
Sample Name:   1927220005 MS             Location:         Vial 79
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       30 µl
  
```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  10/2/2019 08:05:58
  
```

Perchlorate analysis

=====
Sample Information
=====

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
  
```

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.081	PBA	124857.0	2.9350	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.108	PBA	42987.5	3.2268	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.113	BBA	156479.1	5.0000	CLO4-89-ISTD

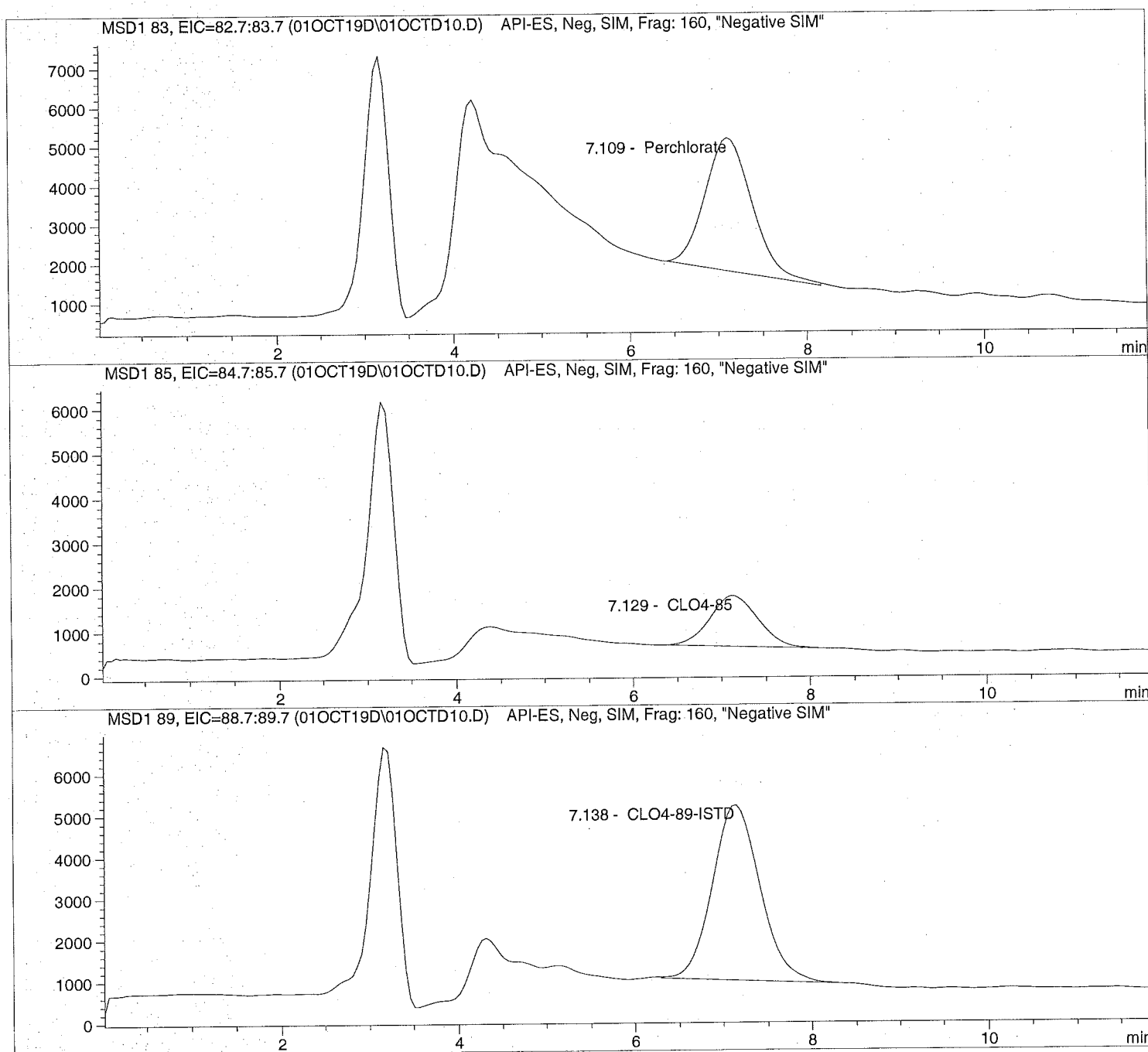
=====
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD10.D Sample Name: 1927220006 MSD

=====
Injection Date: 10/01/2019 12:46:41 Seq Line: 10
Sample Name: 1927220006 MSD Location: Vial 80
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD10.D Sample Name: 1927220006 MSD

=====
Injection Date: 10/01/2019 12:46:41 Seq Line: 10
Sample Name: 1927220006 MSD Location: Vial 80
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

=====
Sample Information
=====

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019, 00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.109	PBA	125081.4	2.9304	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.129	PBA	42652.4	3.1897	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.138	BBA	157002.2	5.0000	CLO4-89-ISTD

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

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD11.D

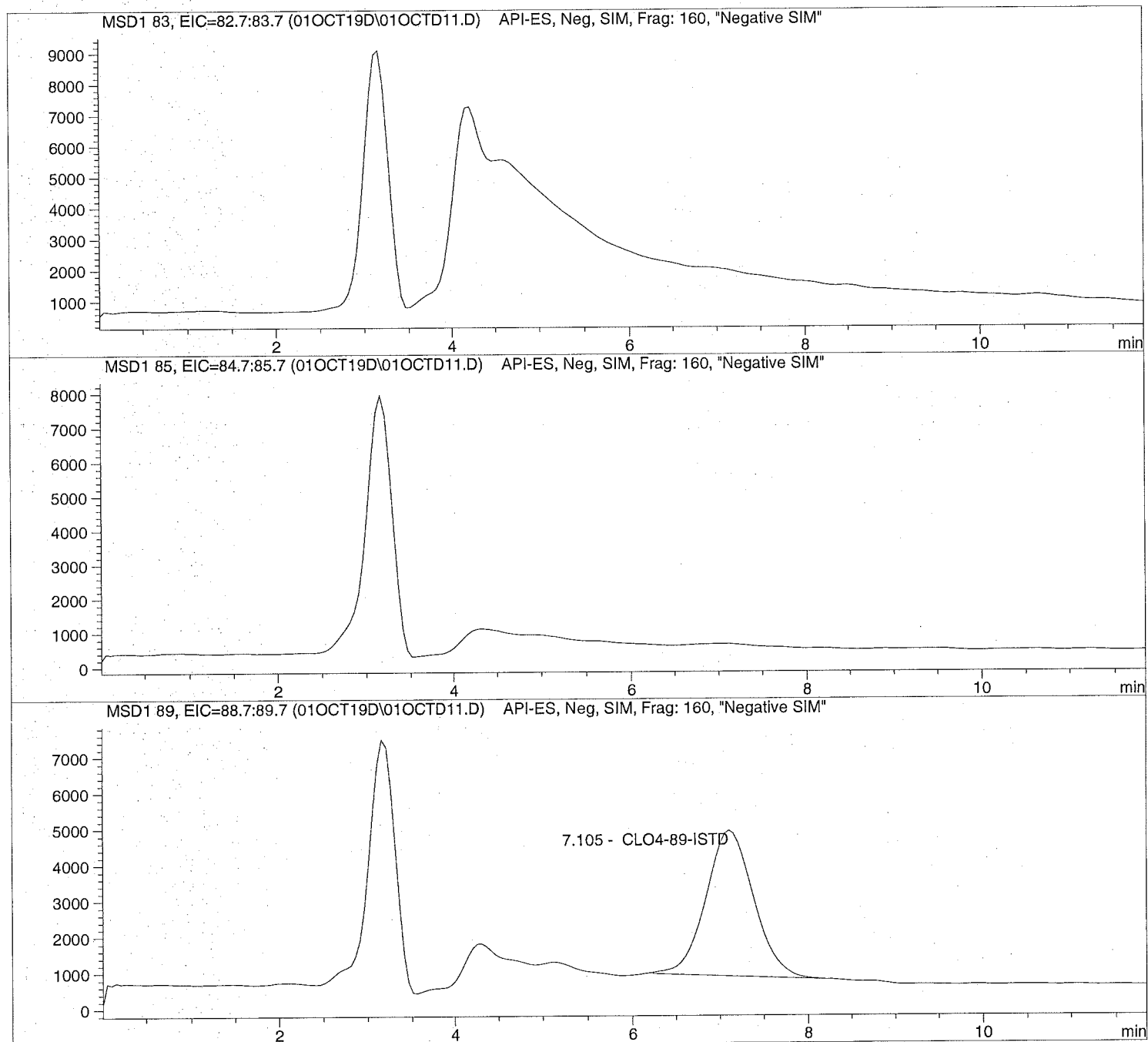
Sample Name: 1927220007

Injection Date: 10/01/2019 13:00:30
Sample Name: 1927220007
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
Inj. No.: 1
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD11.D Sample Name: 1927220007

```

=====
Injection Date: 10/01/2019 13:00:30      Seq Line:          11
Sample Name:    1927220007                Location:         Vial 81
Acq Operator:   TNB                       Inj. No.:        1
                                           Inj. Vol.:      30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.105	BBA	153526.1	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD12.D

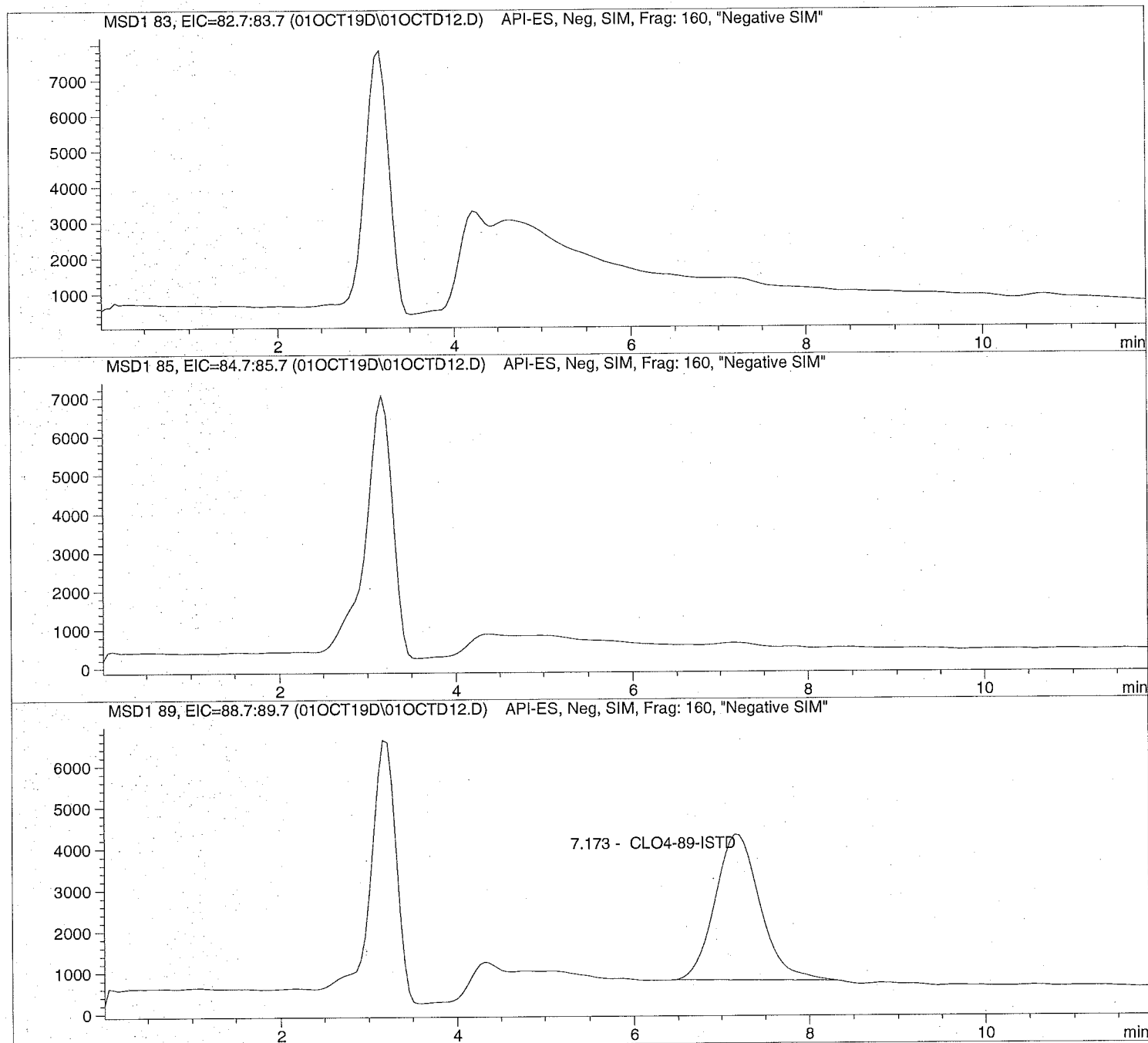
Sample Name: 1927220008

Injection Date: 10/01/2019 13:14:17
Sample Name: 1927220008
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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD12.D Sample Name: 1927220008

```

=====
Injection Date: 10/01/2019 13:14:17      Seq Line:                    12
Sample Name:    1927220008                Location:                  Vial 82
Acq Operator:   TNB                        Inj. No.:                 1
                                          Inj. Vol.:                30 µl
=====

```

```

Acq. Method:        CLO4-AQN.M
Analysis Method:    C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:      10/2/2019 08:05:58
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:                    Signal
Calib. Data Modified:        Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:                  1.000000
Dilution:                    1.000000
Sample Amount:                0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.173	PBA	125991.0	5.0000	CLO4-89-ISTD

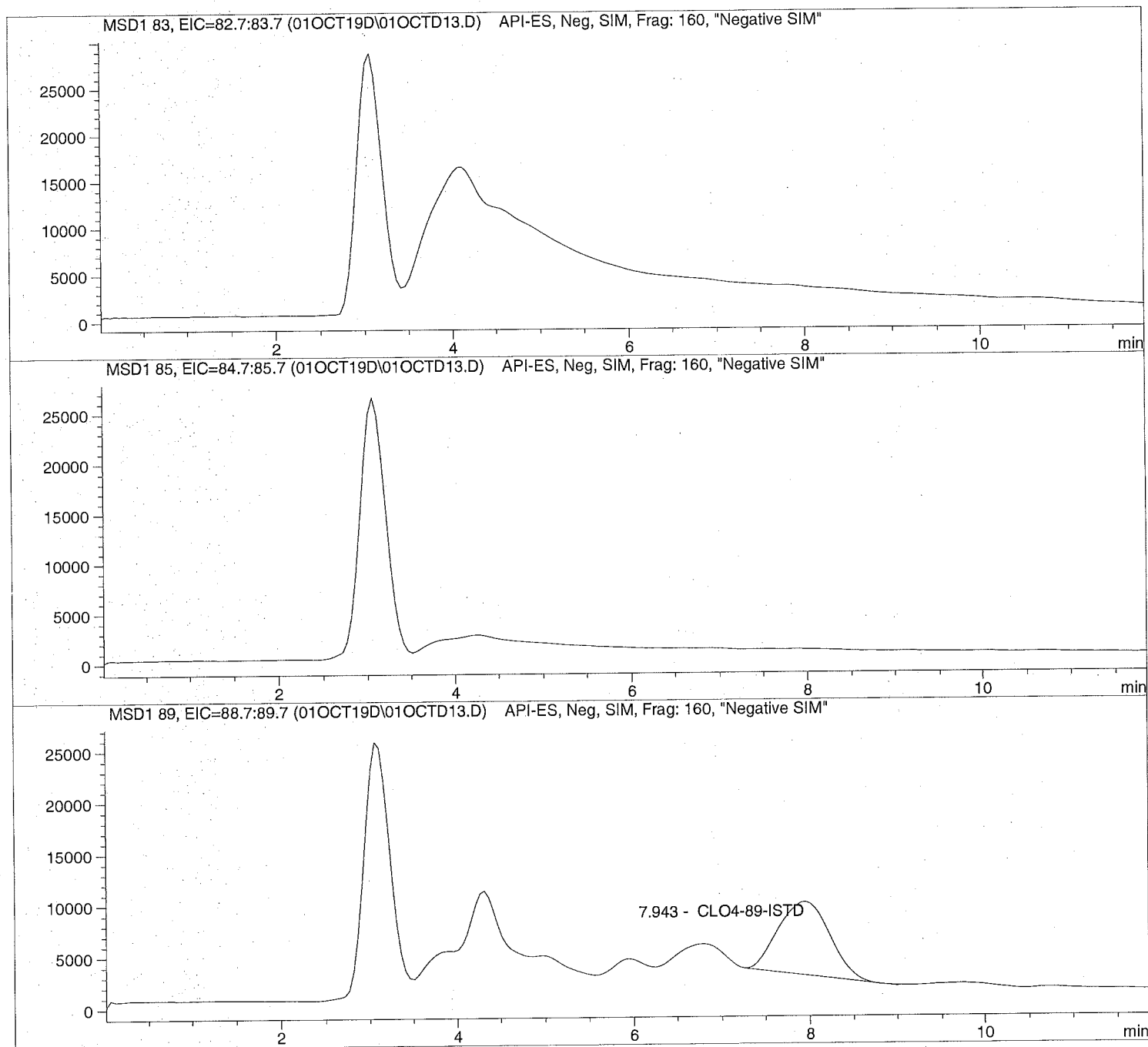
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD13.D Sample Name: 1927220001 RE

=====
Injection Date: 10/01/2019 13:49:07 Seq Line: 13
Sample Name: 1927220001 RE Location: Vial 86
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD13.D Sample Name: 1927220001 RE

```

=====
Injection Date: 10/01/2019 13:49:07      Seq Line:          13
Sample Name:   1927220001 RE             Location:         Vial 86
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  10/2/2019 08:05:58
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.943	VBA	284558.6	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD14.D

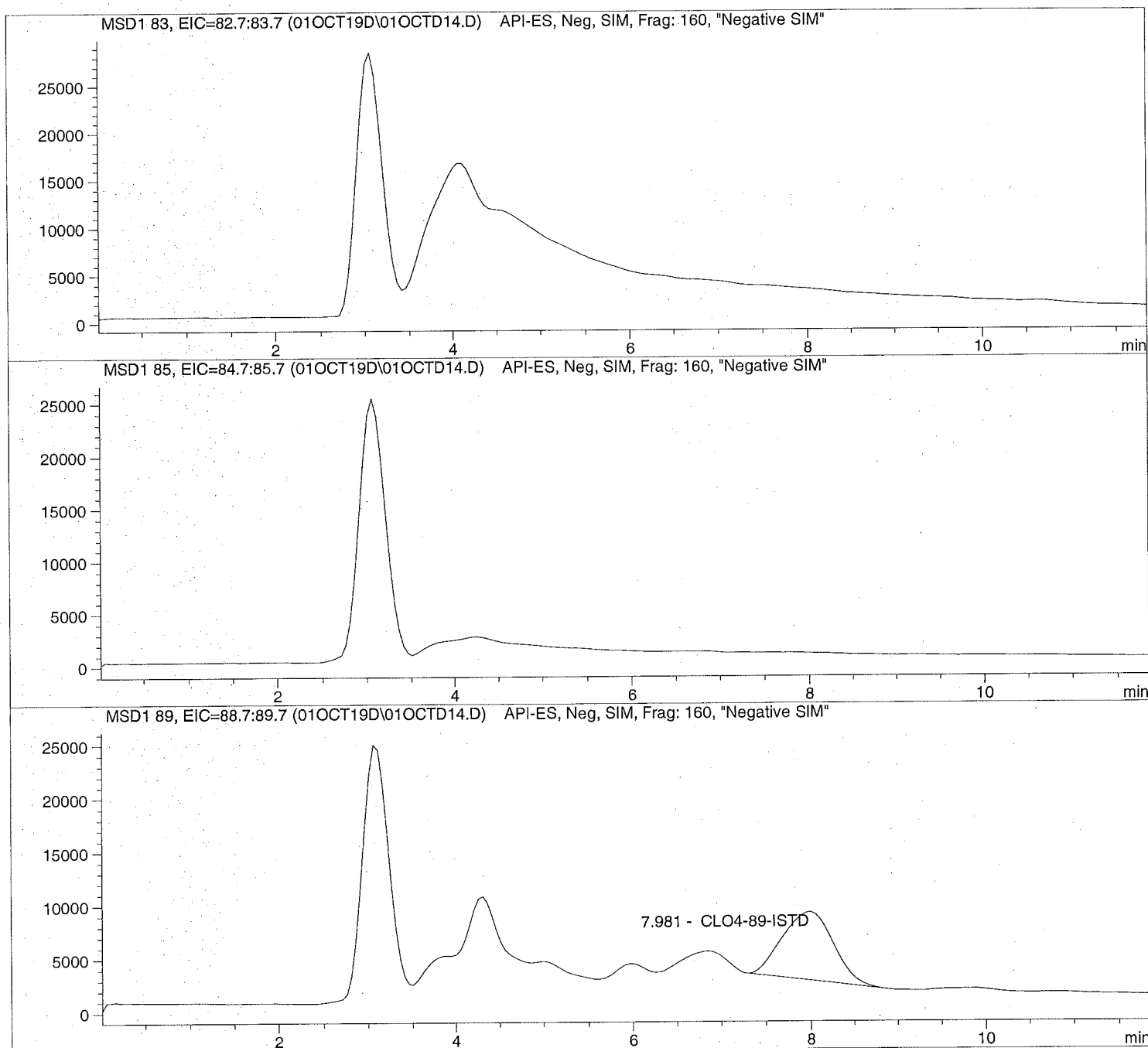
Sample Name: 1927220002 RE

Injection Date: 10/01/2019 14:09:00
Sample Name: 1927220002 RE
Acq Operator: TNB

Seq Line: 14
Location: Vial 87
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD14.D Sample Name: 1927220002 RE

```

=====
Injection Date: 10/01/2019 14:09:00      Seq Line:          14
Sample Name:   1927220002 RE             Location:          Vial 87
Acq Operator:  TNB                       Inj. No.:         1
                                           Inj. Vol.:        30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  10/2/2019 08:05:58
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.981	VBA	252777.4	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD15.D

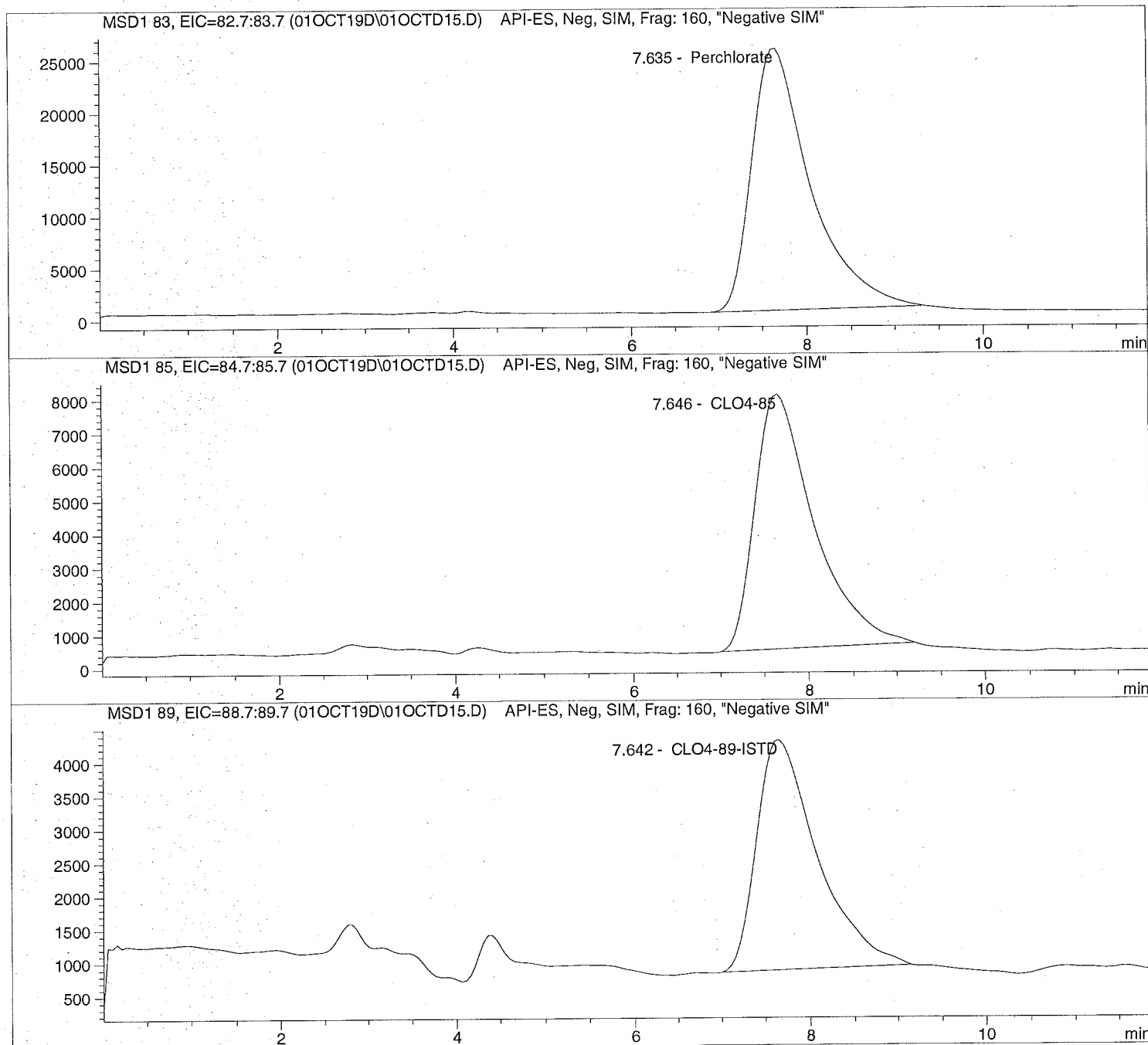
Sample Name: 676593 CCV@25

Injection Date: 10/01/2019 14:22:50
Sample Name: 676593 CCV@25
Acq Operator: TNB

Seq Line: 15
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD15.D Sample Name: 676593 CCV@25

Injection Date: 10/01/2019 14:22:50 Seq Line: 15
 Sample Name: 676593 CCV@25 Location: Vial 71
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By: Signal
 Calib. Data Modified: Mon, 23. Sep. 2019, 00:20:59 pm
 Multiplier: 1.000000
 Dilution: 1.000000
 Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.635	PBA	1161631.1	24.3624	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.646	PBA	350571.0	24.1264	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.642	PBA	163352.1	5.0000	CLO4-89-ISTD

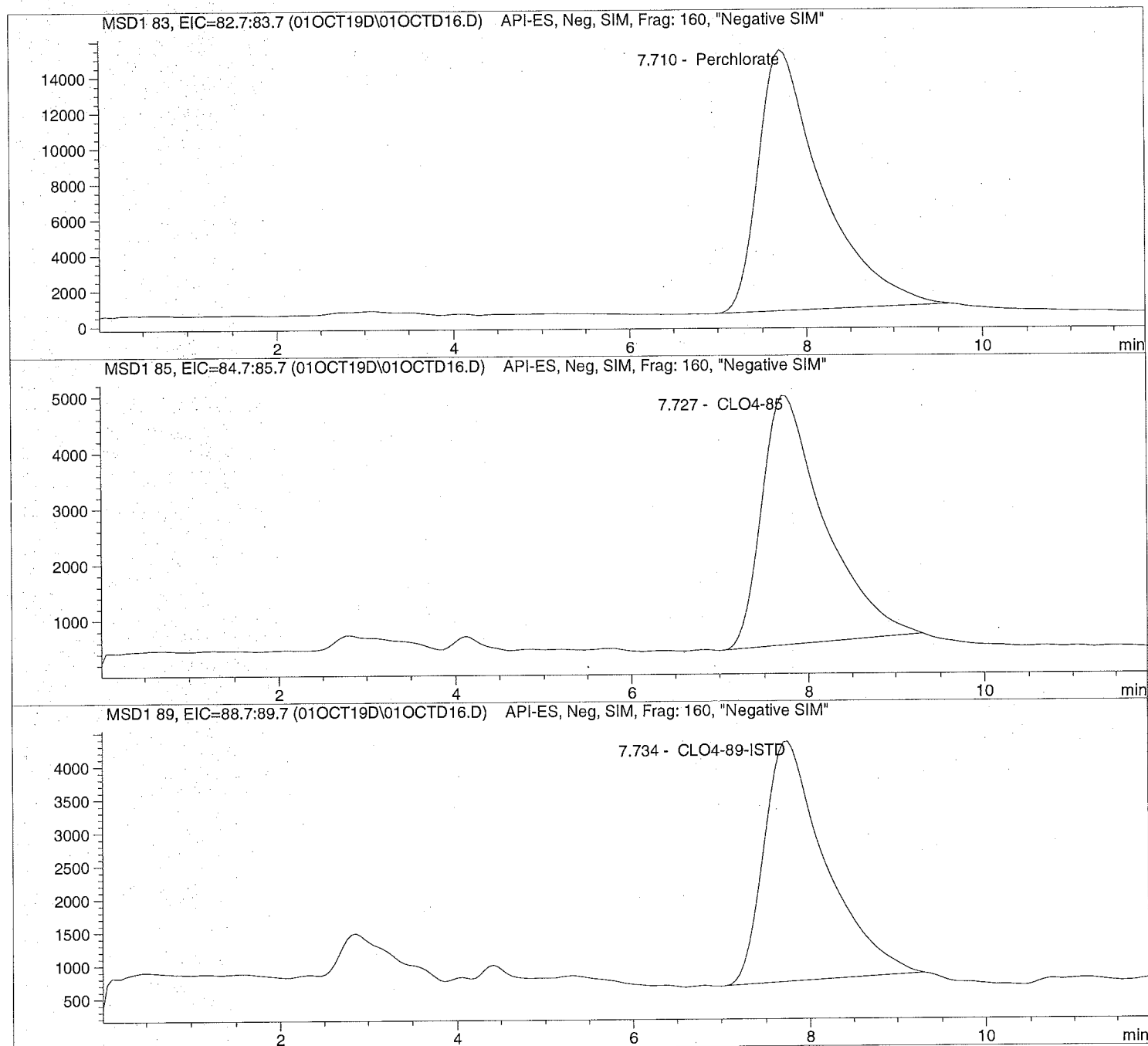
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD16.D Sample Name: 1927568001 1K

```
=====
Injection Date: 10/01/2019 14:36:36      Seq Line:          16
Sample Name:    1927568001 1K             Location:           Vial 83
Acq Operator:   TNB                       Inj. No.:          1
                                           Inj. Vol.:         30 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
=====
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD16.D Sample Name: 1927568001 1K

```

=====
Injection Date: 10/01/2019 14:36:36      Seq Line:      16
Sample Name:    1927568001 1K            Location:      Vial 83
Acq Operator:   TNB                      Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1000.000000
Sample Amount:  0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.710	PBA	734459.3	14890.2051	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.727	PBA	220255.9	14585.8174	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.734	PBA	175719.3	5000.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD17.D

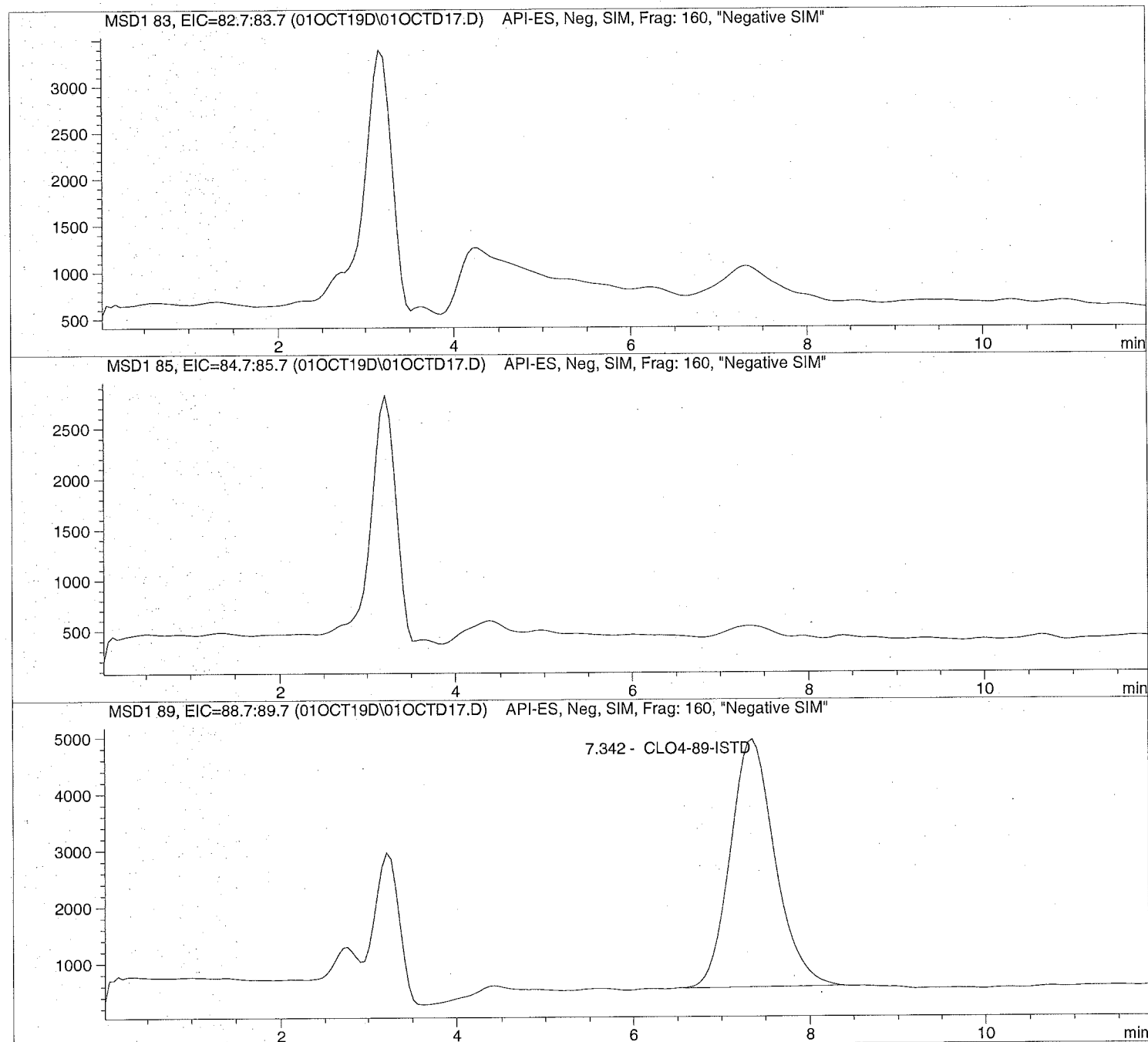
Sample Name: 1927591001

Injection Date: 10/01/2019 14:50:25
Sample Name: 1927591001
Acq Operator: TNB

Seq Line: 17
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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD17.D Sample Name: 1927591001

```

=====
Injection Date: 10/01/2019 14:50:25      Seq Line:          17
Sample Name:    1927591001              Location:         Vial 84
Acq Operator:   TNB                     Inj. No.:        1
                                           Inj. Vol.:       30 µl
  
```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
  
```

Perchlorate analysis

Sample Information

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.342	BBA	154253.7	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD18.D

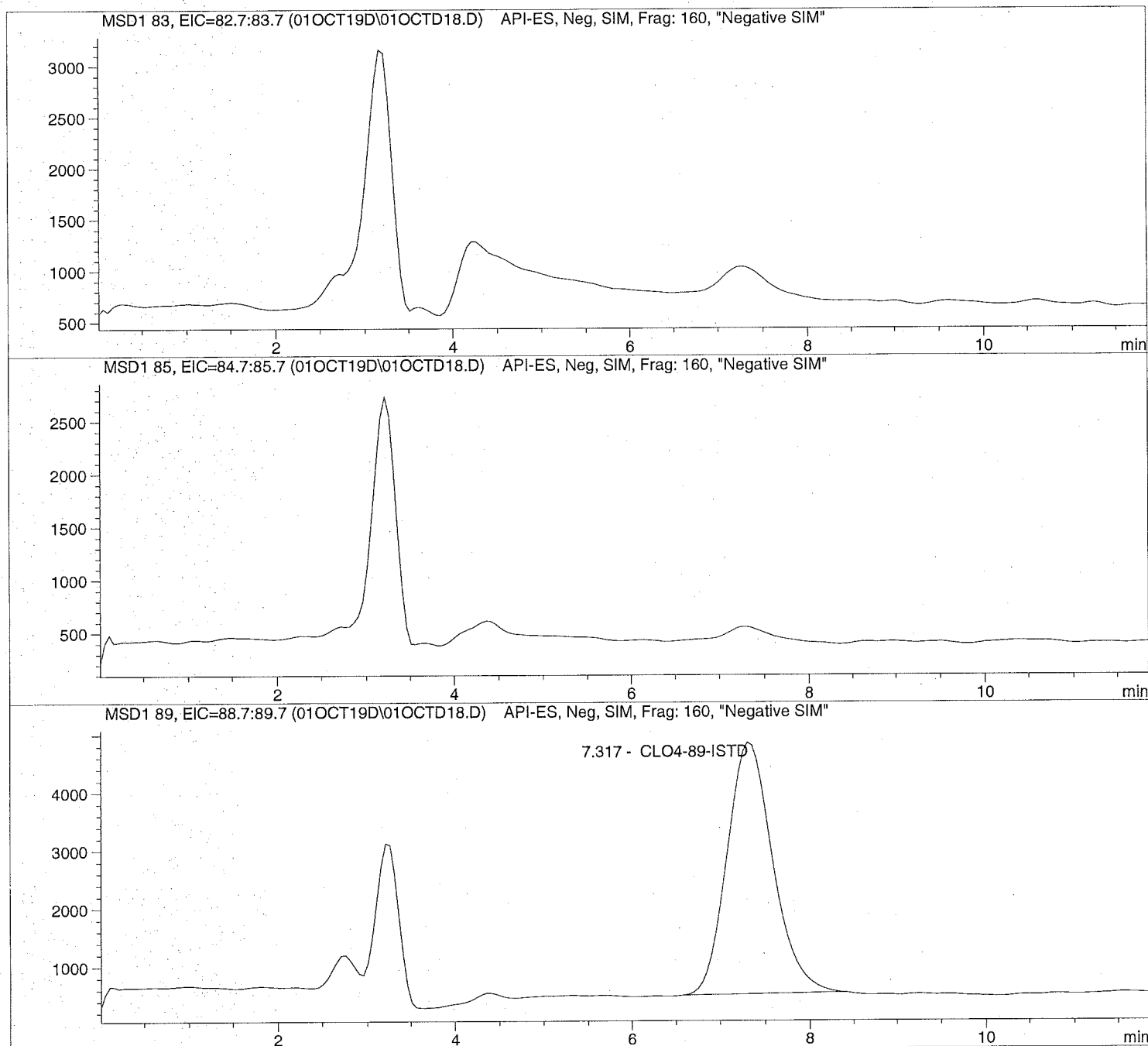
Sample Name: 1927596001

Injection Date: 10/01/2019 15:04:19
Sample Name: 1927596001
Acq Operator: TNB

Seq Line: 18
Location: Vial 85
Inj. No.: 1
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD18.D Sample Name: 1927596001

```

=====
Injection Date: 10/01/2019 15:04:19      Seq Line: 18
Sample Name: 1927596001                    Location: Vial 85
Acq Operator: TNB                          Inj. No.: 1
                                          Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.317	BBA	153001.9	5.0000	CLO4-89-ISTD

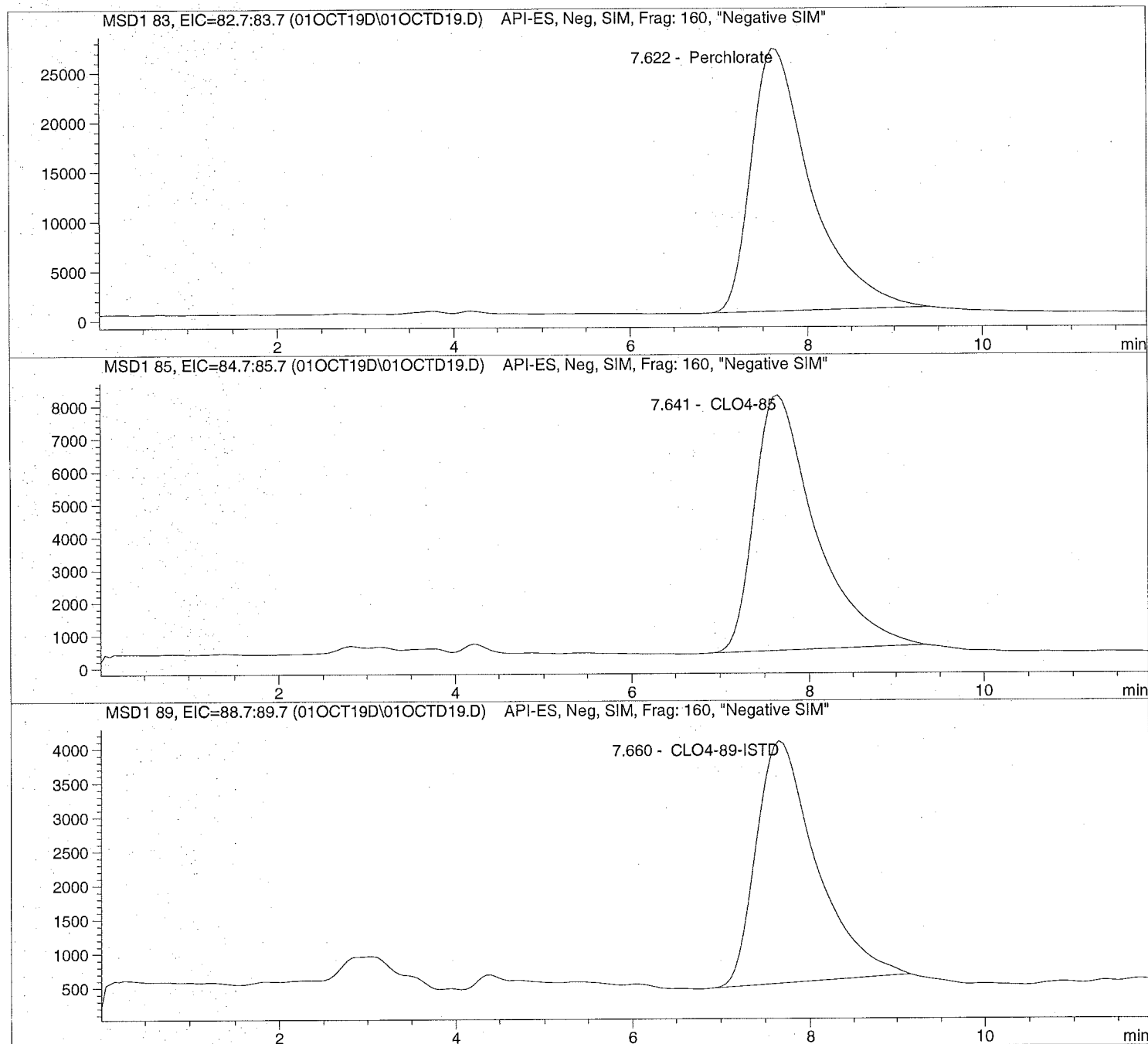
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD19.D Sample Name: 676594 CCV@25

=====
Injection Date: 10/01/2019 15:18:13 Seq Line: 19
Sample Name: 676594 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD19.D Sample Name: 676594 CCV@25

=====
Injection Date: 10/01/2019 15:18:13 Seq Line: 19
Sample Name: 676594 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

=====
Sample Information
=====

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.622	PBA	1236865.2	25.3082	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.641	PBA	371181.1	24.9437	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.660	PBA	166779.7	5.0000	CLO4-89-ISTD

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



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

**Initial
Calibration**

=====
 Calibration Table
 =====

Perchlorate

Calib. Data Modified : 9/23/2019 12:20:59 PM

Calculate : Internal Standard
 Based on : Peak Area

Rel. Reference Window : 20.000 %
 Abs. Reference Window : 0.000 min
 Rel. Non-ref. Window : 20.000 %
 Abs. Non-ref. Window : 0.000 min
 Use Multiplier & Dilution Factor with ISTDs
 Uncalibrated Peaks : not reported
 Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
 Origin : Ignored (some peaks differ, see below)
 Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
 Average Response : Average all calibrations
 Average Retention Time: Floating Average New 75%

Calibration Report Options :
 Printout of recalibrations within a sequence:
 Calibration Table after Recalibration
 Normal Report after Recalibration
 If the sequence is done with bracketing:
 Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD ISTD Amount Name
 #

#	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: CLO4-89-ISTD

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

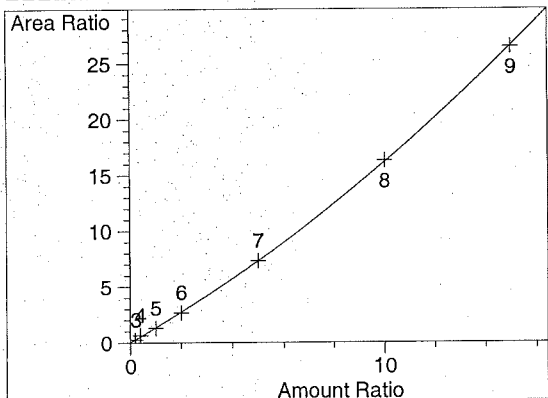
Compound: CLO4-85

Time Window : From 3.601 min To 11.913 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

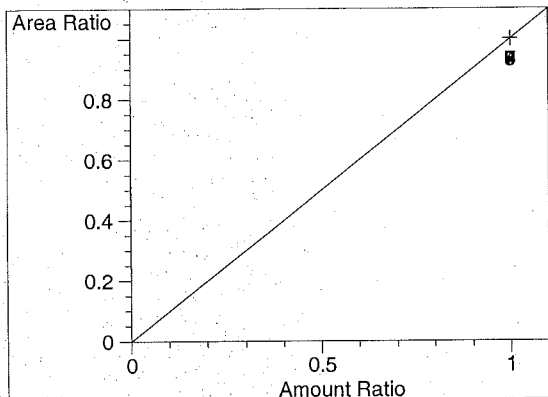
=====
 Peak Sum Table
 =====

No Entries in table
 =====

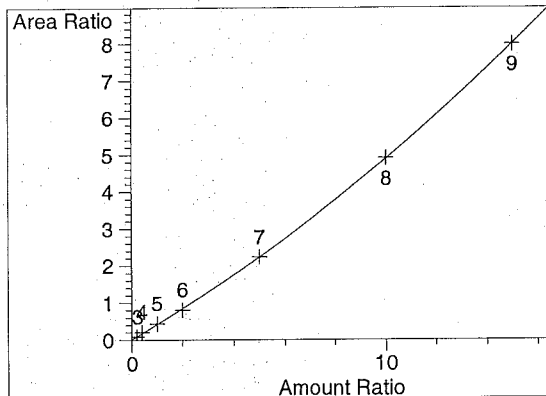
=====
 Calibration Curves
 =====



Perchlorate at exp. RT: 7.750
 MSD1 83, EIC=82.7:83.7
 Correlation: 0.99975
 Residual Std. Dev.: 0.10284
 Formula: $y = ax^2 + bx + c$
 a: 3.10463e-2
 b: 1.30369
 c: 2.19496e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333



CLO4-89-ISTD at exp. RT: 7.767
 MSD1 89, EIC=88.7:89.7
 Correlation: 1.00000
 Residual Std. Dev.: 0.00000
 Formula: $y = mx + b$
 m: 1.00000
 b: 0.00000
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1
 Level 8 : 1
 Level 9 : 1



CLO4-85 at exp. RT: 7.778
 MSD1 85, EIC=84.7:85.7
 Correlation: 0.99969
 Residual Std. Dev.: 0.02601
 Formula: $y = ax^2 + bx + c$
 a: 8.85207e-3
 b: 3.99283e-1
 c: 1.33505e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 3 : 1
 Level 4 : 0.5
 Level 5 : 0.2
 Level 6 : 0.1
 Level 7 : 0.04
 Level 8 : 0.02
 Level 9 : 0.013333

Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP3.M

['#' ==> Run has not been reprocessed with Batch Review Method

['*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	5.39218e4	7.750	8.75982e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.32825e5	7.797	2.37682
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.76271e5	7.770	4.77237
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	5.61298e5	7.785	9.75097
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	1.51820e6	7.741	25.01082
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	3.31156e6	7.775	50.40300
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.23914e6	7.736	74.79107
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	5.74879e5	7.756	10.11855

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.14568e5	7.767	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.04758e5	7.816	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.13407e5	7.793	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.09246e5	7.798	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.07403e5	7.763	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.02929e5	7.800	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.97933e5	7.765	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	2.06243e5	7.776	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	1.70436e4	7.778	8.24488e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.20754e4	7.805	2.38090
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	9.24707e4	7.787	5.14166
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	1.68622e5	7.781	9.52209
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	4.63724e5	7.760	25.04916
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	9.95933e5	7.793	50.14223
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.58066e6	7.758	74.93659
#*	ICAL Verf@10ug/L	Vial 80	1	Control	11	1.71000e5	7.760	9.79043

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
11	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

Injection Date: 9/20/2019 09:24:05

Seq Line: 3

Sample Name: CLO4@ 1.0ug/L

Location: Vial 73

Acq Operator: TNB

Inj. No.: 1

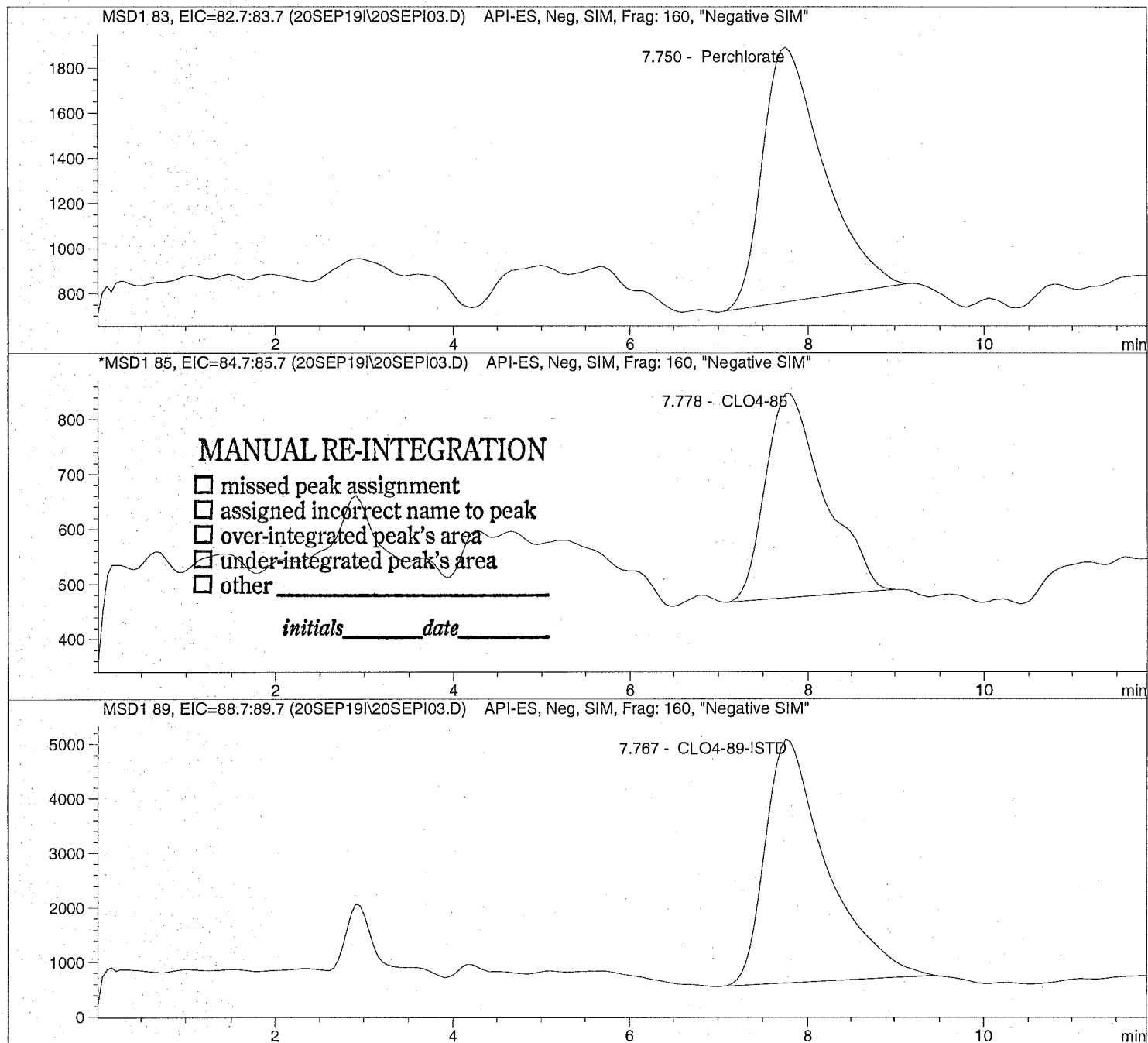
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M

Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M

Last Changed: 9/23/2019 12:21:47

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line: 3
Sample Name: CLO4@ 1.0ug/L      Location: Vial 73
Acq Operator: TNB      Inj. No.: 1
                                         Inj. Vol.: 30 µl

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.778	MM	17043.6	0.8245	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

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

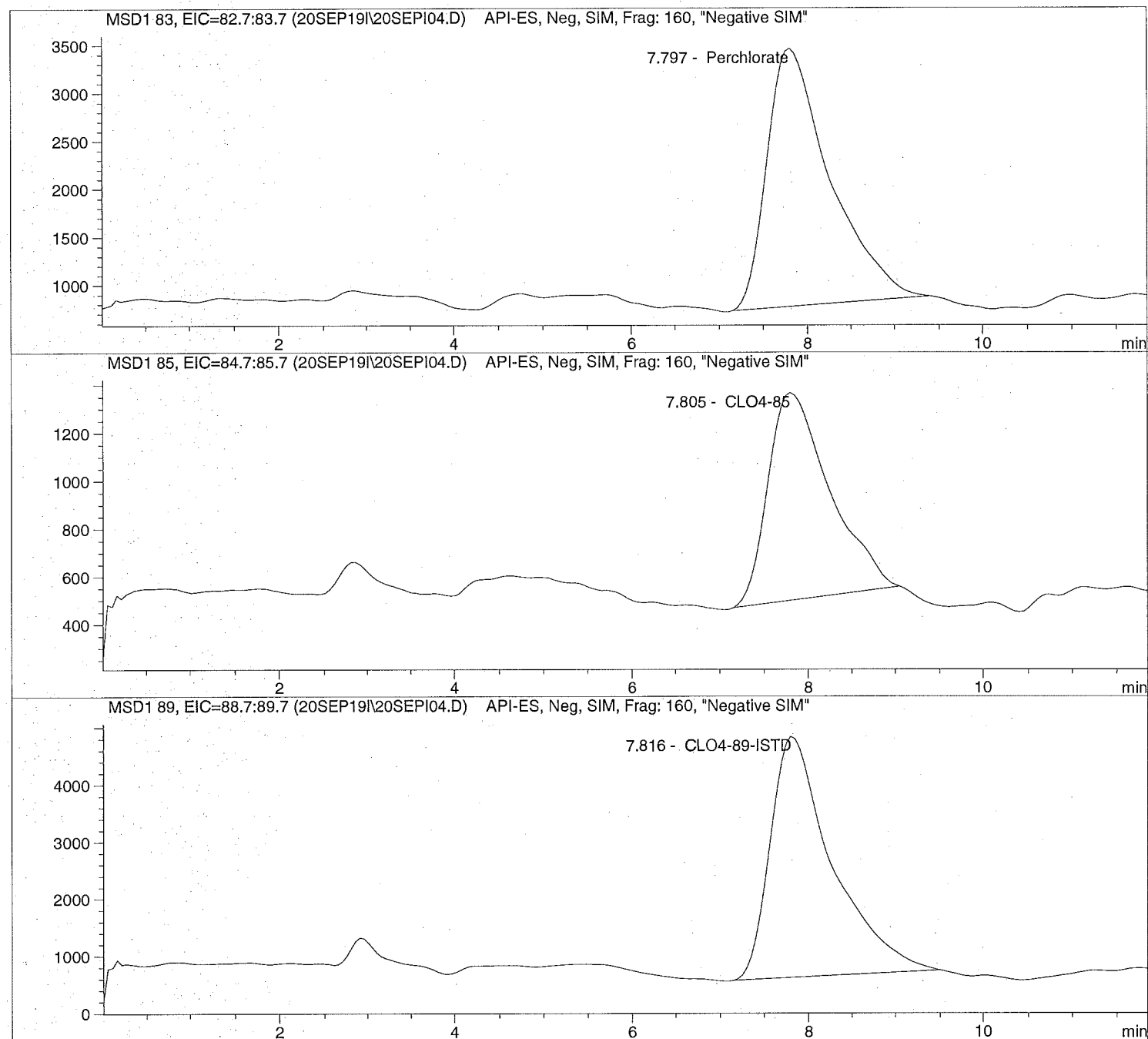
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D Sample Name: CLO4@ 2.0ug/L

```
=====
Injection Date: 9/20/2019 09:37:58      Seq Line: 4
Sample Name: CLO4@ 2.0ug/L              Location: Vial 74
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 9/23/2019 12:21:47
=====
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI04.D

Sample Name: CLO4@ 2.0ug/L

```

=====
Injection Date: 9/20/2019 09:37:58      Seq Line: 4
Sample Name:    CLO4@ 2.0ug/L           Location:  Vial 74
Acq Operator:   TNB                     Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:21:47
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  2.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.797	PBA	132825.2	2.3768	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.805	PBA	42075.4	2.3809	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.816	PBA	204758.3	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI05.D

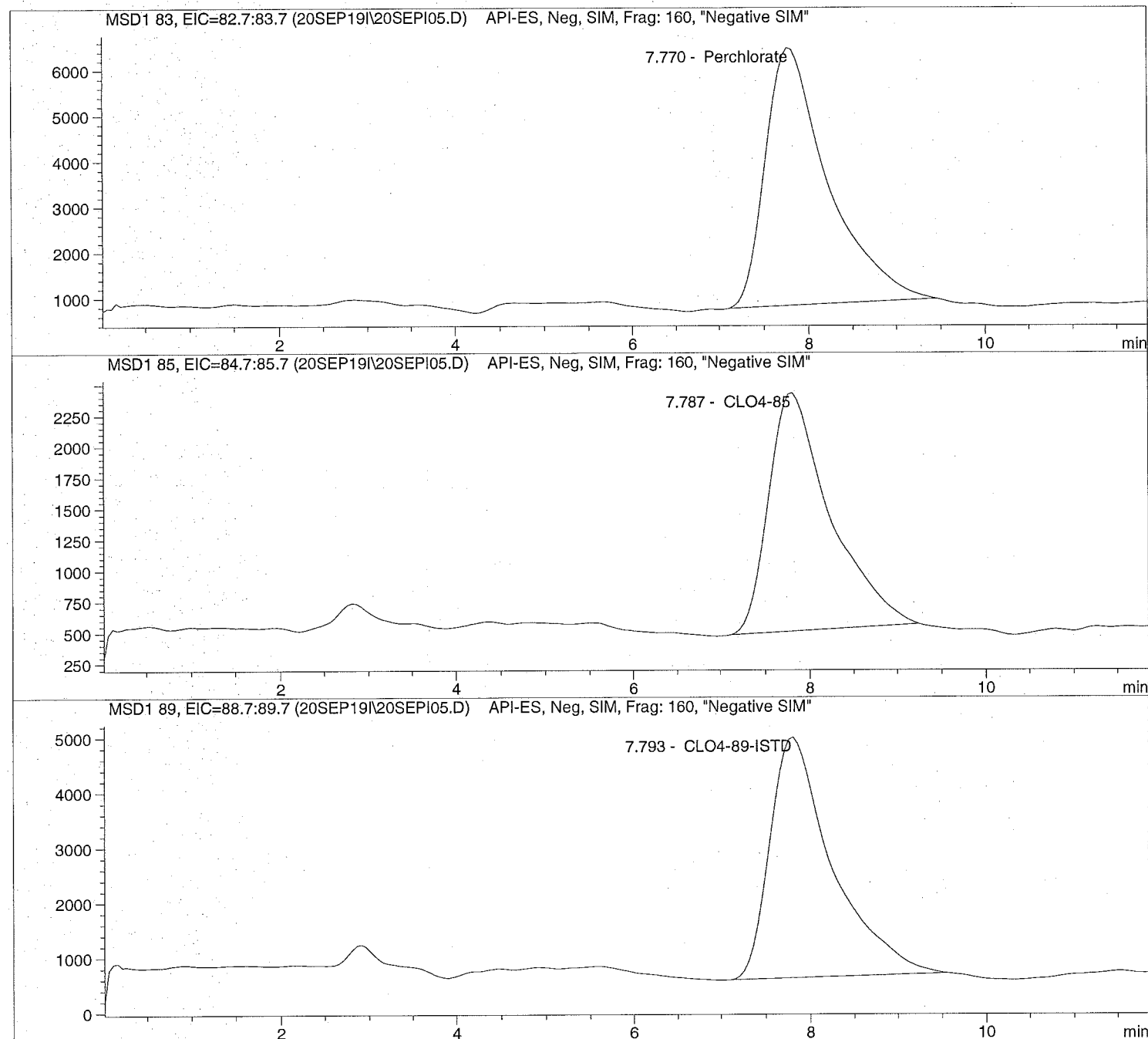
Sample Name: CLO4@ 5.0ug/L

Injection Date: 9/20/2019 09:51:49
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

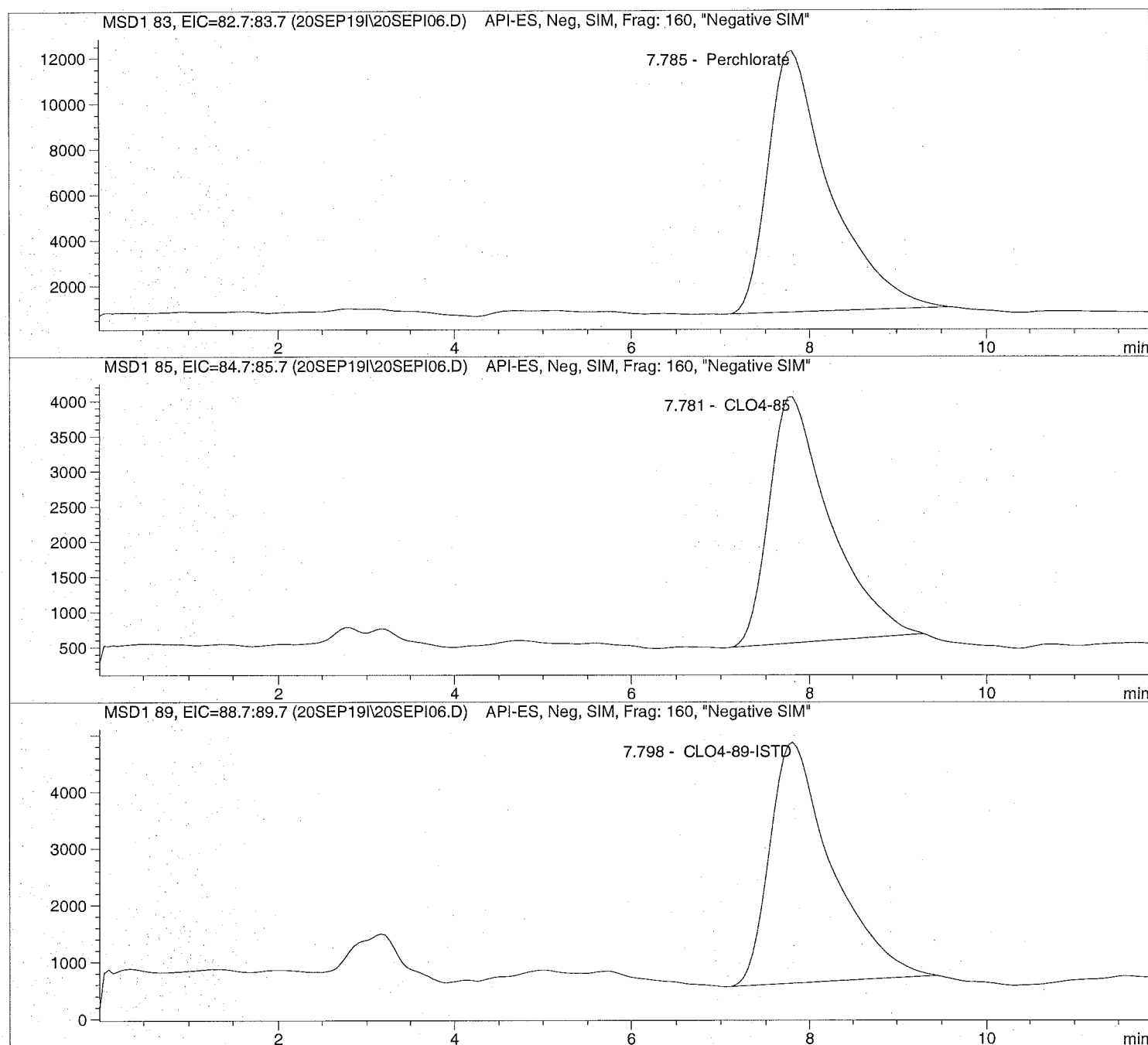
Sample Name: CLO4@ 10.ug/L

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 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\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

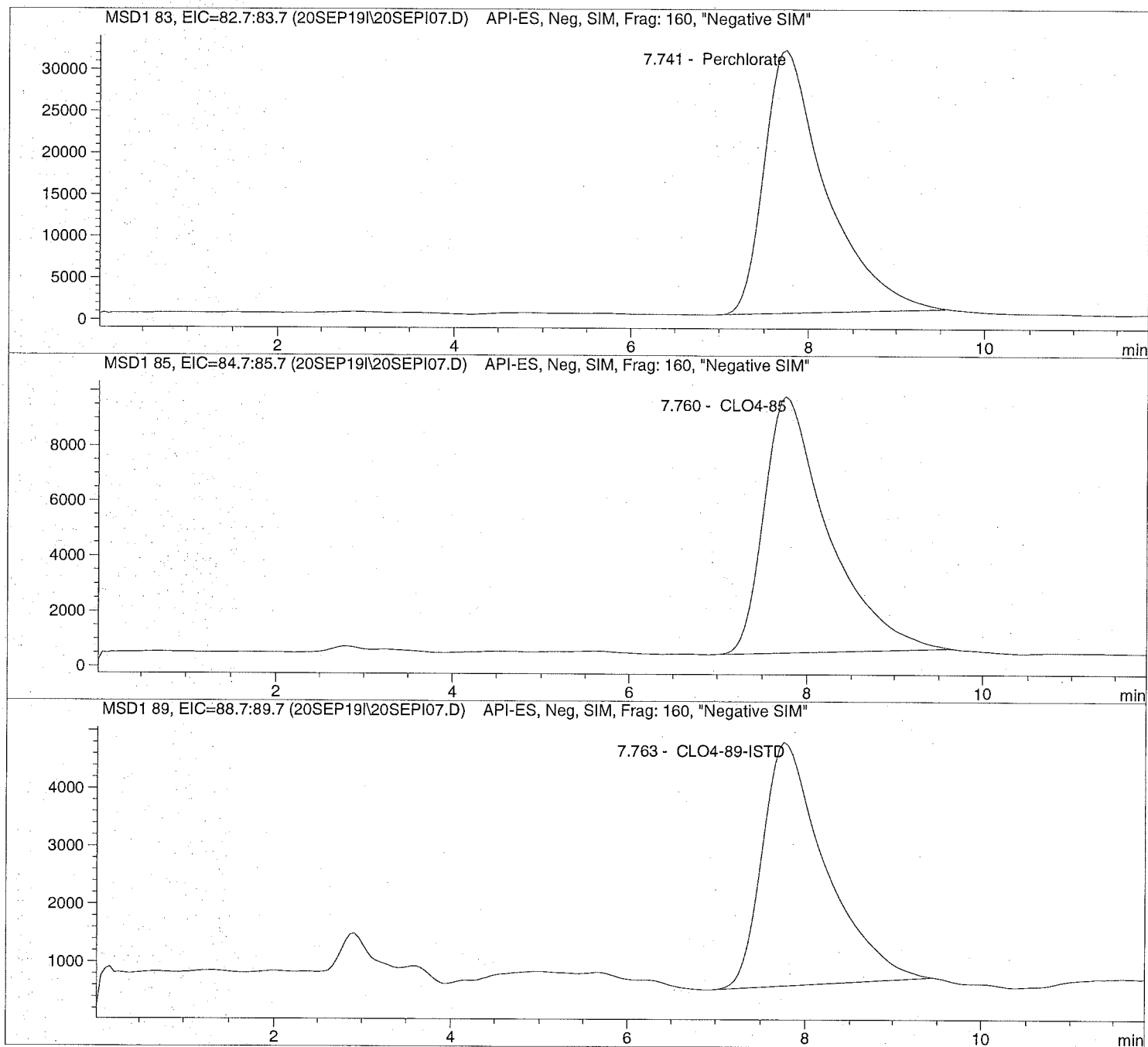
Sample Name: CLO4@ 25.ug/L

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\20SEP19\20SEPI08.D

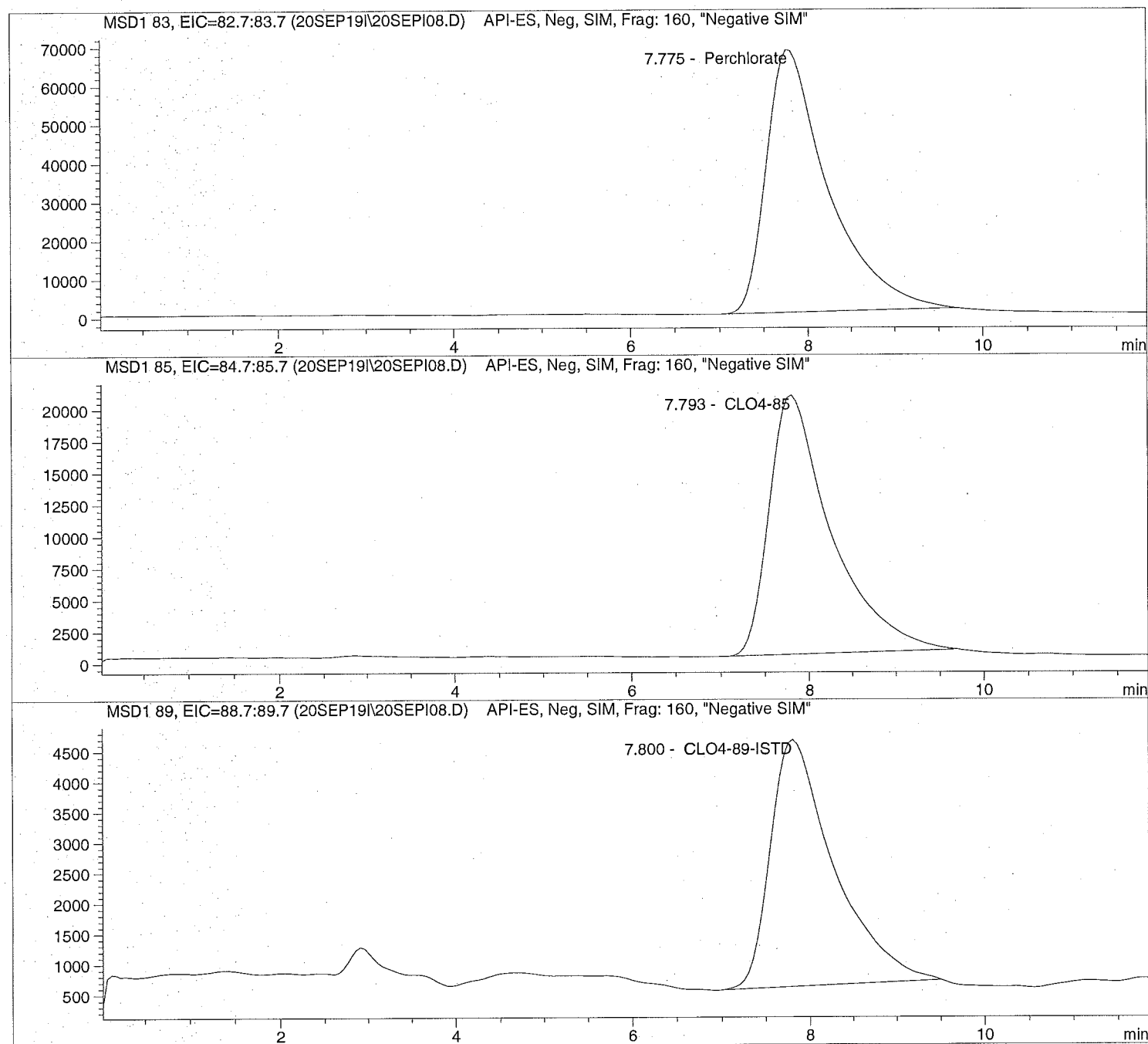
Sample Name: CLO4@ 50.ug/L

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

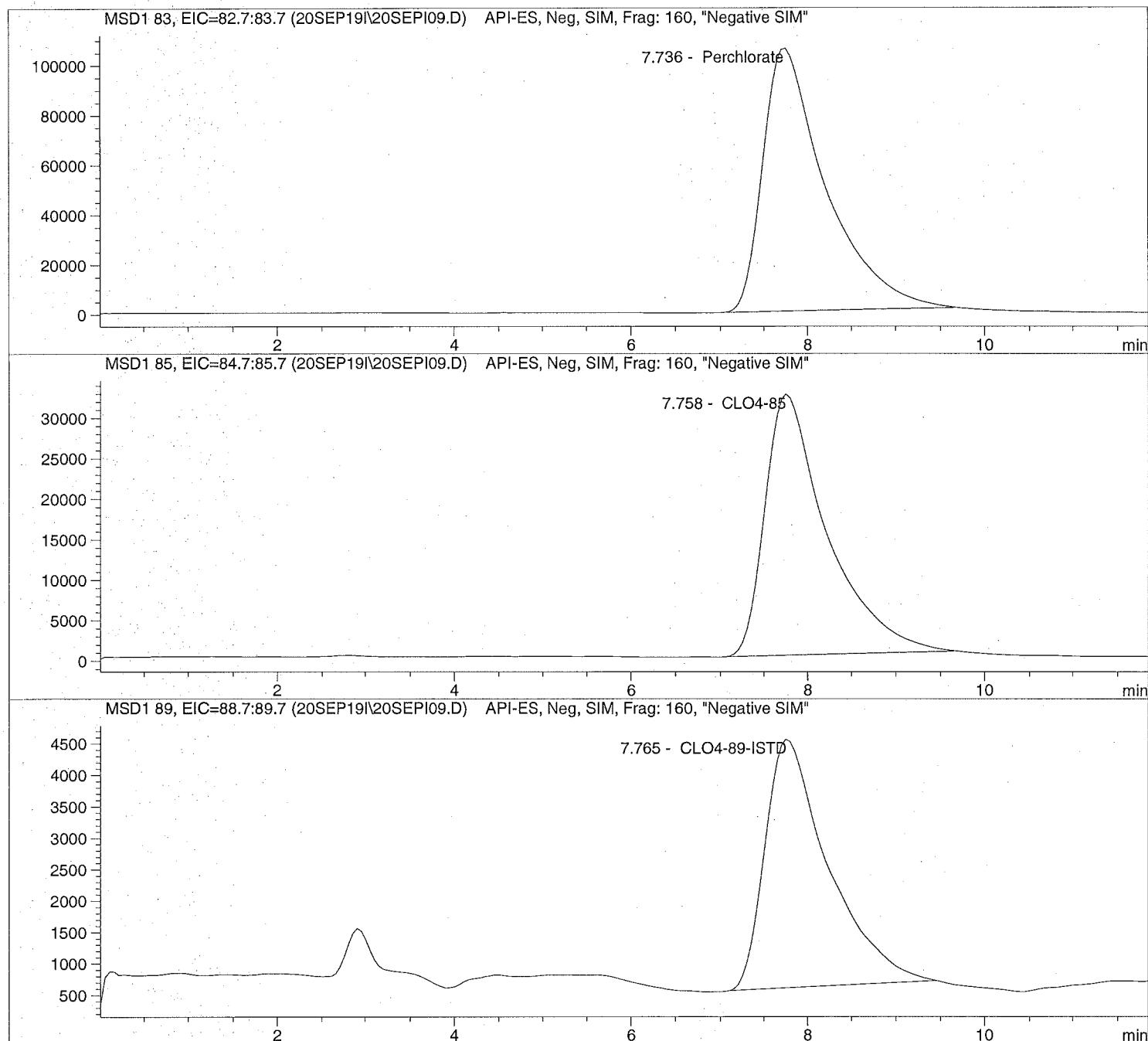
Inj. Vol.: 30 µl

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\20SEP19\20SEPI11.D

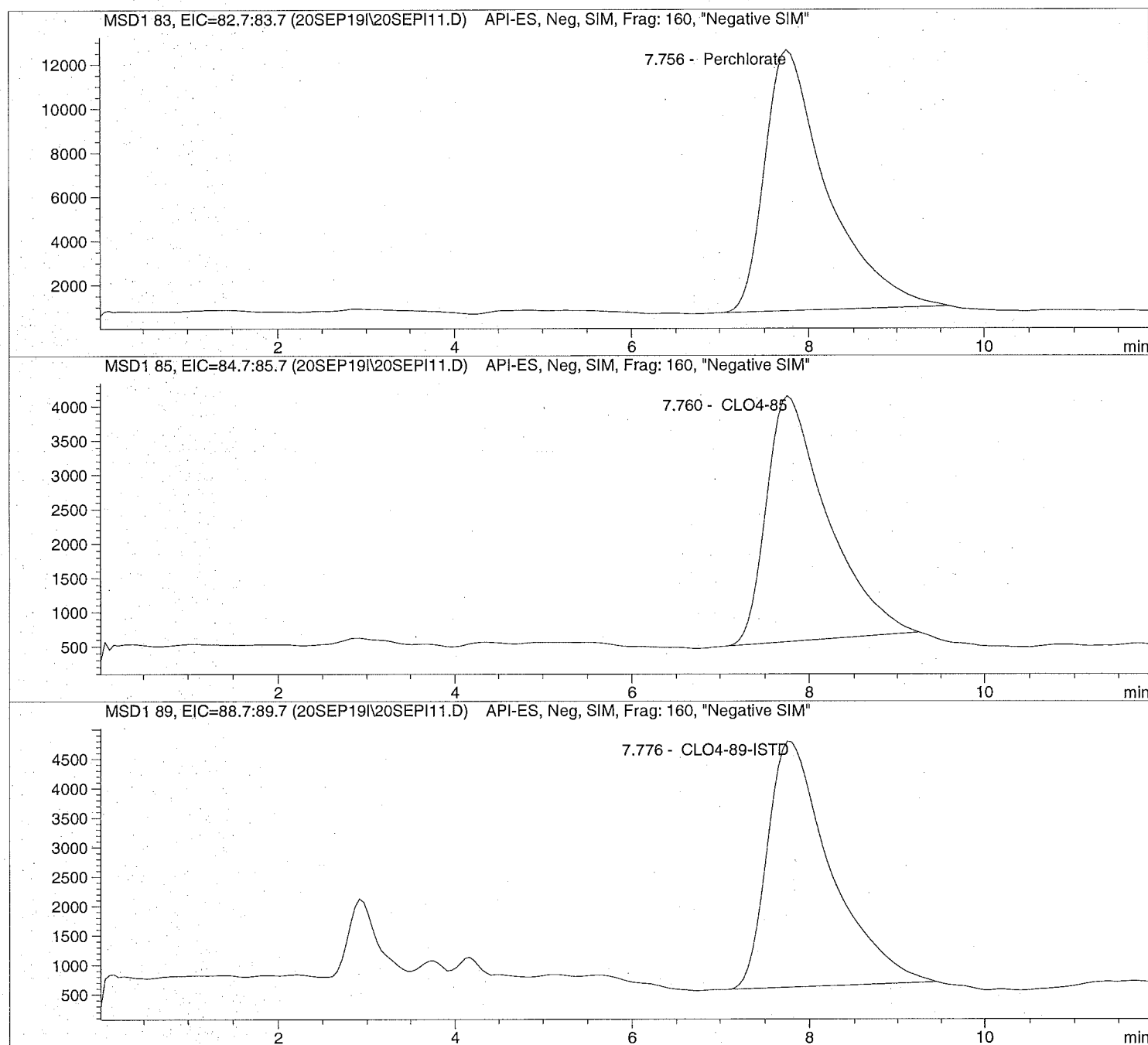
Sample Name: ICAL Verf@10ug/L

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\20SEP19T\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

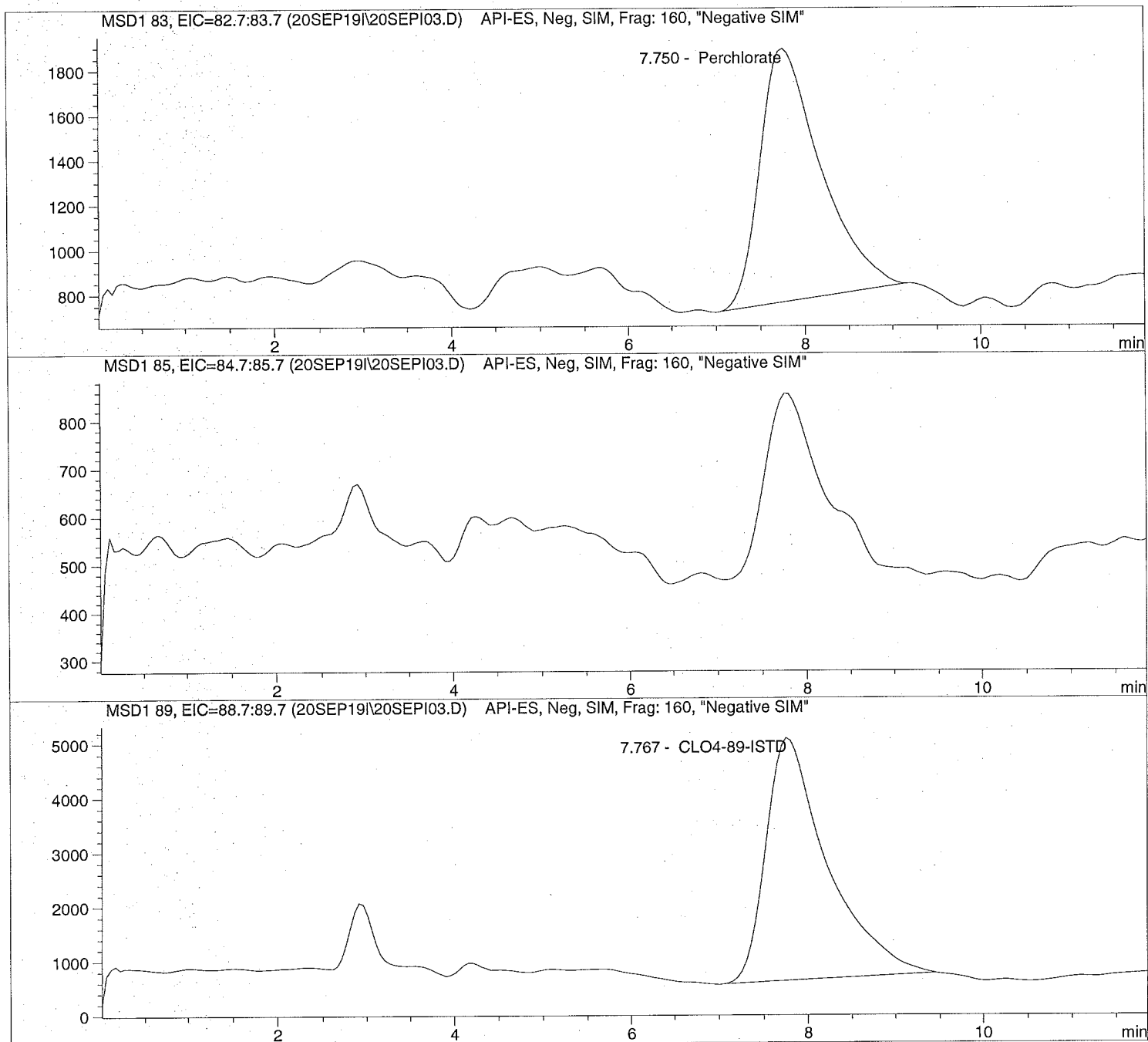
Inj. Vol.: 30 µl

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 ***
=====

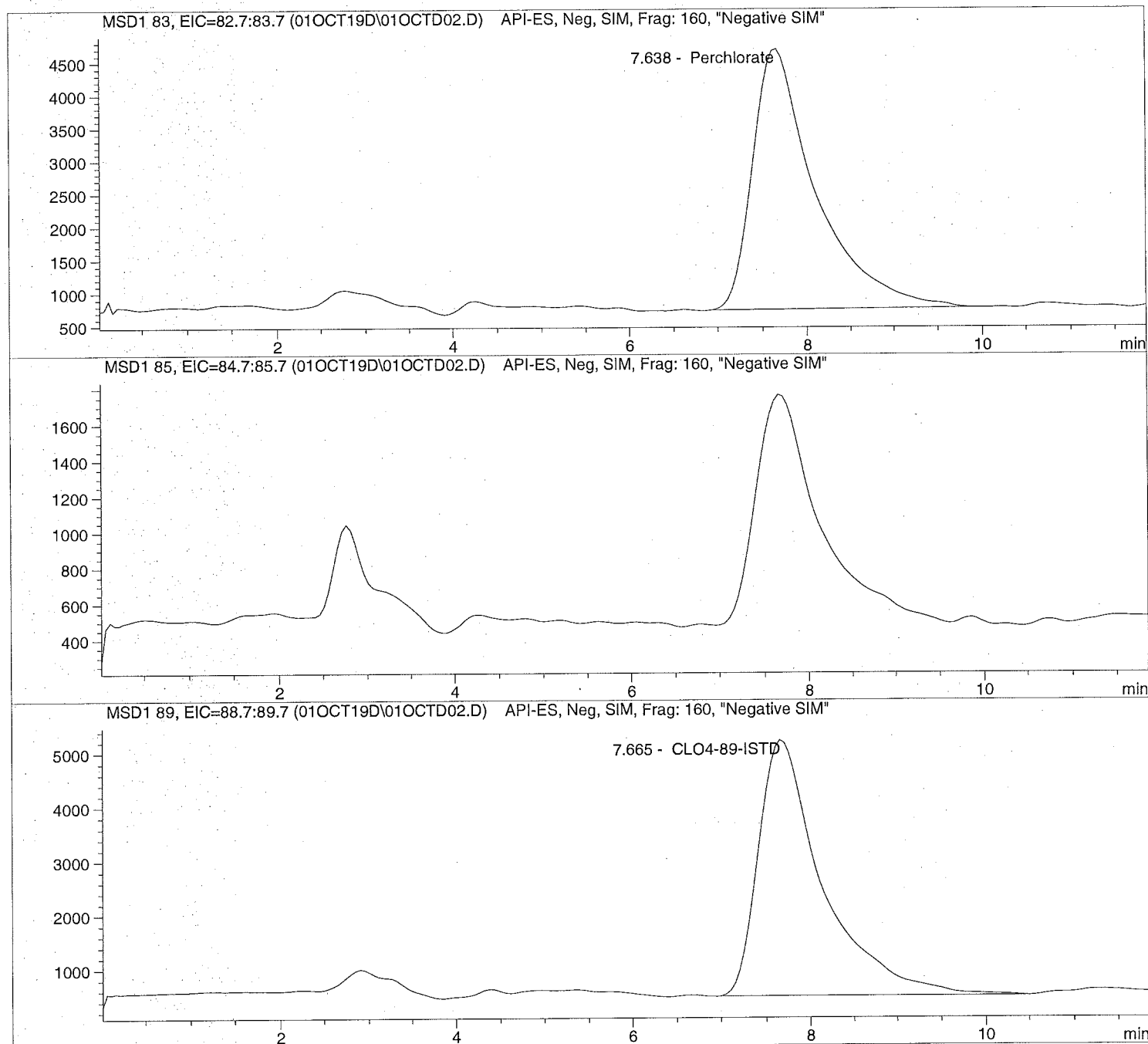
```

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD02.D Sample Name: 676592 QC@3.0

=====
Injection Date: 10/01/2019 10:56:09 Seq Line: 2
Sample Name: 676592 QC@3.0 Location: Vial 72
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 09:16:52

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD02.D Sample Name: 676592 QC@3.0

=====
Injection Date: 10/01/2019 10:56:09 Seq Line: 2
Sample Name: 676592 QC@3.0 Location: Vial 72
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 09:16:52

Perchlorate analysis

=====
Sample Information
=====

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 3.000

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.638	BB S	195089.7	3.0114	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.665	PB S	238378.3	5.0000	CLO4-89-ISTD

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

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD05.D

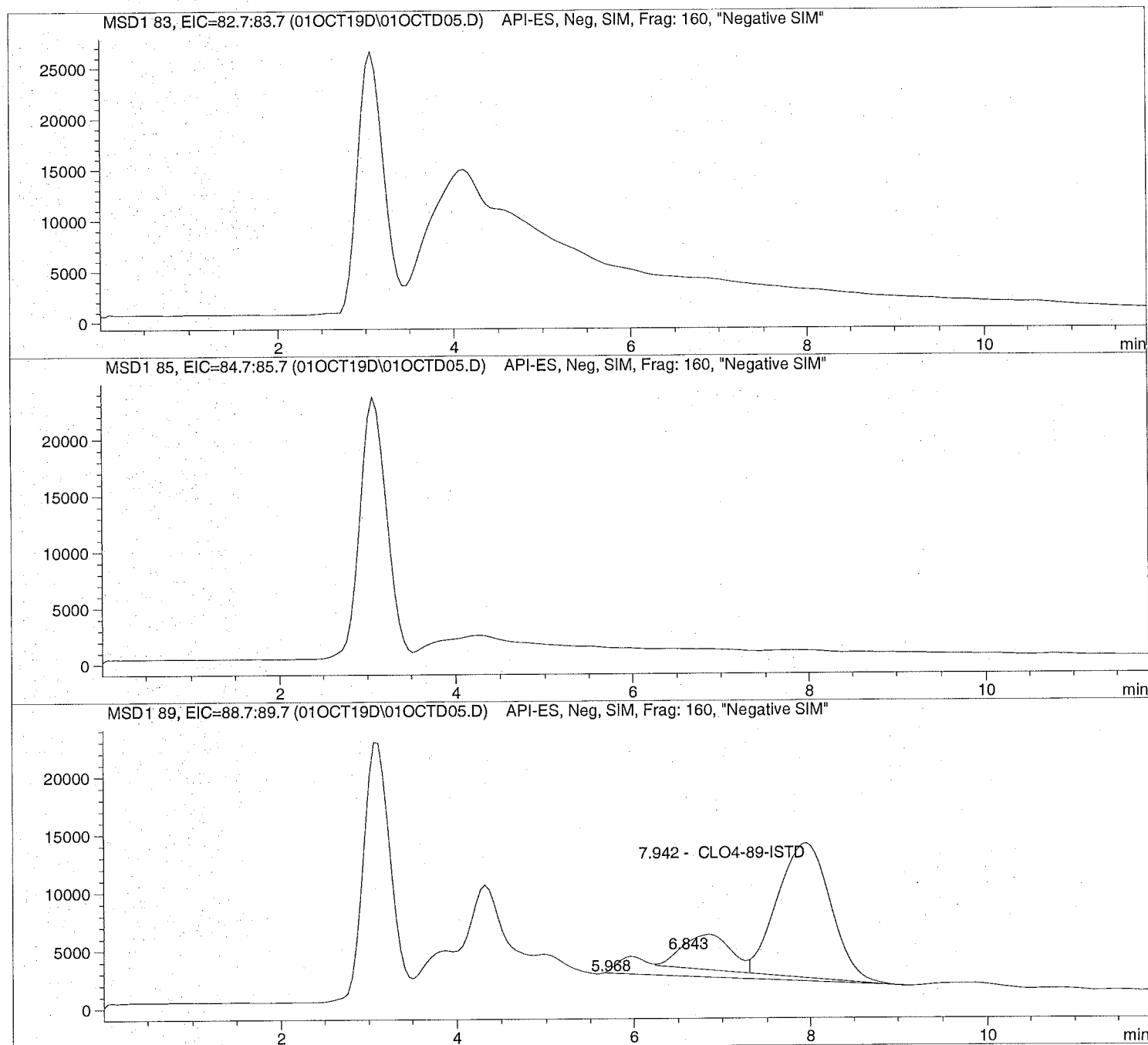
Sample Name: 1927220001

Injection Date: 10/01/2019 11:37:35
Sample Name: 1927220001
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: 10/2/2019 09:16:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD05.D Sample Name: 1927220001

```

=====
Injection Date: 10/01/2019 11:37:35      Seq Line:          5
Sample Name:    1927220001                Location:         Vial 75
Acq Operator:   TNB                       Inj. No.:        1
                                           Inj. Vol.:       30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 09:16:52
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
5.968	PB S	100244.2	0.0000	
6.843	BB T	116415.9	0.0000	
7.942	PBAT	488651.6	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD06.D

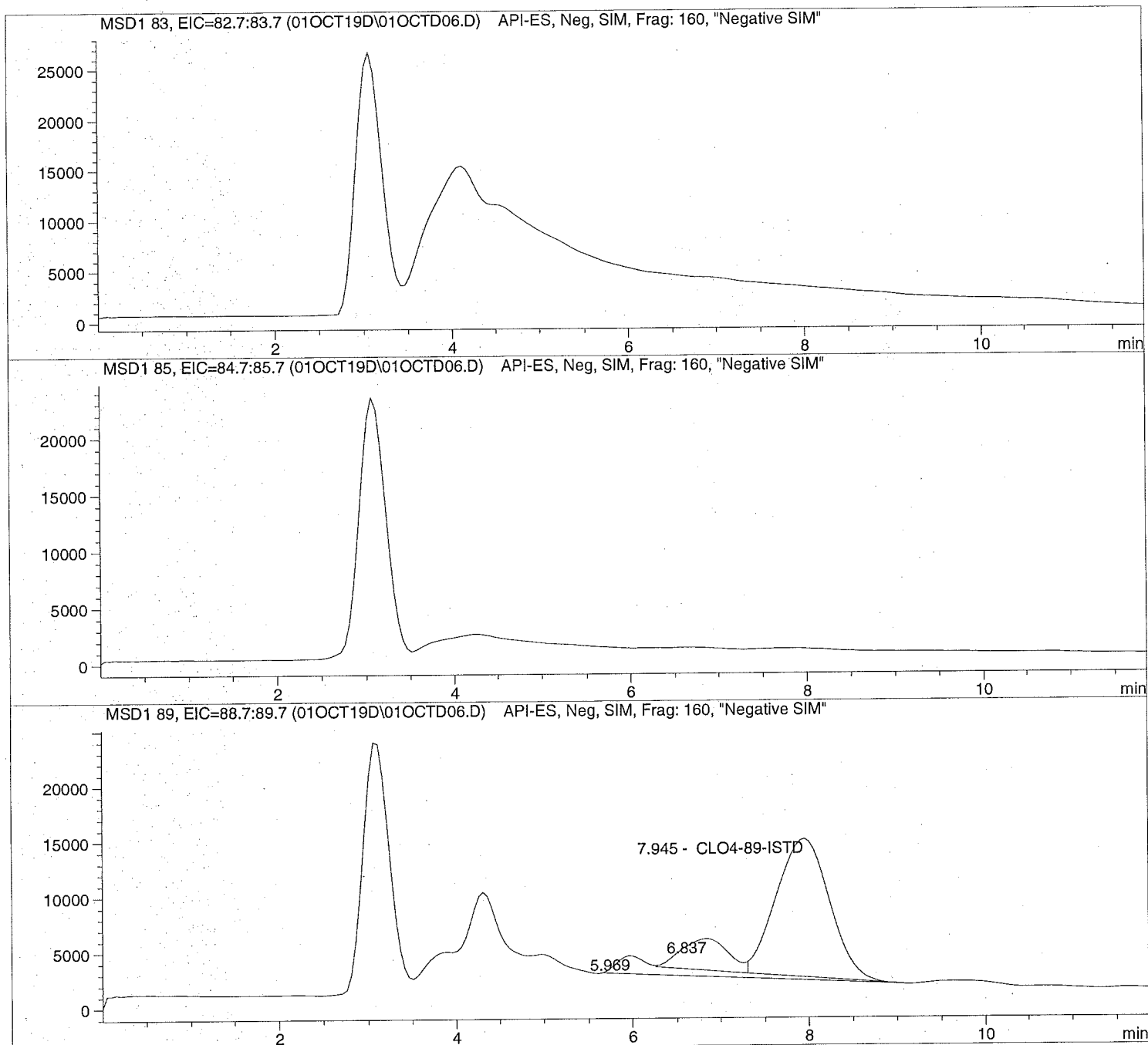
Sample Name: 1927220002

Injection Date: 10/01/2019 11:51:24
Sample Name: 1927220002
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: 10/2/2019 09:16:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD06.D Sample Name: 1927220002

```

=====
Injection Date: 10/01/2019 11:51:24      Seq Line: 6
Sample Name:    1927220002                Location:  Vial 76
Acq Operator:   TNB                       Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 09:16:52
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
5.969	PB S	94987.9	0.0000	
6.837	BB T	106969.7	0.0000	
7.945	PBAT	520312.7	5.0000	CLO4-89-ISTD

*** End of Report ***



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

October 10, 2019

Analytical Report for Service Request No: K1908984

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

RE: ALS Houston DOD TOC / HS19091201

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory September 27, 2019
For your reference, these analyses have been assigned our service request number **K1908984**.

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)636-1 068
www.alsglobal.com



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

Service Request: K1908984
Date Received: 09/27/2019

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 09/27/2019. 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:

Method SM 5310 C, 10/08/2019: The Relative Percent Difference (RPD) criterion for the replicate analysis of Total Organic Carbon in sample LH18/24-SP650_092419 was not applicable because the analyte concentration was not significantly greater than the Method Reporting Limit (MRL). Analytical values derived from measurements close to the detection limit are not subject to the same accuracy and precision criteria as results derived from measurements higher on the calibration range for the method.

Approved by Kelley Lovejoy

Date 10/10/2019



Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

K1908984



10450 Standliff 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: 12228

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 Standliff 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 Standliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19091201
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19091201-01	LH18/24-SP650_092419	Groundwater	24 Sep 2019 14:00
TOC Analysis for DOD Level IV			09 Oct 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: S. Winkler
Received By: A. Pedersen
Cooler ID(s): _____

Date/Time: 9/26/19 18:00
Date/Time: 9-27-19 09:50
Temperature(s): _____

RIGHT SOLUTIONS | RIGHT PARTNER



PC KL

Cooler Receipt and Preservation Form

Client Als Houston Service Request K19 08984
 Received: 9.27.19 Opened: 9.27.19 By: NP Unloaded: 9.27.19 By: NP

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

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
0.0	-0.2	1.4	1.2	-0.2	350	12278	1251 0290 0110	

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

Sample ID on Bottle	Sample ID on COC	Identified by:

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

Notes, Discrepancies, & Resolutions: _____



General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

Analytical Report

Client: ALS Environmental - US
Project: ALS Houston DOD TOC/HS19091201
Sample Matrix: Water
Analysis Method: SM 5310 C
Prep Method: None

Service Request: K1908984
Date Collected: 09/24/19
Date Received: 09/27/19

Units: mg/L
Basis: NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_092419	K1908984-001	1.64	0.50	0.20	0.07	1	10/08/19 05:01	
Method Blank	K1908984-MB	ND U	0.50	0.20	0.07	1	10/08/19 02:51	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: ALS Houston DOD TOC/HS19091201
Sample Matrix: Water

Service Request: K1908984
Date Collected: 09/24/19
Date Received: 09/27/19
Date Analyzed: 10/08/19

Replicate Sample Summary
General Chemistry Parameters

Sample Name: LH18/24-SP650_092419
Lab Code: K1908984-001

Units: mg/L
Basis: NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample	Average	RPD	RPD Limit
						K1908984-001DUP Result			
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	1.64	1.26	1.45	26 *	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: ALS Houston DOD TOC/HS19091201
Sample Matrix: Water

Service Request: K1908984
Date Analyzed: 10/08/19
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: 654322

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1908984-LCS	24.2	25.0	97	83-117

Client: ALS Environmental - US
Project: ALS Houston DOD TOC/HS19091201

Service Request: K1908984

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	654322	KQ1914459-01	10/07/19 16:27	25.0	24.5	98	90-110
CCV2	654322	KQ1914459-02	10/08/19 02:18	25.0	24.3	97	90-110
CCV3	654322	KQ1914459-03	10/08/19 07:42	25.0	24.2	97	90-110
CCV4	654322	KQ1914459-04	10/08/19 13:04	25.0	24.0	96	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US
Project: ALS Houston DOD TOC/HS19091201

Service Request:K1908984

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	654322	KQ1914459-05	10/07/19 16:43	0.50	0.20	0.07	ND	U
CCB2	654322	KQ1914459-06	10/08/19 02:35	0.50	0.20	0.07	ND	U
CCB3	654322	KQ1914459-07	10/08/19 07:58	0.50	0.20	0.07	ND	U
CCB4	654322	KQ1914459-08	10/08/19 13:21	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)636-1 068
www.alsglobal.com

Work Request # ^{Original} (K1908802, 8957, 8805, 8720, 8725, 8728, 8706, 8896, 8918, 8984, 8997, 8998)
 Tier: IV IV IV II ± V III II III IV IV III
 Date Analyzed: 10/5/19 POC: 654319
 Analyst: BCD TOC: 654320,
 Run # 654321,
 Analysis: TOC/DOC 654322

**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: K1908957-13/134 report a high %RSD due to suspected non-homogeneous cloudy sample. K1908984-1/1d, and 8998-1/1d report a high %RSD. However, these samples are less than six the MEL.

Final Approved by: Fournier Date: 10/10/19 DQREPORT

Analytical Results Summary


Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 654319 Method/Testcode: 9060A/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
K1908802-022	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	1.65 mg/L	10 mL	1.65 mg/L	1		0.50			10/5/19 17:03:00	N	IV
K1908802-023	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	0.83 mg/L	10 mL	0.83 mg/L	1		0.50			10/5/19 19:27:00	N	IV
K1908957-001	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	0.83 mg/L	10 mL	0.83 mg/L	1		0.50			10/5/19 23:28:00	N	IV
K1908957-002	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	1.43 mg/L	10 mL	1.43 mg/L	1		0.50			10/6/19 00:32:00	N	IV
K1908957-003	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	1.06 mg/L	10 mL	1.06 mg/L	1		0.50			10/6/19 01:35:00	N	IV
K1908957-004	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	0.30 mg/L	10 mL	0.50 mg/L U	1		0.50			10/6/19 02:39:00	N	IV
K1908957-006	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	0.50 mg/L	10 mL	0.50 mg/L	1		0.50			10/6/19 03:43:00	N	IV
K1908957-008	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	1.58 mg/L	10 mL	1.58 mg/L	1		0.50			10/6/19 04:46:00	N	IV
K1908957-010	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	2.28 mg/L	10 mL	2.28 mg/L	1		0.50			10/6/19 05:50:00	N	IV
K1908957-011	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	1.72 mg/L	10 mL	1.72 mg/L	1		0.50			10/6/19 06:53:00	N	IV
K1908957-012	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	0.55 mg/L	10 mL	0.55 mg/L	1		0.50			10/6/19 07:57:00	N	IV
K1908957-013	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	3.05 mg/L	10 mL	3.05 mg/L	1		0.50			10/6/19 09:01:00	N	IV
K1908957-014	Carbon, Dissolved Organic (DOC)	N/A		Pore Water	0.88 mg/L	10 mL	0.88 mg/L	1		0.50			10/6/19 12:45:00	N	IV
KQ1914456-01	Carbon, Dissolved Organic (DOC)	CCV		Pore Water	24.93 mg/L	10 mL	24.9 mg/L	1					10/5/19 14:05:00	N	IV
KQ1914456-02	Carbon, Dissolved Organic (DOC)	CCV		Pore Water	24.59 mg/L	10 mL	24.6 mg/L	1					10/5/19 22:54:00	N	IV
KQ1914456-03	Carbon, Dissolved Organic (DOC)	CCV		Pore Water	24.99 mg/L	10 mL	25.0 mg/L	1					10/6/19 10:04:00	N	IV
KQ1914456-04	Carbon, Dissolved Organic (DOC)	CCV		Pore Water	24.38 mg/L	10 mL	24.4 mg/L	1					10/6/19 19:41:00	N	IV
KQ1914456-05	Carbon, Dissolved Organic (DOC)	CCB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/5/19 14:22:00	N	IV
KQ1914456-06	Carbon, Dissolved Organic (DOC)	CCB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/5/19 23:11:00	N	IV
KQ1914456-07	Carbon, Dissolved Organic (DOC)	CCB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/6/19 10:21:00	N	IV
KQ1914456-08	Carbon, Dissolved Organic (DOC)	CCB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/6/19 19:57:00	N	IV
KQ1914456-09	Carbon, Dissolved Organic (DOC)	MB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/5/19 14:39:00	N	IV
KQ1914456-10	Carbon, Dissolved Organic (DOC)	LCS		Pore Water	24.52 mg/L	10 mL	24.5 mg/L	1		0.50	98		10/5/19 15:42:00	N	IV

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

10/10/19


Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 654319 Method/Testcode: 9060A/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
KQ1914456-11	Carbon, Dissolved Organic MB (DOC)			Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/5/19 14:39:00	N	IV
KQ1914456-12	Carbon, Dissolved Organic MB (DOC)			Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/5/19 14:39:00	N	IV
KQ1914456-13	Carbon, Dissolved Organic MB (DOC)			Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/5/19 14:39:00	N	IV
KQ1914456-14	Carbon, Dissolved Organic LCS (DOC)			Pore Water	24.83 mg/L	10 mL	24.8 mg/L	1		0.50	99		10/5/19 15:42:00	N	IV
KQ1914456-15	Carbon, Dissolved Organic LCS (DOC)			Pore Water	24.57 mg/L	10 mL	24.6 mg/L	1		0.50	98		10/5/19 15:42:00	N	IV
KQ1914456-16	Carbon, Dissolved Organic LCS (DOC)			Pore Water	24.60 mg/L	10 mL	24.6 mg/L	1		0.50	98		10/5/19 15:42:00	N	IV
KQ1914456-17	Carbon, Dissolved Organic MS (DOC)		K1908802-022	Pore Water	27.65 mg/L	10 mL	27.7 mg/L	1		0.50	105		10/5/19 18:07:00	N	IV
KQ1914456-18	Carbon, Dissolved Organic MS (DOC)		K1908802-022	Pore Water	27.72 mg/L	10 mL	27.7 mg/L	1		0.50	105		10/5/19 18:07:00	N	IV
KQ1914456-19	Carbon, Dissolved Organic MS (DOC)		K1908802-022	Pore Water	27.76 mg/L	10 mL	27.8 mg/L	1		0.50	106		10/5/19 18:07:00	N	IV
KQ1914456-20	Carbon, Dissolved Organic MS (DOC)		K1908802-022	Pore Water	27.67 mg/L	10 mL	27.7 mg/L	1		0.50	105		10/5/19 18:07:00	N	IV
KQ1914456-21	Carbon, Dissolved Organic MS (DOC)		K1908802-023	Pore Water	27.48 mg/L	10 mL	27.5 mg/L	1		0.50	107		10/5/19 20:31:00	N	IV
KQ1914456-22	Carbon, Dissolved Organic MS (DOC)		K1908802-023	Pore Water	27.55 mg/L	10 mL	27.6 mg/L	1		0.50	107		10/5/19 20:31:00	N	IV
KQ1914456-23	Carbon, Dissolved Organic MS (DOC)		K1908802-023	Pore Water	27.38 mg/L	10 mL	27.4 mg/L	1		0.50	106		10/5/19 20:31:00	N	IV
KQ1914456-24	Carbon, Dissolved Organic MS (DOC)		K1908802-023	Pore Water	27.27 mg/L	10 mL	27.3 mg/L	1		0.50	106		10/5/19 20:31:00	N	IV
KQ1914456-25	Carbon, Dissolved Organic DUP (DOC)		K1908957-011	Pore Water	1.67 mg/L	10 mL	1.67 mg/L	1		0.50		3	10/6/19 06:53:00	N	IV
KQ1914456-26	Carbon, Dissolved Organic TRP (DOC)		K1908957-011	Pore Water	1.71 mg/L	10 mL	1.71 mg/L	1		0.50		2	10/6/19 06:53:00	N	IV
KQ1914456-27	Carbon, Dissolved Organic QUAD (DOC)		K1908957-011	Pore Water	1.70 mg/L	10 mL	1.70 mg/L	1		0.50		1	10/6/19 06:53:00	N	IV
KQ1914456-28	Carbon, Dissolved Organic DUP (DOC)		K1908957-012	Pore Water	0.57 mg/L	10 mL	0.57 mg/L	1		0.50		5	10/6/19 07:57:00	N	IV
KQ1914456-29	Carbon, Dissolved Organic TRP (DOC)		K1908957-012	Pore Water	0.53 mg/L	10 mL	0.53 mg/L	1		0.50		4	10/6/19 07:57:00	N	IV
KQ1914456-30	Carbon, Dissolved Organic QUAD (DOC)		K1908957-012	Pore Water	0.50 mg/L	10 mL	0.50 mg/L	1		0.50		6	10/6/19 07:57:00	N	IV
KQ1914456-31	Carbon, Dissolved Organic DUP (DOC)		K1908957-013	Pore Water	4.16 mg/L	10 mL	4.16 mg/L	1		0.50		31*	10/6/19 09:01:00	N	IV
KQ1914456-32	Carbon, Dissolved Organic TRP (DOC)		K1908957-013	Pore Water	4.51 mg/L	10 mL	4.51 mg/L	1		0.50		20	10/6/19 09:01:00	N	IV
KQ1914456-33	Carbon, Dissolved Organic QUAD (DOC)		K1908957-013	Pore Water	4.71 mg/L	10 mL	4.71 mg/L	1		0.50		18	10/6/19 09:01:00	N	IV

Page 21 of 65

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: 654319 Method/Testcode: 9060A/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
KQ1914456-34	Carbon, Dissolved Organic (DOC)	DUP	K1908957-014	Pore Water	0.73 mg/L	10 mL	0.73 mg/L	1		0.50		18	10/6/19 12:45:00	N	IV
KQ1914456-35	Carbon, Dissolved Organic (DOC)	TRP	K1908957-014	Pore Water	0.70 mg/L	10 mL	0.70 mg/L	1		0.50		13	10/6/19 12:45:00	N	IV
KQ1914456-36	Carbon, Dissolved Organic (DOC)	QUAD	K1908957-014	Pore Water	0.68 mg/L	10 mL	0.68 mg/L	1		0.50		12	10/6/19 12:45:00	N	IV
KQ1914456-37	Carbon, Dissolved Organic (DOC)	DUP	K1908957-001	Pore Water	0.76 mg/L	10 mL	0.76 mg/L	1		0.50		10	10/5/19 23:28:00	N	IV
KQ1914456-38	Carbon, Dissolved Organic (DOC)	TRP	K1908957-001	Pore Water	0.73 mg/L	10 mL	0.73 mg/L	1		0.50		7	10/5/19 23:28:00	N	IV
KQ1914456-39	Carbon, Dissolved Organic (DOC)	QUAD	K1908957-001	Pore Water	0.79 mg/L	10 mL	0.79 mg/L	1		0.50		6	10/5/19 23:28:00	N	IV
KQ1914456-40	Carbon, Dissolved Organic (DOC)	DUP	K1908957-002	Pore Water	1.48 mg/L	10 mL	1.48 mg/L	1		0.50		3	10/6/19 00:32:00	N	IV
KQ1914456-41	Carbon, Dissolved Organic (DOC)	TRP	K1908957-002	Pore Water	1.49 mg/L	10 mL	1.49 mg/L	1		0.50		2	10/6/19 00:32:00	N	IV
KQ1914456-42	Carbon, Dissolved Organic (DOC)	QUAD	K1908957-002	Pore Water	1.52 mg/L	10 mL	1.52 mg/L	1		0.50		2	10/6/19 00:32:00	N	IV
KQ1914456-43	Carbon, Dissolved Organic (DOC)	DUP	K1908957-003	Pore Water	1.06 mg/L	10 mL	1.06 mg/L	1		0.50		<1	10/6/19 01:35:00	N	IV
KQ1914456-44	Carbon, Dissolved Organic (DOC)	TRP	K1908957-003	Pore Water	0.99 mg/L	10 mL	0.99 mg/L	1		0.50		4	10/6/19 01:35:00	N	IV
KQ1914456-45	Carbon, Dissolved Organic (DOC)	QUAD	K1908957-003	Pore Water	1.04 mg/L	10 mL	1.04 mg/L	1		0.50		3	10/6/19 01:35:00	N	IV
KQ1914456-46	Carbon, Dissolved Organic (DOC)	DUP	K1908957-004	Pore Water	0.32 mg/L	10 mL	0.50 mg/L	U 1		0.50		NC	10/6/19 02:39:00	N	IV
KQ1914456-47	Carbon, Dissolved Organic (DOC)	TRP	K1908957-004	Pore Water	0.35 mg/L	10 mL	0.50 mg/L	U 1		0.50		NC	10/6/19 02:39:00	N	IV
KQ1914456-48	Carbon, Dissolved Organic (DOC)	QUAD	K1908957-004	Pore Water	0.30 mg/L	10 mL	0.50 mg/L	U 1		0.50		NC	10/6/19 02:39:00	N	IV
KQ1914456-49	Carbon, Dissolved Organic (DOC)	DUP	K1908957-006	Pore Water	0.52 mg/L	10 mL	0.52 mg/L	1		0.50		3	10/6/19 03:43:00	N	IV
KQ1914456-50	Carbon, Dissolved Organic (DOC)	TRP	K1908957-006	Pore Water	0.54 mg/L	10 mL	0.54 mg/L	1		0.50		4	10/6/19 03:43:00	N	IV
KQ1914456-51	Carbon, Dissolved Organic (DOC)	QUAD	K1908957-006	Pore Water	0.51 mg/L	10 mL	0.51 mg/L	1		0.50		4	10/6/19 03:43:00	N	IV
KQ1914456-52	Carbon, Dissolved Organic (DOC)	DUP	K1908957-008	Pore Water	1.58 mg/L	10 mL	1.58 mg/L	1		0.50		<1	10/6/19 04:46:00	N	IV
KQ1914456-53	Carbon, Dissolved Organic (DOC)	TRP	K1908957-008	Pore Water	1.64 mg/L	10 mL	1.64 mg/L	1		0.50		2	10/6/19 04:46:00	N	IV
KQ1914456-54	Carbon, Dissolved Organic (DOC)	QUAD	K1908957-008	Pore Water	1.58 mg/L	10 mL	1.58 mg/L	1		0.50		2	10/6/19 04:46:00	N	IV
KQ1914456-55	Carbon, Dissolved Organic (DOC)	DUP	K1908957-010	Pore Water	2.23 mg/L	10 mL	2.23 mg/L	1		0.50		2	10/6/19 05:50:00	N	IV
KQ1914456-56	Carbon, Dissolved Organic (DOC)	TRP	K1908957-010	Pore Water	2.32 mg/L	10 mL	2.32 mg/L	1		0.50		2	10/6/19 05:50:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 654319 Method/Testcode: 9060A/TOC D

<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>
KQ1914456-57	Carbon, Dissolved Organic (DOC)	QUAD	K1908957-010	Pore Water	2.38 mg/L	10 mL	2.38 mg/L	1		0.50		3	10/6/19 05:50:00	N	IV
KQ1914456-58	Carbon, Dissolved Organic (DOC)	DUP	K1908802-022	Pore Water	1.60 mg/L	10 mL	1.60 mg/L	1		0.50		16	10/5/19 17:03:00	N	IV
KQ1914456-59	Carbon, Dissolved Organic (DOC)	TRP	K1908802-022	Pore Water	1.57 mg/L	10 mL	1.57 mg/L	1		0.50		9	10/5/19 17:03:00	N	IV
KQ1914456-60	Carbon, Dissolved Organic (DOC)	QUAD	K1908802-022	Pore Water	1.68 mg/L	10 mL	1.68 mg/L	1		0.50		9	10/5/19 17:03:00	N	IV
KQ1914456-61	Carbon, Dissolved Organic (DOC)	DUP	K1908802-023	Pore Water	0.78 mg/L	10 mL	0.78 mg/L	1		0.50		6	10/5/19 19:27:00	N	IV
KQ1914456-62	Carbon, Dissolved Organic (DOC)	TRP	K1908802-023	Pore Water	0.78 mg/L	10 mL	0.78 mg/L	1		0.50		3	10/5/19 19:27:00	N	IV
KQ1914456-63	Carbon, Dissolved Organic (DOC)	QUAD	K1908802-023	Pore Water	0.77 mg/L	10 mL	0.77 mg/L	1		0.50		3	10/5/19 19:27:00	N	IV
KQ1914456-64	Carbon, Dissolved Organic (DOC)	MS	K1908957-001	Pore Water	26.63 mg/L	10 mL	26.6 mg/L	1		0.50	103		10/5/19 21:51:00	N	IV
KQ1914456-65	Carbon, Dissolved Organic (DOC)	MS	K1908957-001	Pore Water	26.77 mg/L	10 mL	26.8 mg/L	1		0.50	104		10/5/19 21:51:00	N	IV
KQ1914456-66	Carbon, Dissolved Organic (DOC)	MS	K1908957-001	Pore Water	26.73 mg/L	10 mL	26.7 mg/L	1		0.50	104		10/5/19 21:51:00	N	IV
KQ1914456-67	Carbon, Dissolved Organic (DOC)	MS	K1908957-001	Pore Water	27.34 mg/L	10 mL	27.3 mg/L	1		0.50	106		10/5/19 21:51:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 654320 Method/Testcode: 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1908802-021	Carbon, Total Organic (TOC)	N/A		Water	0.06 mg/L	10 mL	0.50 mg/L U	1		0.50			10/6/19 13:49:00	N	IV
K1908802-022	Carbon, Total Organic (TOC)	N/A		Pore Water	1.58 mg/L	10 mL	1.58 mg/L	1		0.50			10/6/19 16:13:00	N	IV
K1908802-023	Carbon, Total Organic (TOC)	N/A		Pore Water	0.73 mg/L	10 mL	0.73 mg/L	1		0.50			10/6/19 17:17:00	N	IV
K1908805-001	Carbon, Total Organic (TOC)	N/A		Ocean Water	0.14 mg/L	10 mL	1.0 mg/L U	2		1.0			10/6/19 20:14:00	N	IV
K1908805-002	Carbon, Total Organic (TOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0			10/6/19 22:38:00	N	IV
K1908805-003	Carbon, Total Organic (TOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0			10/6/19 23:41:00	N	IV
K1908805-004	Carbon, Total Organic (TOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0			10/7/19 00:45:00	N	IV
K1908805-005	Carbon, Total Organic (TOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0			10/7/19 01:49:00	N	IV
K1908805-006	Carbon, Total Organic (TOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0			10/7/19 02:52:00	N	IV
K1908805-007	Carbon, Total Organic (TOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0			10/7/19 03:56:00	N	IV
K1908805-008	Carbon, Total Organic (TOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0			10/7/19 05:00:00	N	IV
K1908805-009	Carbon, Total Organic (TOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0			10/7/19 08:44:00	N	IV
K1908805-010	Carbon, Total Organic (TOC)	N/A		Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0			10/7/19 09:48:00	N	IV
KQ1914457-01	Carbon, Total Organic (TOC)	CCV		Water	24.99 mg/L	10 mL	25.0 mg/L	1					10/6/19 10:04:00	N	IV
KQ1914457-02	Carbon, Total Organic (TOC)	CCV		Water	24.38 mg/L	10 mL	24.4 mg/L	1					10/6/19 19:41:00	N	IV
KQ1914457-03	Carbon, Total Organic (TOC)	CCV		Water	24.21 mg/L	10 mL	24.2 mg/L	1					10/7/19 06:04:00	N	IV
KQ1914457-04	Carbon, Total Organic (TOC)	CCV		Water	24.50 mg/L	10 mL	24.5 mg/L	1					10/7/19 16:27:00	N	IV
KQ1914457-05	Carbon, Total Organic (TOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/6/19 10:21:00	N	IV
KQ1914457-06	Carbon, Total Organic (TOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/6/19 19:57:00	N	IV
KQ1914457-07	Carbon, Total Organic (TOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/7/19 06:20:00	N	IV
KQ1914457-08	Carbon, Total Organic (TOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/7/19 16:43:00	N	IV
KQ1914457-09	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/6/19 10:38:00	N	IV

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

10/10/19
Freemly

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 654320 Method/Testcode: 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1914457-10	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/6/19 10:38:00	N	IV
KQ1914457-11	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/6/19 10:38:00	N	IV
KQ1914457-12	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/6/19 10:38:00	N	IV
KQ1914457-13	Carbon, Total Organic (TOC)	LCS		Water	24.18 mg/L	10 mL	24.2 mg/L	1		0.50	97		10/6/19 11:42:00	N	IV
KQ1914457-14	Carbon, Total Organic (TOC)	LCS		Water	24.16 mg/L	10 mL	24.2 mg/L	1		0.50	97		10/6/19 11:42:00	N	IV
KQ1914457-15	Carbon, Total Organic (TOC)	LCS		Water	24.05 mg/L	10 mL	24.1 mg/L	1		0.50	96		10/6/19 11:42:00	N	IV
KQ1914457-16	Carbon, Total Organic (TOC)	LCS		Water	24.14 mg/L	10 mL	24.1 mg/L	1		0.50	97		10/6/19 11:42:00	N	IV
KQ1914457-17	Carbon, Total Organic (TOC)	MS	K1908802-021	Water	26.04 mg/L	10 mL	26.0 mg/L	1		0.50	104		10/6/19 14:53:00	N	IV
KQ1914457-18	Carbon, Total Organic (TOC)	MS	K1908802-021	Water	25.88 mg/L	10 mL	25.9 mg/L	1		0.50	104		10/6/19 14:53:00	N	IV
KQ1914457-19	Carbon, Total Organic (TOC)	MS	K1908802-021	Water	26.08 mg/L	10 mL	26.1 mg/L	1		0.50	104		10/6/19 14:53:00	N	IV
KQ1914457-20	Carbon, Total Organic (TOC)	MS	K1908802-021	Water	25.68 mg/L	10 mL	25.7 mg/L	1		0.50	103		10/6/19 14:53:00	N	IV
KQ1914457-21	Carbon, Total Organic (TOC)	MS	K1908802-023	Pore Water	27.02 mg/L	10 mL	27.0 mg/L	1		0.50	105		10/6/19 18:21:00	N	IV
KQ1914457-22	Carbon, Total Organic (TOC)	MS	K1908802-023	Pore Water	27.14 mg/L	10 mL	27.1 mg/L	1		0.50	106		10/6/19 18:21:00	N	IV
KQ1914457-23	Carbon, Total Organic (TOC)	MS	K1908802-023	Pore Water	27.15 mg/L	10 mL	27.1 mg/L	1		0.50	106		10/6/19 18:21:00	N	IV
KQ1914457-24	Carbon, Total Organic (TOC)	MS	K1908802-023	Pore Water	27.04 mg/L	10 mL	27.0 mg/L	1		0.50	105		10/6/19 18:21:00	N	IV
KQ1914457-25	Carbon, Total Organic (TOC)	MS	K1908805-001	Ocean Water	13.00 mg/L	10 mL	26.0 mg/L	2		1.0	104		10/6/19 21:18:00	N	IV
KQ1914457-26	Carbon, Total Organic (TOC)	MS	K1908805-001	Ocean Water	12.98 mg/L	10 mL	26.0 mg/L	2		1.0	104		10/6/19 21:18:00	N	IV
KQ1914457-27	Carbon, Total Organic (TOC)	MS	K1908805-001	Ocean Water	13.23 mg/L	10 mL	26.5 mg/L	2		1.0	106		10/6/19 21:18:00	N	IV
KQ1914457-28	Carbon, Total Organic (TOC)	MS	K1908805-001	Ocean Water	13.28 mg/L	10 mL	26.6 mg/L	2		1.0	106		10/6/19 21:18:00	N	IV
KQ1914457-29	Carbon, Total Organic (TOC)	DUP	K1908805-003	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/6/19 23:41:00	N	IV
KQ1914457-30	Carbon, Total Organic (TOC)	TRP	K1908805-003	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/6/19 23:41:00	N	IV
KQ1914457-31	Carbon, Total Organic (TOC)	QUAD	K1908805-003	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/6/19 23:41:00	N	IV
KQ1914457-32	Carbon, Total Organic (TOC)	DUP	K1908805-004	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 00:45:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 654320 Method/Testcode: 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1914457-33	Carbon, Total Organic (TOC)	TRP	K1908805-004	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 00:45:00	N	IV
KQ1914457-34	Carbon, Total Organic (TOC)	QUAD	K1908805-004	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 00:45:00	N	IV
KQ1914457-35	Carbon, Total Organic (TOC)	DUP	K1908805-005	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 01:49:00	N	IV
KQ1914457-36	Carbon, Total Organic (TOC)	TRP	K1908805-005	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 01:49:00	N	IV
KQ1914457-37	Carbon, Total Organic (TOC)	QUAD	K1908805-005	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 01:49:00	N	IV
KQ1914457-38	Carbon, Total Organic (TOC)	DUP	K1908805-006	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 02:52:00	N	IV
KQ1914457-39	Carbon, Total Organic (TOC)	TRP	K1908805-006	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 02:52:00	N	IV
KQ1914457-40	Carbon, Total Organic (TOC)	QUAD	K1908805-006	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 02:52:00	N	IV
KQ1914457-41	Carbon, Total Organic (TOC)	DUP	K1908805-007	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 03:56:00	N	IV
KQ1914457-42	Carbon, Total Organic (TOC)	TRP	K1908805-007	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 03:56:00	N	IV
KQ1914457-43	Carbon, Total Organic (TOC)	QUAD	K1908805-007	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 03:56:00	N	IV
KQ1914457-44	Carbon, Total Organic (TOC)	DUP	K1908805-008	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 05:00:00	N	IV
KQ1914457-45	Carbon, Total Organic (TOC)	TRP	K1908805-008	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 05:00:00	N	IV
KQ1914457-46	Carbon, Total Organic (TOC)	QUAD	K1908805-008	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 05:00:00	N	IV
KQ1914457-47	Carbon, Total Organic (TOC)	DUP	K1908805-009	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 08:44:00	N	IV
KQ1914457-48	Carbon, Total Organic (TOC)	TRP	K1908805-009	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 08:44:00	N	IV
KQ1914457-49	Carbon, Total Organic (TOC)	QUAD	K1908805-009	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 08:44:00	N	IV
KQ1914457-50	Carbon, Total Organic (TOC)	DUP	K1908805-010	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 09:48:00	N	IV
KQ1914457-51	Carbon, Total Organic (TOC)	TRP	K1908805-010	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 09:48:00	N	IV
KQ1914457-52	Carbon, Total Organic (TOC)	QUAD	K1908805-010	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/7/19 09:48:00	N	IV
KQ1914457-53	Carbon, Total Organic (TOC)	DUP	K1908805-001	Ocean Water	0.11 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/6/19 20:14:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 654320 Method/Testcode: 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1914457-54	Carbon, Total Organic (TOC)	TRP	K1908805-001	Ocean Water	0.14 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/6/19 20:14:00	N	IV
KQ1914457-55	Carbon, Total Organic (TOC)	QUAD	K1908805-001	Ocean Water	0.03 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/6/19 20:14:00	N	IV
KQ1914457-56	Carbon, Total Organic (TOC)	DUP	K1908805-002	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/6/19 22:38:00	N	IV
KQ1914457-57	Carbon, Total Organic (TOC)	TRP	K1908805-002	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/6/19 22:38:00	N	IV
KQ1914457-58	Carbon, Total Organic (TOC)	QUAD	K1908805-002	Ocean Water	0.00 mg/L	10 mL	1.0 mg/L U	2		1.0		NC	10/6/19 22:38:00	N	IV
KQ1914457-59	Carbon, Total Organic (TOC)	DUP	K1908802-021	Water	0.07 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	10/6/19 13:49:00	N	IV
KQ1914457-60	Carbon, Total Organic (TOC)	TRP	K1908802-021	Water	0.19 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	10/6/19 13:49:00	N	IV
KQ1914457-61	Carbon, Total Organic (TOC)	QUAD	K1908802-021	Water	0.11 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	10/6/19 13:49:00	N	IV
KQ1914457-62	Carbon, Total Organic (TOC)	DUP	K1908802-022	Pore Water	1.54 mg/L	10 mL	1.54 mg/L	1		0.50		3	10/6/19 16:13:00	N	IV
KQ1914457-63	Carbon, Total Organic (TOC)	TRP	K1908802-022	Pore Water	1.51 mg/L	10 mL	1.51 mg/L	1		0.50		2	10/6/19 16:13:00	N	IV
KQ1914457-64	Carbon, Total Organic (TOC)	QUAD	K1908802-022	Pore Water	1.53 mg/L	10 mL	1.53 mg/L	1		0.50		2	10/6/19 16:13:00	N	IV
KQ1914457-65	Carbon, Total Organic (TOC)	DUP	K1908802-023	Pore Water	0.72 mg/L	10 mL	0.72 mg/L	1		0.50		1	10/6/19 17:17:00	N	IV
KQ1914457-66	Carbon, Total Organic (TOC)	TRP	K1908802-023	Pore Water	0.69 mg/L	10 mL	0.69 mg/L	1		0.50		3	10/6/19 17:17:00	N	IV
KQ1914457-67	Carbon, Total Organic (TOC)	QUAD	K1908802-023	Pore Water	0.73 mg/L	10 mL	0.73 mg/L	1		0.50		2	10/6/19 17:17:00	N	IV

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

Analytical Results Summary


Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 654321 Method/Testcode: 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1908957-001	Carbon, Total Organic (TOC)	N/A		Pore Water	0.74 mg/L	10 mL	0.74 mg/L	1		0.50			10/7/19 10:52:00	N	IV
K1908957-002	Carbon, Total Organic (TOC)	N/A		Pore Water	1.38 mg/L	10 mL	1.38 mg/L	1		0.50			10/7/19 13:16:00	N	IV
K1908957-003	Carbon, Total Organic (TOC)	N/A		Pore Water	0.86 mg/L	10 mL	0.86 mg/L	1		0.50			10/7/19 14:19:00	N	IV
K1908957-004	Carbon, Total Organic (TOC)	N/A		Pore Water	0.15 mg/L	10 mL	0.50 mg/L U	1		0.50			10/7/19 15:23:00	N	IV
K1908957-005	Carbon, Total Organic (TOC)	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/7/19 17:00:00	N	IV
K1908957-006	Carbon, Total Organic (TOC)	N/A		Pore Water	0.27 mg/L	10 mL	0.50 mg/L U	1		0.50			10/7/19 18:04:00	N	IV
K1908957-008	Carbon, Total Organic (TOC)	N/A		Pore Water	1.44 mg/L	10 mL	1.44 mg/L	1		0.50			10/7/19 19:07:00	N	IV
K1908957-010	Carbon, Total Organic (TOC)	N/A		Pore Water	2.09 mg/L	10 mL	2.09 mg/L	1		0.50			10/7/19 20:11:00	N	IV
K1908957-011	Carbon, Total Organic (TOC)	N/A		Pore Water	1.55 mg/L	10 mL	1.55 mg/L	1		0.50			10/7/19 21:15:00	N	IV
K1908957-012	Carbon, Total Organic (TOC)	N/A		Pore Water	0.40 mg/L	10 mL	0.50 mg/L U	1		0.50			10/7/19 22:19:00	N	IV
K1908957-013	Carbon, Total Organic (TOC)	N/A		Pore Water	2.90 mg/L	10 mL	2.90 mg/L	1		0.50			10/7/19 23:22:00	N	IV
K1908957-014	Carbon, Total Organic (TOC)	N/A		Pore Water	0.06 mg/L	10 mL	0.50 mg/L U	1		0.50			10/8/19 00:26:00	N	IV
KQ1914458-01	Carbon, Total Organic (TOC)	CCV		Pore Water	24.21 mg/L	10 mL	24.2 mg/L	1					10/7/19 06:04:00	N	IV
KQ1914458-02	Carbon, Total Organic (TOC)	CCV		Pore Water	24.50 mg/L	10 mL	24.5 mg/L	1					10/7/19 16:27:00	N	IV
KQ1914458-03	Carbon, Total Organic (TOC)	CCV		Pore Water	24.28 mg/L	10 mL	24.3 mg/L	1					10/8/19 02:18:00	N	IV
KQ1914458-04	Carbon, Total Organic (TOC)	CCB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/7/19 06:20:00	N	IV
KQ1914458-05	Carbon, Total Organic (TOC)	CCB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/7/19 16:43:00	N	IV
KQ1914458-06	Carbon, Total Organic (TOC)	CCB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/8/19 02:35:00	N	IV
KQ1914458-07	Carbon, Total Organic (TOC)	MB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/7/19 06:37:00	N	IV
KQ1914458-08	Carbon, Total Organic (TOC)	LCS		Pore Water	23.98 mg/L	10 mL	24.0 mg/L	1		0.50	96		10/7/19 07:41:00	N	IV
KQ1914458-09	Carbon, Total Organic (TOC)	MS	K1908957-001	Pore Water	27.62 mg/L	10 mL	27.6 mg/L	1		0.50	108		10/7/19 11:55:00	N	IV
KQ1914458-10	Carbon, Total Organic (TOC)	MS	K1908957-001	Pore Water	27.35 mg/L	10 mL	27.3 mg/L	1		0.50	106		10/7/19 11:55:00	N	IV
KQ1914458-11	Carbon, Total Organic (TOC)	MS	K1908957-001	Pore Water	27.56 mg/L	10 mL	27.6 mg/L	1		0.50	107		10/7/19 11:55:00	N	IV

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

10/10/19


Analytical Results Summary

00952880

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 654321 Method/Testcode: 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1914458-12	Carbon, Total Organic (TOC)	MS	K1908957-001	Pore Water	27.29 mg/L	10 mL	27.3 mg/L	1		0.50	106		10/7/19 11:55:00	N	IV
KQ1914458-13	Carbon, Total Organic (TOC)	DUP	K1908957-011	Pore Water	1.56 mg/L	10 mL	1.56 mg/L	1		0.50		<1	10/7/19 21:15:00	N	IV
KQ1914458-14	Carbon, Total Organic (TOC)	TRP	K1908957-011	Pore Water	1.60 mg/L	10 mL	1.60 mg/L	1		0.50		2	10/7/19 21:15:00	N	IV
KQ1914458-15	Carbon, Total Organic (TOC)	QUAD	K1908957-011	Pore Water	1.57 mg/L	10 mL	1.57 mg/L	1		0.50		1	10/7/19 21:15:00	N	IV
KQ1914458-16	Carbon, Total Organic (TOC)	DUP	K1908957-012	Pore Water	0.35 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	10/7/19 22:19:00	N	IV
KQ1914458-17	Carbon, Total Organic (TOC)	TRP	K1908957-012	Pore Water	0.39 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	10/7/19 22:19:00	N	IV
KQ1914458-18	Carbon, Total Organic (TOC)	QUAD	K1908957-012	Pore Water	0.42 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	10/7/19 22:19:00	N	IV
KQ1914458-19	Carbon, Total Organic (TOC)	DUP	K1908957-013	Pore Water	3.30 mg/L	10 mL	3.30 mg/L	1		0.50		13	10/7/19 23:22:00	N	IV
KQ1914458-20	Carbon, Total Organic (TOC)	TRP	K1908957-013	Pore Water	3.60 mg/L	10 mL	3.60 mg/L	1		0.50		11	10/7/19 23:22:00	N	IV
KQ1914458-21	Carbon, Total Organic (TOC)	QUAD	K1908957-013	Pore Water	3.77 mg/L	10 mL	3.77 mg/L	1		0.50		11	10/7/19 23:22:00	N	IV
KQ1914458-22	Carbon, Total Organic (TOC)	DUP	K1908957-014	Pore Water	0.66 mg/L	10 mL	0.66 mg/L	1		0.50		NC	10/8/19 00:26:00	N	IV
KQ1914458-23	Carbon, Total Organic (TOC)	TRP	K1908957-014	Pore Water	0.61 mg/L	10 mL	0.61 mg/L	1		0.50		NC	10/8/19 00:26:00	N	IV
KQ1914458-24	Carbon, Total Organic (TOC)	QUAD	K1908957-014	Pore Water	0.58 mg/L	10 mL	0.58 mg/L	1		0.50		NC	10/8/19 00:26:00	N	IV
KQ1914458-25	Carbon, Total Organic (TOC)	DUP	K1908957-001	Pore Water	0.71 mg/L	10 mL	0.71 mg/L	1		0.50		4	10/7/19 10:52:00	N	IV
KQ1914458-26	Carbon, Total Organic (TOC)	TRP	K1908957-001	Pore Water	0.64 mg/L	10 mL	0.64 mg/L	1		0.50		8	10/7/19 10:52:00	N	IV
KQ1914458-27	Carbon, Total Organic (TOC)	QUAD	K1908957-001	Pore Water	0.67 mg/L	10 mL	0.67 mg/L	1		0.50		7	10/7/19 10:52:00	N	IV
KQ1914458-28	Carbon, Total Organic (TOC)	DUP	K1908957-002	Pore Water	1.40 mg/L	10 mL	1.40 mg/L	1		0.50		2	10/7/19 13:16:00	N	IV
KQ1914458-29	Carbon, Total Organic (TOC)	TRP	K1908957-002	Pore Water	1.38 mg/L	10 mL	1.38 mg/L	1		0.50		1	10/7/19 13:16:00	N	IV
KQ1914458-30	Carbon, Total Organic (TOC)	QUAD	K1908957-002	Pore Water	1.40 mg/L	10 mL	1.40 mg/L	1		0.50		1	10/7/19 13:16:00	N	IV
KQ1914458-31	Carbon, Total Organic (TOC)	DUP	K1908957-003	Pore Water	0.88 mg/L	10 mL	0.88 mg/L	1		0.50		3	10/7/19 14:19:00	N	IV
KQ1914458-32	Carbon, Total Organic (TOC)	TRP	K1908957-003	Pore Water	0.81 mg/L	10 mL	0.81 mg/L	1		0.50		5	10/7/19 14:19:00	N	IV
KQ1914458-33	Carbon, Total Organic (TOC)	QUAD	K1908957-003	Pore Water	0.82 mg/L	10 mL	0.82 mg/L	1		0.50		4	10/7/19 14:19:00	N	IV
KQ1914458-34	Carbon, Total Organic (TOC)	DUP	K1908957-004	Pore Water	0.11 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	10/7/19 15:23:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 654321 Method/Testcode: 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1914458-35	Carbon, Total Organic (TOC)	TRP	K1908957-004	Pore Water	0.16 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	10/7/19 15:23:00	N	IV
KQ1914458-36	Carbon, Total Organic (TOC)	QUAD	K1908957-004	Pore Water	0.10 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	10/7/19 15:23:00	N	IV
KQ1914458-37	Carbon, Total Organic (TOC)	DUP	K1908957-005	Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	10/7/19 17:00:00	N	IV
KQ1914458-38	Carbon, Total Organic (TOC)	TRP	K1908957-005	Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	10/7/19 17:00:00	N	IV
KQ1914458-39	Carbon, Total Organic (TOC)	QUAD	K1908957-005	Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	10/7/19 17:00:00	N	IV
KQ1914458-40	Carbon, Total Organic (TOC)	DUP	K1908957-006	Pore Water	0.32 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	10/7/19 18:04:00	N	IV
KQ1914458-41	Carbon, Total Organic (TOC)	TRP	K1908957-006	Pore Water	0.28 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	10/7/19 18:04:00	N	IV
KQ1914458-42	Carbon, Total Organic (TOC)	QUAD	K1908957-006	Pore Water	0.25 mg/L	10 mL	0.50 mg/L U	1		0.50		NC	10/7/19 18:04:00	N	IV
KQ1914458-43	Carbon, Total Organic (TOC)	DUP	K1908957-008	Pore Water	1.43 mg/L	10 mL	1.43 mg/L	1		0.50		<1	10/7/19 19:07:00	N	IV
KQ1914458-44	Carbon, Total Organic (TOC)	TRP	K1908957-008	Pore Water	1.46 mg/L	10 mL	1.46 mg/L	1		0.50		1	10/7/19 19:07:00	N	IV
KQ1914458-45	Carbon, Total Organic (TOC)	QUAD	K1908957-008	Pore Water	1.52 mg/L	10 mL	1.52 mg/L	1		0.50		3	10/7/19 19:07:00	N	IV
KQ1914458-46	Carbon, Total Organic (TOC)	DUP	K1908957-010	Pore Water	2.14 mg/L	10 mL	2.14 mg/L	1		0.50		2	10/7/19 20:11:00	N	IV
KQ1914458-47	Carbon, Total Organic (TOC)	TRP	K1908957-010	Pore Water	2.13 mg/L	10 mL	2.13 mg/L	1		0.50		1	10/7/19 20:11:00	N	IV
KQ1914458-48	Carbon, Total Organic (TOC)	QUAD	K1908957-010	Pore Water	2.07 mg/L	10 mL	2.07 mg/L	1		0.50		1	10/7/19 20:11:00	N	IV
KQ1914458-49	Carbon, Total Organic (TOC)	MB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/7/19 06:37:00	N	IV
KQ1914458-50	Carbon, Total Organic (TOC)	MB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/7/19 06:37:00	N	IV
KQ1914458-51	Carbon, Total Organic (TOC)	MB		Pore Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			10/7/19 06:37:00	N	IV
KQ1914458-52	Carbon, Total Organic (TOC)	LCS		Pore Water	24.03 mg/L	10 mL	24.0 mg/L	1		0.50	96		10/7/19 07:41:00	N	IV
KQ1914458-53	Carbon, Total Organic (TOC)	LCS		Pore Water	24.11 mg/L	10 mL	24.1 mg/L	1		0.50	96		10/7/19 07:41:00	N	IV
KQ1914458-54	Carbon, Total Organic (TOC)	LCS		Pore Water	24.19 mg/L	10 mL	24.2 mg/L	1		0.50	97		10/7/19 07:41:00	N	IV

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

Analytical Results Summary

Instrument Name: K-TOC-03

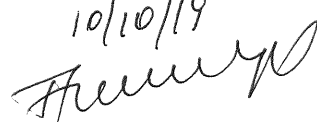
Analyst: BDITZLER

Analysis Lot: 654322 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
K1908720-004	Carbon, Total Organic	N/A		Water	0.83 mg/L	10 mL	0.83 mg/L	1	0.07	0.50			10/8/19 08:15:00	N	II
K1908725-002	Carbon, Total Organic	N/A		Water	18.07 mg/L	10 mL	36.1 mg/L	2	0.2	1.0			10/8/19 03:25:00	N	I
K1908728-001	Carbon, Total Organic	N/A		Water	13.69 mg/L	10 mL	13.7 mg/L	1	0.07	0.50			10/8/19 03:57:00	N	V
K1908728-002	Carbon, Total Organic	N/A		Water	22.97 mg/L	10 mL	23.0 mg/L	1	0.07	0.50			10/8/19 04:29:00	N	V
K1908776-001	Carbon, Total Organic	N/A		Water	0.88 mg/L	10 mL	0.88 mg/L	1	0.07	0.50			10/8/19 05:33:00	N	II
K1908896-001	Carbon, Total Organic	N/A		Water	4.52 mg/L	10 mL	452 mg/L	100	7	50			10/8/19 06:05:00	N	II
K1908896-002	Carbon, Total Organic	N/A		Water	5.87 mg/L	10 mL	587 mg/L	100	7	50			10/8/19 06:38:00	N	II
K1908896-003	Carbon, Total Organic	N/A		Water	4.70 mg/L	10 mL	470 mg/L	100	7	50			10/8/19 07:10:00	N	II
K1908981-001	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			10/8/19 08:47:00	N	III
K1908981-002	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			10/8/19 09:19:00	N	III
K1908981-003	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			10/8/19 09:52:00	N	III
K1908981-004	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			10/8/19 01:29:00	Y	III
K1908981-005	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			10/8/19 10:24:00	N	III
K1908981-006	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			10/8/19 10:56:00	N	III
K1908984-001	Carbon, Total Organic	N/A		Water	1.64 mg/L	10 mL	1.64 mg/L	1	0.07	0.50			10/8/19 05:01:00	N	IV
K1908997-001	Carbon, Total Organic	N/A		Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			10/8/19 11:28:00	N	IV
K1908998-001	Carbon, Total Organic	N/A		Surface Water	0.18 mg/L	10 mL	0.18 mg/L	J 1	0.07	0.50			10/8/19 12:00:00	N	III
K1908998-002	Carbon, Total Organic	N/A		Surface Water	0.02 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			10/8/19 12:32:00	N	III
KQ1914459-01	Carbon, Total Organic	CCV		Water	24.50 mg/L	10 mL	24.5 mg/L	1					10/7/19 16:27:00	N	III
KQ1914459-02	Carbon, Total Organic	CCV		Water	24.28 mg/L	10 mL	24.3 mg/L	1					10/8/19 02:18:00	N	III
KQ1914459-03	Carbon, Total Organic	CCV		Water	24.16 mg/L	10 mL	24.2 mg/L	1					10/8/19 07:42:00	N	III
KQ1914459-04	Carbon, Total Organic	CCV		Water	23.97 mg/L	10 mL	24.0 mg/L	1					10/8/19 13:04:00	N	III
KQ1914459-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			10/7/19 16:43:00	N	III
KQ1914459-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			10/8/19 02:35:00	N	III
KQ1914459-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			10/8/19 07:58:00	N	III
KQ1914459-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			10/8/19 13:21:00	N	III
KQ1914459-09	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50			10/8/19 02:51:00	N	III
KQ1914459-10	Carbon, Total Organic	LCS		Water	24.16 mg/L	10 mL	24.2 mg/L	1	0.07	0.50	97		10/8/19 03:08:00	N	III
KQ1914459-11	Carbon, Total Organic	MS	K1908981-004	Water	25.31 mg/L	10 mL	25.3 mg/L	1	0.07	0.50	101		10/8/19 02:02:00	N	III
KQ1914459-12	Carbon, Total Organic	DUP	K1908720-004	Water	0.80 mg/L	10 mL	0.80 mg/L	1	0.07	0.50		4	10/8/19 08:15:00	N	II
KQ1914459-13	Carbon, Total Organic	DUP	K1908725-002	Water	17.88 mg/L	10 mL	35.8 mg/L	2	0.2	1.0		1	10/8/19 03:25:00	N	I
KQ1914459-14	Carbon, Total Organic	DUP	K1908728-002	Water	22.95 mg/L	10 mL	22.9 mg/L	1	0.07	0.50		<1	10/8/19 04:29:00	N	V
KQ1914459-15	Carbon, Total Organic	DUP	K1908728-001	Water	13.31 mg/L	10 mL	13.3 mg/L	1	0.07	0.50		3	10/8/19 03:57:00	N	V
KQ1914459-16	Carbon, Total Organic	DUP	K1908776-001	Water	0.81 mg/L	10 mL	0.81 mg/L	1	0.07	0.50		9	10/8/19 05:33:00	N	II

Page 31 of 64

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

10/10/19


Analytical Results Summary

Instrument Name: K-TOC-03

Analyst: BDITZLER

Analysis Lot: 654322 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>
KQ1914459-17	Carbon, Total Organic	DUP	K1908896-001	Water	4.53 mg/L	10 mL	453 mg/L	100	7	50	<1		10/8/19 06:05:00	N	II
KQ1914459-18	Carbon, Total Organic	DUP	K1908896-002	Water	5.94 mg/L	10 mL	594 mg/L	100	7	50	1		10/8/19 06:38:00	N	II
KQ1914459-19	Carbon, Total Organic	DUP	K1908981-005	Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	10/8/19 10:24:00	N	III
KQ1914459-20	Carbon, Total Organic	DUP	K1908981-006	Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	10/8/19 10:56:00	N	III
KQ1914459-21	Carbon, Total Organic	DUP	K1908981-001	Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	10/8/19 08:47:00	N	III
KQ1914459-22	Carbon, Total Organic	DUP	K1908981-002	Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	10/8/19 09:19:00	N	III
KQ1914459-23	Carbon, Total Organic	DUP	K1908981-003	Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	10/8/19 09:52:00	N	III
KQ1914459-24	Carbon, Total Organic	DUP	K1908981-004	Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	10/8/19 01:29:00	N	III
KQ1914459-25	Carbon, Total Organic	DUP	K1908896-003	Water	4.69 mg/L	10 mL	469 mg/L	100	7	50	<1		10/8/19 07:10:00	N	II
KQ1914459-26	Carbon, Total Organic	DUP	K1908984-001	Water	1.26 mg/L	10 mL	1.26 mg/L	1	0.07	0.50	26*		10/8/19 05:01:00	N	IV
KQ1914459-27	Carbon, Total Organic	DUP	K1908997-001	Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	10/8/19 11:28:00	N	IV
KQ1914459-28	Carbon, Total Organic	DUP	K1908998-001	Surface Water	0.19 mg/L	10 mL	0.19 mg/L	J 1	0.07	0.50		11*	10/8/19 12:00:00	N	III
KQ1914459-29	Carbon, Total Organic	DUP	K1908998-002	Surface Water	0.00 mg/L	10 mL	0.50 mg/L	U 1	0.07	0.50		NC	10/8/19 12:32:00	N	III

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

DOC: 654319

TOC: 654320,
654321,
654322**Schedule: 10052019**

Version: 6

Instrument: Fusion1

Last Saved by: Fusion1 (Fusion1)

Last Saved on: 2019/10/05 13:28 - Saturday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Clean)	Clean	Clean		1
(Blank)	Blank	Reagent/Acid Blank		1
D	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
1	Sample	MB1	Extended Reaction 021711 (Extended Reaction 021711)	4
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	4
2	Sample	ICS	Extended Reaction 021711 (Extended Reaction 021711)	1
3	Sample	K1908802-022.04 doc	Extended Reaction 021711 (Extended Reaction 021711)	4
4	Sample	K1908802-022.04 ms doc	Extended Reaction 021711 (Extended Reaction 021711)	4
5	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
6	Sample	K1908802-023.04 doc	Extended Reaction 021711 (Extended Reaction 021711)	4
7	Sample	K1908802-023.04 ms doc	Extended Reaction 021711 (Extended Reaction 021711)	4
8	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
9	Sample	K1908957-001.04 doc	Extended Reaction 021711 (Extended Reaction 021711)	4
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
10	Sample	K1908957-001.04 doc	Extended Reaction 021711 (Extended Reaction 021711)	4
11	Sample	K1908957-002.04 doc	Extended Reaction 021711 (Extended Reaction 021711)	4
12	Sample	K1908957-003.04 doc	Extended Reaction 021711 (Extended Reaction 021711)	4
13	Sample	K1908957-004.04 doc	Extended Reaction 021711 (Extended Reaction 021711)	4
14	Sample	K1908957-006.04 doc	Extended Reaction 021711 (Extended Reaction 021711)	4
15	Sample	K1908957-008.04 doc	Extended Reaction 021711 (Extended Reaction 021711)	4
16	Sample	K1908957-010.04 doc	Extended Reaction 021711 (Extended Reaction 021711)	4
17	Sample	K1908957-011.04 doc	Extended Reaction 021711 (Extended Reaction 021711)	4
18	Sample	K1908957-012.04 doc	Extended Reaction 021711 (Extended Reaction 021711)	4
19	Sample	K1908957-013.04 doc	Extended Reaction 021711 (Extended Reaction 021711)	4
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
20	Sample	MB2	Extended Reaction 021711 (Extended Reaction 021711)	4
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	4
21	Sample	K1908957-014.04 doc	Extended Reaction 021711 (Extended Reaction 021711)	4
22	Sample	K1908802-021.03	Extended Reaction 021711 (Extended Reaction 021711)	4
23	Sample	K1908802-021.03 ms	Extended Reaction 021711 (Extended Reaction 021711)	4
24	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
25	Sample	K1908802-022.03	Extended Reaction 021711 (Extended Reaction 021711)	4
26	Sample	K1908802-023.03	Extended Reaction 021711 (Extended Reaction 021711)	4
27	Sample	K1908802-023.03 ms	Extended Reaction 021711 (Extended Reaction 021711)	4
28	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
29	Sample	K1908805-001.20 2x	Extended Reaction 021711 (Extended Reaction 021711)	4
30	Sample	K1908805-001.20 ms 2x	Extended Reaction 021711 (Extended Reaction 021711)	4
31	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
32	Sample	K1908805-002.20 2x	Extended Reaction 021711 (Extended Reaction 021711)	4
33	Sample	K1908805-003.20 2x	Extended Reaction 021711 (Extended Reaction 021711)	4
34	Sample	K1908805-004.20 2x	Extended Reaction 021711 (Extended Reaction 021711)	4
35	Sample	K1908805-005.20 2x	Extended Reaction 021711 (Extended Reaction 021711)	4
36	Sample	K1908805-006.20 2x	Extended Reaction 021711 (Extended Reaction 021711)	4
37	Sample	K1908805-007.20 2x	Extended Reaction 021711 (Extended Reaction 021711)	4
38	Sample	K1908805-008.20 2x	Extended Reaction 021711 (Extended Reaction 021711)	4
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

Printed on: October 8, 2019 17:07:56

Page 1

10/10/19


Schedule: 10052019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
39	Sample	MB3	Extended Reaction 021711 (Extended Reaction 021711)	4
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	4
40	Sample	K1908805-009.20 2x	Extended Reaction 021711 (Extended Reaction 021711)	4
41	Sample	K1908805-010.20 2x	Extended Reaction 021711 (Extended Reaction 021711)	4
42	Sample	K1908957-001.03	Extended Reaction 021711 (Extended Reaction 021711)	4
43	Sample	K1908957-001.03 ms	Extended Reaction 021711 (Extended Reaction 021711)	4
44	Sample	RB	Extended Reaction 021711 (Extended Reaction 021711)	1
45	Sample	K1908957-002.03	Extended Reaction 021711 (Extended Reaction 021711)	4
46	Sample	K1908957-003.03	Extended Reaction 021711 (Extended Reaction 021711)	4
47	Sample	K1908957-004.03	Extended Reaction 021711 (Extended Reaction 021711)	4
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
48	Sample	K1908957-005.03	Extended Reaction 021711 (Extended Reaction 021711)	4
49	Sample	K1908957-006.03	Extended Reaction 021711 (Extended Reaction 021711)	4
50	Sample	K1908957-008.03	Extended Reaction 021711 (Extended Reaction 021711)	4
51	Sample	K1908957-010.03	Extended Reaction 021711 (Extended Reaction 021711)	4
52	Sample	K1908957-011.03	Extended Reaction 021711 (Extended Reaction 021711)	4
53	Sample	K1908957-012.03	Extended Reaction 021711 (Extended Reaction 021711)	4
54	Sample	K1908957-013.03	Extended Reaction 021711 (Extended Reaction 021711)	4
55	Sample	K1908957-014.03	Extended Reaction 021711 (Extended Reaction 021711)	4
56	Sample	K1908981-004.01	Extended Reaction 021711 (Extended Reaction 021711)	2
57	Sample	K1908981-004.01 ms	Extended Reaction 021711 (Extended Reaction 021711)	1
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
58	Sample	MB4	Extended Reaction 021711 (Extended Reaction 021711)	1
C	Check Standard	[TOC] LCS ER [25.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
59	Sample	K1908725-002.22 2x	Extended Reaction 021711 (Extended Reaction 021711)	2
60	Sample	K1908728-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
61	Sample	K1908728-002.01	Extended Reaction 021711 (Extended Reaction 021711)	2
62	Sample	K1908984-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
63	Sample	K1908776-001.06	Extended Reaction 021711 (Extended Reaction 021711)	2
64	Sample	K1908896-001.01 100x	Extended Reaction 021711 (Extended Reaction 021711)	2
65	Sample	K1908896-002.01 100x	Extended Reaction 021711 (Extended Reaction 021711)	2
66	Sample	K1908896-003.01 100x	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
67	Sample	K1908720-004.05	Extended Reaction 021711 (Extended Reaction 021711)	2
68	Sample	K1908981-001.01	Extended Reaction 021711 (Extended Reaction 021711)	2
69	Sample	K1908981-002.01	Extended Reaction 021711 (Extended Reaction 021711)	2
70	Sample	K1908981-003.01	Extended Reaction 021711 (Extended Reaction 021711)	2
71	Sample	K1908981-005.01	Extended Reaction 021711 (Extended Reaction 021711)	2
72	Sample	K1908981-006.01	Extended Reaction 021711 (Extended Reaction 021711)	2
73	Sample	K1908997-001.02	Extended Reaction 021711 (Extended Reaction 021711)	2
74	Sample	K1908998-001.02	Extended Reaction 021711 (Extended Reaction 021711)	2
75	Sample	K1908998-002.02	Extended Reaction 021711 (Extended Reaction 021711)	2
B	Check Standard	[TOC] CCV 021711 [25 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1
D	Check Standard	[TOC] CCB 021711 [0.0 ppm]	Extended Reaction 021711 (Extended Reaction 021711)	1

Fusion Report - 10052019

Saturday, October 05, 2019 11:50 AM

(View - Repts, Unused Repts, Meta-Data, Signature, History)
Printed on 2019/10/08 17:08 - Tuesday

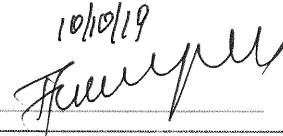
Report Summary Information

Company Location: Gen Chem Lab
 Schedule Name: 10052019
 Instrument Name: Fusion1
 Report Version: 1 of 1
 Report Creation by Operators (schedule version): Fusion1 (Fusion1) (v2)
 Fusion1 (Fusion1) (v3)
 Fusion1 (Fusion1) (v4)
 Fusion1 (Fusion1) (v5)
 Fusion1 (Fusion1) (v6)

Engine Version: 1.1.5.1
 Firmware Version: 1.2.0696
 Connection: RS232 COM1

Comment:

Report Results

10/10/19


Sample Type: Clean							From Schedule Version 2
Pos	Analysis Type	Sample ID			Start Time		
◆ (clean)		Clean			2019/10/05 11:50		
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	IC Clean	12.51	16.27	3.75	49.57	05:21	
2	TC Clean	5.48	9.00	3.52	50.27	04:03	
3	TC Clean	2.86	6.36	3.50	50.19	03:46	
4	TC Clean	1.74	5.31	3.58	50.26	03:54	

Sample Type: Clean							From Schedule Version 3
Pos	Analysis Type	Sample ID			Start Time		
◆ (clean)		Clean			2019/10/05 12:18		
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	IC Clean	11.26	14.90	3.64	49.64	05:21	
2	TC Clean	7.94	11.45	3.51	50.30	04:05	
3	TC Clean	4.83	8.43	3.60	50.24	03:46	

4	TC Clean	2.64	6.25	3.61	50.19	03:48
---	----------	------	------	------	-------	-------

Sample Type: Clean From Schedule Version 4

Pos	Analysis Type	Sample ID			Start Time	
◊ (clean)		Clean			2019/10/05 12:52	
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.21	14.80	3.59	49.57	05:10
2	TC Clean	8.28	11.93	3.65	50.12	04:04
3	TC Clean	3.66	7.38	3.72	50.09	03:48
4	TC Clean	2.24	5.69	3.44	50.12	03:46

Sample Type: Blank (Creating v1303) From Schedule Version 5

Pos	Analysis Type	Sample ID			Start Time	
◊ (blank)		Reagent/Acid Blank			2019/10/05 13:15	
Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.40	15.03	3.63	49.55	05:13
2	TC Clean	5.97	9.73	3.76	50.22	04:04
3	TC Clean	3.70	7.38	3.68	50.17	03:55
4	TC Clean	1.89	5.69	3.79	50.25	03:53
5	Reagent Blank	5.10	8.84	3.74	50.08	05:03
6	Acid Blank	1.44	5.03	3.58	49.72	05:28

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
◊ D	TOC	RB	0.5110 ppm	0.0000 ppm	0.0000%	2019/10/05 13:48		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5110	5.1102	14.05	17.71	3.66	50.27	12:30
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 10.3878 (IC) (v1303)		Extended Reaction 021711 (v4)		Extended Reaction 021711 (v27)		

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◊ B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.9294 ppm (PASS)	0.0000 ppm	0%	2019/10/05 14:05

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9294	249.2939	189.92	193.56	3.65	50.27	12:33

Completion State Success - Criteria met. **Success Action** Do Nothing **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27) **STD Conc - Pos B** 50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◊ D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/05 14:22

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	10.02	13.56	3.54	50.24	12:32

Completion State Success - Criteria met. **Success Action** Do Nothing **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27) **STD Conc - Pos D** 0 ppmC

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/05 14:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	10.02	13.37	3.36	50.24	12:28
2	TOC	0.0000	0.0000	9.47	12.93	3.45	50.22	12:26
3	TOC	0.0000	0.0000	10.03	13.45	3.42	50.23	12:31
4	TOC	0.0000	0.0000	9.73	13.02	3.29	50.24	12:27

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) (v1303) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER From Schedule Version 6

Concentration	Min / Max

Pos	BAT	(ppm)	Dil	Sample ID	(% dev)	Result	Std. Dev.	RSD	Start Time
♦ C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.6295 ppm (PASS)	0.1344 ppm	0.55%	2019/10/05 15:42

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.5242	245.2425	187.01	190.41	3.40	50.22	12:28
C	TOC	25.0 ppm	2	24.8256	248.2563	189.17	192.69	3.52	50.20	12:30
C	TOC	25.0 ppm	3	24.5676	245.6762	187.32	190.91	3.59	50.18	12:29
C	TOC	25.0 ppm	4	24.6005	246.0053	187.56	191.17	3.61	50.18	12:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 2	TOC	ICS	0.2971 ppm	0.0000 ppm	0.0000%	2019/10/05 16:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2971	2.9709	12.52	16.00	3.49	50.17	12:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3878 (IC) (v1303)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 3	TOC	K1908802-022.04 doc	1.6239 ppm	0.0464 ppm	2.8600%	2019/10/05 17:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6472	16.4724	22.20	25.75	3.55	50.14	12:28
2	TOC	1.6012	16.0122	21.87	25.44	3.58	50.12	12:30
3	TOC	1.5717	15.7165	21.66	25.25	3.60	50.12	12:27
4	TOC	1.6756	16.7555	22.40	26.03	3.62	50.12	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3878 (IC) (v1303)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 4	TOC	K1908802-022.04 ms doc	27.6996 ppm	0.0503 ppm	0.1800%	2019/10/05 18:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.6652	276.6516	208.76	212.26	3.51	50.12	12:28
2	TOC	27.7594	277.5944	209.43	212.98	3.55	50.11	12:26
3	TOC	27.7225	277.2248	209.17	212.76	3.59	50.14	12:25

4	TOC	27.6515	276.5149	208.66	212.47	3.81	50.16	12:28
---	-----	---------	----------	--------	--------	------	-------	-------

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
5	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/05 19:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	10.12	13.78	3.66	50.19	12:32

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
6	TOC	K1908802-023.04 doc	0.7918 ppm	0.0249 ppm	3.1500%	2019/10/05 19:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8287	8.2872	16.33	19.86	3.53	50.21	12:29
2	TOC	0.7840	7.8396	16.01	19.59	3.59	50.25	12:30
3	TOC	0.7796	7.7963	15.98	19.54	3.57	50.26	12:30
4	TOC	0.7748	7.7475	15.94	19.49	3.55	50.29	12:31

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
7	TOC	K1908802-023.04 ms doc	27.4219 ppm	0.1227 ppm	0.4500%	2019/10/05 20:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.2698	272.6978	205.92	209.54	3.62	50.31	12:29
2	TOC	27.3846	273.8456	206.74	210.29	3.55	50.35	12:27
3	TOC	27.5533	275.5331	207.95	211.54	3.59	50.35	12:30
4	TOC	27.4801	274.8009	207.43	211.03	3.60	50.38	12:26

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
8	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/05 21:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.96	12.66	3.70	50.40	12:31

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC)
Method Extended Reaction
Calibration Extended Reaction

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
	9	TOC	K1908957-001.04 doc	26.8682 ppm	0.3225 ppm	1.2000%	2019/10/05 21:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.7672	267.6715	202.32	205.93	3.62	50.42	12:26
2	TOC	26.6328	266.3285	201.35	204.99	3.64	50.43	12:24
3	TOC	26.7282	267.2824	202.04	205.65	3.61	50.45	12:30
4	TOC	27.3445	273.4453	206.46	210.13	3.67	50.46	12:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3878 (IC) (v1303)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.5873 ppm (PASS)	0.0000 ppm	0%	2019/10/05 22:54

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5873	245.8728	187.46	191.15	3.68	50.49	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/05 23:11

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	9.07	12.74	3.67	50.49	12:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 6

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

◆	10	TOC	K1908957-001.04 doc	0.7778 ppm	0.0451 ppm	5.8000%	2019/10/05 23:28		
---	----	-----	---------------------	------------	------------	---------	------------------	--	--

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8347	8.3472	16.37	19.89	3.52	50.51	12:24
2	TOC	0.7573	7.5732	15.82	19.35	3.53	50.55	12:26
3	TOC	0.7297	7.2970	15.62	19.00	3.38	50.54	12:26
4	TOC	0.7895	7.8953	16.05	19.44	3.39	50.55	12:30

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	11	TOC	K1908957-002.04 doc	1.4795 ppm	0.0362 ppm	2.4400%	2019/10/06 00:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4318	14.3177	20.65	24.26	3.61	50.55	12:28
2	TOC	1.4803	14.8030	21.00	24.69	3.68	50.54	12:26
3	TOC	1.4863	14.8630	21.04	24.61	3.56	50.49	12:24
4	TOC	1.5195	15.1949	21.28	24.98	3.69	50.47	12:29

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	12	TOC	K1908957-003.04 doc	1.0380 ppm	0.0309 ppm	2.9800%	2019/10/06 01:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0583	10.5828	17.98	21.51	3.53	50.46	12:29
2	TOC	1.0572	10.5717	17.97	21.44	3.47	50.46	12:25
3	TOC	0.9927	9.9273	17.51	21.05	3.55	50.44	12:30
4	TOC	1.0438	10.4378	17.87	21.49	3.62	50.43	12:28

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◆	13	TOC	K1908957-004.04 doc	0.3167 ppm	0.0225 ppm	7.0900%	2019/10/06 02:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2983	2.9834	12.53	16.19	3.67	50.48	12:31
2	TOC	0.3240	3.2400	12.71	16.31	3.60	50.49	12:29
3	TOC	0.3453	3.4534	12.86	16.50	3.64	50.53	12:28
4	TOC	0.2993	2.9932	12.53	16.10	3.57	50.55	12:24

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
14	TOC	K1908957-006.04 doc	0.5176 ppm	0.0193 ppm	3.7200%	2019/10/06 03:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5024	5.0238	13.99	17.54	3.55	50.57	12:26
2	TOC	0.5173	5.1730	14.10	17.74	3.64	50.58	12:24
3	TOC	0.5449	5.4491	14.30	17.99	3.69	50.63	12:28
4	TOC	0.5060	5.0600	14.02	17.49	3.47	50.65	12:28

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
15	TOC	K1908957-008.04 doc	1.5941 ppm	0.0290 ppm	1.8200%	2019/10/06 04:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5756	15.7556	21.68	25.25	3.56	50.66	12:26
2	TOC	1.5822	15.8225	21.73	25.23	3.50	50.68	12:28
3	TOC	1.6375	16.3748	22.13	25.62	3.49	50.74	12:29
4	TOC	1.5813	15.8127	21.73	25.33	3.61	50.75	12:29

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
16	TOC	K1908957-010.04 doc	2.3043 ppm	0.0625 ppm	2.7100%	2019/10/06 05:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2839	22.8390	26.76	30.19	3.43	50.76	12:28
2	TOC	2.2322	22.3215	26.39	29.99	3.60	50.79	12:26
3	TOC	2.3203	23.2030	27.02	30.47	3.44	50.81	12:26
4	TOC	2.3807	23.8068	27.46	30.95	3.50	50.80	12:27

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
17	TOC	K1908957-011.04 doc	1.7001 ppm	0.0232 ppm	1.3600%	2019/10/06 06:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7213	17.2130	22.73	26.11	3.38	50.83	12:31
2	TOC	1.6676	16.6760	22.34	25.83	3.48	50.84	12:24
3	TOC	1.7101	17.1014	22.65	26.23	3.58	50.86	12:29
4	TOC	1.7015	17.0149	22.59	26.17	3.58	50.87	12:31

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

1:10 (TC) 10.3878 (IC) (v1303) Extended Reaction 021711 (v4) Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
18	TOC	K1908957-012.04 doc	0.5377 ppm	0.0309 ppm	5.7600%	2019/10/06 07:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5478	5.4784	14.32	17.85	3.54	50.88	12:30
2	TOC	0.5743	5.7434	14.51	17.98	3.47	50.86	12:29
3	TOC	0.5272	5.2720	14.17	17.70	3.53	50.85	12:27
4	TOC	0.5014	5.0140	13.98	17.66	3.68	50.84	12:27

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) (v1303) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
19	TOC	K1908957-013.04 doc	4.1050 ppm	0.7406 ppm	18.0400%	2019/10/06 09:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.0466	30.4663	32.23	35.70	3.47	50.82	12:29
2	TOC	4.1609	41.6095	40.22	43.85	3.63	50.81	12:26
3	TOC	4.5063	45.0626	42.70	46.22	3.52	50.80	12:29
4	TOC	4.7061	47.0611	44.13	47.70	3.57	50.78	12:28

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) (v1303) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711

From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.9895 ppm (PASS)	0.0000 ppm	0%	2019/10/06 10:04

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9895	249.8950	190.35	193.79	3.45	50.77	12:31

Completion State Success - Criteria met. **Success Action** Do Nothing **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27) **STD Conc - Pos B** 50 ppmC

Sample Type: Check Standard --> CCB 021711

From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:2	[TOC] CCB	0 / infinity	0.0000	0.0000	0%	2019/10/06 10:21

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	9.44	12.91	3.47	50.74	12:32

021711 [0.0 ppm] (NA / NA) ppm (PASS) ppm

<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	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/06 10:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.36	12.80	3.45	50.72	12:27
2	TOC	0.0000	0.0000	9.41	13.08	3.67	50.72	12:25
3	TOC	0.0000	0.0000	8.71	12.35	3.64	50.69	12:25
4	TOC	0.0000	0.0000	8.13	11.78	3.65	50.69	12:29

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 10.3878 (IC) (v1303)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.1330 ppm (PASS)	0.0548 ppm	0.23%	2019/10/06 11:42

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.1752	241.7517	184.51	187.96	3.45	50.68	12:26
C	TOC	25.0 ppm	2	24.1623	241.6234	184.42	188.09	3.67	50.69	12:30
C	TOC	25.0 ppm	3	24.0536	240.5355	183.64	187.21	3.57	50.65	12:26
C	TOC	25.0 ppm	4	24.1411	241.4114	184.26	187.78	3.52	50.63	12:28

<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	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
21	TOC	K1908957-014.04 doc	0.7484 ppm	0.0905 ppm	12.1000%	2019/10/06 12:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8800	8.8005	16.70	20.23	3.54	50.62	12:32
2	TOC	0.7349	7.3486	15.66	19.35	3.70	50.60	12:25
3	TOC	0.6962	6.9623	15.38	18.95	3.57	50.59	12:25
4	TOC	0.6824	6.8243	15.28	18.73	3.44	50.56	12:27

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) (v1303) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 22	TOC	K1908802-021.03	0.1075 ppm	0.0570 ppm	53.0000%	2019/10/06 13:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0613	0.6125	10.83	14.30	3.48	50.53	12:28
2	TOC	0.0749	0.7492	10.92	14.33	3.41	50.50	12:27
3	TOC	0.1883	1.8830	11.74	15.32	3.58	50.46	12:27
4	TOC	0.1055	1.0546	11.14	14.66	3.52	50.41	12:27

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) (v1303) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 23	TOC	K1908802-021.03 ms	25.9202 ppm	0.1844 ppm	0.7100%	2019/10/06 14:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.6768	256.7682	194.50	198.09	3.59	50.39	12:32
2	TOC	26.0817	260.8168	197.40	201.09	3.69	50.36	12:25
3	TOC	25.8796	258.7960	195.95	199.53	3.57	50.35	12:26
4	TOC	26.0428	260.4277	197.12	200.69	3.56	50.31	12:25

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) (v1303) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 24	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/06 15:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.44	12.90	3.45	50.28	12:31

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) (v1303) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 25	TOC	K1908802-022.03	1.5389 ppm	0.0314 ppm	2.0400%	2019/10/06 16:13

Rep	Base	Adjusted	Baseline	Pressure	Run
-----	------	----------	----------	----------	-----

#	Analysis Type	ppm	µg	(Abs)	NDIR (Abs)	(Abs)	(psig)	Time
1	TOC	1.5821	15.8211	21.73	25.28	3.55	50.28	12:26
2	TOC	1.5355	15.3553	21.40	25.00	3.61	50.27	12:30
3	TOC	1.5069	15.0694	21.19	24.77	3.58	50.23	12:25
4	TOC	1.5311	15.3107	21.37	24.91	3.54	50.22	12:30

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
26	TOC	K1908802-023.03	0.7165 ppm	0.0179 ppm	2.4900%	2019/10/06 17:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7265	7.2650	15.60	19.15	3.55	50.21	12:26
2	TOC	0.7191	7.1910	15.54	19.04	3.50	50.19	12:29
3	TOC	0.6905	6.9051	15.34	18.88	3.54	50.17	12:30
4	TOC	0.7297	7.2970	15.62	19.15	3.53	50.17	12:32

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
27	TOC	K1908802-023.03 ms	27.0861 ppm	0.0683 ppm	0.2500%	2019/10/06 18:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.0385	270.3855	204.26	207.87	3.61	50.18	12:26
2	TOC	27.1496	271.4956	205.06	208.66	3.60	50.19	12:28
3	TOC	27.1398	271.3980	204.99	208.57	3.58	50.19	12:25
4	TOC	27.0165	270.1651	204.10	207.77	3.67	50.26	12:24

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
28	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/06 19:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.23	11.80	3.57	50.22	12:33

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711

From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

♦	B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.3789 ppm (PASS)	0.0000 ppm	0%	2019/10/06 19:41
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.3789	243.7892	185.97	189.59	3.62	50.25	12:31
Completion State		Success Action		Method		Calibration		STD Conc - Pos B		
Success - Criteria met.		Do Nothing		Extended Reaction 021711 (v4)		Extended Reaction 021711 (v27)		50 ppmC		

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
♦	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/06 19:57
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.63	11.18	3.55	50.25	12:34
Completion State		Success Action		Method		Calibration		STD Conc - Pos D		
Success - Criteria met.		Do Nothing		Extended Reaction 021711 (v4)		Extended Reaction 021711 (v27)		0 ppmC		

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time			
♦	29	TOC	K1908805-001.20 2x	0.1027 ppm	0.0543 ppm	52.8600%	2019/10/06 20:14		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	TOC	0.1367	1.3670	11.37	14.99	3.62	50.26	12:31	
2	TOC	0.1055	1.0546	11.14	14.73	3.58	50.31	12:27	
3	TOC	0.1434	1.4340	11.42	14.95	3.53	50.31	12:23	
4	TOC	0.0251	0.2513	10.57	14.18	3.62	50.33	12:25	
Dilution		Blank Contribution		Method		Calibration			
1:10		(TC) 10.3878 (IC) (v1303)		Extended Reaction 021711 (v4)		Extended Reaction 021711 (v27)			
Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time			
♦	30	TOC	K1908805-001.20 ms 2x	13.1249 ppm	0.1562 ppm	1.1900%	2019/10/06 21:18		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time	
1	TOC	13.2848	132.8485	105.64	109.24	3.59	50.35	12:27	
2	TOC	13.2327	132.3269	105.27	108.88	3.61	50.37	12:23	

3	TOC	12.9812	129.8123	103.47	107.21	3.74	50.38	12:24
4	TOC	13.0009	130.0090	103.61	107.32	3.71	50.40	12:26

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
31	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/06 22:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.51	13.16	3.65	50.41	12:30

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
32	TOC	K1908805-002.20 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/06 22:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.45	12.97	3.52	50.45	12:28
2	TOC	0.0000	0.0000	9.10	12.85	3.75	50.46	12:31
3	TOC	0.0000	0.0000	9.26	12.78	3.52	50.47	12:26
4	TOC	0.0000	0.0000	8.89	12.52	3.64	50.50	12:26

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
33	TOC	K1908805-003.20 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/06 23:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.99	12.52	3.52	50.51	12:26
2	TOC	0.0000	0.0000	8.55	12.19	3.64	50.50	12:24
3	TOC	0.0000	0.0000	8.73	12.20	3.47	50.53	12:29
4	TOC	0.0000	0.0000	8.44	11.96	3.53	50.56	12:26

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
34	TOC	K1908805-004.20 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/07 00:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.81	12.34	3.53	50.56	12:28
2	TOC	0.0000	0.0000	8.56	12.16	3.60	50.59	12:26
3	TOC	0.0000	0.0000	8.37	11.93	3.56	50.60	12:26

4	TOC	0.0000	0.0000	8.31	11.96	3.65	50.61	12:30
---	-----	--------	--------	------	-------	------	-------	-------

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) (v1303) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
35	TOC	K1908805-005.20 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/07 01:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.60	12.11	3.51	50.62	12:29
2	TOC	0.0000	0.0000	8.04	11.62	3.59	50.63	12:26
3	TOC	0.0000	0.0000	7.94	11.59	3.64	50.65	12:30
4	TOC	0.0000	0.0000	8.07	11.68	3.61	50.65	12:29

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) (v1303) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
36	TOC	K1908805-006.20 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/07 02:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.02	11.72	3.69	50.64	12:29
2	TOC	0.0000	0.0000	7.63	11.30	3.66	50.68	12:25
3	TOC	0.0000	0.0000	7.97	11.61	3.64	50.68	12:29
4	TOC	0.0000	0.0000	7.71	11.38	3.68	50.68	12:31

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) (v1303) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
37	TOC	K1908805-007.20 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/07 03:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.78	11.29	3.51	50.71	12:30
2	TOC	0.0000	0.0000	7.32	10.90	3.58	50.73	12:28
3	TOC	0.0000	0.0000	7.64	11.12	3.48	50.73	12:24
4	TOC	0.0000	0.0000	7.54	10.97	3.44	50.73	12:28

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) (v1303) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
38	TOC	K1908805-008.20 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/07 05:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.97	11.47	3.50	50.75	12:28

2	TOC	0.0000	0.0000	8.16	11.73	3.57	50.74	12:27
3	TOC	0.0000	0.0000	8.07	11.63	3.56	50.76	12:24
4	TOC	0.0000	0.0000	7.69	11.20	3.52	50.76	12:31
Dilution		Blank Contribution		Method		Calibration		
1:10		(TC) 10.3878 (IC) (v1303)		Extended Reaction 021711 (v4)		Extended Reaction 021711 (v27)		

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
♦ B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.2131 ppm (PASS)	0.0000 ppm	0%	2019/10/07 06:04	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2131	242.1310	184.78	188.33	3.56	50.77	12:30
Completion State		Success Action		Method		Calibration		STD Conc - Pos B		
Success - Criteria met.		Do Nothing		Extended Reaction 021711 (v4)		Extended Reaction 021711 (v27)		50 ppmC		

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
♦ D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/07 06:20	
Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.72	11.15	3.43	50.76	12:31
Completion State		Success Action		Method		Calibration		STD Conc - Pos D		
Success - Criteria met.		Do Nothing		Extended Reaction 021711 (v4)		Extended Reaction 021711 (v27)		0 ppmC		

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time		
♦ 39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/07 06:37		
Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.11	10.68	3.57	50.75	12:27
2	TOC	0.0000	0.0000	7.16	10.64	3.48	50.75	12:26
3	TOC	0.0000	0.0000	6.77	10.39	3.62	50.73	12:30
4	TOC	0.0000	0.0000	6.94	10.48	3.54	50.71	12:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3878 (IC) (v1303)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Sample Type: Check Standard --> LCS ER

From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
♦ C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.0785 ppm (PASS)	0.0918 ppm	0.38%	2019/10/07 07:41

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	23.9841	239.8410	183.14	186.72	3.59	50.70	12:28
C	TOC	25.0 ppm	2	24.0300	240.2998	183.47	187.04	3.58	50.68	12:30
C	TOC	25.0 ppm	3	24.1064	241.0641	184.01	187.69	3.68	50.67	12:25
C	TOC	25.0 ppm	4	24.1936	241.9358	184.64	188.35	3.71	50.65	12:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	25 ppmC

Sample Type: Sample

From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 40	TOC	K1908805-009.20 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/07 08:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.67	12.24	3.57	50.72	12:26
2	TOC	0.0000	0.0000	8.40	11.98	3.58	50.65	12:27
3	TOC	0.0000	0.0000	7.90	11.64	3.74	50.60	12:28
4	TOC	0.0000	0.0000	7.87	11.46	3.58	50.62	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3878 (IC) (v1303)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
♦ 41	TOC	K1908805-010.20 2x	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/07 09:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.56	11.20	3.64	50.61	12:28
2	TOC	0.0000	0.0000	7.40	11.02	3.63	50.57	12:27
3	TOC	0.0000	0.0000	7.66	11.16	3.50	50.60	12:27
4	TOC	0.0000	0.0000	7.67	11.11	3.45	50.57	12:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 10.3878 (IC)	Extended Reaction	Extended Reaction

(v1303)

021711 (v4)

021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
42	TOC	K1908957-001.03	0.6908 ppm	0.0449 ppm	6.5000%	2019/10/07 10:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7423	7.4226	15.71	19.35	3.64	50.58	12:30
2	TOC	0.7098	7.0976	15.48	18.97	3.50	50.57	12:31
3	TOC	0.6388	6.3877	14.97	18.71	3.74	50.55	12:27
4	TOC	0.6725	6.7252	15.21	18.69	3.48	50.52	12:26

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
43	TOC	K1908957-001.03 ms	27.4552 ppm	0.1613 ppm	0.5900%	2019/10/07 11:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.2903	272.9028	206.07	209.61	3.54	50.54	12:27
2	TOC	27.5643	275.6433	208.03	211.77	3.74	50.51	12:23
3	TOC	27.3462	273.4621	206.47	210.10	3.63	50.49	12:27
4	TOC	27.6198	276.1984	208.43	211.93	3.50	50.47	12:29

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
44	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/07 12:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.85	11.33	3.48	50.44	12:33

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
45	TOC	K1908957-002.03	1.3889 ppm	0.0141 ppm	1.0100%	2019/10/07 13:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3765	13.7654	20.26	23.64	3.38	50.45	12:27
2	TOC	1.4008	14.0081	20.43	23.92	3.49	50.42	12:28
3	TOC	1.3770	13.7696	20.26	23.89	3.63	50.42	12:23
4	TOC	1.4014	14.0136	20.44	23.91	3.48	50.41	12:28

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8552	8.5522	16.52	20.01	3.49	50.39	12:30
2	TOC	0.8819	8.8186	16.71	20.24	3.53	50.35	12:24
3	TOC	0.8052	8.0515	16.16	19.80	3.64	50.31	12:26
4	TOC	0.8171	8.1715	16.25	19.75	3.50	50.28	12:26

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) (v1303) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
47	TOC	K1908957-004.03	0.1290 ppm	0.0301 ppm	23.3200%	2019/10/07 15:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1541	1.5413	11.49	14.96	3.47	50.26	12:29
2	TOC	0.1078	1.0783	11.16	14.72	3.55	50.25	12:28
3	TOC	0.1555	1.5553	11.50	14.88	3.38	50.24	12:32
4	TOC	0.0985	0.9849	11.09	14.57	3.47	50.20	12:29

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) (v1303) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711

From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.5029 ppm (PASS)	0.0000 ppm	0%	2019/10/07 16:27

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5029	245.0291	186.86	190.49	3.63	50.19	12:33

Completion State Success - Criteria met. **Success Action** Do Nothing **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27) **STD Conc - Pos B** 50 ppmC

Sample Type: Check Standard --> CCB 021711

From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/07 16:43

Base

Pos	Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.03	10.48	3.46	50.18	12:31
Completion State		Success Action		Method		Calibration		STD Conc - Pos D		
Success - Criteria met.		Do Nothing		Extended Reaction 021711 (v4)		Extended Reaction 021711 (v27)		0 ppmC		

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
48	TOC	K1908957-005.03	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/07 17:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.41	10.01	3.60	50.18	12:26
2	TOC	0.0000	0.0000	6.13	9.66	3.53	50.18	12:27
3	TOC	0.0000	0.0000	6.37	9.88	3.51	50.18	12:26
4	TOC	0.0000	0.0000	5.87	9.43	3.56	50.19	12:29

Dilution 1:10	Blank Contribution (TC) 10.3878 (IC) (v1303)	Method Extended Reaction 021711 (v4)	Calibration Extended Reaction 021711 (v27)
-------------------------	---	---	---

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
49	TOC	K1908957-006.03	0.2799 ppm	0.0304 ppm	10.8700%	2019/10/07 18:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2650	2.6501	12.29	15.74	3.45	50.20	12:25
2	TOC	0.3234	3.2344	12.71	16.08	3.37	50.20	12:29
3	TOC	0.2767	2.7672	12.37	15.77	3.40	50.20	12:28
4	TOC	0.2544	2.5441	12.21	15.73	3.51	50.22	12:25

Dilution 1:10	Blank Contribution (TC) 10.3878 (IC) (v1303)	Method Extended Reaction 021711 (v4)	Calibration Extended Reaction 021711 (v27)
-------------------------	---	---	---

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
50	TOC	K1908957-008.03	1.4614 ppm	0.0385 ppm	2.6300%	2019/10/07 19:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4361	14.3609	20.68	24.14	3.45	50.23	12:27
2	TOC	1.4330	14.3302	20.66	24.17	3.50	50.23	12:28
3	TOC	1.4602	14.6022	20.86	24.33	3.47	50.23	12:27
4	TOC	1.5161	15.1614	21.26	24.63	3.37	50.23	12:27

Dilution 1:10	Blank Contribution (TC) 10.3878 (IC) (v1303)	Method Extended Reaction 021711 (v4)	Calibration Extended Reaction 021711 (v27)
-------------------------	---	---	---

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

	Type		(ppmC)		
51	TOC	K1908957-010.03	2.1067 ppm	0.0310 ppm	1.4700%

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0944	20.9436	25.40	29.04	3.63	50.23	12:29
2	TOC	2.1351	21.3509	25.70	29.12	3.43	50.23	12:26
3	TOC	2.1285	21.2853	25.65	29.34	3.69	50.23	12:29
4	TOC	2.0687	20.6870	25.22	28.93	3.71	50.25	12:27

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) (v1303) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
52	TOC	K1908957-011.03	1.5682 ppm	0.0201 ppm	1.2800%	2019/10/07 21:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5510	15.5101	21.51	25.22	3.71	50.24	12:28
2	TOC	1.5580	15.5798	21.56	25.22	3.66	50.26	12:29
3	TOC	1.5966	15.9661	21.84	25.57	3.74	50.27	12:27
4	TOC	1.5673	15.6733	21.63	25.29	3.66	50.27	12:29

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) (v1303) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
53	TOC	K1908957-012.03	0.3896 ppm	0.0267 ppm	6.8600%	2019/10/07 22:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4015	4.0154	13.27	16.79	3.52	50.27	12:26
2	TOC	0.3538	3.5385	12.92	16.53	3.61	50.27	12:29
3	TOC	0.3865	3.8648	13.16	16.69	3.53	50.29	12:25
4	TOC	0.4163	4.1633	13.37	16.90	3.53	50.28	12:26

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) (v1303) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
54	TOC	K1908957-013.03	3.3939 ppm	0.3819 ppm	11.2500%	2019/10/07 23:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9033	29.0326	31.20	34.79	3.58	50.31	12:25
2	TOC	3.2971	32.9710	34.03	37.65	3.62	50.30	12:24
3	TOC	3.6017	36.0169	36.21	39.81	3.60	50.29	12:25
4	TOC	3.7737	37.7365	37.45	41.03	3.58	50.32	12:23

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) **Method** Extended Reaction **Calibration** Extended Reaction

(v1303) 021711 (v4) 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
55	TOC	K1908957-014.03	0.4790 ppm	0.2793 ppm	58.3100%	2019/10/08 00:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0626	0.6265	10.84	14.41	3.58	50.31	12:27
2	TOC	0.6591	6.5913	15.11	18.82	3.70	50.31	12:30
3	TOC	0.6095	6.0949	14.76	18.36	3.60	50.33	12:27
4	TOC	0.5848	5.8480	14.58	18.18	3.60	50.32	12:29

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
56	TOC	K1908981-004.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/08 01:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.95	12.48	3.53	50.33	12:26
2	TOC	0.0000	0.0000	8.66	12.17	3.51	50.34	12:26

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
57	TOC	K1908981-004.01 ms	25.3070 ppm	0.0000 ppm	0.0000%	2019/10/08 02:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.3070	253.0696	191.85	195.27	3.42	50.34	12:33

Dilution 1:10
Blank Contribution (TC) 10.3878 (IC) (v1303)
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711

From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.2757 ppm (PASS)	0.0000 ppm	0%	2019/10/08 02:18

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2757	242.7572	185.23	188.67	3.44	50.34	12:29

Completion State Success - Criteria met.
Success Action Do Nothing
Method Extended Reaction 021711 (v4)
Calibration Extended Reaction 021711 (v27)
STD Conc - Pos B 50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◊ D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/08 02:35

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	7.45	10.85	3.40	50.36	12:30

Completion State Success - Criteria met.	Success Action Do Nothing	Method Extended Reaction 021711 (v4)	Calibration Extended Reaction 021711 (v27)	STD Conc - Pos D 0 ppmC
--	-------------------------------------	--	--	-----------------------------------

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/08 02:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.19	10.70	3.51	50.37	12:27

Dilution 1:10	Blank Contribution (TC) 10.3878 (IC) (v1303)	Method Extended Reaction 021711 (v4)	Calibration Extended Reaction 021711 (v27)
-------------------------	--	--	--

Sample Type: Check Standard --> LCS ER From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◊ C	TOC	25.0000	1:1	[TOC] LCS ER [25.0 ppm]	0 / infinity (NA / NA)	24.1646 ppm (PASS)	0.0000 ppm	0%	2019/10/08 03:08

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.1646	241.6457	184.43	187.98	3.55	50.38	12:29

Completion State Success - Criteria met.	Success Action Do Nothing	Method Extended Reaction 021711 (v4)	Calibration Extended Reaction 021711 (v27)	STD Conc - Pos C 25 ppmC
--	-------------------------------------	--	--	------------------------------------

Sample Type: Sample From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◊ 59	TOC	K1908725-002.22 2x	17.9771 ppm	0.1340 ppm	0.7500%	2019/10/08 03:25

Rep	Base	Adjusted	Baseline	Pressure	Run

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.5199	45.1993	42.80	46.44	3.64	50.46	12:28
2	TOC	4.5289	45.2885	42.86	46.56	3.70	50.48	12:25

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) (v1303) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
65	TOC	K1908896-002.01 100x	5.9068 ppm	0.0481 ppm	0.8100%	2019/10/08 06:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.8727	58.7273	52.50	56.06	3.57	50.50	12:29
2	TOC	5.9408	59.4079	52.98	56.49	3.50	50.51	12:28

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) (v1303) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
66	TOC	K1908896-003.01 100x	4.6926 ppm	0.0065 ppm	0.1400%	2019/10/08 07:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.6972	46.9719	44.07	47.56	3.49	50.52	12:27
2	TOC	4.6880	46.8798	44.00	47.57	3.57	50.52	12:24

Dilution 1:10 **Blank Contribution** (TC) 10.3878 (IC) (v1303) **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27)

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	24.1551 ppm (PASS)	0.0000 ppm	0%	2019/10/08 07:42

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1551	241.5508	184.36	187.89	3.53	50.55	12:31

Completion State Success - Criteria met. **Success Action** Do Nothing **Method** Extended Reaction 021711 (v4) **Calibration** Extended Reaction 021711 (v27) **STD Conc - Pos B** 50 ppmC

Sample Type: Check Standard --> CCB 021711

From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time	
◊	D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/08 07:58

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	6.45	9.96	3.51	50.53	12:32

<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	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Sample Type: Sample

From Schedule Version 6

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◊	67	TOC	K1908720-004.05	0.8144 ppm	0.0219 ppm	2.6900%	2019/10/08 08:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8298	8.2984	16.34	19.82	3.48	50.53	12:29
2	TOC	0.7989	7.9888	16.12	19.53	3.41	50.51	12:26

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 10.3878 (IC) (v1303)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◊	68	TOC	K1908981-001.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/08 08:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.90	11.38	3.48	50.52	12:24
2	TOC	0.0000	0.0000	7.95	11.51	3.56	50.50	12:25

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 10.3878 (IC) (v1303)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◊	69	TOC	K1908981-002.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/08 09:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.87	11.47	3.60	50.52	12:28
2	TOC	0.0000	0.0000	7.74	11.39	3.65	50.48	12:30

<u>Dilution</u>	<u>Blank Contribution</u>	<u>Method</u>	<u>Calibration</u>
1:10	(TC) 10.3878 (IC) (v1303)	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)

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

◊	70	TOC	K1908981-003.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/08 09:52
---	----	-----	-----------------	------------	------------	---------	------------------

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.23	11.78	3.54	50.47	12:27
2	TOC	0.0000	0.0000	8.26	11.85	3.58	50.45	12:27

Dilution 1:10 Blank Contribution (TC) 10.3878 (IC) (v1303) Method Extended Reaction 021711 (v4) Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◊	71	TOC	K1908981-005.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/08 10:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.32	10.98	3.66	50.47	12:27
2	TOC	0.0000	0.0000	7.39	11.05	3.65	50.45	12:25

Dilution 1:10 Blank Contribution (TC) 10.3878 (IC) (v1303) Method Extended Reaction 021711 (v4) Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◊	72	TOC	K1908981-006.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/08 10:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.26	8.80	3.54	50.45	12:25
2	TOC	0.0000	0.0000	5.43	8.98	3.55	50.43	12:25

Dilution 1:10 Blank Contribution (TC) 10.3878 (IC) (v1303) Method Extended Reaction 021711 (v4) Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◊	73	TOC	K1908997-001.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/10/08 11:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	9.61	13.28	3.67	50.41	12:26
2	TOC	0.0000	0.0000	9.92	13.64	3.72	50.42	12:25

Dilution 1:10 Blank Contribution (TC) 10.3878 (IC) (v1303) Method Extended Reaction 021711 (v4) Calibration Extended Reaction 021711 (v27)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time	
◊	74	TOC	K1908998-001.02	0.1851 ppm	0.0138 ppm	7.4600%	2019/10/08 12:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1753	1.7533	11.64	15.22	3.57	50.45	12:30
2	TOC	0.1949	1.9486	11.78	15.54	3.76	50.46	12:24

<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>		<u>Calibration</u>	
1:10		(TC) 10.3878 (IC) (v1303)		Extended Reaction 021711 (v4)		Extended Reaction 021711 (v27)	

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
75	TOC	K1908998-002.02	0.0110 ppm	0.0155 ppm	141.4200%	2019/10/08 12:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0219	0.2192	10.54	14.23	3.69	50.41	12:28
2	TOC	0.0000	0.0000	10.24	13.98	3.73	50.43	12:26

<u>Dilution</u>		<u>Blank Contribution</u>		<u>Method</u>		<u>Calibration</u>	
1:10		(TC) 10.3878 (IC) (v1303)		Extended Reaction 021711 (v4)		Extended Reaction 021711 (v27)	

Sample Type: Check Standard --> CCV 021711 From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
B	TOC	25.0000	1:2	[TOC] CCV 021711 [25 ppm]	0 / infinity (NA / NA)	23.9721 ppm (PASS)	0.0000 ppm	0%	2019/10/08 13:04

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9721	239.7211	183.05	186.72	3.67	50.43	12:29

<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	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	50 ppmC

Sample Type: Check Standard --> CCB 021711 From Schedule Version 6

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:2	[TOC] CCB 021711 [0.0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/10/08 13:21

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0.0 ppm	1	0.0000	0.0000	5.96	9.76	3.80	50.46	12:30

<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	Extended Reaction 021711 (v4)	Extended Reaction 021711 (v27)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1302	1.3107	0.8740	0.0000	0.0000	0.0000	2019/10/03 16:47	Fusion1 (Fusion1)
v1303	1.7007	1.4450	0.0000	0.0000	0.0000	2019/10/05 13:48	Fusion1 (Fusion1)

Calibrations**Name: Extended Reaction 021711 (TOC)**

Version: v27
 Calibration curve formula: TOC: $y = 7.170x + 11.164$
 Ver Creation: 2019/03/11 21:51
 r^2 value: TOC: $r^2 = 0.99991$
 Comment:
 Operator: Fusion1 (Fusion1)
 Basic Analysis Type: TOC

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
0.0 ppm	10.4100	0.0000		2019/03/11 20:12
0.50 ppm	14.7740	0.5000		2019/03/11 20:28
1.00 ppm	18.0020	1.0000		2019/03/11 20:44
5.00 ppm	47.2310	5.0000		2019/03/11 21:01
10.0 ppm	85.1320	10.0000		2019/03/11 21:17
25.0 ppm	188.5200	25.0000		2019/03/11 21:33
50.0 ppm	370.1610	50.0000		2019/03/11 21:49

Methods**Name: Extended Reaction 021711 (TOC)**

Version: v4
 Operator: Fusion1 (Fusion1)
 Ver Creation: 2019/01/31 11:21
 Comment:

Parameter	Value	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	4.00 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	2019/10/08 13:38

StarLIMS Run: 654319, 654320, 654321, 654322
 Analysis: DOC/TOC
 Method: SM 5310 C, 9060A, 415.1, 9060

CCV: 11-GEN-05-79K 50 ppm LCS: 11-GEN-05-79J 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-78M

ICS TV: 25.0 ppm ICS % R < 1

Spike ID: 11-GEN-05-77J 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-81E

21 % H3PO4: 11-GEN-05-81F

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: 16967789

Analyzed By: <i>BCD</i>	Date Analyzed: <i>10/5/19</i>
Reviewed By: <i>Hawryly</i>	Date Reviewed: <i>10/10/19</i>



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

October 09, 2019

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

Work Order: **HS19091233**

Laboratory Results for: **Groundwater Treatment Plant Quarterly Influent Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Sep 25, 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 simple oval.

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
Work Order: HS19091233

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19091233-01	LH18/24-SP140_092419	Water		24-Sep-2019 14:00	25-Sep-2019 08:50	<input type="checkbox"/>
HS19091233-02	Trip Blank	Water		24-Sep-2019 14:00	25-Sep-2019 08:50	<input type="checkbox"/>

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
Work Order: HS19091233

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: 145678****Sample ID: LCS-145678**

- Insufficient sample volume available for MS/MSD. A LCS/LCSD pair provided as batch quality control.

GCMS Volatiles by Method BFB_Tune**Batch ID: R347232**

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

GCMS Volatiles by Method SW8260**Batch ID: R347193****Sample ID: HS19090962-10MSD**

- MSD was performed on unrelated sample

Metals by Method SW6020**Batch ID: 146020****Sample ID: LH18/24-SP140_092419 (HS19091233-01MSD)**

- The MS and/or MSD recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount.
Barium, Calcium, Magnesium, Manganese, Sodium

Sample ID: LH18/24-SP140_092419 (HS19091233-01PDS)

- The PDS recovery was outside method control limits, however the result in the parent sample is greater than 4x the spike amount.
Barium and Manganese

Metals by Method SW7470**Batch ID: 145884**

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

WetChemistry by Method E1664A**Batch ID: R347939**

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

WetChemistry by Method SW9056**Batch ID: R347908**

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

WetChemistry by Method E410.4**Batch ID: R347382**

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
Work Order: HS19091233

CASE NARRATIVE

WetChemistry by Method E410.4

Batch ID: R347382

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

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Influent Samples
 Sample ID: LH18/24-SP140_092419
 Collection Date: 24-Sep-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19091233
 Lab ID:HS19091233-01
 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	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09
1,1,1-Trichloroethane	12	U	5.0	12	25	UG/L	25	27-Sep-2019 21:09
1,1,2,2-Tetrachloroethane	12	U	12	12	25	UG/L	25	27-Sep-2019 21:09
1,1,2-Trichloroethane	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09
1,1-Dichloroethane	12	U	5.0	12	25	UG/L	25	27-Sep-2019 21:09
1,1-Dichloroethene	12	U	5.0	12	25	UG/L	25	27-Sep-2019 21:09
1,1-Dichloropropene	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09
1,2,3-Trichlorobenzene	12	U	10	12	25	UG/L	25	27-Sep-2019 21:09
1,2,3-Trichloropropane	12	U	12	12	25	UG/L	25	27-Sep-2019 21:09
1,2,4-Trichlorobenzene	12	U	12	12	25	UG/L	25	27-Sep-2019 21:09
1,2,4-Trimethylbenzene	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09
1,2-Dibromo-3-chloropropane	12	U	5.0	12	25	UG/L	25	27-Sep-2019 21:09
1,2-Dibromoethane	12	U	5.0	12	25	UG/L	25	27-Sep-2019 21:09
1,2-Dichlorobenzene	12	U	12	12	25	UG/L	25	27-Sep-2019 21:09
1,2-Dichloroethane	53		5.0	12	25	UG/L	25	27-Sep-2019 21:09
1,2-Dichloropropane	12	U	12	12	25	UG/L	25	27-Sep-2019 21:09
1,3,5-Trimethylbenzene	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09
1,3-Dichlorobenzene	12	U	10	12	25	UG/L	25	27-Sep-2019 21:09
1,3-Dichloropropane	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09
1,4-Dichlorobenzene	12	U	10	12	25	UG/L	25	27-Sep-2019 21:09
2,2-Dichloropropane	12	U	5.0	12	25	UG/L	25	27-Sep-2019 21:09
2-Butanone	25	U	12	25	50	UG/L	25	27-Sep-2019 21:09
2-Chlorotoluene	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09
2-Hexanone	25	U	25	25	50	UG/L	25	27-Sep-2019 21:09
4-Chlorotoluene	12	U	10	12	25	UG/L	25	27-Sep-2019 21:09
4-Isopropyltoluene	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09
4-Methyl-2-pentanone	25	U	18	25	50	UG/L	25	27-Sep-2019 21:09
Acetone	25	U	10	25	50	UG/L	25	27-Sep-2019 21:09
Benzene	12	U	5.0	12	25	UG/L	25	27-Sep-2019 21:09
Bromobenzene	12	U	10	12	25	UG/L	25	27-Sep-2019 21:09
Bromochloromethane	12	U	5.0	12	25	UG/L	25	27-Sep-2019 21:09
Bromodichloromethane	12	U	5.0	12	25	UG/L	25	27-Sep-2019 21:09
Bromoform	12	U	10	12	25	UG/L	25	27-Sep-2019 21:09
Bromomethane	12	U	10	12	25	UG/L	25	27-Sep-2019 21:09
Carbon disulfide	25	U	15	25	50	UG/L	25	27-Sep-2019 21:09
Carbon tetrachloride	12	U	12	12	25	UG/L	25	27-Sep-2019 21:09
Chlorobenzene	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09
Chloroethane	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09
Chloroform	12	U	5.0	12	25	UG/L	25	27-Sep-2019 21:09

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

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Influent Samples
 Sample ID: LH18/24-SP140_092419
 Collection Date: 24-Sep-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19091233
 Lab ID:HS19091233-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED	
VOLATILES ORGANICS BY METHOD 8260C		Method:SW8260						Analyst: PC	
Chloromethane	12	U	5.0	12	25	UG/L	25	27-Sep-2019 21:09	
cis-1,2-Dichloroethene	3,600		5.0	12	25	UG/L	25	27-Sep-2019 21:09	
cis-1,3-Dichloropropene	12	U	2.5	12	25	UG/L	25	27-Sep-2019 21:09	
Dibromochloromethane	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09	
Dibromomethane	12	U	5.0	12	25	UG/L	25	27-Sep-2019 21:09	
Dichlorodifluoromethane	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09	
Ethylbenzene	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09	
Hexachlorobutadiene	25	U	25	25	25	UG/L	25	27-Sep-2019 21:09	
Isopropylbenzene	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09	
m,p-Xylene	25	U	12	25	50	UG/L	25	27-Sep-2019 21:09	
Methylene chloride	10,000		80	200	400	UG/L	200	29-Sep-2019 15:07	
n-Butylbenzene	12	U	10	12	25	UG/L	25	27-Sep-2019 21:09	
n-Propylbenzene	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09	
Naphthalene	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09	
o-Xylene	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09	
sec-Butylbenzene	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09	
Styrene	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09	
tert-Butylbenzene	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09	
Tetrachloroethene	73		7.5	12	25	UG/L	25	27-Sep-2019 21:09	
Toluene	12	U	5.0	12	25	UG/L	25	27-Sep-2019 21:09	
trans-1,2-Dichloroethene	12	J	5.0	12	25	UG/L	25	27-Sep-2019 21:09	
trans-1,3-Dichloropropene	12	U	5.0	12	25	UG/L	25	27-Sep-2019 21:09	
Trichloroethene	8,900		40	100	200	UG/L	200	29-Sep-2019 15:07	
Trichlorofluoromethane	12	U	7.5	12	25	UG/L	25	27-Sep-2019 21:09	
Vinyl chloride	49		5.0	12	25	UG/L	25	27-Sep-2019 21:09	
Surr: 1,2-Dichloroethane-d4	82.4			0	81-118	%REC	25	27-Sep-2019 21:09	
Surr: 1,2-Dichloroethane-d4	104			0	81-118	%REC	200	29-Sep-2019 15:07	
Surr: 4-Bromofluorobenzene	105			0	85-114	%REC	25	27-Sep-2019 21:09	
Surr: 4-Bromofluorobenzene	113			0	85-114	%REC	200	29-Sep-2019 15:07	
Surr: Dibromofluoromethane	89.6			0	80-119	%REC	25	27-Sep-2019 21:09	
Surr: Dibromofluoromethane	111			0	80-119	%REC	200	29-Sep-2019 15:07	
Surr: Toluene-d8	96.2			0	89-112	%REC	25	27-Sep-2019 21:09	
Surr: Toluene-d8	96.5			0	89-112	%REC	200	29-Sep-2019 15:07	
SEMIVOLATILES SIM		Method:SW8270SIM						Prep:SW3510 / 26-Sep-2019 Analyst: LG	
1,4-Dioxane	20		1.0	1.0	1.0	ug/L	100	01-Oct-2019 12:24	
Surr: 2-Fluorobiphenyl	113			0	40-140	%REC	100	01-Oct-2019 12:24	
Surr: 4-Terphenyl-d14	105			0	40-140	%REC	100	01-Oct-2019 12:24	
Surr: Nitrobenzene-d5	82.4			0	40-140	%REC	100	01-Oct-2019 12:24	

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

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Influent Samples
 Sample ID: LH18/24-SP140_092419
 Collection Date: 24-Sep-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19091233
 Lab ID:HS19091233-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A			Method:SW6020			Prep:SW3010A / 04-Oct-2019		Analyst: JC
Aluminum	0.0495		0.00180	0.00500	0.0100	mg/L	1	08-Oct-2019 21:11
Antimony	0.000427	J	0.000400	0.00100	0.00200	mg/L	1	08-Oct-2019 21:11
Arsenic	0.00102	J	0.000400	0.00100	0.00200	mg/L	1	08-Oct-2019 21:11
Barium	0.973		0.00190	0.00250	0.00400	mg/L	1	08-Oct-2019 21:11
Beryllium	0.00100	U	0.000200	0.00100	0.00200	mg/L	1	08-Oct-2019 21:11
Cadmium	0.000289	J	0.000200	0.00100	0.00200	mg/L	1	08-Oct-2019 21:11
Calcium	44.1		0.0340	0.0500	0.500	mg/L	1	08-Oct-2019 21:11
Chromium	0.00146	J	0.000400	0.00100	0.00400	mg/L	1	08-Oct-2019 21:11
Cobalt	0.0120		0.000200	0.00100	0.00500	mg/L	1	08-Oct-2019 21:11
Iron	1.00		0.0120	0.0500	0.200	mg/L	1	08-Oct-2019 21:11
Lead	0.00100	U	0.000600	0.00100	0.00200	mg/L	1	08-Oct-2019 21:11
Magnesium	35.3		0.0100	0.0500	0.200	mg/L	1	08-Oct-2019 21:11
Manganese	0.714		0.000700	0.00100	0.00500	mg/L	1	08-Oct-2019 21:11
Nickel	0.0141		0.000600	0.00100	0.00200	mg/L	1	08-Oct-2019 21:11
Potassium	1.29		0.0180	0.0500	0.200	mg/L	1	08-Oct-2019 21:11
Selenium	0.00250	U	0.00110	0.00250	0.00200	mg/L	1	08-Oct-2019 21:11
Silver	0.00100	U	0.000200	0.00100	0.00200	mg/L	1	08-Oct-2019 21:11
Sodium	223		0.280	1.00	4.00	mg/L	20	09-Oct-2019 11:46
Thallium	0.000424	J	0.000200	0.00100	0.00200	mg/L	1	08-Oct-2019 21:11
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	08-Oct-2019 21:11
Zinc	0.0354		0.00200	0.00100	0.00400	mg/L	1	08-Oct-2019 21:11
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 01-Oct-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	01-Oct-2019 17:01
OIL & GREASE (HEM) BY E1664A			Method:E1664A					Analyst: KAH
Oil and Grease	1.00	U	0.610	1.00	2.00	mg/L	1	08-Oct-2019 14:40
CHEMICAL OXYGEN DEMAND BY E410.4			Method:E410.4					Analyst: MZD
Chemical Oxygen Demand	18.0		5.00	15.0	15.0	mg/L	1	01-Oct-2019 15:00
ANIONS BY SW9056A			Method:SW9056					Analyst: KMU
Chloride	439		2.00	5.00	5.00	mg/L	10	07-Oct-2019 21:54
Sulfate	39.2		2.00	5.00	5.00	mg/L	10	07-Oct-2019 21:54
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA					Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41

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

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Influent Samples
 Sample ID: Trip Blank
 Collection Date: 24-Sep-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19091233
 Lab ID:HS19091233-02
 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	27-Sep-2019 17:08	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Sep-2019 17:08	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Sep-2019 17:08	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Sep-2019 17:08	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	27-Sep-2019 17:08	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Sep-2019 17:08	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:08	

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

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Influent Samples
 Sample ID: Trip Blank
 Collection Date: 24-Sep-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19091233
 Lab ID:HS19091233-02
 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	27-Sep-2019 17:08
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:08
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Sep-2019 17:08
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:08
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Sep-2019 17:08
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Sep-2019 17:08
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Sep-2019 17:08
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 17:08
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:08
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:08
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:08
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:08
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:08
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:08
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>84.6</i>			<i>0</i>	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>27-Sep-2019 17:08</i>
<i>Surr: 4-Bromofluorobenzene</i>	<i>102</i>			<i>0</i>	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>27-Sep-2019 17:08</i>
<i>Surr: Dibromofluoromethane</i>	<i>90.4</i>			<i>0</i>	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>27-Sep-2019 17:08</i>
<i>Surr: Toluene-d8</i>	<i>100</i>			<i>0</i>	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>27-Sep-2019 17:08</i>

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

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

Batch ID: 145678 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampleID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19091233-01	1	990	1 (mL)	0.00101

Batch ID: 145884 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampleID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19091233-01	1	10 (mL)	10 (mL)	1

Batch ID: 146020 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampleID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19091233-01	1	10	10 (mL)	1

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 145678 (1)		Test Name : SEMIVOLATILES SIM			Matrix: Water	
HS19091233-01	LH18/24-SP140_092419	24 Sep 2019 14:00		26 Sep 2019 08:07	01 Oct 2019 12:24	100
Batch ID: 145884 (0)		Test Name : MERCURY BY SW7470A			Matrix: Water	
HS19091233-01	LH18/24-SP140_092419	24 Sep 2019 14:00		01 Oct 2019 10:00	01 Oct 2019 17:01	1
Batch ID: 146020 (0)		Test Name : ICP-MS METALS BY SW6020A			Matrix: Water	
HS19091233-01	LH18/24-SP140_092419	24 Sep 2019 14:00		04 Oct 2019 12:20	09 Oct 2019 11:46	20
HS19091233-01	LH18/24-SP140_092419	24 Sep 2019 14:00		04 Oct 2019 12:20	08 Oct 2019 21:11	1
Batch ID: R347193 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19091233-01	LH18/24-SP140_092419	24 Sep 2019 14:00			27 Sep 2019 21:09	25
HS19091233-02	Trip Blank	24 Sep 2019 14:00			27 Sep 2019 17:08	1
Batch ID: R347232 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19091233-01	LH18/24-SP140_092419	24 Sep 2019 14:00			29 Sep 2019 15:07	200
Batch ID: R347382 (0)		Test Name : CHEMICAL OXYGEN DEMAND BY E410.4			Matrix: Water	
HS19091233-01	LH18/24-SP140_092419	24 Sep 2019 14:00			01 Oct 2019 15:00	1
Batch ID: R347602 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Water	
HS19091233-01	LH18/24-SP140_092419	24 Sep 2019 14:00			04 Oct 2019 09:41	1
Batch ID: R347908 (0)		Test Name : ANIONS BY SW9056A			Matrix: Water	
HS19091233-01	LH18/24-SP140_092419	24 Sep 2019 14:00			07 Oct 2019 21:54	10
Batch ID: R347939 (0)		Test Name : OIL & GREASE (HEM) BY E1664A			Matrix: Water	
HS19091233-01	LH18/24-SP140_092419	24 Sep 2019 14:00			08 Oct 2019 14:40	1

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: 145884 (0)		Instrument: HG03		Method: MERCURY BY SW7470A						
MBLK	Sample ID: MBLK-145884	Units: mg/L		Analysis Date: 01-Oct-2019 16:36						
Client ID:	Run ID: HG03_347401	SeqNo: 5278412		PrepDate: 01-Oct-2019		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-145884	Units: mg/L		Analysis Date: 01-Oct-2019 16:37						
Client ID:	Run ID: HG03_347401	SeqNo: 5278413		PrepDate: 01-Oct-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00541	0.000200	0.005	0	108	80 - 120				
MS	Sample ID: HS19091325-02MS	Units: mg/L		Analysis Date: 01-Oct-2019 16:58						
Client ID:	Run ID: HG03_347401	SeqNo: 5278421		PrepDate: 01-Oct-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00511	0.000200	0.005	0.000131	99.6	75 - 125				
MS	Sample ID: HS19091280-02MS	Units: mg/L		Analysis Date: 01-Oct-2019 16:45						
Client ID:	Run ID: HG03_347401	SeqNo: 5278415		PrepDate: 01-Oct-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00508	0.000200	0.005	0.000002	102	75 - 125				
MSD	Sample ID: HS19091325-02MSD	Units: mg/L		Analysis Date: 01-Oct-2019 16:59						
Client ID:	Run ID: HG03_347401	SeqNo: 5278422		PrepDate: 01-Oct-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00503	0.000200	0.005	0.000131	98.0	75 - 125	0.00511	1.58	20	
MSD	Sample ID: HS19091280-02MSD	Units: mg/L		Analysis Date: 01-Oct-2019 16:47						
Client ID:	Run ID: HG03_347401	SeqNo: 5278416		PrepDate: 01-Oct-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00501	0.000200	0.005	0.000002	100	75 - 125	0.00508	1.39	20	

The following samples were analyzed in this batch: HS19091233-01

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: 146020 (0)		Instrument: ICPMS04		Method: ICP-MS METALS BY SW6020A						
MBLK	Sample ID: MBLK-146020	Units: mg/L			Analysis Date: 08-Oct-2019 21:06					
Client ID:	Run ID: ICPMS04_347830	SeqNo: 5287987	PrepDate: 04-Oct-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.00500	0.0100								U
Antimony	0.00100	0.00200								U
Arsenic	0.00100	0.00200								U
Barium	0.00250	0.00400								U
Beryllium	0.00100	0.00200								U
Cadmium	0.00100	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.00100	0.00400								U
Cobalt	0.00100	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00200								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00200								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00200								U
Silver	0.00100	0.00200								U
Sodium	0.0500	0.200								U
Thallium	0.00100	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00100	0.00400								U

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: 146020 (0)		Instrument: ICPMS04		Method: ICP-MS METALS BY SW6020A						
LCS	Sample ID: LCS-146020	Units: mg/L			Analysis Date: 08-Oct-2019 21:08					
Client ID:	Run ID: ICPMS04_347830	SeqNo: 5287988		PrepDate: 04-Oct-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Aluminum	0.1029	0.0100	0.1	0	103	80 - 120				
Antimony	0.04905	0.00200	0.05	0	98.1	80 - 120				
Arsenic	0.04985	0.00200	0.05	0	99.7	80 - 120				
Barium	0.0495	0.00400	0.05	0	99.0	80 - 120				
Beryllium	0.04992	0.00200	0.05	0	99.8	80 - 120				
Cadmium	0.05102	0.00200	0.05	0	102	80 - 120				
Calcium	5.173	0.500	5	0	103	80 - 120				
Chromium	0.04895	0.00400	0.05	0	97.9	80 - 120				
Cobalt	0.04971	0.00500	0.05	0	99.4	80 - 120				
Iron	5.012	0.200	5	0	100	80 - 120				
Lead	0.04838	0.00200	0.05	0	96.8	80 - 120				
Magnesium	5.142	0.200	5	0	103	80 - 120				
Manganese	0.0492	0.00500	0.05	0	98.4	80 - 120				
Nickel	0.04948	0.00200	0.05	0	99.0	80 - 120				
Potassium	4.904	0.200	5	0	98.1	80 - 120				
Selenium	0.04992	0.00200	0.05	0	99.8	80 - 120				
Silver	0.04902	0.00200	0.05	0	98.0	80 - 120				
Sodium	5.087	0.200	5	0	102	80 - 120				
Thallium	0.0465	0.00200	0.05	0	93.0	80 - 120				
Vanadium	0.04843	0.00500	0.05	0	96.9	80 - 120				
Zinc	0.05086	0.00400	0.05	0	102	80 - 120				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: 146020 (0)		Instrument: ICPMS04		Method: ICP-MS METALS BY SW6020A						
MS		Sample ID: HS19091233-01MS		Units: mg/L		Analysis Date: 08-Oct-2019 21:15				
Client ID: LH18/24-SP140_092419		Run ID: ICPMS04_347830		SeqNo: 5287991		PrepDate: 04-Oct-2019		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Aluminum	0.1476	0.0100	0.1	0.04948	98.1	80 - 120				
Antimony	0.04837	0.00200	0.05	0.000427	95.9	80 - 120				
Arsenic	0.05051	0.00200	0.05	0.001022	99.0	80 - 120				
Barium	1.018	0.00400	0.05	0.973	89.8	80 - 120			O	
Beryllium	0.05183	0.00200	0.05	0.000174	103	80 - 120				
Cadmium	0.04922	0.00200	0.05	0.000289	97.9	80 - 120				
Calcium	48.78	0.500	5	44.07	94.4	80 - 120			O	
Chromium	0.04971	0.00400	0.05	0.001462	96.5	80 - 120				
Cobalt	0.05936	0.00500	0.05	0.01195	94.8	80 - 120				
Iron	5.782	0.200	5	1.002	95.6	80 - 120				
Lead	0.04769	0.00200	0.05	0.000144	95.1	80 - 120				
Magnesium	40.12	0.200	5	35.32	96.0	80 - 120			O	
Manganese	0.7545	0.00500	0.05	0.714	80.9	80 - 120			O	
Nickel	0.06196	0.00200	0.05	0.01407	95.8	80 - 120				
Potassium	6.242	0.200	5	1.287	99.1	80 - 120				
Selenium	0.04951	0.00200	0.05	0.000323	98.4	80 - 120				
Silver	0.04623	0.00200	0.05	0.000015	92.4	80 - 120				
Sodium	211.5	0.200	5	209.2	47.3	80 - 120			SEO	
Thallium	0.0453	0.00200	0.05	0.000424	89.8	80 - 120				
Vanadium	0.048	0.00500	0.05	0.000182	95.6	80 - 120				
Zinc	0.08459	0.00400	0.05	0.03543	98.3	80 - 120				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: 146020 (0)		Instrument: ICPMS04		Method: ICP-MS METALS BY SW6020A						
MSD		Sample ID: HS19091233-01MSD		Units: mg/L		Analysis Date: 08-Oct-2019 21:17				
Client ID: LH18/24-SP140_092419		Run ID: ICPMS04_347830		SeqNo: 5287992		PrepDate: 04-Oct-2019		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1429	0.0100	0.1	0.04948	93.4	80 - 120	0.1476	3.21	20	
Antimony	0.0465	0.00200	0.05	0.000427	92.2	80 - 120	0.04837	3.92	20	
Arsenic	0.04929	0.00200	0.05	0.001022	96.5	80 - 120	0.05051	2.44	20	
Barium	0.9968	0.00400	0.05	0.973	47.5	80 - 120	1.018	2.1	20	SO
Beryllium	0.05053	0.00200	0.05	0.000174	101	80 - 120	0.05183	2.53	20	
Cadmium	0.04795	0.00200	0.05	0.000289	95.3	80 - 120	0.04922	2.62	20	
Calcium	47.72	0.500	5	44.07	73.2	80 - 120	48.78	2.2	20	SO
Chromium	0.04706	0.00400	0.05	0.001462	91.2	80 - 120	0.04971	5.47	20	
Cobalt	0.05713	0.00500	0.05	0.01195	90.4	80 - 120	0.05936	3.82	20	
Iron	5.573	0.200	5	1.002	91.4	80 - 120	5.782	3.67	20	
Lead	0.0467	0.00200	0.05	0.000144	93.1	80 - 120	0.04769	2.1	20	
Magnesium	37.99	0.200	5	35.32	53.4	80 - 120	40.12	5.45	20	SO
Manganese	0.732	0.00500	0.05	0.714	36.0	80 - 120	0.7545	3.02	20	SO
Nickel	0.05957	0.00200	0.05	0.01407	91.0	80 - 120	0.06196	3.93	20	
Potassium	6.084	0.200	5	1.287	96.0	80 - 120	6.242	2.56	20	
Selenium	0.04666	0.00200	0.05	0.000323	92.7	80 - 120	0.04951	5.93	20	
Silver	0.04401	0.00200	0.05	0.000015	88.0	80 - 120	0.04623	4.92	20	
Sodium	203.6	0.200	5	209.2	-111	80 - 120	211.5	3.81	20	SEO
Thallium	0.04546	0.00200	0.05	0.000424	90.1	80 - 120	0.0453	0.344	20	
Vanadium	0.04651	0.00500	0.05	0.000182	92.6	80 - 120	0.048	3.16	20	
Zinc	0.08182	0.00400	0.05	0.03543	92.8	80 - 120	0.08459	3.33	20	

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: 146020 (0)		Instrument: ICPMS04		Method: ICP-MS METALS BY SW6020A						
PDS		Sample ID: HS19091233-01PDS		Units: mg/L		Analysis Date: 08-Oct-2019 21:20				
Client ID: LH18/24-SP140_092419		Run ID: ICPMS04_347830		SeqNo: 5287993		PrepDate: 04-Oct-2019		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Aluminum	0.1404	0.0100	0.1	0.04948	90.9	75 - 125				
Antimony	0.08891	0.00200	0.1	0.000427	88.5	75 - 125				
Arsenic	0.1016	0.00200	0.1	0.001022	101	75 - 125				
Barium	1.044	0.00400	0.1	0.973	71.2	75 - 125			SO	
Beryllium	0.09989	0.00200	0.1	0.000174	99.7	75 - 125				
Cadmium	0.09913	0.00200	0.1	0.000289	98.8	75 - 125				
Calcium	52.51	0.500	10	44.07	84.5	75 - 125			O	
Chromium	0.09727	0.00400	0.1	0.001462	95.8	75 - 125				
Cobalt	0.1054	0.00500	0.1	0.01195	93.4	75 - 125				
Iron	10.6	0.200	10	1.002	96.0	75 - 125				
Lead	0.09861	0.00200	0.1	0.000144	98.5	75 - 125				
Magnesium	43.77	0.200	10	35.32	84.5	75 - 125				
Manganese	0.769	0.00500	0.1	0.714	55.0	75 - 125			SO	
Nickel	0.108	0.00200	0.1	0.01407	93.9	75 - 125				
Potassium	11.03	0.200	10	1.287	97.5	75 - 125				
Selenium	0.09848	0.00200	0.1	0.000323	98.2	75 - 125				
Silver	0.08536	0.00200	0.1	0.000015	85.3	75 - 125				
Thallium	0.0969	0.00200	0.1	0.000424	96.5	75 - 125				
Vanadium	0.0977	0.00500	0.1	0.000182	97.5	75 - 125				
Zinc	0.1314	0.00400	0.1	0.03543	96.0	75 - 125				
PDS		Sample ID: HS19091233-01PDS		Units: mg/L		Analysis Date: 09-Oct-2019 11:51				
Client ID: LH18/24-SP140_092419		Run ID: ICPMS04_347919		SeqNo: 5288626		PrepDate: 04-Oct-2019		DF: 20		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Sodium	417.8	4.00	200	222.6	97.6	75 - 125				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: 146020 (0)		Instrument: ICPMS04		Method: ICP-MS METALS BY SW6020A						
SD	Sample ID: HS19091233-01SD	Units: mg/L			Analysis Date: 08-Oct-2019 21:13					
Client ID: LH18/24-SP140_092419	Run ID: ICPMS04_347830	SeqNo: 5287990	PrepDate: 04-Oct-2019	DF: 5						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.05235	0.0500					0.04948	0	10	
Antimony	0.00500	0.0100					0.000427	0	10	U
Arsenic	0.00500	0.0100					0.001022	0	10	U
Barium	0.8963	0.0200					0.973	7.88	10	
Beryllium	0.00500	0.0100					0.000174	0	10	U
Cadmium	0.00500	0.0100					0.000289	0	10	U
Calcium	43.92	2.50					44.07	0.329	10	
Chromium	0.00500	0.0200					0.001462	0	10	U
Cobalt	0.01189	0.0250					0.01195	0	10	J
Iron	0.9582	1.00					1.002	4.35	10	J
Lead	0.00500	0.0100					0.000144	0	10	U
Magnesium	36.58	1.00					35.32	3.57	10	
Manganese	0.6636	0.0250					0.714	7.05	10	
Nickel	0.0136	0.0100					0.01407	3.34	10	
Potassium	1.278	1.00					1.287	0.668	10	
Selenium	0.0125	0.0100					0.000323	0	10	U
Silver	0.00500	0.0100					0.000015	0	10	U
Thallium	0.00500	0.0100					0.000424	0	10	U
Vanadium	0.00500	0.0250					0.000182	0	10	U
Zinc	0.03378	0.0200					0.03543	4.65	10	
SD	Sample ID: HS19091233-01SD	Units: mg/L			Analysis Date: 09-Oct-2019 11:48					
Client ID: LH18/24-SP140_092419	Run ID: ICPMS04_347919	SeqNo: 5288625	PrepDate: 04-Oct-2019	DF: 100						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	229.9	20.0					222.6	3.29	10	

The following samples were analyzed in this batch: HS19091233-01

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: 145678 (1)		Instrument: SV-6		Method: SEMIVOLATILES SIM						
MBLK	Sample ID: MBLK-145678	Units: ug/L		Analysis Date: 01-Oct-2019 10:46						
Client ID:	Run ID: SV-6_347402	SeqNo: 5277874		PrepDate: 26-Sep-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	
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.08117</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>101</i>	<i>40 - 140</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>0.101</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>126</i>	<i>40 - 140</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>0.07768</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>97.1</i>	<i>40 - 140</i>				
LCS	Sample ID: LCS-145678	Units: ug/L		Analysis Date: 01-Oct-2019 11:06						
Client ID:	Run ID: SV-6_347402	SeqNo: 5277875		PrepDate: 26-Sep-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.08772	0.010	0.08	0	110	40 - 140				
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.09312</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>116</i>	<i>40 - 140</i>				
<i>Surr: 4-Terphenyl-d14</i>	<i>0.08862</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>111</i>	<i>40 - 140</i>				
<i>Surr: Nitrobenzene-d5</i>	<i>0.08759</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>109</i>	<i>40 - 140</i>				
LCSD	Sample ID: LCSD-145678	Units: ug/L		Analysis Date: 01-Oct-2019 11:25						
Client ID:	Run ID: SV-6_347402	SeqNo: 5277876		PrepDate: 26-Sep-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.0791	0.010	0.08	0	98.9	40 - 140	0.08772	10.3	20	
<i>Surr: 2-Fluorobiphenyl</i>	<i>0.09612</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>120</i>	<i>40 - 140</i>	<i>0.09312</i>	<i>3.17</i>	<i>20</i>	
<i>Surr: 4-Terphenyl-d14</i>	<i>0.08439</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>105</i>	<i>40 - 140</i>	<i>0.08862</i>	<i>4.89</i>	<i>20</i>	
<i>Surr: Nitrobenzene-d5</i>	<i>0.0895</i>	<i>0</i>	<i>0.08</i>	<i>0</i>	<i>112</i>	<i>40 - 140</i>	<i>0.08759</i>	<i>2.15</i>	<i>20</i>	
The following samples were analyzed in this batch: HS19091233-01										

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: R347193 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-190927	Units: UG/L			Analysis Date: 27-Sep-2019 12:20					
Client ID:	Run ID: VOA6_347193	SeqNo: 5273201	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-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: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: R347193 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-190927	Units: UG/L			Analysis Date: 27-Sep-2019 12:20					
Client ID:	Run ID: VOA6_347193	SeqNo: 5273201	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	41.29	1.0	50	0	82.6	81 - 118				
Surr: 4-Bromofluorobenzene	50.75	1.0	50	0	101	85 - 114				
Surr: Dibromofluoromethane	44.75	1.0	50	0	89.5	80 - 119				
Surr: Toluene-d8	49.34	1.0	50	0	98.7	89 - 112				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: R347193 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-190927	Units: UG/L			Analysis Date: 27-Sep-2019 11:32					
Client ID:	Run ID: VOA6_347193	SeqNo: 5273200		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.73	1.0	20	0	93.7	78 - 124				
1,1,1-Trichloroethane	17.29	1.0	20	0	86.5	74 - 131				
1,1,2,2-Tetrachloroethane	18.58	1.0	20	0	92.9	71 - 121				
1,1,2-Trichloroethane	18.91	1.0	20	0	94.5	80 - 119				
1,1-Dichloroethane	17.12	1.0	20	0	85.6	77 - 125				
1,1-Dichloroethene	18.82	1.0	20	0	94.1	71 - 131				
1,1-Dichloropropene	17.7	1.0	20	0	88.5	78 - 125				
1,2,3-Trichlorobenzene	19.88	1.0	20	0	99.4	69 - 129				
1,2,3-Trichloropropane	18.15	1.0	20	0	90.8	73 - 122				
1,2,4-Trichlorobenzene	19.55	1.0	20	0	97.7	69 - 130				
1,2,4-Trimethylbenzene	19.19	1.0	20	0	96.0	76 - 124				
1,2-Dibromo-3-chloropropane	18.58	1.0	20	0	92.9	62 - 128				
1,2-Dibromoethane	18.41	1.0	20	0	92.0	77 - 121				
1,2-Dichlorobenzene	19.48	1.0	20	0	97.4	80 - 119				
1,2-Dichloroethane	17.88	1.0	20	0	89.4	73 - 128				
1,2-Dichloropropane	18.09	1.0	20	0	90.4	78 - 122				
1,3,5-Trimethylbenzene	19.05	1.0	20	0	95.3	75 - 124				
1,3-Dichlorobenzene	19.57	1.0	20	0	97.9	80 - 119				
1,3-Dichloropropane	17.96	1.0	20	0	89.8	80 - 119				
1,4-Dichlorobenzene	19.54	1.0	20	0	97.7	79 - 118				
2,2-Dichloropropane	18.09	1.0	20	0	90.4	60 - 139				
2-Butanone	33.9	2.0	40	0	84.7	56 - 143				
2-Chlorotoluene	18.67	1.0	20	0	93.4	79 - 122				
2-Hexanone	35.56	2.0	40	0	88.9	57 - 139				
4-Chlorotoluene	18.74	1.0	20	0	93.7	78 - 122				
4-Isopropyltoluene	19.51	1.0	20	0	97.6	77 - 127				
4-Methyl-2-pentanone	34.63	2.0	40	0	86.6	67 - 130				
Acetone	35.18	2.0	40	0	88.0	39 - 160				
Benzene	17.97	1.0	20	0	89.9	79 - 120				
Bromobenzene	18.25	1.0	20	0	91.3	80 - 120				
Bromochloromethane	18.48	1.0	20	0	92.4	78 - 123				
Bromodichloromethane	17.84	1.0	20	0	89.2	79 - 125				
Bromoform	19.45	1.0	20	0	97.2	66 - 130				
Bromomethane	20.24	1.0	20	0	101	53 - 141				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: R347193 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-190927	Units: UG/L			Analysis Date: 27-Sep-2019 11:32					
Client ID:	Run ID: VOA6_347193	SeqNo: 5273200	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.17	2.0	40	0	87.9	64 - 133				
Carbon tetrachloride	17.78	1.0	20	0	88.9	72 - 136				
Chlorobenzene	19.57	1.0	20	0	97.9	82 - 118				
Chloroethane	18.56	1.0	20	0	92.8	60 - 138				
Chloroform	17.47	1.0	20	0	87.3	79 - 124				
Chloromethane	19.65	1.0	20	0	98.2	50 - 139				
cis-1,2-Dichloroethene	17.62	1.0	20	0	88.1	78 - 123				
cis-1,3-Dichloropropene	18.22	1.0	20	0	91.1	75 - 124				
Dibromochloromethane	18.47	1.0	20	0	92.4	74 - 126				
Dibromomethane	18.19	1.0	20	0	91.0	79 - 123				
Dichlorodifluoromethane	17.59	1.0	20	0	87.9	32 - 152				
Ethylbenzene	19.71	1.0	20	0	98.6	79 - 121				
Hexachlorobutadiene	20.5	1.0	20	0	103	66 - 134				
Isopropylbenzene	20.05	1.0	20	0	100	72 - 131				
m,p-Xylene	39.75	2.0	40	0	99.4	80 - 121				
Methylene chloride	18.5	2.0	20	0	92.5	74 - 124				
Naphthalene	19.2	1.0	20	0	96.0	61 - 128				
n-Butylbenzene	19.58	1.0	20	0	97.9	75 - 128				
n-Propylbenzene	18.64	1.0	20	0	93.2	76 - 126				
o-Xylene	20.08	1.0	20	0	100	78 - 122				
sec-Butylbenzene	19.35	1.0	20	0	96.8	77 - 126				
Styrene	18.72	1.0	20	0	93.6	78 - 123				
tert-Butylbenzene	19.47	1.0	20	0	97.3	78 - 124				
Tetrachloroethene	18.65	1.0	20	0	93.3	74 - 129				
Toluene	19.63	1.0	20	0	98.2	80 - 121				
trans-1,2-Dichloroethene	18	1.0	20	0	90.0	75 - 124				
trans-1,3-Dichloropropene	17.98	1.0	20	0	89.9	73 - 127				
Trichloroethene	18.29	1.0	20	0	91.4	79 - 123				
Trichlorofluoromethane	18.17	1.0	20	0	90.9	65 - 141				
Vinyl chloride	18.06	1.0	20	0	90.3	58 - 137				
Surr: 1,2-Dichloroethane-d4	48.59	1.0	50	0	97.2	81 - 118				
Surr: 4-Bromofluorobenzene	53.49	1.0	50	0	107	85 - 114				
Surr: Dibromofluoromethane	50.11	1.0	50	0	100	80 - 119				
Surr: Toluene-d8	48.05	1.0	50	0	96.1	89 - 112				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: R347193 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19090962-10MS	Units: UG/L			Analysis Date: 27-Sep-2019 15:08					
Client ID:	Run ID: VOA6_347193	SeqNo: 5273208		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.48	1.0	20	0	92.4	78 - 124				
1,1,1-Trichloroethane	16.46	1.0	20	0	82.3	74 - 131				
1,1,2,2-Tetrachloroethane	19.19	1.0	20	0	96.0	71 - 121				
1,1,2-Trichloroethane	18.87	1.0	20	0	94.3	80 - 119				
1,1-Dichloroethane	15.47	1.0	20	0	77.4	77 - 125				
1,1-Dichloroethene	17.17	1.0	20	0	85.8	71 - 131				
1,1-Dichloropropene	18.06	1.0	20	0	90.3	78 - 125				
1,2,3-Trichlorobenzene	19.08	1.0	20	0	95.4	69 - 129				
1,2,3-Trichloropropane	18.7	1.0	20	0	93.5	73 - 122				
1,2,4-Trichlorobenzene	19.48	1.0	20	0	97.4	69 - 130				
1,2,4-Trimethylbenzene	20.47	1.0	20	0	102	76 - 124				
1,2-Dibromo-3-chloropropane	18.27	1.0	20	0	91.4	62 - 128				
1,2-Dibromoethane	17.95	1.0	20	0	89.8	77 - 121				
1,2-Dichlorobenzene	20.28	1.0	20	0	101	80 - 119				
1,2-Dichloroethane	16.27	1.0	20	0	81.4	73 - 128				
1,2-Dichloropropane	16.99	1.0	20	0	84.9	78 - 122				
1,3,5-Trimethylbenzene	20.56	1.0	20	0	103	75 - 124				
1,3-Dichlorobenzene	20.5	1.0	20	0	103	80 - 119				
1,3-Dichloropropane	17.84	1.0	20	0	89.2	80 - 119				
1,4-Dichlorobenzene	20.19	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	16.92	1.0	20	0	84.6	60 - 139				
2-Butanone	27	2.0	40	0	67.5	56 - 143				
2-Chlorotoluene	19.91	1.0	20	0	99.6	79 - 122				
2-Hexanone	33.67	2.0	40	0	84.2	57 - 139				
4-Chlorotoluene	19.89	1.0	20	0	99.4	78 - 122				
4-Isopropyltoluene	21.09	1.0	20	0	105	77 - 127				
4-Methyl-2-pentanone	33.07	2.0	40	0	82.7	67 - 130				
Acetone	23.95	2.0	40	0	59.9	39 - 160				
Benzene	17.38	1.0	20	0	86.9	79 - 120				
Bromobenzene	18.84	1.0	20	0	94.2	80 - 120				
Bromochloromethane	16.58	1.0	20	0	82.9	78 - 123				
Bromodichloromethane	16.99	1.0	20	0	85.0	79 - 125				
Bromoform	19.02	1.0	20	0	95.1	66 - 130				
Bromomethane	15.6	1.0	20	0	78.0	53 - 141				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: R347193 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19090962-10MS	Units: UG/L			Analysis Date: 27-Sep-2019 15:08					
Client ID:	Run ID: VOA6_347193	SeqNo: 5273208		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	31.25	2.0	40	0	78.1	64 - 133				
Carbon tetrachloride	17.8	1.0	20	0	89.0	72 - 136				
Chlorobenzene	19.74	1.0	20	0	98.7	82 - 118				
Chloroethane	19.09	1.0	20	0	95.5	60 - 138				
Chloroform	15.89	1.0	20	0	79.4	79 - 124				
Chloromethane	13.47	1.0	20	0	67.4	50 - 139				
cis-1,2-Dichloroethene	16.64	1.0	20	0	83.2	78 - 123				
cis-1,3-Dichloropropene	17.11	1.0	20	0	85.6	75 - 124				
Dibromochloromethane	18.23	1.0	20	0	91.1	74 - 126				
Dibromomethane	16.62	1.0	20	0	83.1	79 - 123				
Dichlorodifluoromethane	8.147	1.0	20	0	40.7	32 - 152				
Ethylbenzene	20.17	1.0	20	0	101	79 - 121				
Hexachlorobutadiene	21.21	1.0	20	0	106	66 - 134				
Isopropylbenzene	20.75	1.0	20	0	104	72 - 131				
m,p-Xylene	40.23	2.0	40	0	101	80 - 121				
Methylene chloride	15.64	2.0	20	0	78.2	74 - 124				
Naphthalene	18.22	1.0	20	0	91.1	61 - 128				
n-Butylbenzene	20.74	1.0	20	0	104	75 - 128				
n-Propylbenzene	20.11	1.0	20	0	101	76 - 126				
o-Xylene	20.13	1.0	20	0	101	78 - 122				
sec-Butylbenzene	20.82	1.0	20	0	104	77 - 126				
Styrene	18.86	1.0	20	0	94.3	78 - 123				
tert-Butylbenzene	21.3	1.0	20	0	106	78 - 124				
Tetrachloroethene	19.74	1.0	20	0	98.7	74 - 129				
Toluene	20.06	1.0	20	0	100	80 - 121				
trans-1,2-Dichloroethene	16.53	1.0	20	0	82.7	75 - 124				
trans-1,3-Dichloropropene	16.66	1.0	20	0	83.3	73 - 127				
Trichloroethene	20.62	1.0	20	2.663	89.8	79 - 123				
Trichlorofluoromethane	16.49	1.0	20	0	82.5	65 - 141				
Vinyl chloride	13.68	1.0	20	0	68.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	42.73	1.0	50	0	85.5	81 - 118				
Surr: 4-Bromofluorobenzene	50.9	1.0	50	0	102	85 - 114				
Surr: Dibromofluoromethane	45.37	1.0	50	0	90.7	80 - 119				
Surr: Toluene-d8	49.06	1.0	50	0	98.1	89 - 112				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: R347193 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19090962-10MSD	Units: UG/L			Analysis Date: 27-Sep-2019 15:32					
Client ID:	Run ID: VOA6_347193	SeqNo: 5273209		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.79	1.0	20	0	88.9	78 - 124	18.48	3.81	20	
1,1,1-Trichloroethane	15.51	1.0	20	0	77.5	74 - 131	16.46	5.99	20	
1,1,2,2-Tetrachloroethane	18.02	1.0	20	0	90.1	71 - 121	19.19	6.32	20	
1,1,2-Trichloroethane	18.6	1.0	20	0	93.0	80 - 119	18.87	1.45	20	
1,1-Dichloroethane	14.66	1.0	20	0	73.3	77 - 125	15.47	5.37	20	S
1,1-Dichloroethene	16.04	1.0	20	0	80.2	71 - 131	17.17	6.81	20	
1,1-Dichloropropene	16.79	1.0	20	0	83.9	78 - 125	18.06	7.28	20	
1,2,3-Trichlorobenzene	18.82	1.0	20	0	94.1	69 - 129	19.08	1.34	20	
1,2,3-Trichloropropane	17.51	1.0	20	0	87.6	73 - 122	18.7	6.55	20	
1,2,4-Trichlorobenzene	18.37	1.0	20	0	91.9	69 - 130	19.48	5.84	20	
1,2,4-Trimethylbenzene	18.37	1.0	20	0	91.8	76 - 124	20.47	10.8	20	
1,2-Dibromo-3-chloropropane	17.67	1.0	20	0	88.3	62 - 128	18.27	3.37	20	
1,2-Dibromoethane	17.46	1.0	20	0	87.3	77 - 121	17.95	2.78	20	
1,2-Dichlorobenzene	18.51	1.0	20	0	92.6	80 - 119	20.28	9.11	20	
1,2-Dichloroethane	15.91	1.0	20	0	79.5	73 - 128	16.27	2.26	20	
1,2-Dichloropropane	16.33	1.0	20	0	81.6	78 - 122	16.99	3.99	20	
1,3,5-Trimethylbenzene	18.53	1.0	20	0	92.6	75 - 124	20.56	10.4	20	
1,3-Dichlorobenzene	18.59	1.0	20	0	92.9	80 - 119	20.5	9.81	20	
1,3-Dichloropropane	17.06	1.0	20	0	85.3	80 - 119	17.84	4.44	20	
1,4-Dichlorobenzene	18.22	1.0	20	0	91.1	79 - 118	20.19	10.2	20	
2,2-Dichloropropane	15.77	1.0	20	0	78.8	60 - 139	16.92	7.04	20	
2-Butanone	27.15	2.0	40	0	67.9	56 - 143	27	0.575	20	
2-Chlorotoluene	17.75	1.0	20	0	88.8	79 - 122	19.91	11.5	20	
2-Hexanone	33.23	2.0	40	0	83.1	57 - 139	33.67	1.31	20	
4-Chlorotoluene	17.95	1.0	20	0	89.8	78 - 122	19.89	10.2	20	
4-Isopropyltoluene	18.75	1.0	20	0	93.8	77 - 127	21.09	11.7	20	
4-Methyl-2-pentanone	32.94	2.0	40	0	82.4	67 - 130	33.07	0.385	20	
Acetone	23.98	2.0	40	0	60.0	39 - 160	23.95	0.127	20	
Benzene	16.4	1.0	20	0	82.0	79 - 120	17.38	5.84	20	
Bromobenzene	17.16	1.0	20	0	85.8	80 - 120	18.84	9.3	20	
Bromochloromethane	16.05	1.0	20	0	80.3	78 - 123	16.58	3.23	20	
Bromodichloromethane	16.53	1.0	20	0	82.6	79 - 125	16.99	2.76	20	
Bromoform	18.43	1.0	20	0	92.1	66 - 130	19.02	3.15	20	
Bromomethane	14.98	1.0	20	0	74.9	53 - 141	15.6	4.04	20	

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: R347193 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19090962-10MSD	Units: UG/L			Analysis Date: 27-Sep-2019 15:32					
Client ID:	Run ID: VOA6_347193	SeqNo: 5273209		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	29.09	2.0	40	0	72.7	64 - 133	31.25	7.14	20	
Carbon tetrachloride	16.93	1.0	20	0	84.7	72 - 136	17.8	4.97	20	
Chlorobenzene	18.44	1.0	20	0	92.2	82 - 118	19.74	6.85	20	
Chloroethane	18	1.0	20	0	90.0	60 - 138	19.09	5.91	20	
Chloroform	15.23	1.0	20	0	76.2	79 - 124	15.89	4.23	20	S
Chloromethane	12.42	1.0	20	0	62.1	50 - 139	13.47	8.13	20	
cis-1,2-Dichloroethene	15.78	1.0	20	0	78.9	78 - 123	16.64	5.31	20	
cis-1,3-Dichloropropene	16.48	1.0	20	0	82.4	75 - 124	17.11	3.8	20	
Dibromochloromethane	17.71	1.0	20	0	88.5	74 - 126	18.23	2.89	20	
Dibromomethane	16.66	1.0	20	0	83.3	79 - 123	16.62	0.27	20	
Dichlorodifluoromethane	7.601	1.0	20	0	38.0	32 - 152	8.147	6.93	20	
Ethylbenzene	19.03	1.0	20	0	95.2	79 - 121	20.17	5.78	20	
Hexachlorobutadiene	19.1	1.0	20	0	95.5	66 - 134	21.21	10.5	20	
Isopropylbenzene	19.43	1.0	20	0	97.2	72 - 131	20.75	6.55	20	
m,p-Xylene	37.51	2.0	40	0	93.8	80 - 121	40.23	7.01	20	
Methylene chloride	15.13	2.0	20	0	75.6	74 - 124	15.64	3.35	20	
Naphthalene	18.15	1.0	20	0	90.7	61 - 128	18.22	0.375	20	
n-Butylbenzene	18.58	1.0	20	0	92.9	75 - 128	20.74	11	20	
n-Propylbenzene	18.1	1.0	20	0	90.5	76 - 126	20.11	10.5	20	
o-Xylene	18.86	1.0	20	0	94.3	78 - 122	20.13	6.52	20	
sec-Butylbenzene	18.81	1.0	20	0	94.1	77 - 126	20.82	10.1	20	
Styrene	17.58	1.0	20	0	87.9	78 - 123	18.86	7.05	20	
tert-Butylbenzene	18.78	1.0	20	0	93.9	78 - 124	21.3	12.6	20	
Tetrachloroethene	18.4	1.0	20	0	92.0	74 - 129	19.74	7.05	20	
Toluene	18.62	1.0	20	0	93.1	80 - 121	20.06	7.44	20	
trans-1,2-Dichloroethene	15.63	1.0	20	0	78.2	75 - 124	16.53	5.59	20	
trans-1,3-Dichloropropene	16.28	1.0	20	0	81.4	73 - 127	16.66	2.31	20	
Trichloroethene	19.11	1.0	20	2.663	82.2	79 - 123	20.62	7.61	20	
Trichlorofluoromethane	15.47	1.0	20	0	77.4	65 - 141	16.49	6.36	20	
Vinyl chloride	12.88	1.0	20	0	64.4	58 - 137	13.68	6.03	20	
Surr: 1,2-Dichloroethane-d4	42.41	1.0	50	0	84.8	81 - 118	42.73	0.745	20	
Surr: 4-Bromofluorobenzene	52.29	1.0	50	0	105	85 - 114	50.9	2.69	20	
Surr: Dibromofluoromethane	45.64	1.0	50	0	91.3	80 - 119	45.37	0.581	20	
Surr: Toluene-d8	48.45	1.0	50	0	96.9	89 - 112	49.06	1.25	20	

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT**Batch ID:** R347193 (0)**Instrument:** VOA6**Method:** VOLATILES ORGANICS BY METHOD
8260C

The following samples were analyzed in this batch:

HS19091233-01	HS19091233-02
---------------	---------------

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: R347232 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-190929	Units: UG/L			Analysis Date: 29-Sep-2019 13:07					
Client ID:	Run ID: VOA6_347232	SeqNo: 5274248		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Methylene chloride	1.0	2.0							U	
Trichloroethene	0.50	1.0							U	
<i>Surr: 1,2-Dichloroethane-d4</i>	44.8	1.0	50	0	89.6	81 - 118				
<i>Surr: 4-Bromofluorobenzene</i>	55.75	1.0	50	0	111	85 - 114				
<i>Surr: Dibromofluoromethane</i>	49.34	1.0	50	0	98.7	80 - 119				
<i>Surr: Toluene-d8</i>	50.69	1.0	50	0	101	89 - 112				
LCS	Sample ID: VLCSW-190929	Units: UG/L			Analysis Date: 29-Sep-2019 12:19					
Client ID:	Run ID: VOA6_347232	SeqNo: 5274247		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Methylene chloride	18.68	2.0	20	0	93.4	74 - 124				
Trichloroethene	18.84	1.0	20	0	94.2	79 - 123				
<i>Surr: 1,2-Dichloroethane-d4</i>	46.88	1.0	50	0	93.8	81 - 118				
<i>Surr: 4-Bromofluorobenzene</i>	51.98	1.0	50	0	104	85 - 114				
<i>Surr: Dibromofluoromethane</i>	48.74	1.0	50	0	97.5	80 - 119				
<i>Surr: Toluene-d8</i>	46.12	1.0	50	0	92.2	89 - 112				
MS	Sample ID: HS19090964-03MS	Units: UG/L			Analysis Date: 29-Sep-2019 14:19					
Client ID:	Run ID: VOA6_347232	SeqNo: 5274250		PrepDate:		DF: 5				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Methylene chloride	87.03	10	100	0	87.0	74 - 124				
Trichloroethene	348	5.0	100	259.3	88.6	79 - 123				
<i>Surr: 1,2-Dichloroethane-d4</i>	230	5.0	250	0	92.0	81 - 118				
<i>Surr: 4-Bromofluorobenzene</i>	263.6	5.0	250	0	105	85 - 114				
<i>Surr: Dibromofluoromethane</i>	247.6	5.0	250	0	99.0	80 - 119				
<i>Surr: Toluene-d8</i>	235.5	5.0	250	0	94.2	89 - 112				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: R347232 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19090964-03MSD	Units: UG/L		Analysis Date: 29-Sep-2019 14:43						
Client ID:	Run ID: VOA6_347232	SeqNo: 5274251		PrepDate:			DF: 5			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methylene chloride	87.96	10	100	0	88.0	74 - 124	87.03	1.06	20	
Trichloroethene	340.6	5.0	100	259.3	81.3	79 - 123	348	2.13	20	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>242.7</i>	<i>5.0</i>	<i>250</i>	<i>0</i>	<i>97.1</i>	<i>81 - 118</i>	<i>230</i>	<i>5.37</i>	<i>20</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>263.8</i>	<i>5.0</i>	<i>250</i>	<i>0</i>	<i>106</i>	<i>85 - 114</i>	<i>263.6</i>	<i>0.0826</i>	<i>20</i>	
<i>Surr: Dibromofluoromethane</i>	<i>252.3</i>	<i>5.0</i>	<i>250</i>	<i>0</i>	<i>101</i>	<i>80 - 119</i>	<i>247.6</i>	<i>1.88</i>	<i>20</i>	
<i>Surr: Toluene-d8</i>	<i>234.6</i>	<i>5.0</i>	<i>250</i>	<i>0</i>	<i>93.8</i>	<i>89 - 112</i>	<i>235.5</i>	<i>0.394</i>	<i>20</i>	

The following samples were analyzed in this batch: HS19091233-01

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: R347382 (0)		Instrument: WetChem_HS		Method: CHEMICAL OXYGEN DEMAND BY E410.4						
MBLK	Sample ID: MBLK-347382	Units: mg/L			Analysis Date: 01-Oct-2019 15:00					
Client ID:	Run ID: WetChem_HS_347382	SeqNo: 5277359			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chemical Oxygen Demand	15.0	15.0							U	
LCS	Sample ID: LCS4-347382	Units: mg/L			Analysis Date: 01-Oct-2019 15:00					
Client ID:	Run ID: WetChem_HS_347382	SeqNo: 5277366			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chemical Oxygen Demand	99	15.0	100	0	99.0	85 - 115				
LCS	Sample ID: LCS3-347382	Units: mg/L			Analysis Date: 01-Oct-2019 15:00					
Client ID:	Run ID: WetChem_HS_347382	SeqNo: 5277365			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chemical Oxygen Demand	104	15.0	100	0	104	85 - 115				
LCS	Sample ID: LCS2-347382	Units: mg/L			Analysis Date: 01-Oct-2019 15:00					
Client ID:	Run ID: WetChem_HS_347382	SeqNo: 5277364			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chemical Oxygen Demand	103	15.0	100	0	103	85 - 115				
LCS	Sample ID: LCS1-347382	Units: mg/L			Analysis Date: 01-Oct-2019 15:00					
Client ID:	Run ID: WetChem_HS_347382	SeqNo: 5277360			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chemical Oxygen Demand	102	15.0	100	0	102	85 - 115				
MS	Sample ID: HS19091488-01MS	Units: mg/L			Analysis Date: 01-Oct-2019 15:00					
Client ID:	Run ID: WetChem_HS_347382	SeqNo: 5277362			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chemical Oxygen Demand	76	15.0	50	22	108	80 - 120				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: R347382 (0)		Instrument: WetChem_HS		Method: CHEMICAL OXYGEN DEMAND BY E410.4						
MSD	Sample ID: HS19091488-01MSD	Units: mg/L			Analysis Date: 01-Oct-2019 15:00					
Client ID:	Run ID: WetChem_HS_347382	SeqNo: 5277363		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chemical Oxygen Demand	82	15.0	50	22	120	80 - 120	76	7.59	20	

The following samples were analyzed in this batch:

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: R347908 (0)		Instrument: ICS-Integrion		Method: ANIONS BY SW9056A						
MBLK	Sample ID: WBLKW1-100719	Units: mg/L			Analysis Date: 07-Oct-2019 20:48					
Client ID:	Run ID: ICS-Integrion_347908	SeqNo: 5288352		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: WLCSW1-100719	Units: mg/L			Analysis Date: 07-Oct-2019 21:05					
Client ID:	Run ID: ICS-Integrion_347908	SeqNo: 5288353		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	19.56	0.500	20	0	97.8	80 - 120				
Sulfate	19.63	0.500	20	0	98.1	80 - 120				
LCSD	Sample ID: WLCSDW1-100719	Units: mg/L			Analysis Date: 07-Oct-2019 21:21					
Client ID:	Run ID: ICS-Integrion_347908	SeqNo: 5288354		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	19.46	0.500	20	0	97.3	80 - 120	19.56	0.528	20	
Sulfate	19.49	0.500	20	0	97.4	80 - 120	19.63	0.729	20	
MS	Sample ID: HS19091343-09MS	Units: mg/L			Analysis Date: 08-Oct-2019 00:57					
Client ID:	Run ID: ICS-Integrion_347908	SeqNo: 5288364		PrepDate:			DF: 10			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	606.3	5.00	100	517.6	88.7	80 - 120			O	
Sulfate	318	5.00	100	222.7	95.3	80 - 120				
MS	Sample ID: HS19091343-02MS	Units: mg/L			Analysis Date: 07-Oct-2019 23:01					
Client ID:	Run ID: ICS-Integrion_347908	SeqNo: 5288359		PrepDate:			DF: 20			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	1181	10.0	200	1016	82.4	80 - 120			O	
Sulfate	616.8	10.0	200	436.1	90.3	80 - 120				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: R347908 (0)		Instrument: ICS-Integrion		Method: ANIONS BY SW9056A						
MSD	Sample ID: HS19091343-09MSD	Units: mg/L			Analysis Date: 08-Oct-2019 01:14					
Client ID:	Run ID: ICS-Integrion_347908	SeqNo: 5288365		PrepDate:			DF: 10			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	605.5	5.00	100	517.6	87.9	80 - 120	606.3	0.132	20	O
Sulfate	315.3	5.00	100	222.7	92.6	80 - 120	318	0.861	20	
MSD	Sample ID: HS19091343-02MSD	Units: mg/L			Analysis Date: 07-Oct-2019 23:17					
Client ID:	Run ID: ICS-Integrion_347908	SeqNo: 5288360		PrepDate:			DF: 20			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1189	10.0	200	1016	86.6	80 - 120	1181	0.712	20	O
Sulfate	625.2	10.0	200	436.1	94.5	80 - 120	616.8	1.35	20	

The following samples were analyzed in this batch: HS19091233-01

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091233

QC BATCH REPORT

Batch ID: R347939 (0)		Instrument: Balance1		Method: OIL & GREASE (HEM) BY E1664A						
MBLK	Sample ID: WBLKW-100819	Units: mg/L		Analysis Date: 08-Oct-2019 14:40						
Client ID:	Run ID: Balance1_347939	SeqNo: 5288873		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-100819	Units: mg/L		Analysis Date: 08-Oct-2019 14:40						
Client ID:	Run ID: Balance1_347939	SeqNo: 5288875		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	100.0	78 - 114				
LCSD	Sample ID: WLCSDW-100819	Units: mg/L		Analysis Date: 08-Oct-2019 14:40						
Client ID:	Run ID: Balance1_347939	SeqNo: 5288874		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Oil and Grease	38.4	2.00	40	0	96.0	78 - 114	40	4.08	18	
MS	Sample ID: HS19100083-01MS	Units: mg/L		Analysis Date: 08-Oct-2019 14:40						
Client ID:	Run ID: Balance1_347939	SeqNo: 5288864		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Oil and Grease	38.75	2.00	40	-0.4167	97.9	78 - 114				

The following samples were analyzed in this batch: HS19091233-01

ALS Houston, US

Date: 09-Oct-19

Client:	Bhate Environmental Associates, Inc.	QUALIFIERS, ACRONYMS, UNITS
Project:	Groundwater Treatment Plant Quarterly Influent Samples	
WorkOrder:	HS19091233	

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	2019-141	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
Work Order: HS19091233

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19091233-01	LH18/24-SP140_092419	Login	9/25/2019 5:27:56 PM	AC	Disposed
HS19091233-01	LH18/24-SP140_092419	Login	9/25/2019 5:27:56 PM	AC	Disposed
HS19091233-01	LH18/24-SP140_092419	Login	9/25/2019 5:27:56 PM	AC	Disposed
HS19091233-01	LH18/24-SP140_092419	Login	9/25/2019 5:27:56 PM	AC	Disposed
HS19091233-01	LH18/24-SP140_092419	Login	9/25/2019 5:27:56 PM	AC	Disposed
HS19091233-01	LH18/24-SP140_092419	Login	9/25/2019 5:27:56 PM	AC	Disposed
HS19091233-02	Trip Blank	Login	9/25/2019 5:27:56 PM	AC	Disposed

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19091233

Date/Time Received: **25-Sep-2019 08:50**
 Received by: **JRM**

Checklist completed by: Asad Chaudhry 25-Sep-2019 Reviewed by: RJ Modashia 25-Sep-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): 1.8c C/UC IR 25
 Cooler(s)/Kit(s): 5161
 Date/Time sample(s) sent to storage: 09/25/2019 18:00

- 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: Trip Blank received 2 vials, 2 COC. Logged in 1 vials per COC.
 Trip Blanks split between W/O HS19091234

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
--	---

Job:
**GROUNDWATER TREATMENT PLANT
 QUARTERLY INFLUENT SAMPLES**

Prepared By: Scott Beesinger	P. O. Number
--	---------------------

Field Sample I.D.	Sample Matrix	Date / Time	MS / MBO	No. OF CONTAINERS	ROD Volatiles	Total Metals	Oil & Grease	Chemical Oxygen Demand	Chloride & Sulfate	1, 4 - DIOXANE	Perchlorate	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP140_092419	Water	09/24/19 / 14:00		4	3		1					HCL	
LH18/24-SP140_092419	Water	09/24/19 / 14:00		1		1						HNO3	
LH18/24-SP140_092419	Water	09/24/19 / 14:00		2					1	1		NONE	
LH18/24-SP140_092419	Water	09/24/19 / 14:00		1				1				H2SO4	
LH18/24-SP140_092419	Water	09/24/19 / 14:00		1							1	NONE	
Trip Blank	Water	09/24/19		2	2							HCL	

HS19091233
 Bhate Environmental Associates, Inc.
 Groundwater Treatment Plant Quarterly Influent Sarr




Additional Remarks: STANDARD TURN AROUND TIME

Relinquished By: <i>Scott Beesinger</i>	Date: 09/24/19	Time: 14:30	Received By:	Date:	Time:	Relinquished By:	Date:	Time:	Received By:	Date:	Time:
---	-----------------------	--------------------	---------------------	--------------	--------------	-------------------------	--------------	--------------	---------------------	--------------	--------------

Received At Lab By: J. MAWRY	Date: 9/25/19	Time: 08:50	Airbill No.:	For Lab Use Only							
Remarks: Colder 5161 Temp 1.8 1R25 CFO.O				Opened By:	Date:	Time:	Temp of Container:	Seal No.:	Condition:		

(Word) S:\1-cesForms\Chain of Custody - BiWeekly

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5687	CUSTODY SEAL		Seal Broken By: <i>sm</i>
	Date: <i>9/24/19</i>	Time: <i>1430</i>	Date:
	Name: <i>SEP II Deelad</i>	Company: <i>BITZTG</i>	Date: <i>09/25/19</i>

5161 SEP 25 2019



Must Deliver Next Business Day
Time and Temperature Sensitive!

5161

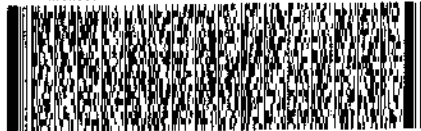
ORIGIN ID: SGRA (903) 930-6193
 SCOTT BEESIMER
 BHATE ENVIRONMENTAL ASSOCIATES
 1209-B EAST GRAND AVE. PHB202
 MARSHALL, TX 75670
 UNITED STATES US

SHIP DATE: 19 JUL 19
 ACTWGT: 1.00 LB. OZM
 CPO: 300130/CAFE3111
 DIMS: 26x14x14 IN

TO CLIENT SERVICES
 ALS LABORATORY GROUP
 10450 STANCLIFF ROAD
 SUITE 210
 HOUSTON TX 77099

(281) 530-5656
 REF: LHAAP 58 - RJ

RMA: (111111)



FedEx
Express



FedEx
 TRK# 4380 9530 9412
 0221

WED - 25 SEP 10:30A
 PRIORITY OVERNIGHT

AB SGRA

77099
 TX-US IAH



4475672 09/24 56711/9904/0582



Case Narrative

Method: 6850

Analysis: Perchlorate

Analysis SOP: LC-MS-CLO4

ALS WO ID(s): 1927220; 1927568; 1927591;
1927596

Client: ALS Laboratories (Houston, TX)

Matrix: Water

ELMS Batch (HBN): 2298 (248917)

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

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

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 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 1927568001 was analyzed and reported from 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 676591) was less than 1/2 the CRDL. The recovery for the LCS (676592) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on samples 1927220005/06 (Client ID: 16WW58-190918). 3.0 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 – 676589) is reported from the analysis of the Laboratory Control Sample (LCS – 676592) 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) along with datafiles 01OCTD02/05/06. Samples 1927220001/02 failed the 50-150% method requirement for ISTD recoveries. These samples were re-prepped, re-analyzed and reported.

Thomas Bosch October 03, 2019
Analyst Date



ANALYTICAL REPORT

Report Date: October 03, 2019

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

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1927568**

Project ID: HS19091233

Purchase Order: HS19091233

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP140_092419	1927568001	09/24/19	09/26/19	

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

44 of 142



ANALYTICAL REPORT

Workorder: 34-1927568

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: LH18/24-SP140_092419	Sampling Site: NA	Collected: 09/24/2019				
Lab ID: 1927568001	Media: 125 mL Nalgene	Received: 09/26/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2298 (HBN: 248917) Analyzed: 10/01/2019 14:36	Instrument ID: LCMS04 %Solids: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	15000	1000	2000	4000	1000	

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 248917)

Field sample 1927568001 was analyzed and reported from 1:1,000 dilution. The reporting limit has been adjusted accordingly.

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

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 10/03/2019 09:55	/S/ Stephen Brose 10/03/2019 13:30

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123Phone: (801) 266-7700
Email: alsst.lab@ALSGlobal.com
Web: www.alssl.com



ANALYTICAL REPORT

Workorder: 34-1927568

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

00952963

Analysis Information

Workorder: 1927568

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2298 (HBN: 248917)
Analyzed By: Thomas Bosch

Blank

LMB: 676591 Analyzed: 10/01/2019 11:23 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 676592 Analyzed: 10/01/2019 10:56 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.01	3.00	100	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1927220004 Analyzed: 10/01/2019 12:19 Dilution: 1 Units: ug/L		MS: 1927220005 Analyzed: 10/01/2019 12:32 Dilution: 1 Units: ug/L				MSD: 1927220006 Analyzed: 10/01/2019 12:46 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	2.94	3	97.8	78.8 123.8	2.93	97.7	0.157	0.0 20.0

Comments

Field sample 1927568001 was analyzed and reported from 1:1,000 dilution. The reporting limit has been adjusted accordingly.

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

Analyst	Peer Review
/S/ Thomas Bosch 10/03/2019 11:24	/S/ Stephen Brose 10/03/2019 13:30

Symbols and Definitions

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

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



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

Subcontract Chain of Custody

18698/#2

SAMPLING STATE: Colorado

COC ID: 12238

SUBCONTRACT TO:

1927568

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: HS19091233
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS19091233-01	LH18/24-SP140_092419	Water	24 Sep 2019 14:00
	SUB_Perch-6850			09 Oct 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. Maxson
Received By: [Signature]
Cooler ID(s): _____

Date/Time: 9/25/19 18:00
Date/Time: 9/26/19 09:54
Temperature(s): _____

COOLER OR CONTAINER INSPECTION REPORT (SEE ALSO CRIR)

Client Name: ALS Houston Project/Task/Site: _____
 Date/Time of Receipt: _____ Number of Coolers Received: 1927568

Condition of Coolers: Acceptable Unacceptable
 Cooler Custody Seals: Present Absent/NA
Intact Broken/NA
 Container Custody Seals: Present Absent NA
Intact Broken/NA
 Ice Present: Yes No/NA
Frozen Melted/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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 <u>9895</u>	<u>3</u> °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: JayLynn Johnson Signature JayLynn Johnson Printed Name 9/26/19 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 # 159489-434 RT2 EXP 05/20



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

SHIP DATE: 25SEP19
NET WT: 9.60 LB
CAB: 300130/CAFE3211
DIMS: 14x11x10 IN
BILL THIRD PARTY

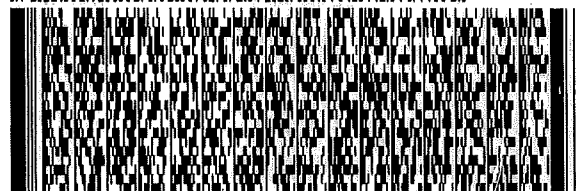
3901/4006/13155

TO **SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE**

SALT LAKE CITY UT 84123

(801) 288-7700

REF: HS19091201/1233/1234 RJ



**FedEx
Express**



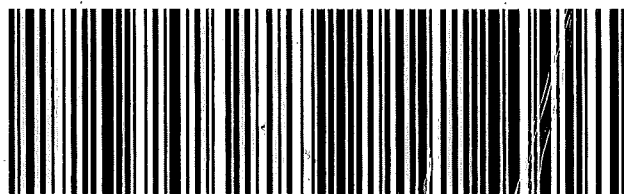
411050908111814

**THU - 26 SEP 3:00P
STANDARD OVERNIGHT**

TRK# 1251 0289 9683
0201

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: _____
Company: _____



ALS Environmental CHAIN-OF-CUSTODY

Project / Job / Task: HS19091233		Split:		Workorder ID: 1927568		Level: ENV_LVL4		Requested Analysis					
Client: ALS Environmental (Houston)				Account: 8101				Type: 125Poly					
Comments:													
Collect Date/Time		Sample ID		Lab ID		QC		Matrix		Containers		Requested Analysis	
1 09/24/2019 14:00		LH18/24-SP140_092419		1927568001				Water		A		EPA 6850, DOD QSM	
2										1			
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
Warathy, Julie	09/26/2019 09:54	ALS Sample Receiving	Sample Login				
<i>Julie Warathy</i>	09/24/19 0800	<i>LOB</i>	<i>Storage</i>				
<i>R.33-1</i>	10/1/19/07:50	<i>T.Booth</i>	<i>analysis</i>				



Batch Worklist

Batch: ELMS/ 2298

Created: 10/1/2019 10:29

Instrument:

Rule: EPA 6850, DoD QSM Water

Analyst: T. Bosch

Status: WP

HBN: 248917



- Workorder: 1927220 [ENV_LVL4]
- Workorder: 1927568 [ENV_LVL4]
- Workorder: 1927591 [ENV_LVL4]
- Workorder: 1927596 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	676588	CCV for HBN 248917 [ELMS/2298]				CCV	3	E685041C3Q	5311		10/3/2019	
2	676589	RLVS for HBN 248917 [ELMS/2298]				RLVS	3	E685041C3Q	5311		10/3/2019	
3	676590	ICS for HBN 248917 [ELMS/2298]				ICS	3	E6850_D3Q	5311		10/3/2019	
4	676591	LMB for HBN 248917 [ELMS/2298]				LMB	3	E6850Q413Q	5311		10/3/2019	
5	676592	LCS for HBN 248917 [ELMS/2298]				LCS	3	E6850Q413Q	5311		10/3/2019	
6	1927220001	16WW25-190919				SAMPLE	3	1927220001-A E6850Q41.3	5480	10/17/2019	10/3/2019	
7	1927220002	16WW25-190919-FD				FLDDUP	3	1927220002-A E6850Q41.3	5480	10/17/2019	10/3/2019	
8	1927220003	16WW49-190919				SAMPLE	3	1927220003-A E6850Q41.3	5480	10/17/2019	10/3/2019	
9	1927220004	16WW58-190918				SAMPLE	3	1927220004-A E6850Q41.3	5480	10/16/2019	10/3/2019	
10	1927220005	16WW58-190918MS				MS	3	1927220005-A E6850Q413Q	5480		10/3/2019	
11	1927220006	16WW58-190918MSD				MSD	3	1927220006-A E6850Q413Q	5480		10/3/2019	
12	1927220007	16WW58-190918-FD				FLDDUP	3	1927220007-A E6850Q41.3	5480	10/16/2019	10/3/2019	
13	1927220008	16WW51-190919				SAMPLE	3	1927220008-A E6850Q41.3	5480	10/16/2019	10/3/2019	
14	1927568001	LH18/24-SP140_092419				SAMPLE	3	1927568001-A E6850Q41.3	5480	10/22/2019	10/9/2019	
15	1927591001	LH18/24-SP650_092419_AIX				SAMPLE	3	1927591001-A E6850Q41.3	5480	10/22/2019	10/9/2019	
16	676593	CCV for HBN 248917 [ELMS/2298]				CCV	3	E685041C3Q	5311		10/3/2019	
17	1927596001	LH18/24-SP650_092419				SAMPLE	3	1927596001-A E6850Q41.3	5480	10/22/2019	10/9/2019	
18	676594	CCV for HBN 248917 [ELMS/2298]				CCV	3	E685041C3Q	5311		10/3/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-upALS Work Order #'s & Sample #()'s: 1927220 (001-08); 1927568 (001); 1927591 (001); 1927596 (001)ELMS Batch/HBN ID: 2296 (248804)Prep Date: 09/30/2019 Analysis Date: 10/01/2019 Analyst: T. BoschAnalyte: **Perchlorate** Matrix: **Water** Method: **6850**Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\OCT\01OCT19D.sReported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**SAMPLE PREPARATION/ANALYSIS:

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

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/5%ACN (B&J Lot DU461-US)/0.1% glacial acetic acid (JT-Baker Lot 122550).
Eluent B1: 95% ACN (B&J Lot DU461-US)/5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 122550).

STANDARDS: Internal Standard Spiking Solution Horizon# 47863. Dilutions of Working Standards (Horizon: 49947/48) used for ICAL, CCV's, RLVS and ICS.

CALIBRATION CURVE: Used curve from 09/20/2019, sequence 20SEP19D.s Offline Quantitation Method: CLO4-DP3.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.

Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 8 Injection Volume: 30µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1 Run time: 12.0min.

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 3.0µL of QC Solution Horizon ID 47516 was used for LCS 676592; Target = 3.0µg/L. ASTM type II water was used for LMB 676591.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on samples 1927220005/06 (Client ID's: 16WW58-190918). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L. Field sample 1927568001 was analyzed and reported from 1:1,000 dilution. The reporting limit has been adjusted accordingly. Samples 1927220001/02 failed the 50-150% method requirement for ISTD recoveries. These samples were re-prepped, re-analyzed and reported.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\OCT\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\248917-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 676589) is reported from the analysis of the Laboratory Control Sample (LCS – 676592) at a level of 3.0µg/L.
- 6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafiles 01OCT19D02/05/06.

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

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

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS. 2298 HBN: 248917</u> <u>1927591 / 19275.96</u>		
Sample Set IDs if Applicable: <u>WV^S 1927220 / 1927568</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 Intrmtd 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/NCCL 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

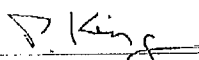


ISO Guide 34 Reference Material

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

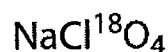
Catalog Number: OLM-7310-S

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	
#*	676588	CCV@25	Vial 71	1	Control	1	1.54525e6	7.598	25.01921
#*	676592	QC@3.0	Vial 72	1	Control	2	1.95090e5	7.638	3.01143
#*	676590	ICS@3.0	Vial 73	1	Control	3	1.58401e5	7.470	2.89276
#*	676591	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1927220001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
#*	1927220002		Vial 76	1	Sample	6	0.00000	0.000	0.00000
#*	1927220003		Vial 77	1	Sample	7	0.00000	0.000	0.00000
#*	1927220004		Vial 78	1	Sample	8	0.00000	0.000	0.00000
#*	1927220005	MS	Vial 79	1	Sample	9	1.24857e5	7.081	2.93501
#*	1927220006	MSD	Vial 80	1	Sample	10	1.25081e5	7.109	2.93042
#*	1927220007		Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1927220008		Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1927220001	RE	Vial 86	1	Sample	13	0.00000	0.000	0.00000
#*	1927220002	RE	Vial 87	1	Sample	14	0.00000	0.000	0.00000
#*	676593	CCV@25	Vial 71	1	Control	15	1.16163e6	7.635	24.36237
#*	1927568001	1K	Vial 83	1	Sample	16	7.34459e5	7.710	1.48902e4
#*	1927591001		Vial 84	1	Sample	17	0.00000	0.000	0.00000
#*	1927596001		Vial 85	1	Sample	18	0.00000	0.000	0.00000
#*	676594	CCV@25	Vial 71	1	Control	19	1.23687e6	7.622	25.30819

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
#*	676588	CCV@25	Vial 71	1	Control	1	2.11020e5	7.618	5.00000
#*	676592	QC@3.0	Vial 72	1	Control	2	2.38378e5	7.665	5.00000
#*	676590	ICS@3.0	Vial 73	1	Control	3	2.01376e5	7.487	5.00000
#*	676591	LMB	Vial 74	1	Control	4	2.07694e5	7.734	5.00000
#*	1927220001		Vial 75	1	Sample	5	4.33588e5	7.953	5.00000
#*	1927220002		Vial 76	1	Sample	6	4.80845e5	7.953	5.00000
#*	1927220003		Vial 77	1	Sample	7	1.29768e5	7.177	5.00000
#*	1927220004		Vial 78	1	Sample	8	1.55844e5	7.141	5.00000
#*	1927220005	MS	Vial 79	1	Sample	9	1.56479e5	7.113	5.00000
#*	1927220006	MSD	Vial 80	1	Sample	10	1.57002e5	7.138	5.00000
#*	1927220007		Vial 81	1	Sample	11	1.53526e5	7.105	5.00000
#*	1927220008		Vial 82	1	Sample	12	1.25991e5	7.173	5.00000
#*	1927220001	RE	Vial 86	1	Sample	13	2.84559e5	7.943	5.00000
#*	1927220002	RE	Vial 87	1	Sample	14	2.52777e5	7.981	5.00000
#*	676593	CCV@25	Vial 71	1	Control	15	1.63352e5	7.642	5.00000
#*	1927568001	1K	Vial 83	1	Sample	16	1.75719e5	7.734	5000.00000
#*	1927591001		Vial 84	1	Sample	17	1.54254e5	7.342	5.00000
#*	1927596001		Vial 85	1	Sample	18	1.53002e5	7.317	5.00000
#*	676594	CCV@25	Vial 71	1	Control	19	1.66780e5	7.660	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
#*	676588	CCV@25	Vial 71	1	Control	1	4.70692e5	7.614	24.99478
#*	676592	QC@3.0	Vial 72	1	Control	2	6.47386e4	7.668	3.18858
#*	676590	ICS@3.0	Vial 73	1	Control	3	5.51383e4	7.474	3.21571
#*	676591	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1927220001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
#*	1927220002		Vial 76	1	Sample	6	0.00000	0.000	0.00000
#*	1927220003		Vial 77	1	Sample	7	0.00000	0.000	0.00000
#*	1927220004		Vial 78	1	Sample	8	0.00000	0.000	0.00000
#*	1927220005	MS	Vial 79	1	Sample	9	4.29875e4	7.108	3.22679
#*	1927220006	MSD	Vial 80	1	Sample	10	4.26524e4	7.129	3.18966

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	1927220007	Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1927220008	Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1927220001 RE	Vial 86	1	Sample	13	0.00000	0.000	0.00000
#*	1927220002 RE	Vial 87	1	Sample	14	0.00000	0.000	0.00000
#*	676593 CCV@25	Vial 71	1	Control	15	3.50571e5	7.646	24.12639
#*	1927568001 1K	Vial 83	1	Sample	16	2.20256e5	7.727	1.45858e4
#*	1927591001	Vial 84	1	Sample	17	0.00000	0.000	0.00000
#*	1927596001	Vial 85	1	Sample	18	0.00000	0.000	0.00000
#*	676594 CCV@25	Vial 71	1	Control	19	3.71181e5	7.641	24.94374

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

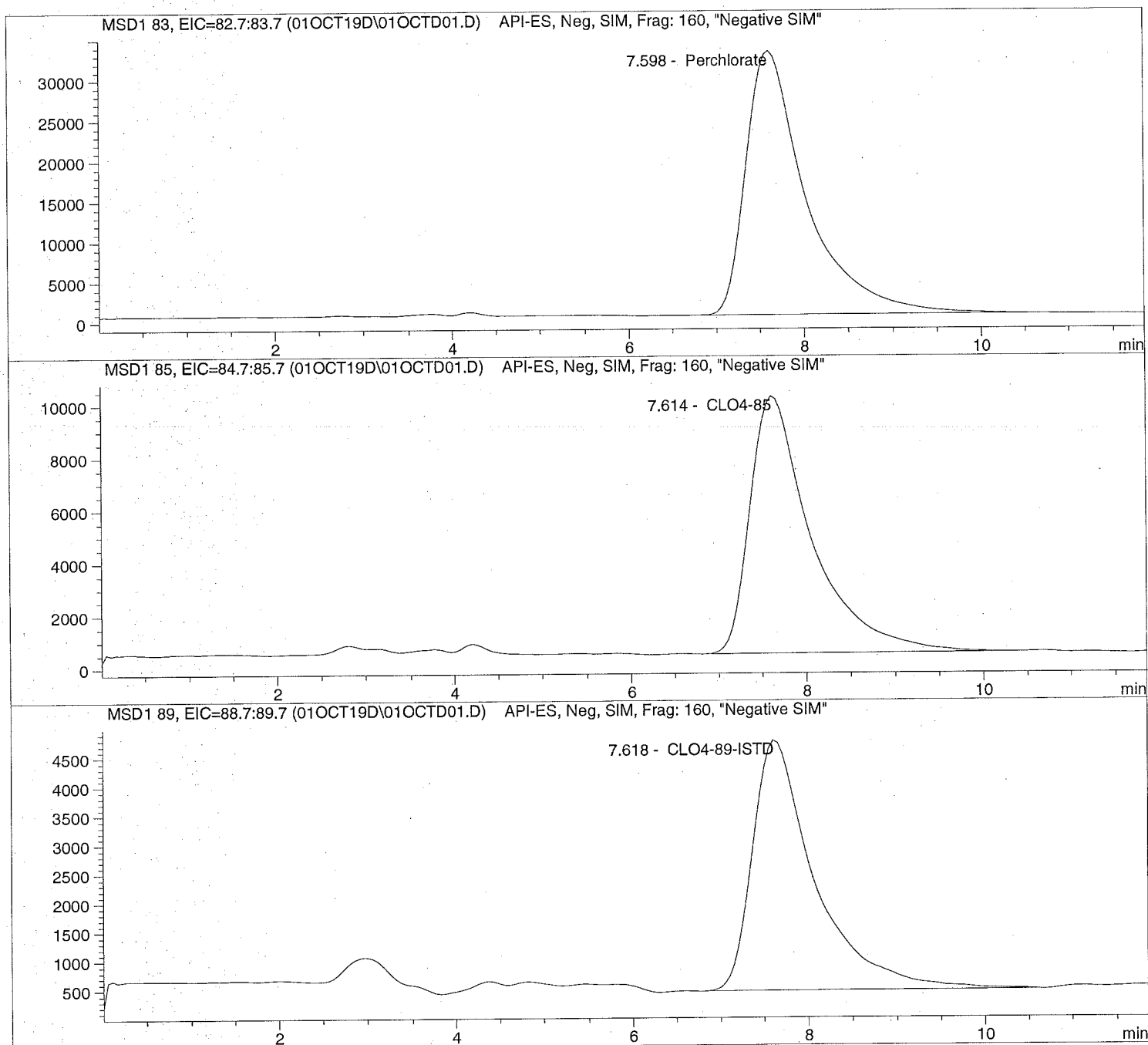
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	==	=====	=====	=====
1	Vial 71	676588	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	676592	QC@3.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	676590	ICS@3.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	676591	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1927220001		CLO4-AQN	1	Sample	
6	Vial 76	1927220002		CLO4-AQN	1	Sample	
7	Vial 77	1927220003		CLO4-AQN	1	Sample	
8	Vial 78	1927220004		CLO4-AQN	1	Sample	
9	Vial 79	1927220005	MS	CLO4-AQN	1	Sample	
10	Vial 80	1927220006	MSD	CLO4-AQN	1	Sample	
11	Vial 81	1927220007		CLO4-AQN	1	Sample	
12	Vial 82	1927220008		CLO4-AQN	1	Sample	
13	Vial 86	1927220001	RE	CLO4-AQN	1	Sample	
14	Vial 87	1927220002	RE	CLO4-AQN	1	Sample	
15	Vial 71	676593	CCV@25	CLO4-AQN	1	Ctrl Samp	
16	Vial 83	1927568001	1K	CLO4-AQN	1	Sample	
17	Vial 84	1927591001		CLO4-AQN	1	Sample	
18	Vial 85	1927596001		CLO4-AQN	1	Sample	
19	Vial 71	676594	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD01.D Sample Name: 676588 CCV@25

=====
Injection Date: 10/01/2019 10:42:23 Seq Line: 1
Sample Name: 676588 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD01.D Sample Name: 676588 CCV@25

```

=====
Injection Date: 10/01/2019 10:42:23      Seq Line: 1
Sample Name: 676588      CCV@25      Location: Vial 71
Acq Operator: TNB      Inj. No.: 1
Inj. Vol.: 30 µl
  
```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58
  
```

Perchlorate analysis

Sample Information

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.598	BB S	1545248.1	25.0192	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.614	BB S	470692.3	24.9948	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.618	PB S	211020.1	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD02.D

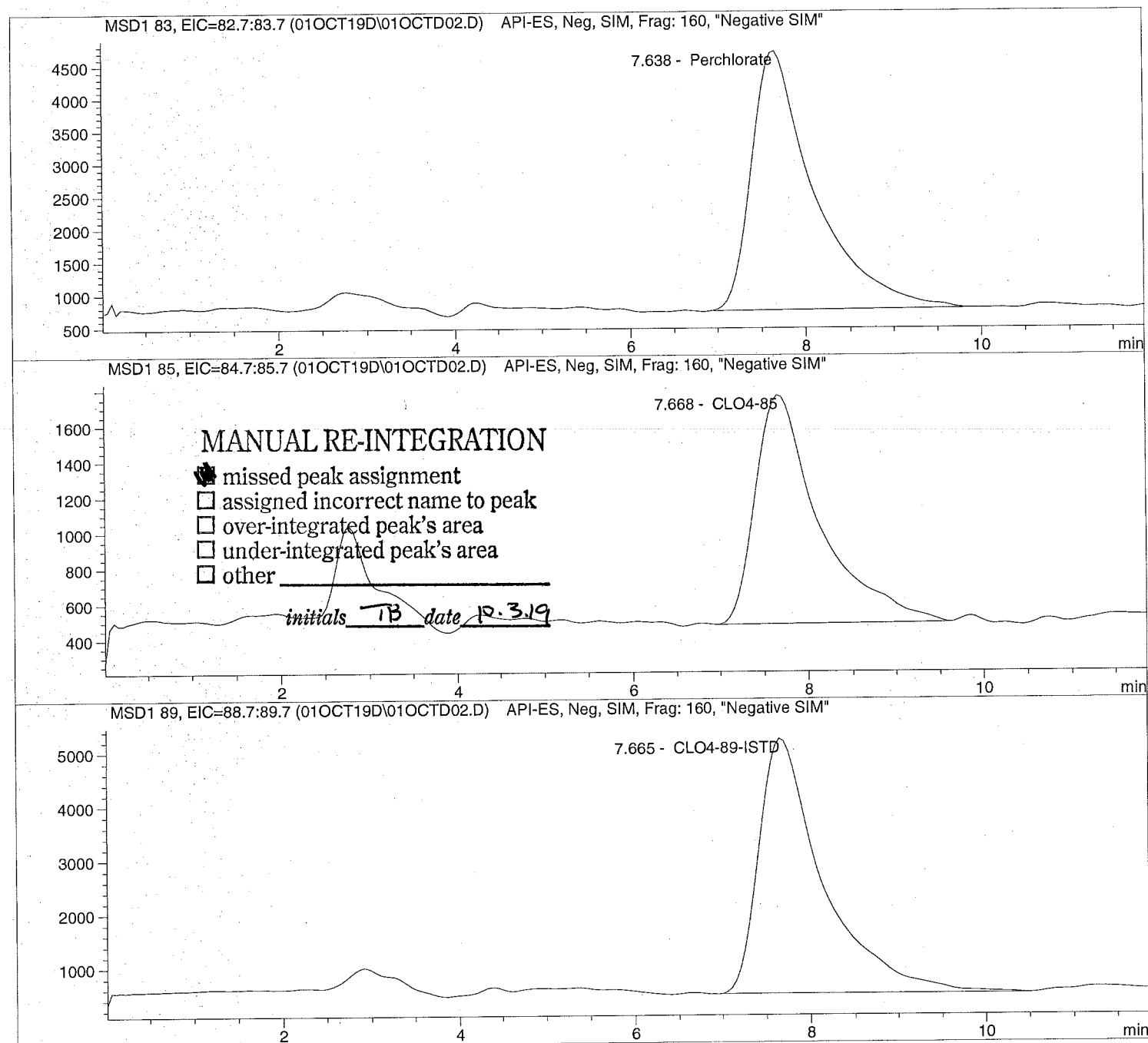
Sample Name: 676592 QC@3.0

Injection Date: 10/01/2019 10:56:09
Sample Name: 676592 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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD02.D Sample Name: 676592 QC@3.0

Injection Date: 10/01/2019 10:56:09 Seq Line: 2
 Sample Name: 676592 QC@3.0 Location: Vial 72
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By: Signal
 Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
 Multiplier: 1.000000
 Dilution: 1.000000
 Sample Amount: 3.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.638	BB S	195089.7	3.0114	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.668	MM	64738.6	3.1886	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.665	PB S	238378.3	5.0000	CLO4-89-ISTD

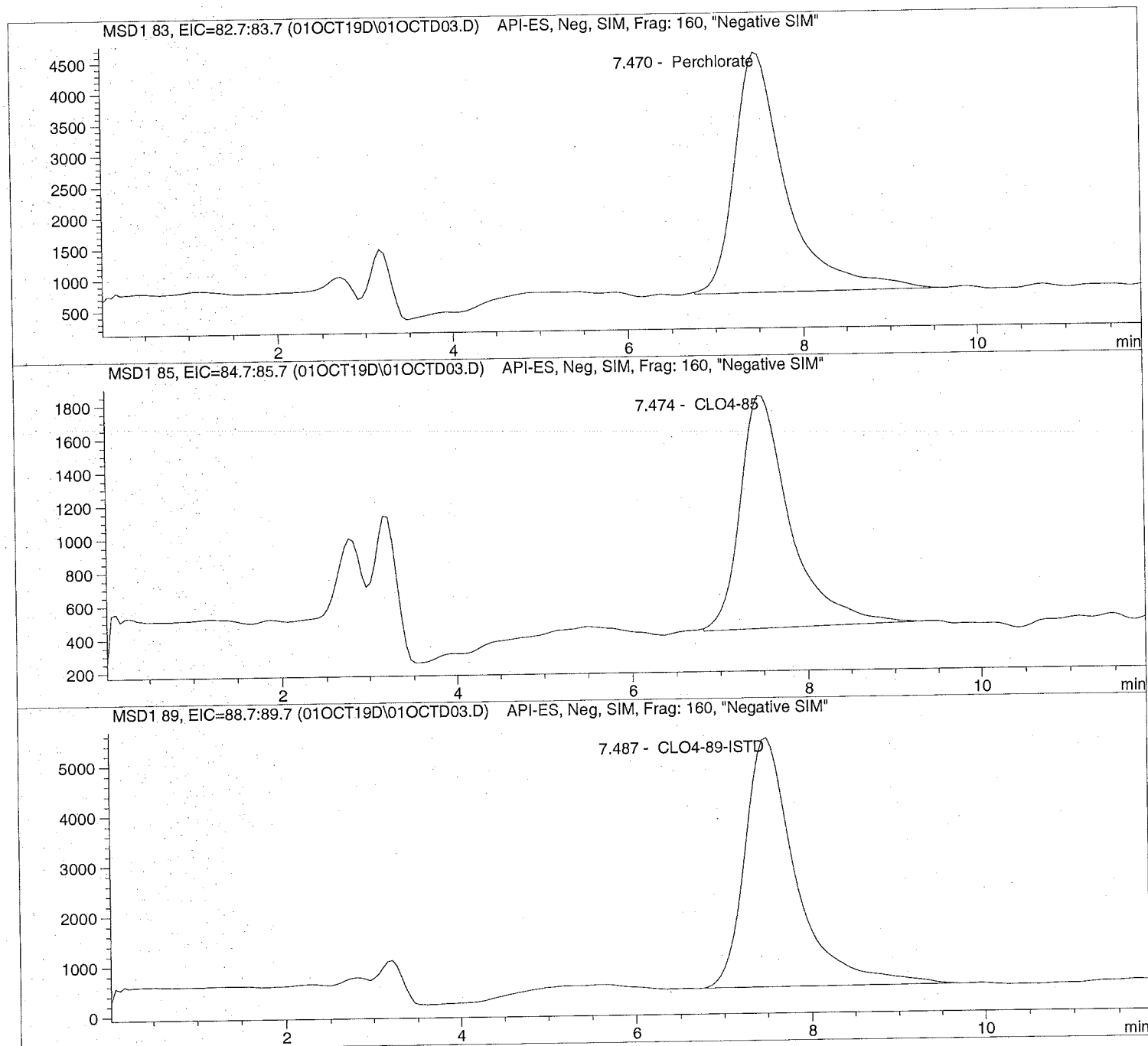
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD03.D Sample Name: 676590 ICS@3.0

=====
Injection Date: 10/01/2019 11:09:58 Seq Line: 3
Sample Name: 676590 ICS@3.0 Location: Vial 73
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD03.D Sample Name: 676590 ICS@3.0

```

=====
Injection Date: 10/01/2019 11:09:58      Seq Line: 3
Sample Name: 676590 ICS@3.0              Location: Vial 73
Acq Operator: TNB                          Inj. No.: 1
                                           Inj. Vol.: 30 µl
  
```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58
  
```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 3.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.470	BB S	158401.3	2.8928	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.474	BB S	55138.3	3.2157	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.487	PB S	201376.3	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD04.D

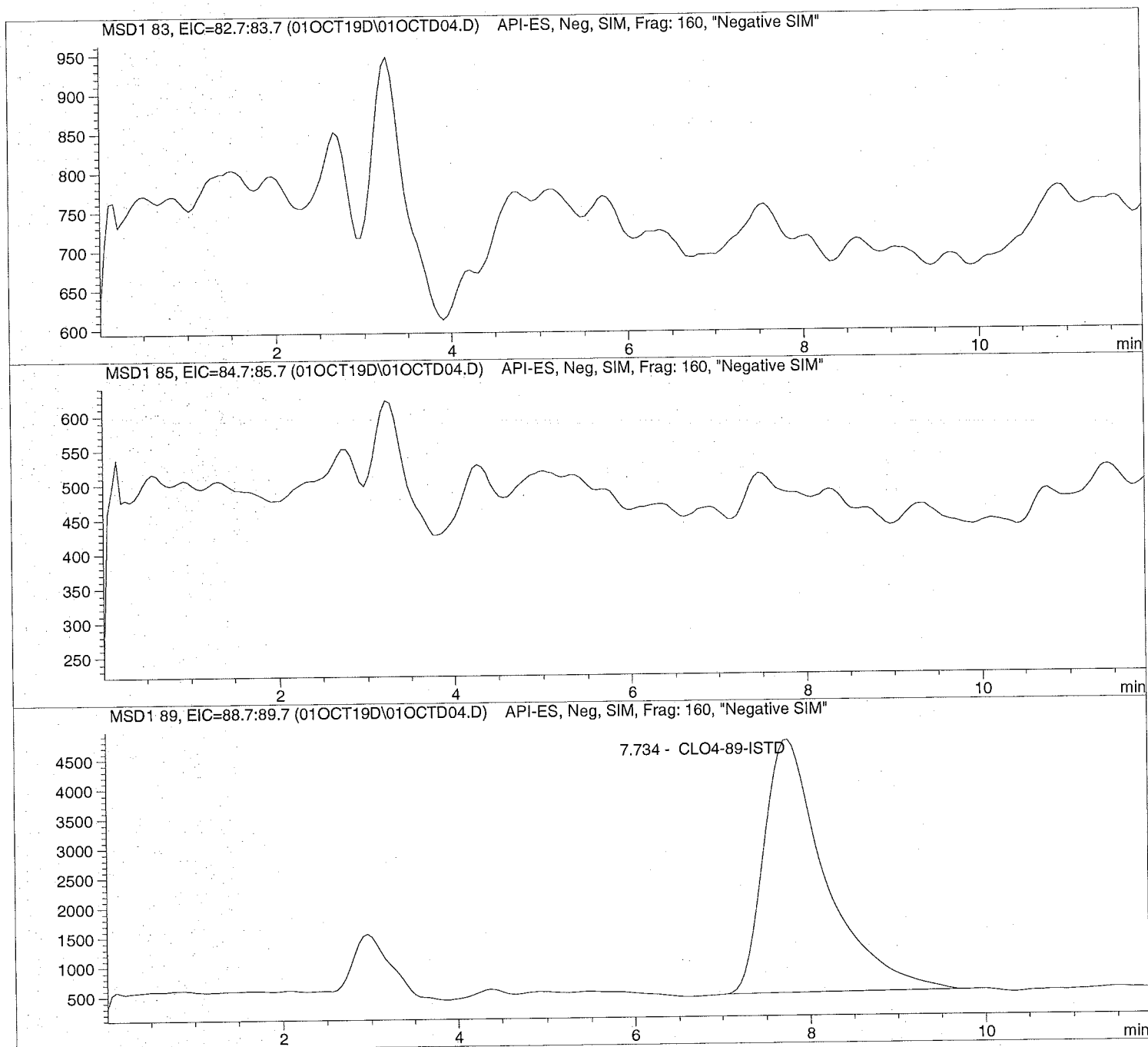
Sample Name: 676591 LMB

Injection Date: 10/01/2019 11:23:50
Sample Name: 676591 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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD04.D Sample Name: 676591 LMB

Injection Date: 10/01/2019 11:23:50 Seq Line: 4
 Sample Name: 676591 LMB Location: Vial 74
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By: Signal
 Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
 Multiplier: 1.000000
 Dilution: 1.000000
 Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.734	PB S	207693.8	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD05.D

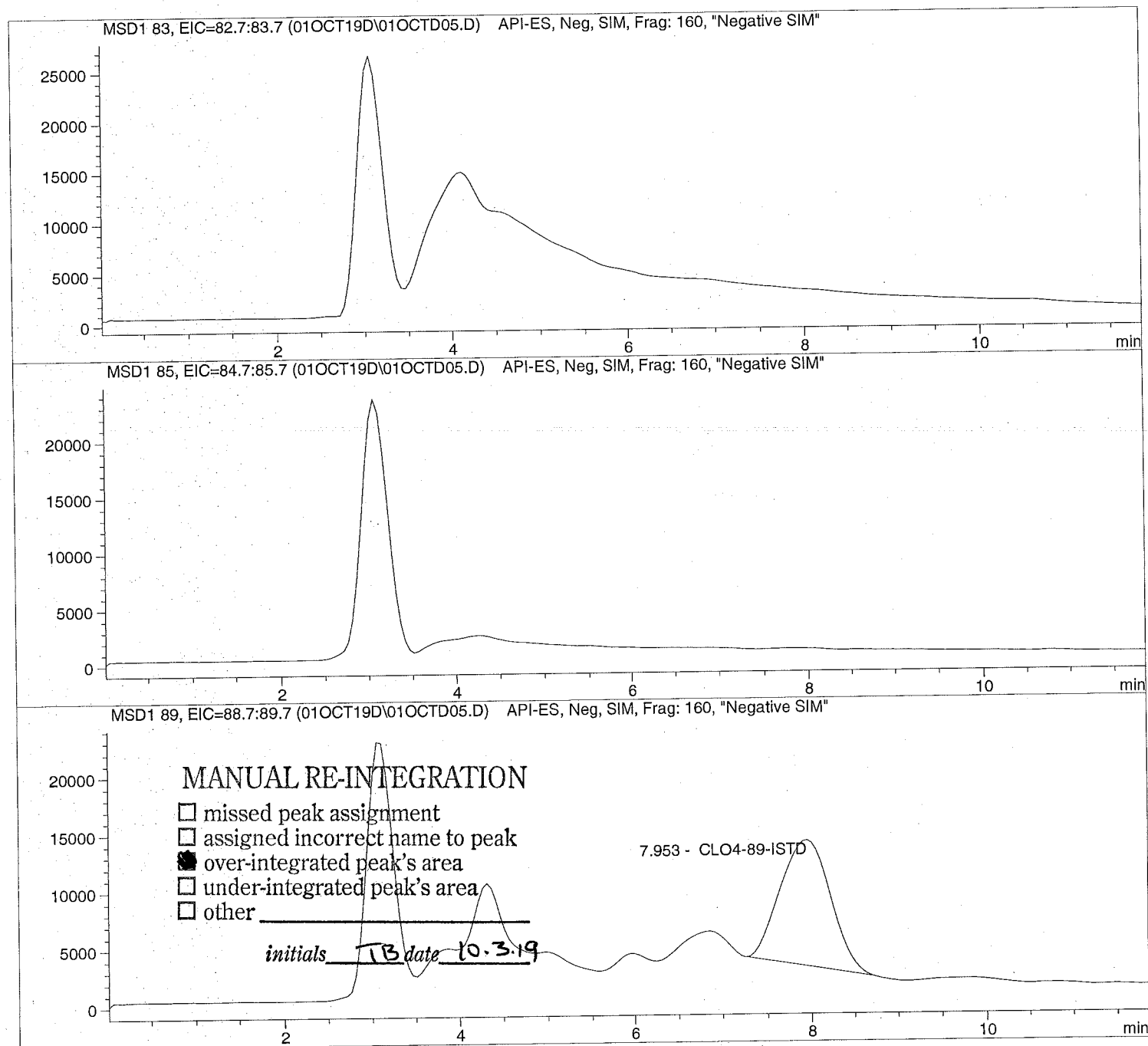
Sample Name: 1927220001

Injection Date: 10/01/2019 11:37:35
 Sample Name: 1927220001
 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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD05.D Sample Name: 1927220001

=====
 Injection Date: 10/01/2019 11:37:35 Seq Line: 5
 Sample Name: 1927220001 Location: Vial 75
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

=====
 Sample Information
 =====

Sorted By: Signal
 Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
 Multiplier: 1.000000
 Dilution: 1.000000
 Sample Amount: 0.000

=====
 LCMS Results
 =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.953	MM	433588.3	5.0000	CLO4-89-ISTD

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

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD06.D

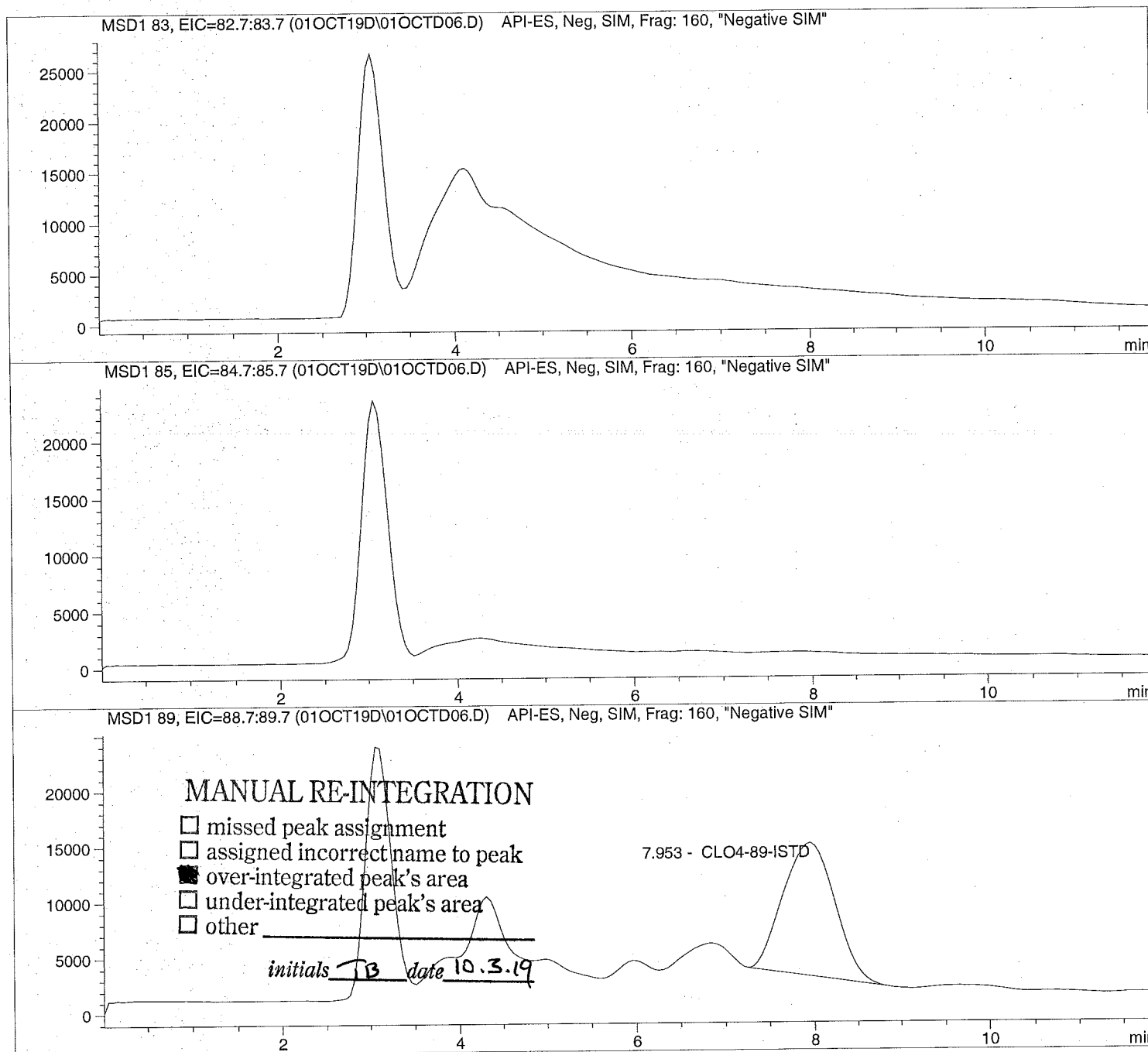
Sample Name: 1927220002

Injection Date: 10/01/2019 11:51:24
 Sample Name: 1927220002
 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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD06.D

Sample Name: 1927220002

```

=====
Injection Date: 10/01/2019 11:51:24      Seq Line:          6
Sample Name:    1927220002                Location:         Vial 76
Acq Operator:   TNB                       Inj. No.:        1
                                           Inj. Vol.:      30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.953	MM	480844.6	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD07.D

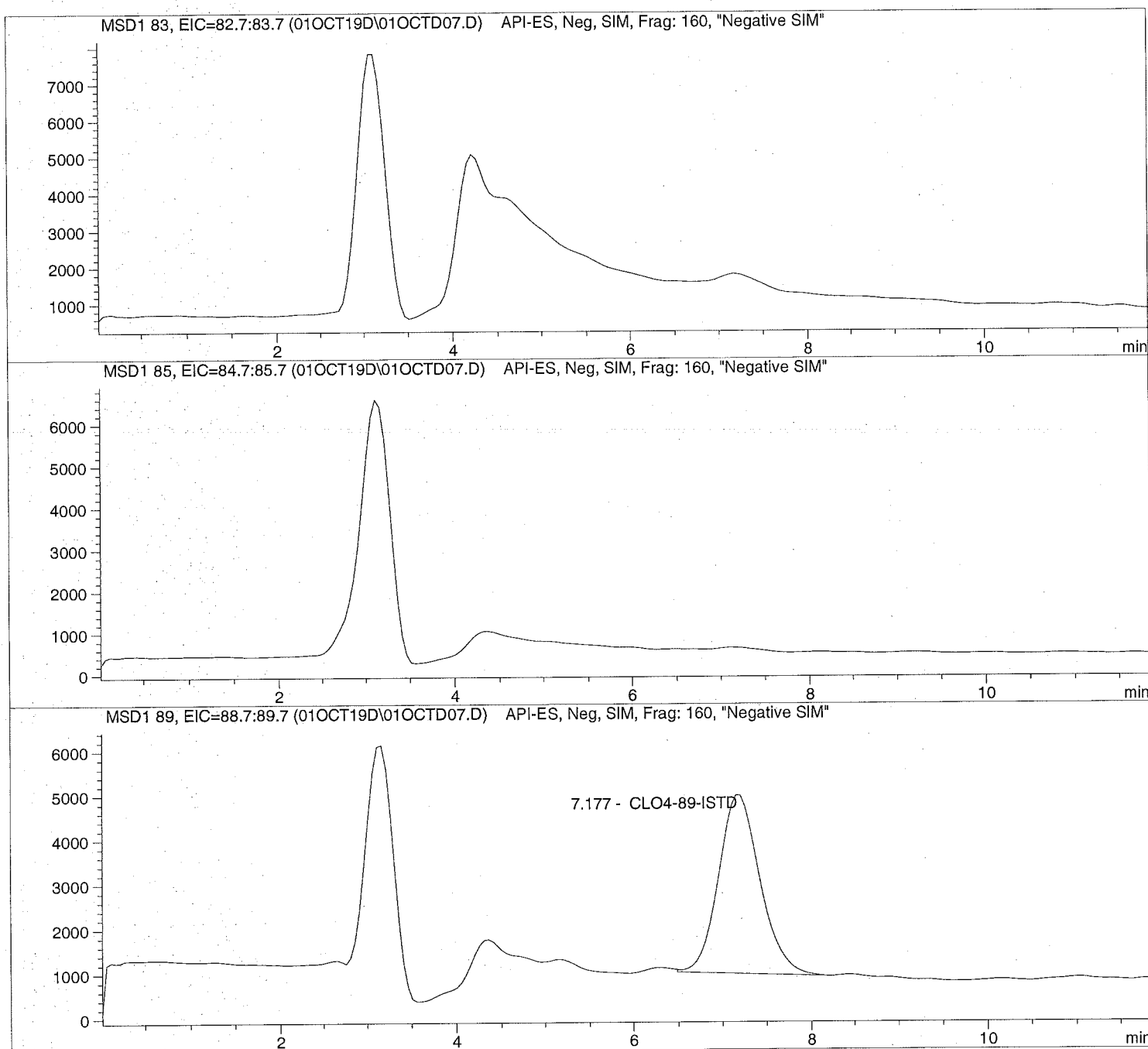
Sample Name: 1927220003

Injection Date: 10/01/2019 12:05:17
Sample Name: 1927220003
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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD07.D

Sample Name: 1927220003

```

=====
Injection Date: 10/01/2019 12:05:17      Seq Line: 7
Sample Name: 1927220003                  Location: Vial 77
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.177	BBA	129768.3	5.0000	CLO4-89-ISTD

```

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

```


Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD08.D

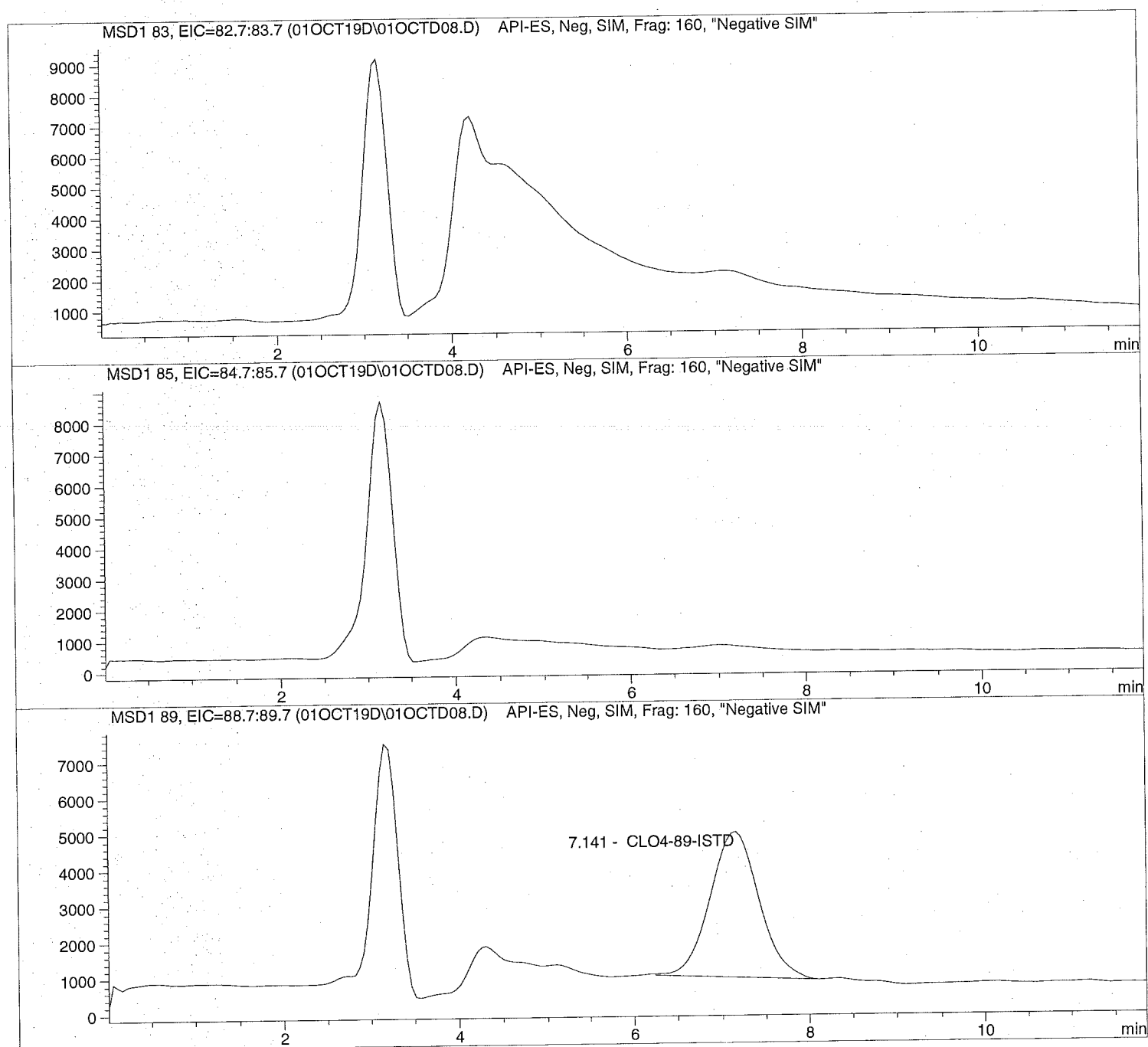
Sample Name: 1927220004

Injection Date: 10/01/2019 12:19:05
Sample Name: 1927220004
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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD08.D Sample Name: 1927220004

```

=====
Injection Date: 10/01/2019 12:19:05      Seq Line:      8
Sample Name:   1927220004                Location:     Vial 78
Acq Operator:  TNB                       Inj. No.:    1
                                           Inj. Vol.:   30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  10/2/2019 08:05:58
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.141	BBA	155843.6	5.0000	CLO4-89-ISTD

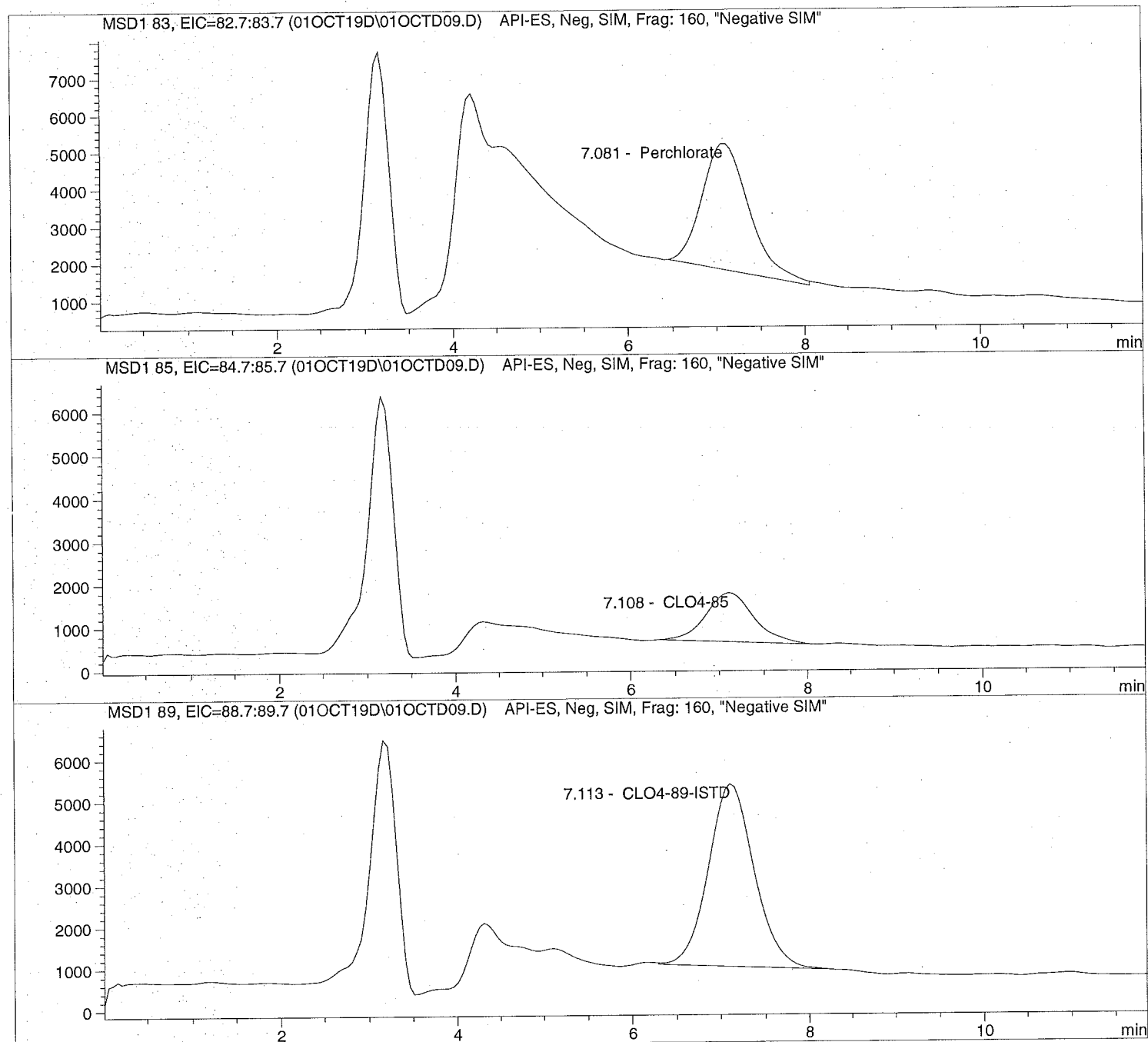
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD09.D Sample Name: 1927220005 MS

=====
Injection Date: 10/01/2019 12:32:51 Seq Line: 9
Sample Name: 1927220005 MS Location: Vial 79
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD09.D Sample Name: 1927220005 MS

```
=====
Injection Date: 10/01/2019 12:32:51      Seq Line:          9
Sample Name:    1927220005 MS             Location:         Vial 79
Acq Operator:   TNB                       Inj. No.:        1
                                           Inj. Vol.:       30 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
=====
```

Perchlorate analysis

Sample Information

```
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.081	PBA	124857.0	2.9350	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.108	PBA	42987.5	3.2268	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.113	BBA	156479.1	5.0000	CLO4-89-ISTD

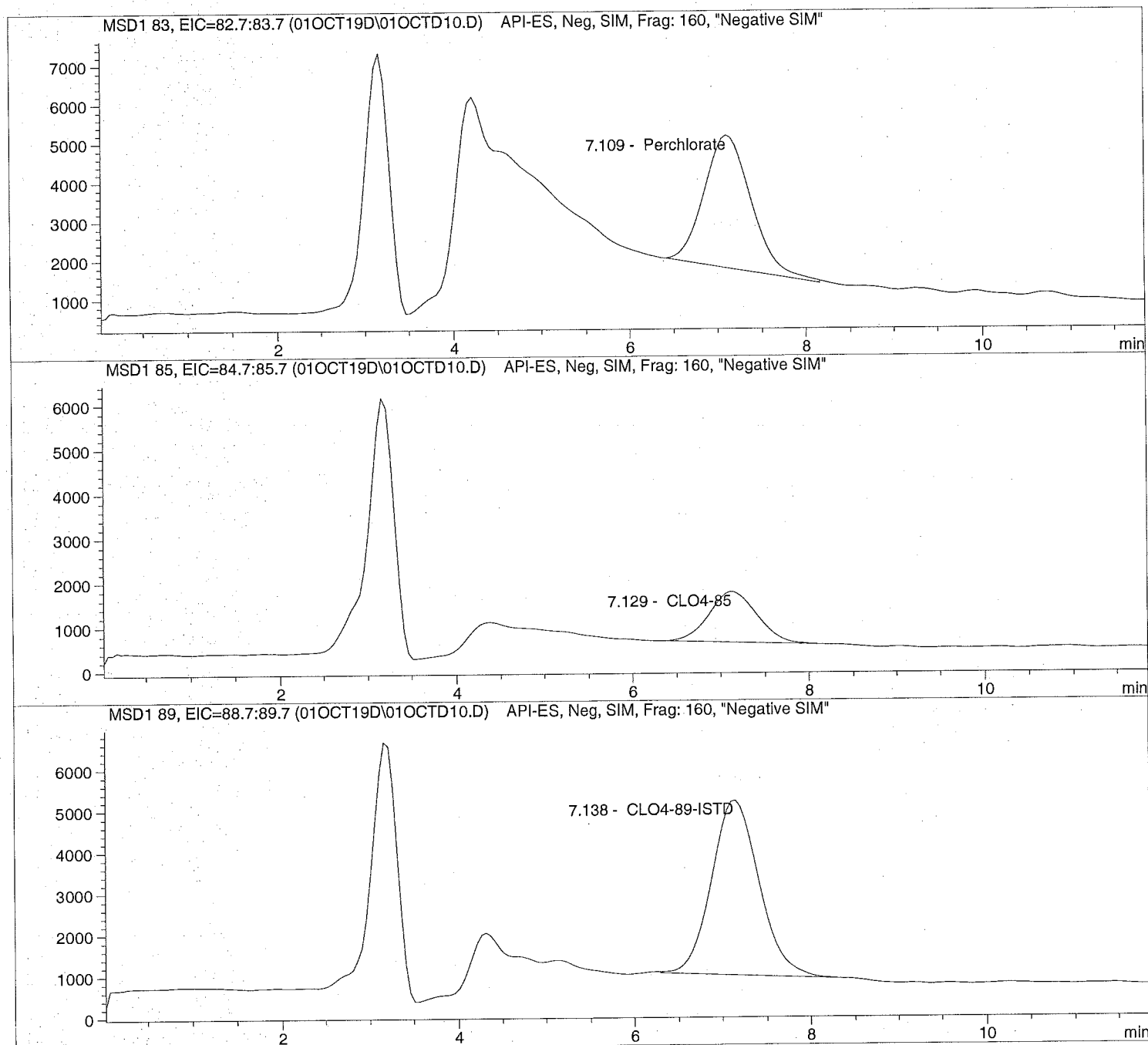
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD10.D Sample Name: 1927220006 MSD

=====
Injection Date: 10/01/2019 12:46:41 Seq Line: 10
Sample Name: 1927220006 MSD Location: Vial 80
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD11.D

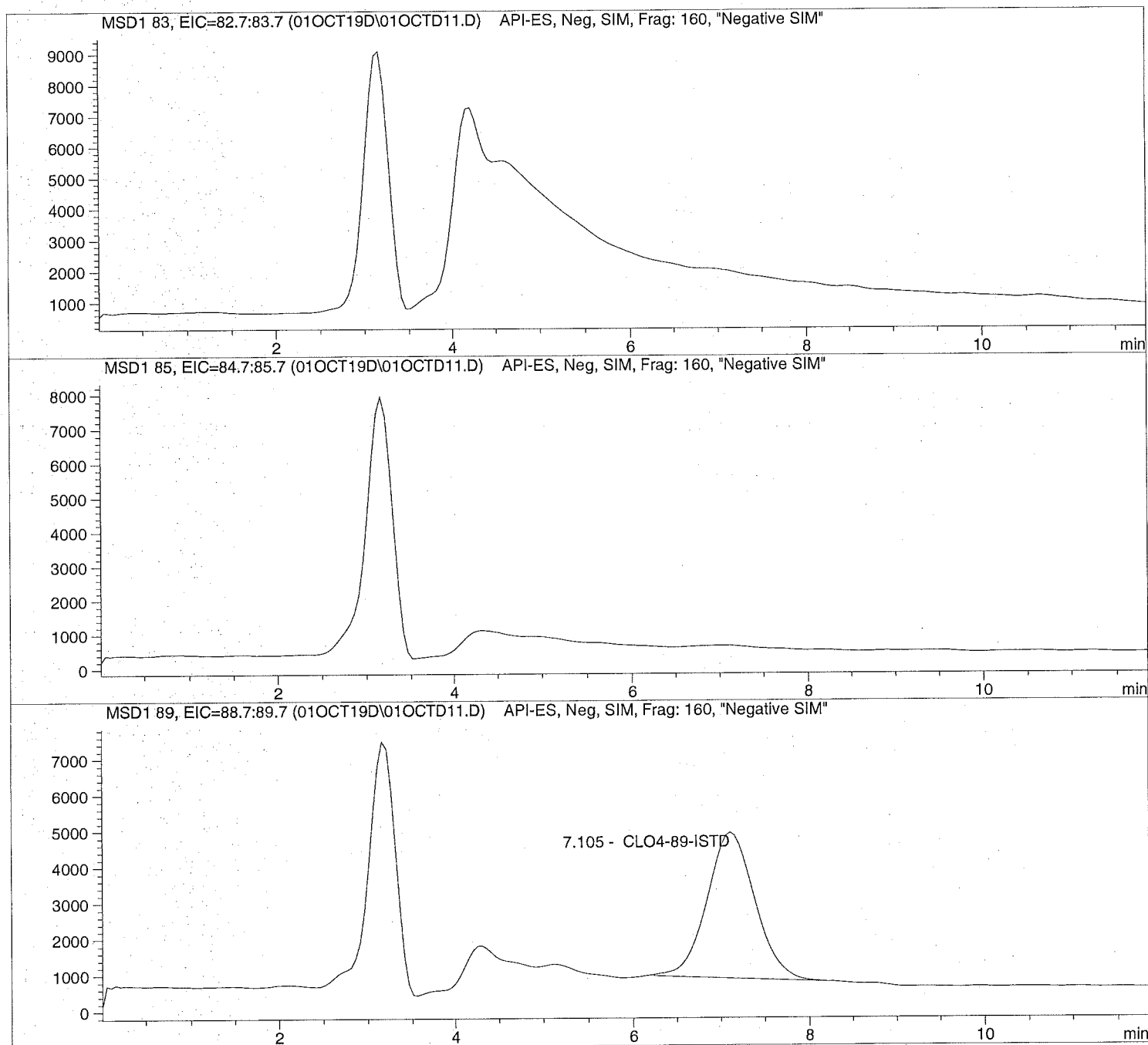
Sample Name: 1927220007

Injection Date: 10/01/2019 13:00:30
Sample Name: 1927220007
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
Inj. No.: 1
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD11.D Sample Name: 1927220007

```

=====
Injection Date: 10/01/2019 13:00:30      Seq Line: 11
Sample Name: 1927220007                  Location: Vial 81
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019, 00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.105	BBA	153526.1	5.0000	CLO4-89-ISTD

```

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

```


Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD12.D

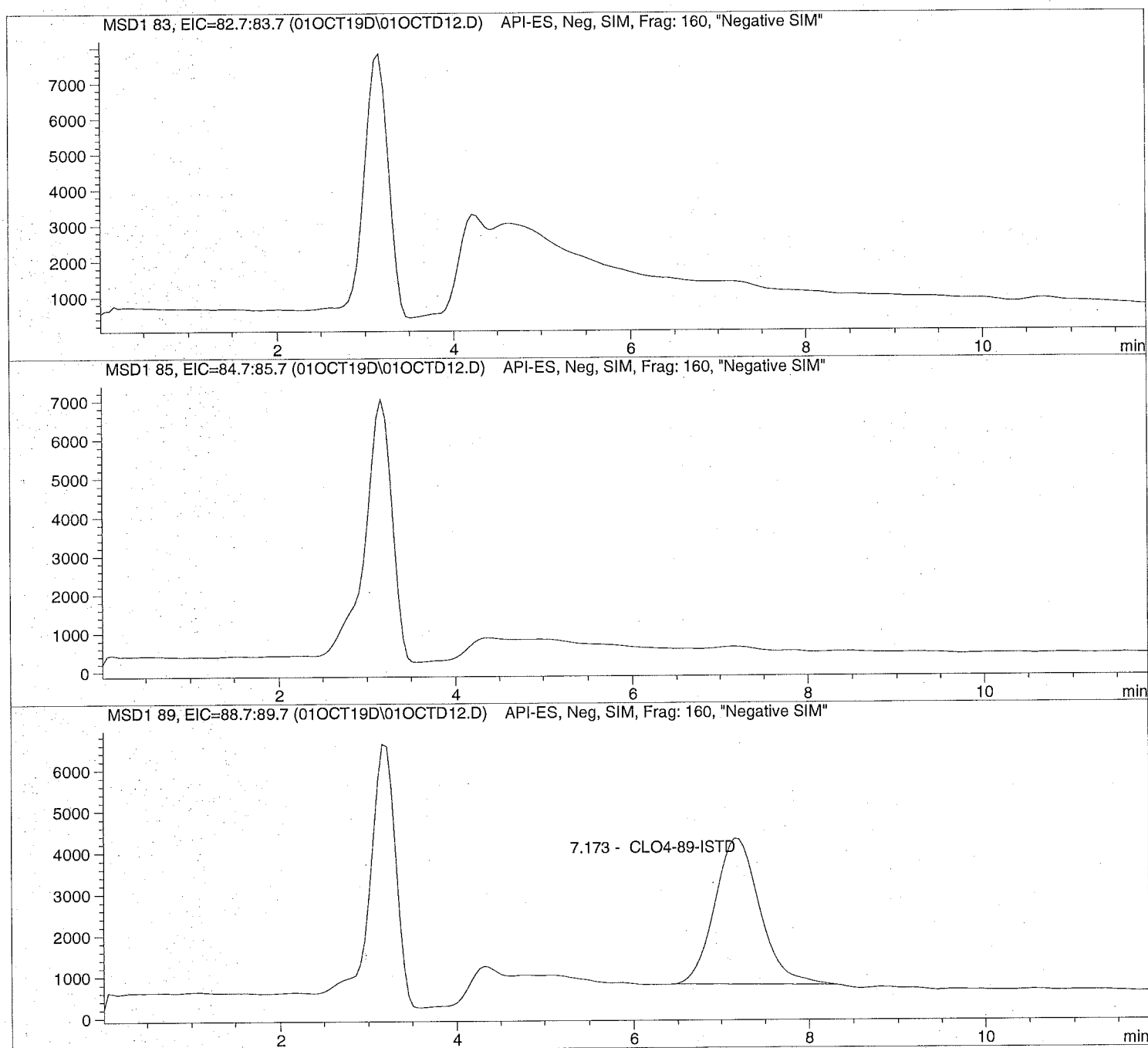
Sample Name: 1927220008

Injection Date: 10/01/2019 13:14:17
Sample Name: 1927220008
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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD12.D Sample Name: 1927220008

```

=====
Injection Date: 10/01/2019 13:14:17      Seq Line:          12
Sample Name:    1927220008                Location:          Vial 82
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:        30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.173	PBA	125991.0	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD13.D

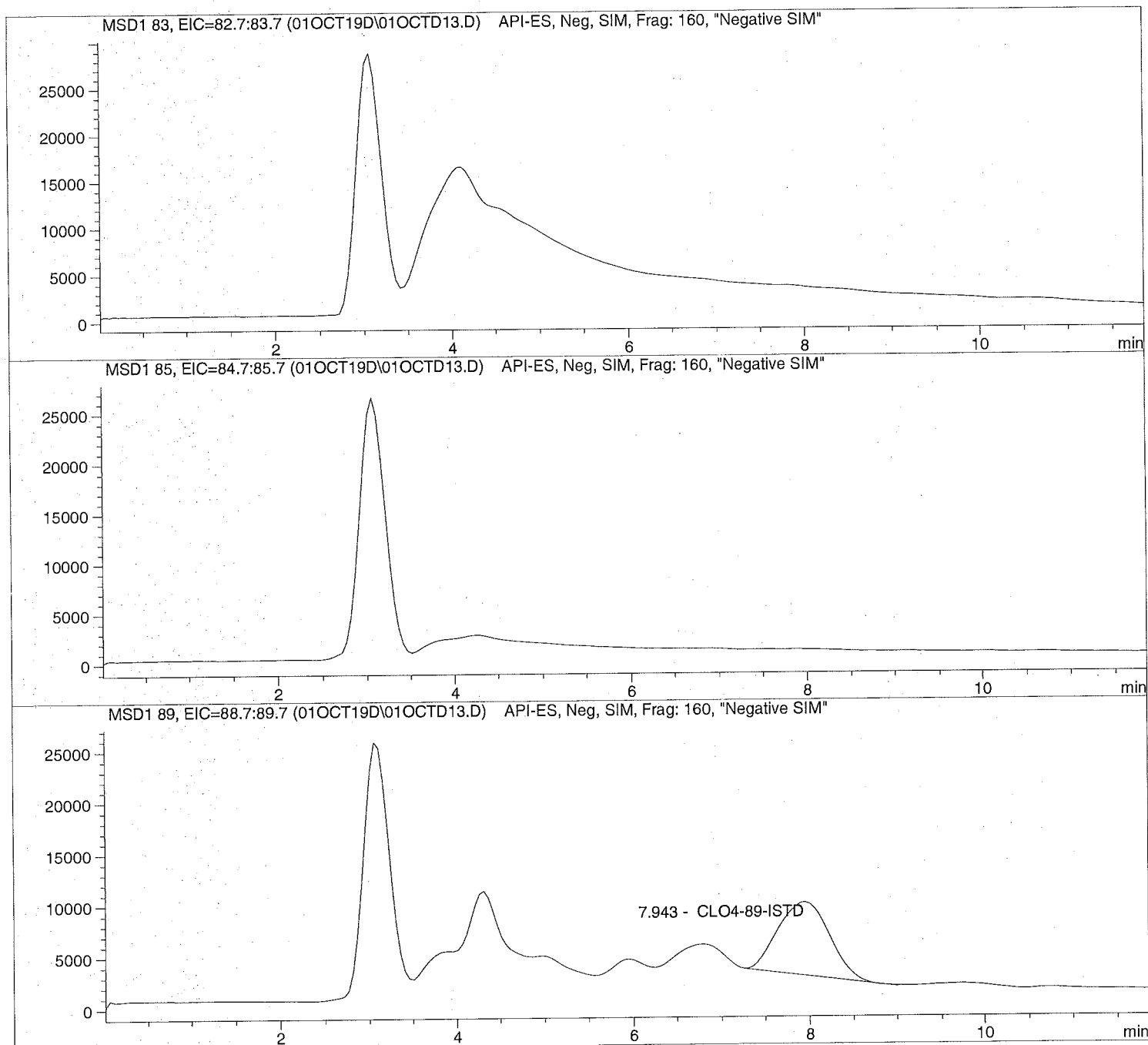
Sample Name: 1927220001 RE

Injection Date: 10/01/2019 13:49:07
Sample Name: 1927220001 RE
Acq Operator: TNB

Seq Line: 13
Location: Vial 86
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD13.D Sample Name: 1927220001 RE

=====
 Injection Date: 10/01/2019 13:49:07 Seq Line: 13
 Sample Name: 1927220001 RE Location: Vial 86
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

=====
 Sample Information
 =====

Sorted By: Signal
 Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
 Multiplier: 1.000000
 Dilution: 1.000000
 Sample Amount: 0.000

=====
 LCMS Results
 =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.943	VBA	284558.6	5.0000	CLO4-89-ISTD

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

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD14.D

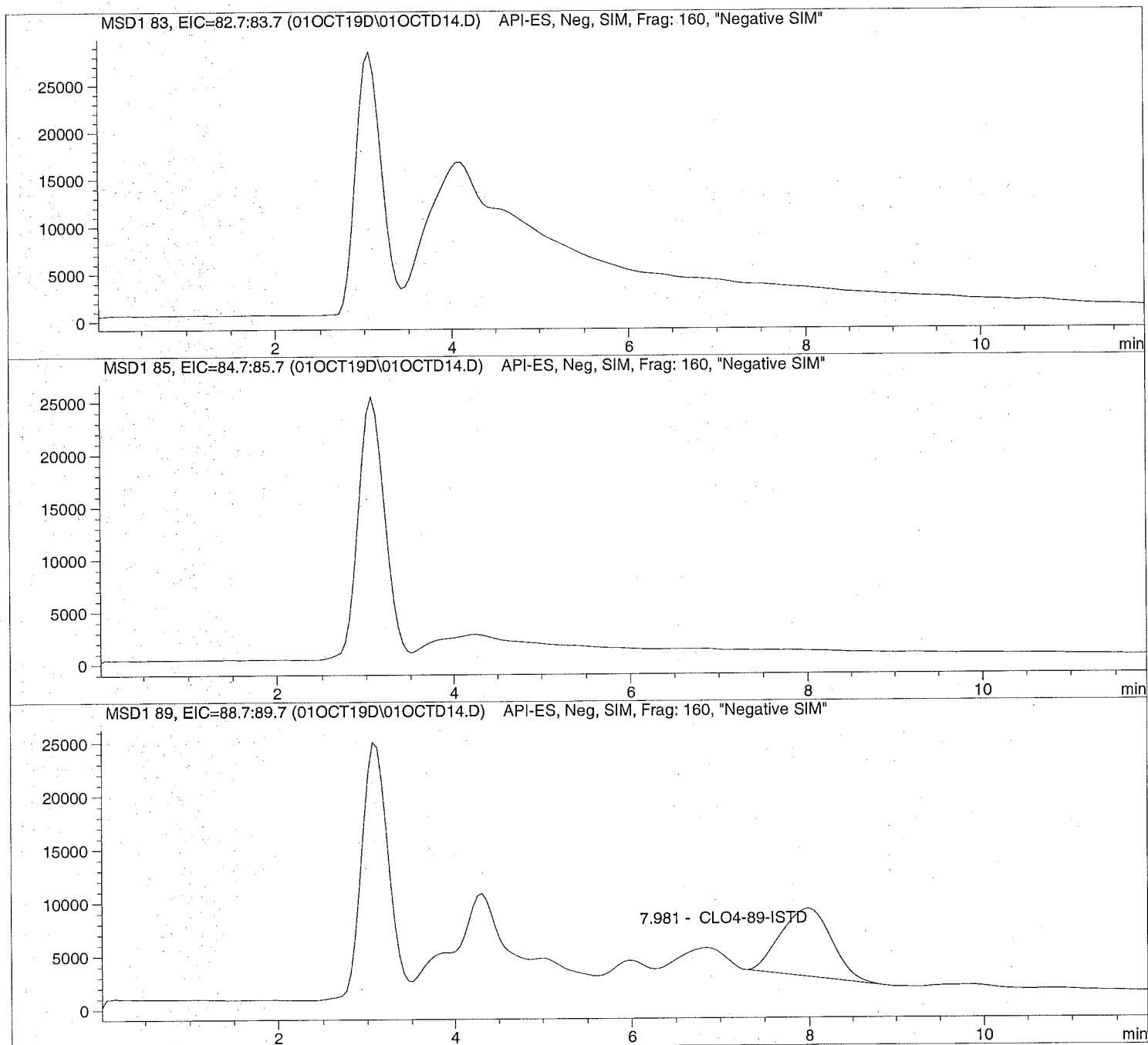
Sample Name: 1927220002 RE

Injection Date: 10/01/2019 14:09:00
Sample Name: 1927220002 RE
Acq Operator: TNB

Seq Line: 14
Location: Vial 87
Inj. No.: 1
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD14.D Sample Name: 1927220002 RE

```

=====
Injection Date: 10/01/2019 14:09:00      Seq Line: 14
Sample Name: 1927220002 RE              Location: Vial 87
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.981	VBA	252777.4	5.0000	CLO4-89-ISTD

```

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

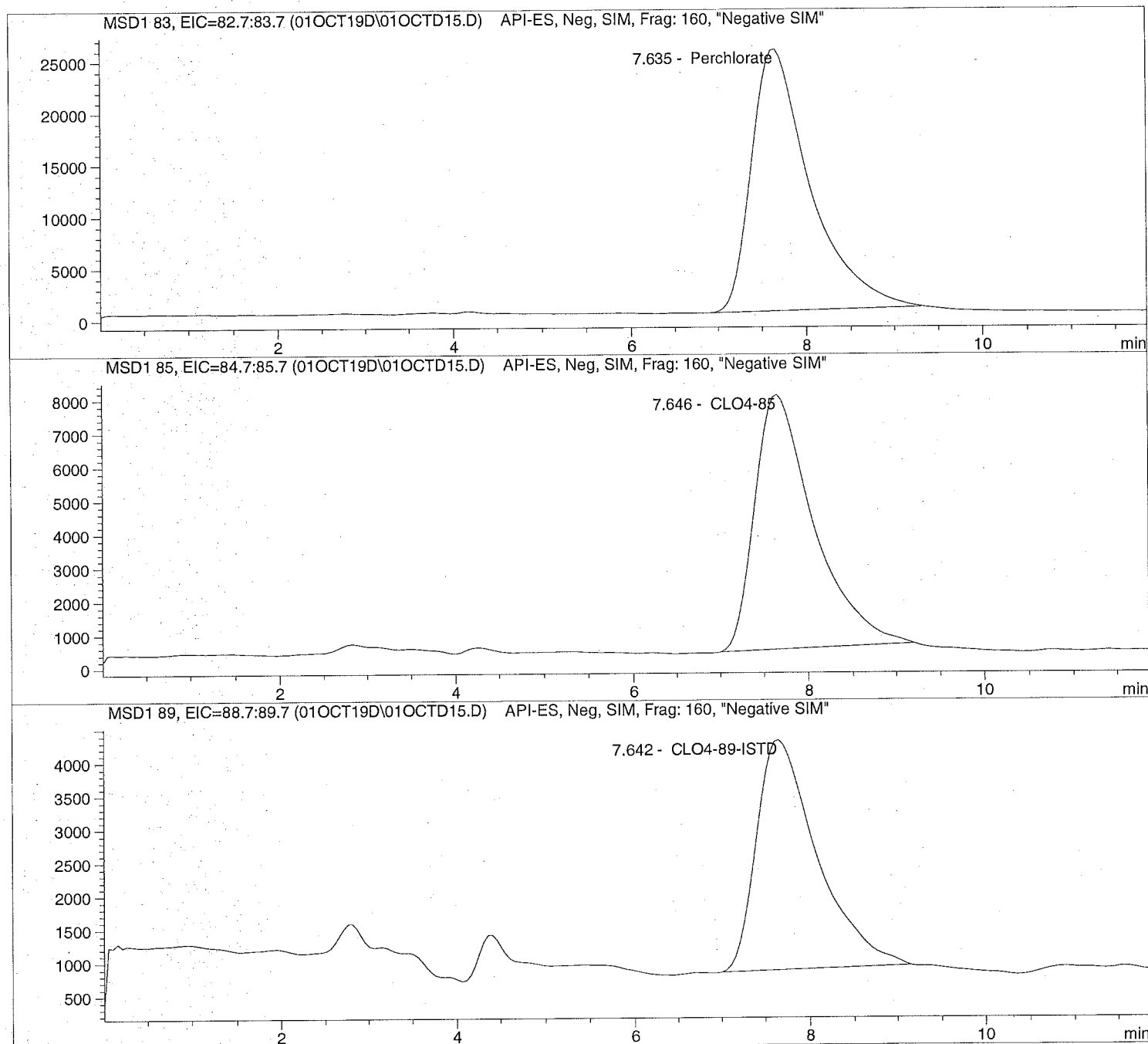
```

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD15.D Sample Name: 676593 CCV@25

=====
Injection Date: 10/01/2019 14:22:50 Seq Line: 15
Sample Name: 676593 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD15.D Sample Name: 676593 CCV@25

=====
 Injection Date: 10/01/2019 14:22:50 Seq Line: 15
 Sample Name: 676593 CCV@25 Location: Vial 71
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

=====
 Sample Information
 =====

Sorted By: Signal
 Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
 Multiplier: 1.000000
 Dilution: 1.000000
 Sample Amount: 25.000

=====
 LCMS Results
 =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.635	PBA	1161631.1	24.3624	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.646	PBA	350571.0	24.1264	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.642	PBA	163352.1	5.0000	CLO4-89-ISTD

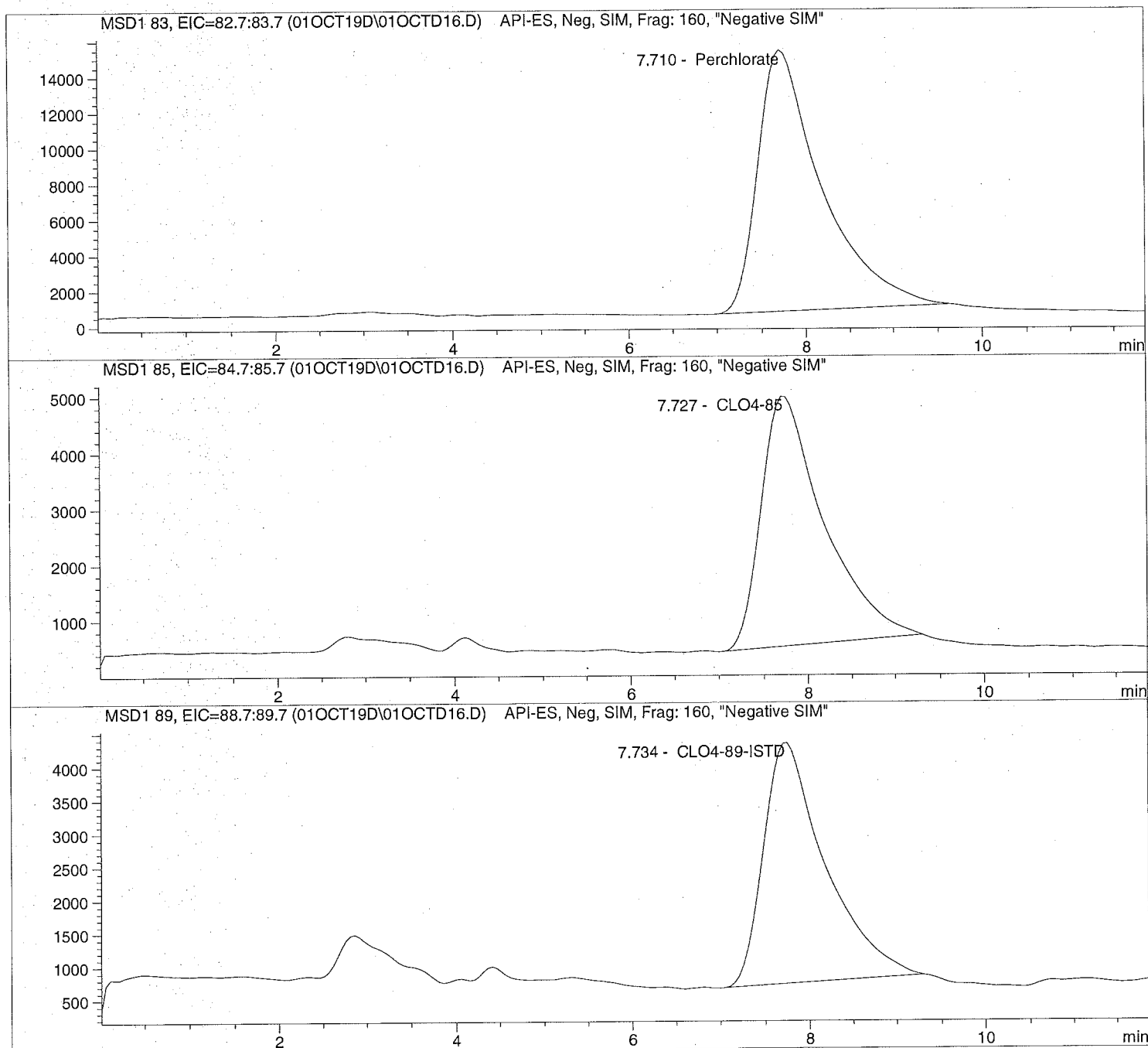
=====
 *** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD16.D Sample Name: 1927568001 1K

=====
Injection Date: 10/01/2019 14:36:36 Seq Line: 16
Sample Name: 1927568001 1K Location: Vial 83
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD16.D Sample Name: 1927568001 1K

```

=====
Injection Date: 10/01/2019 14:36:36      Seq Line:      16
Sample Name:    1927568001 1K           Location:      Vial 83
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
  
```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
  
```

Perchlorate analysis

Sample Information

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1000.000000
Sample Amount:  0.000
  
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.710	PBA	734459.3	14890.2051	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.727	PBA	220255.9	14585.8174	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.734	PBA	175719.3	5000.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD17.D

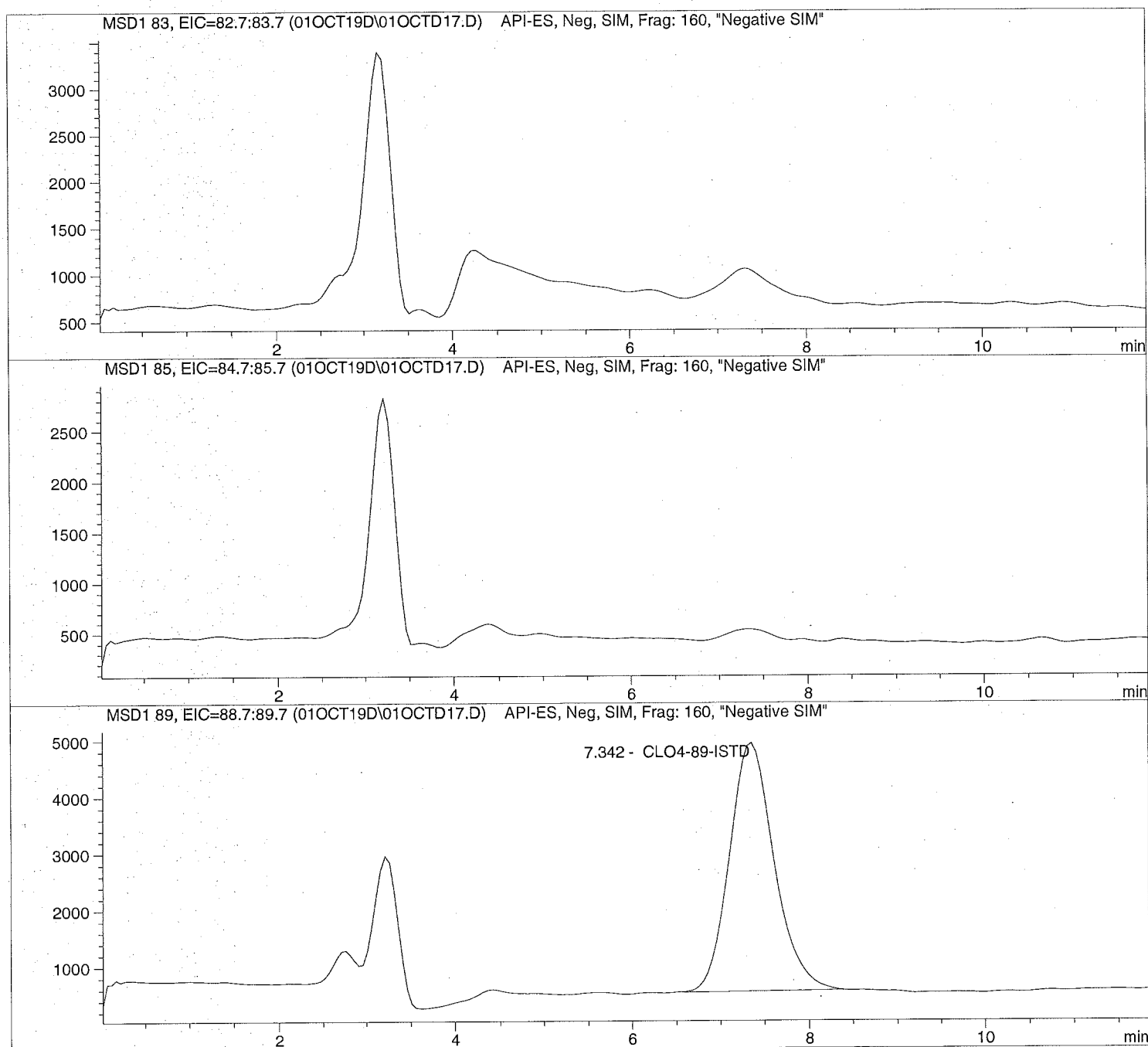
Sample Name: 1927591001

Injection Date: 10/01/2019 14:50:25
Sample Name: 1927591001
Acq Operator: TNB

Seq Line: 17
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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD17.D Sample Name: 1927591001

```

=====
Injection Date: 10/01/2019 14:50:25      Seq Line:            17
Sample Name:    1927591001                Location:            Vial 84
Acq Operator:    TNB                        Inj. No.:            1
                                          Inj. Vol.:           30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:                    Signal
Calib. Data Modified:        Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:                  1.000000
Dilution:                    1.000000
Sample Amount:                0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.342	BBA	154253.7	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD18.D

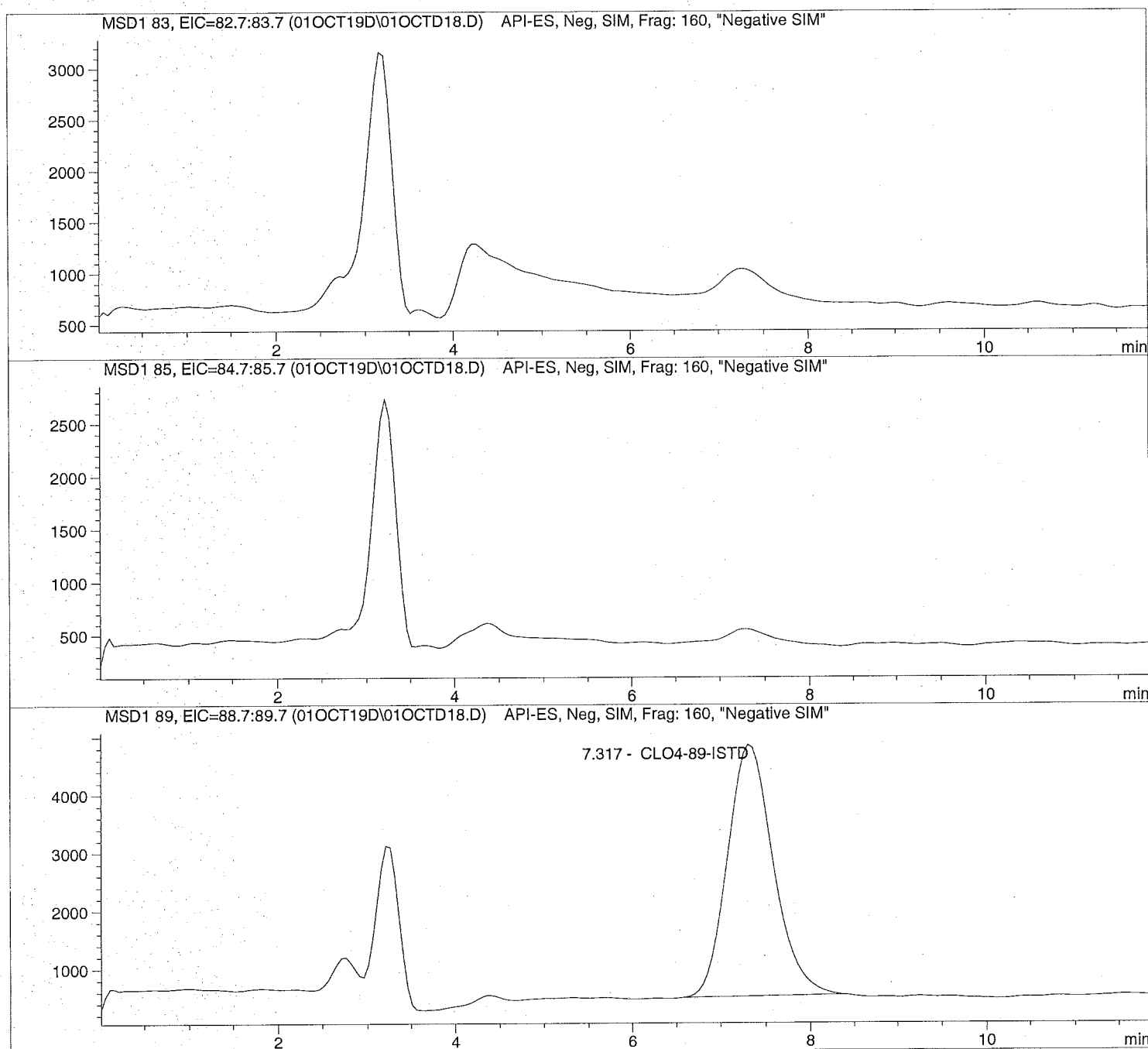
Sample Name: 1927596001

Injection Date: 10/01/2019 15:04:19
Sample Name: 1927596001
Acq Operator: TNB

Seq Line: 18
Location: Vial 85
Inj. No.: 1
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD18.D Sample Name: 1927596001

```

=====
Injection Date: 10/01/2019 15:04:19      Seq Line: 18
Sample Name: 1927596001                  Location: Vial 85
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.317	BBA	153001.9	5.0000	CLO4-89-ISTD

```

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

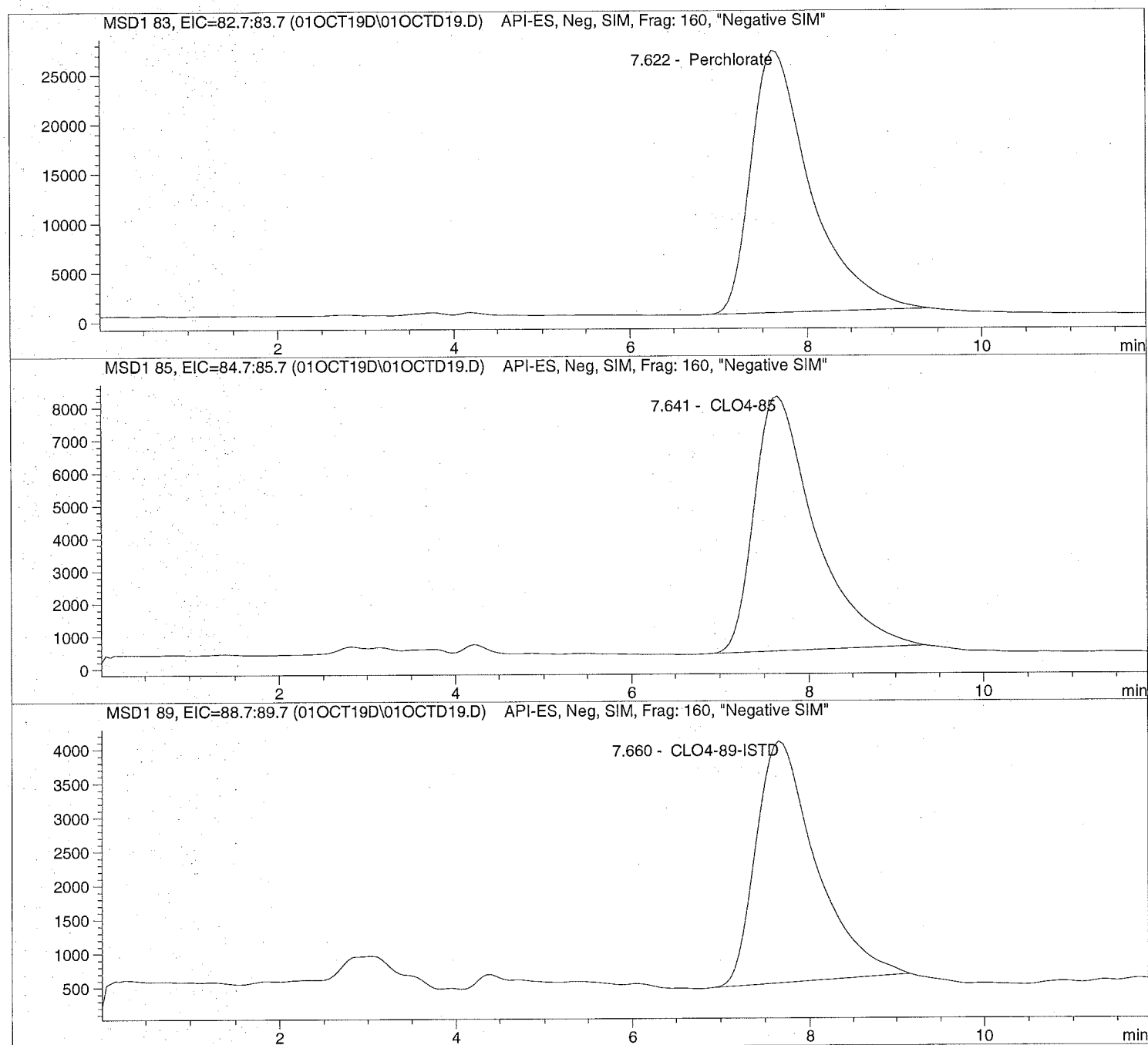
```

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD19.D Sample Name: 676594 CCV@25

```
=====
Injection Date: 10/01/2019 15:18:13      Seq Line:      19
Sample Name:    676594   CCV@25          Location:      Vial 71
Acq Operator:   TNB                Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
=====
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD19.D Sample Name: 676594 CCV@25

Injection Date: 10/01/2019 15:18:13 Seq Line: 19
 Sample Name: 676594 CCV@25 Location: Vial 71
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

Sample Information

Sorted By: Signal
 Calib. Data Modified: Mon, 23. Sep. 2019, 00:20:59 pm
 Multiplier: 1.000000
 Dilution: 1.000000
 Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.622	PBA	1236865.2	25.3082	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.641	PBA	371181.1	24.9437	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.660	PBA	166779.7	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

=====
Calibration Table
=====

Perchlorate

Calib. Data Modified : 9/23/2019 12:20:59 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min

Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
 Calibration Table after Recalibration
 Normal Report after Recalibration
If the sequence is done with bracketing:
 Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD ISTD Amount Name
#

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: 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

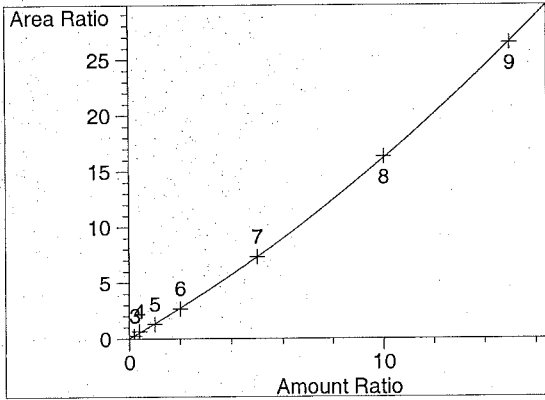
Compound: CLO4-85

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

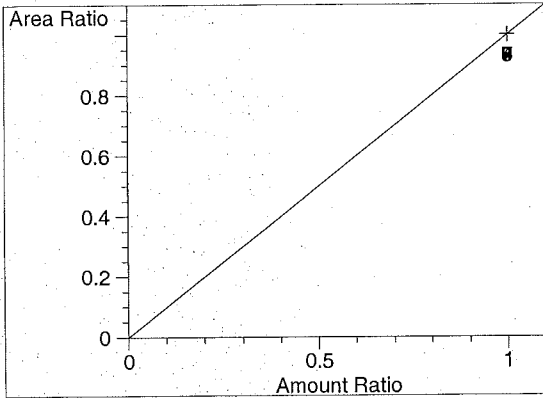
=====
 Peak Sum Table
 =====

No Entries in table
 =====

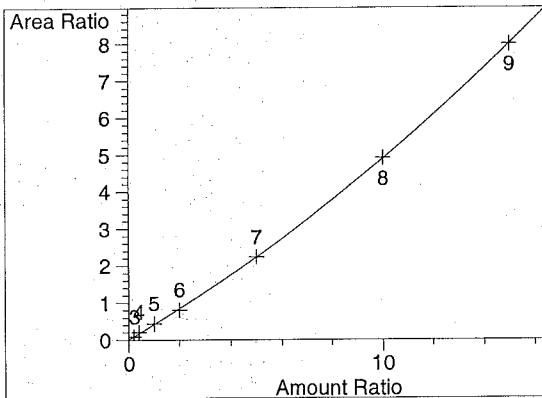
=====
 Calibration Curves
 =====



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

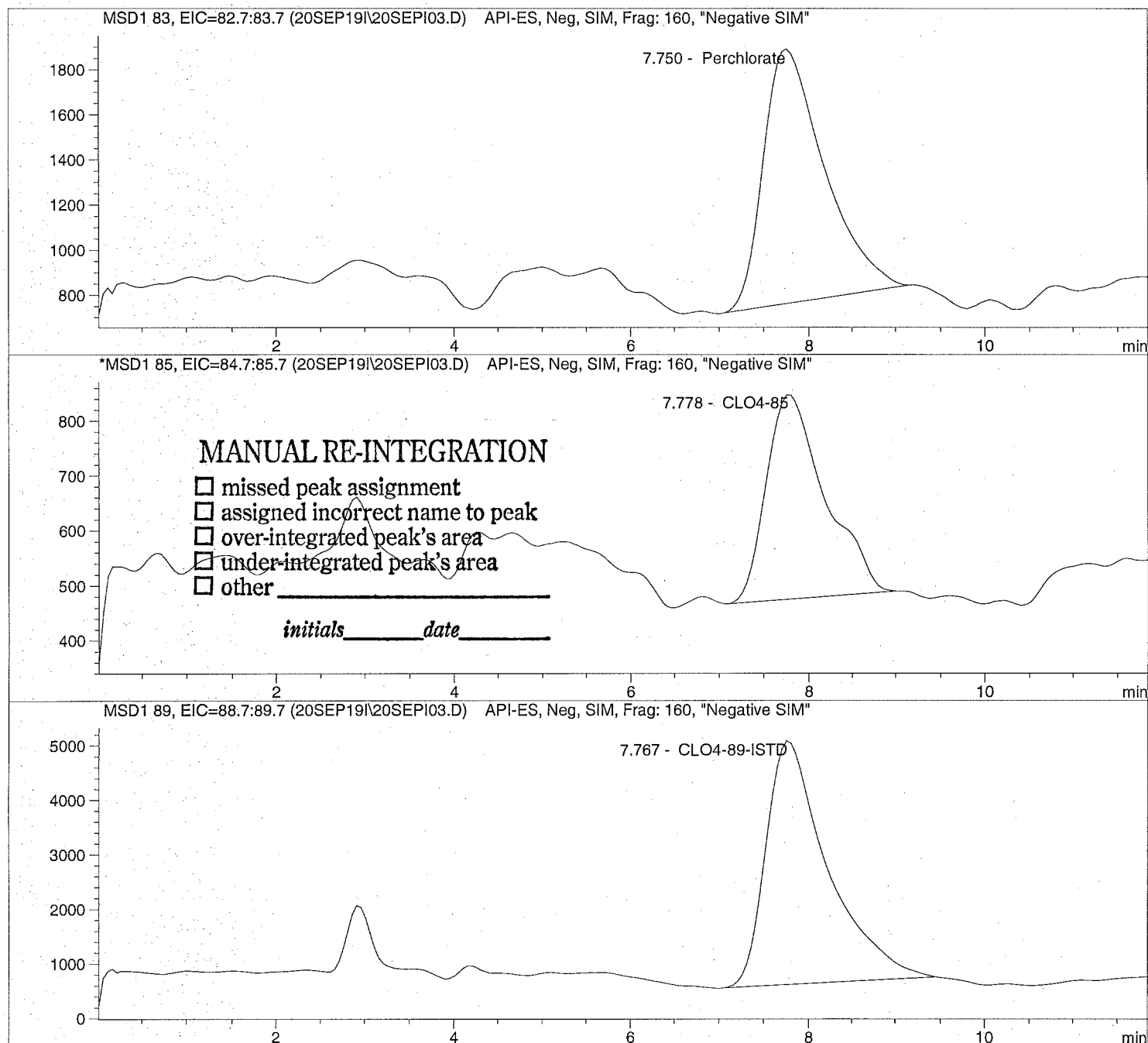
Inj. Vol.: 30 µl

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

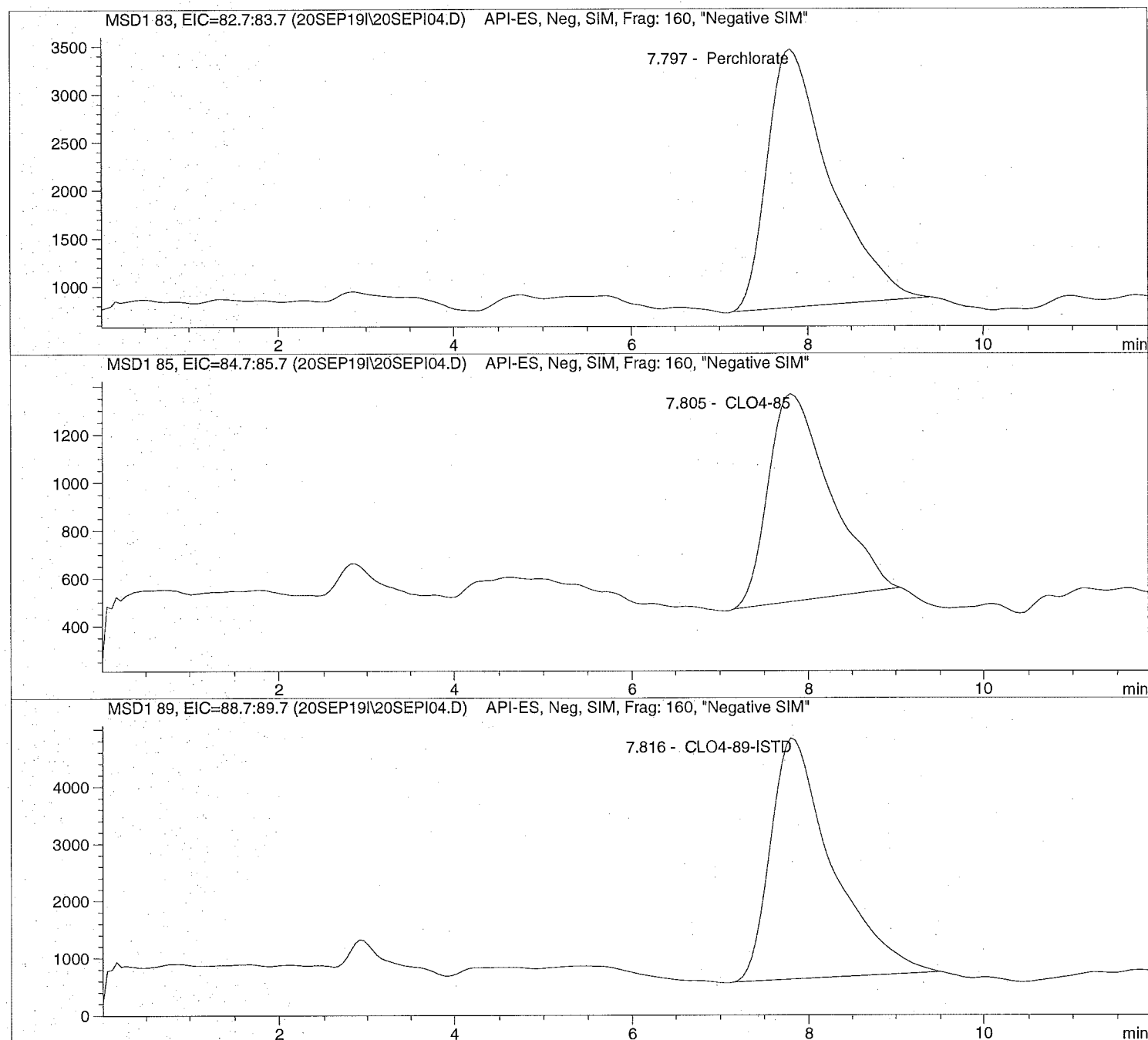
*** End of Report ***

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

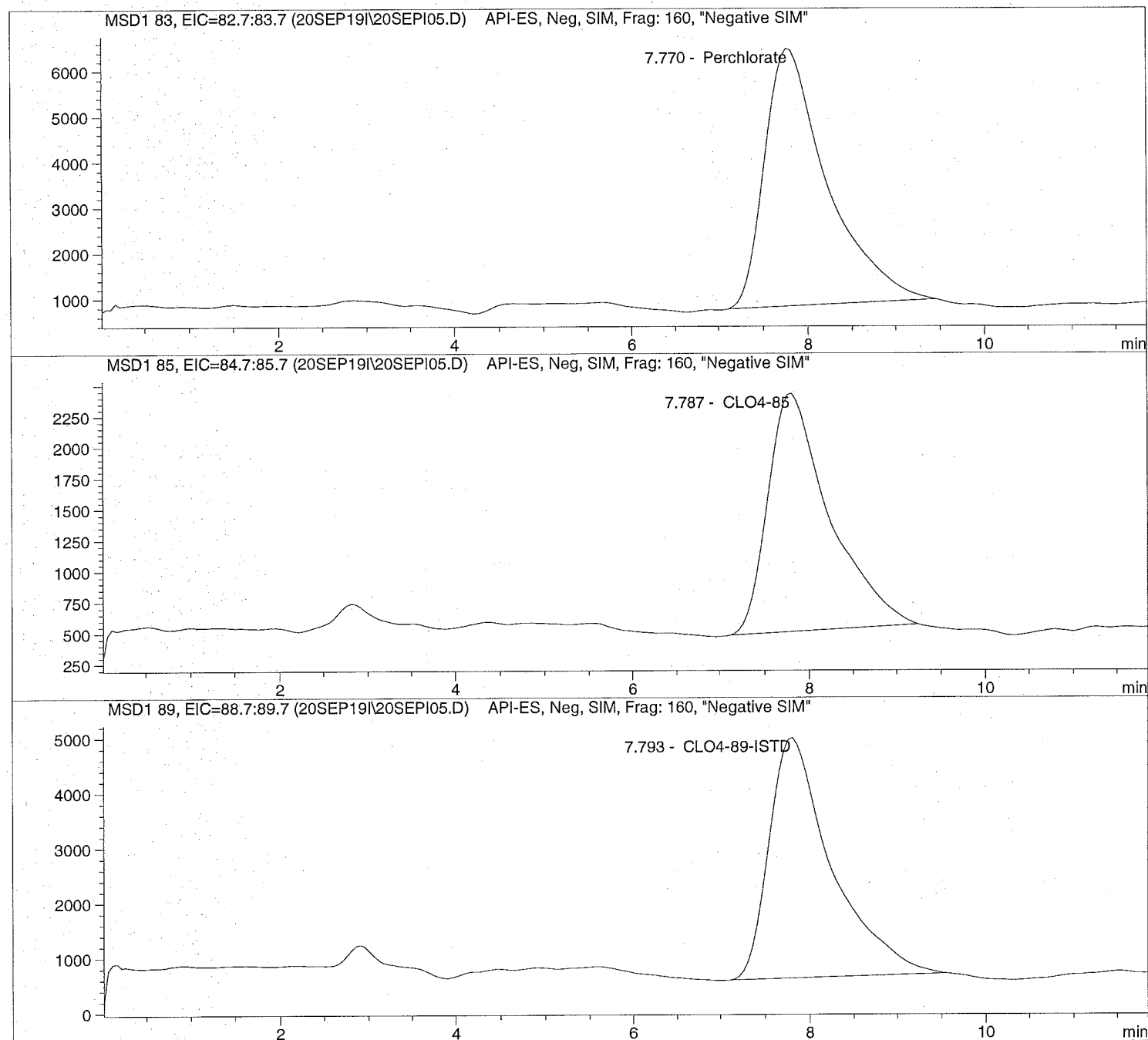
Sample Name: CLO4@ 5.0ug/L

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

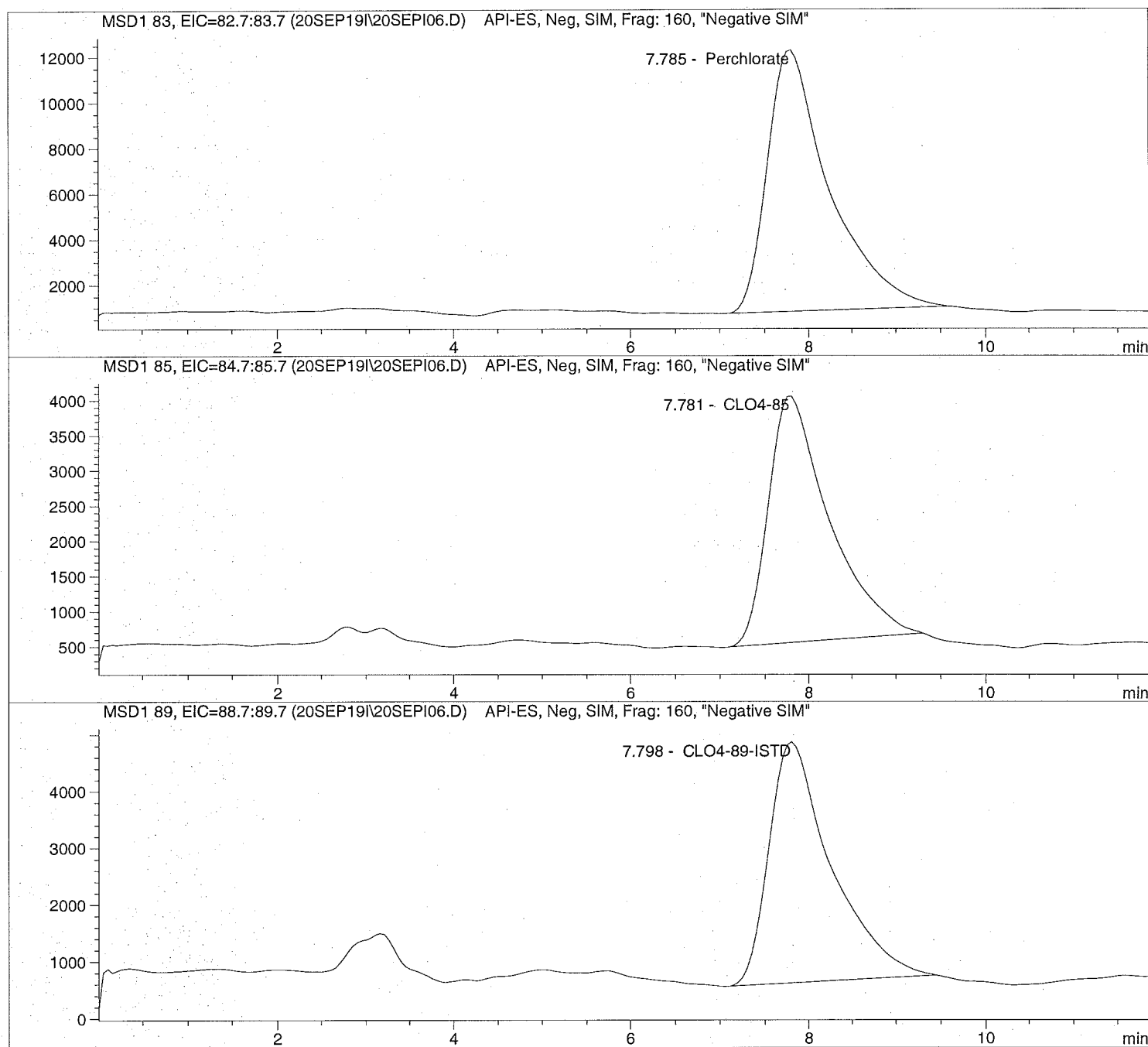
Sample Name: CLO4@ 10.ug/L

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\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

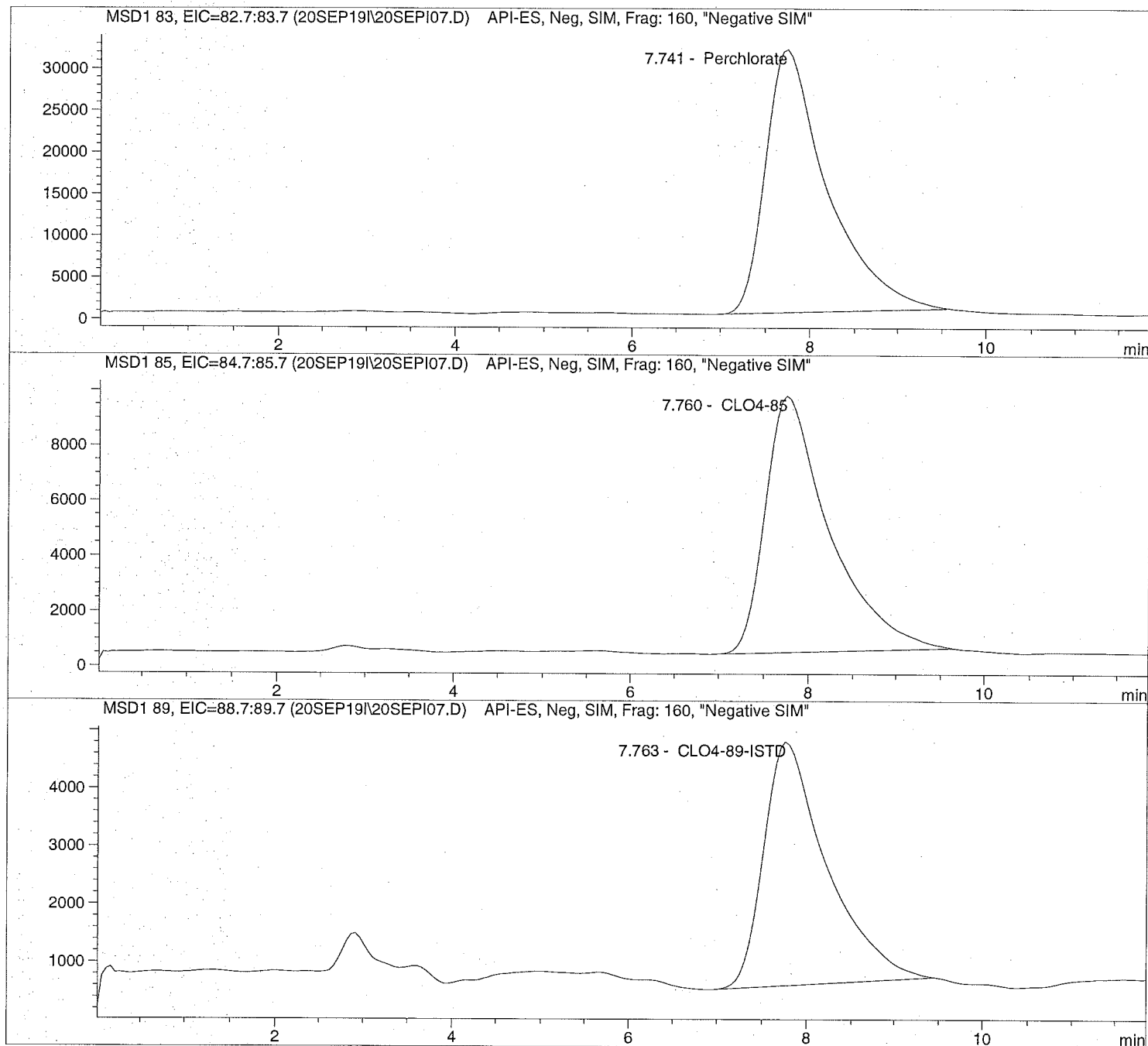
Inj. Vol.: 30 µl

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

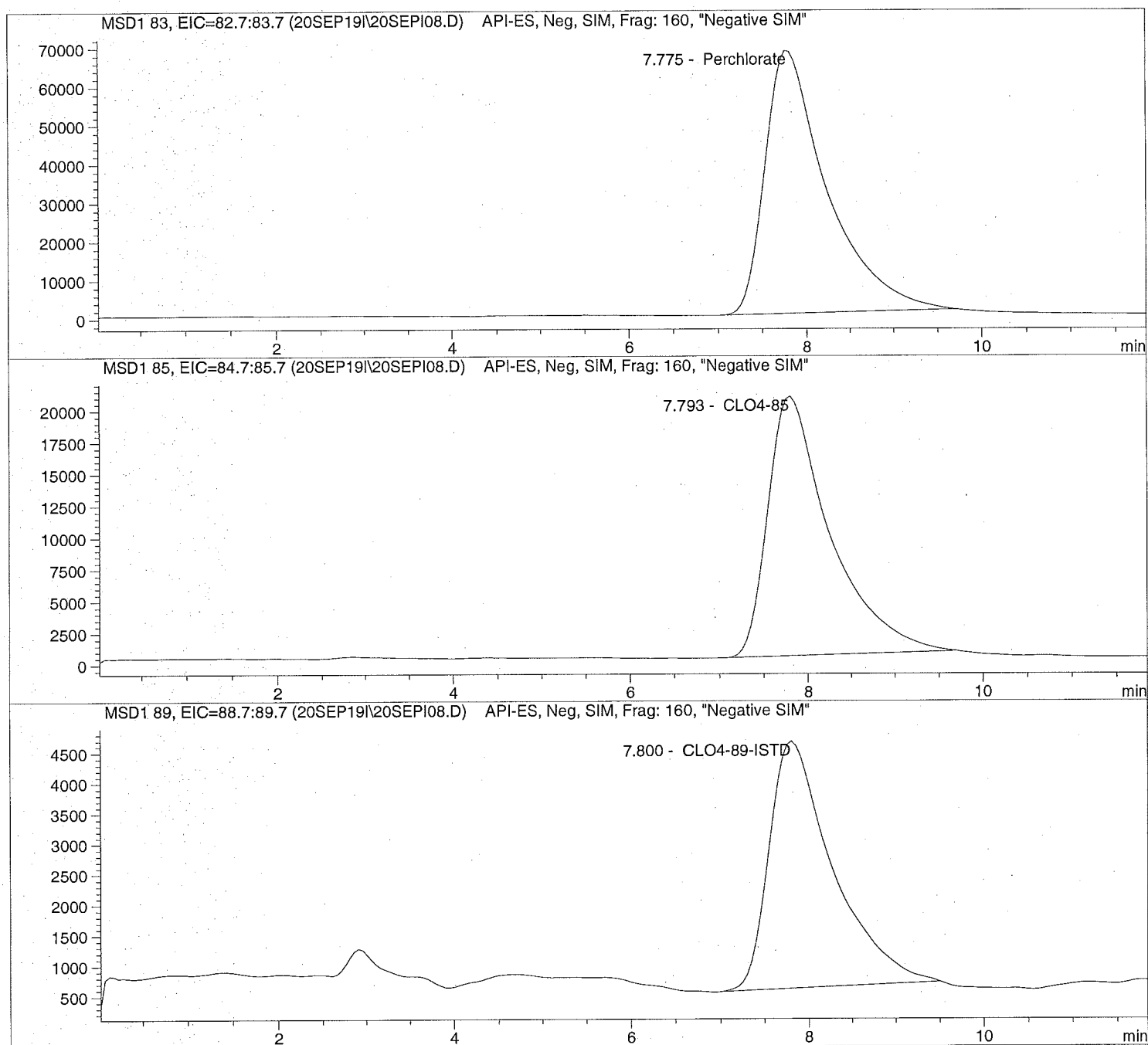
Sample Name: CLO4@ 50.ug/L

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

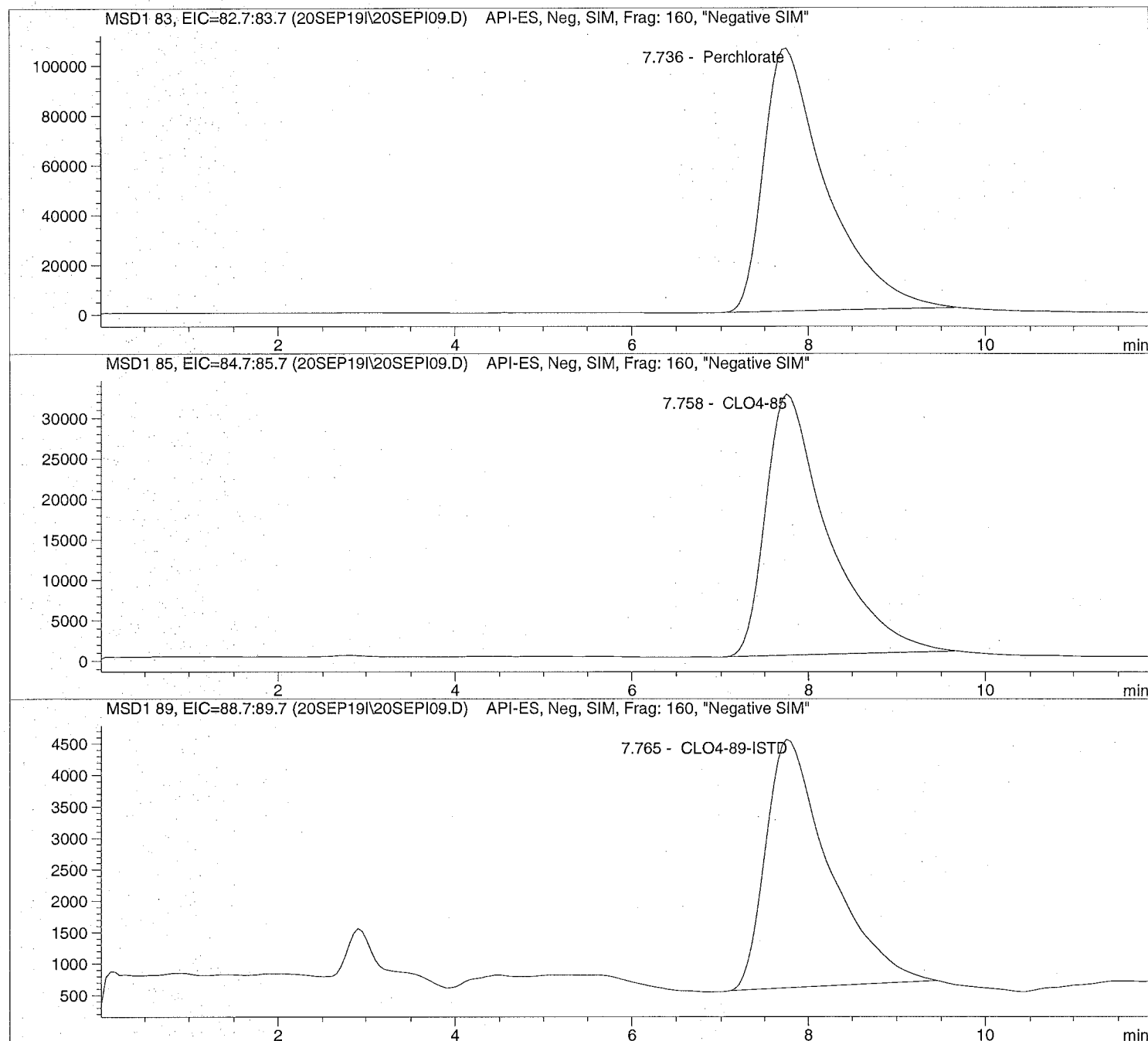
Inj. Vol.: 30 µl

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\20SEP19I\20SEPI11.D

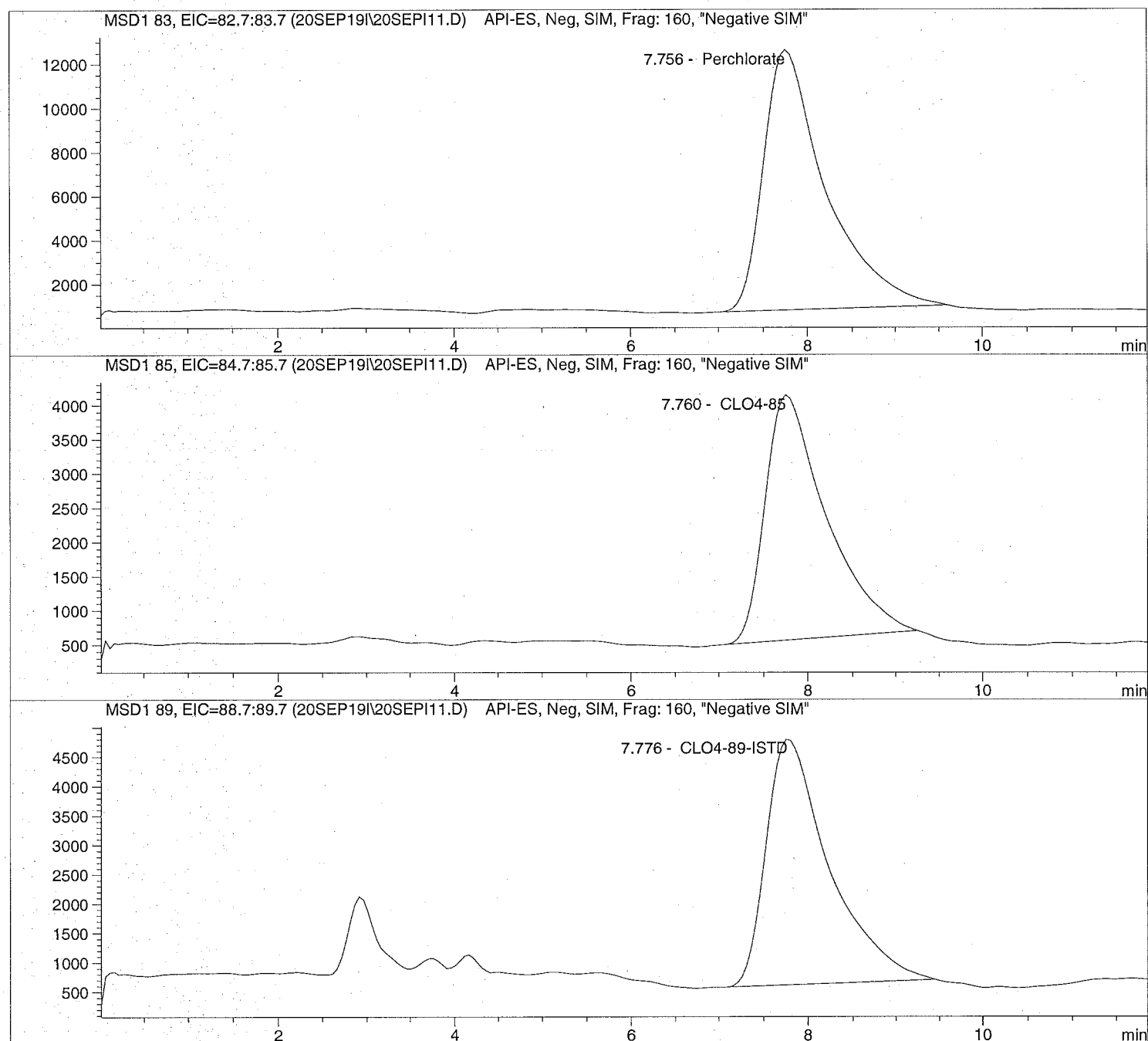
Sample Name: ICAL Verf@10ug/L

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\20SEP19I\20SEPI03.D

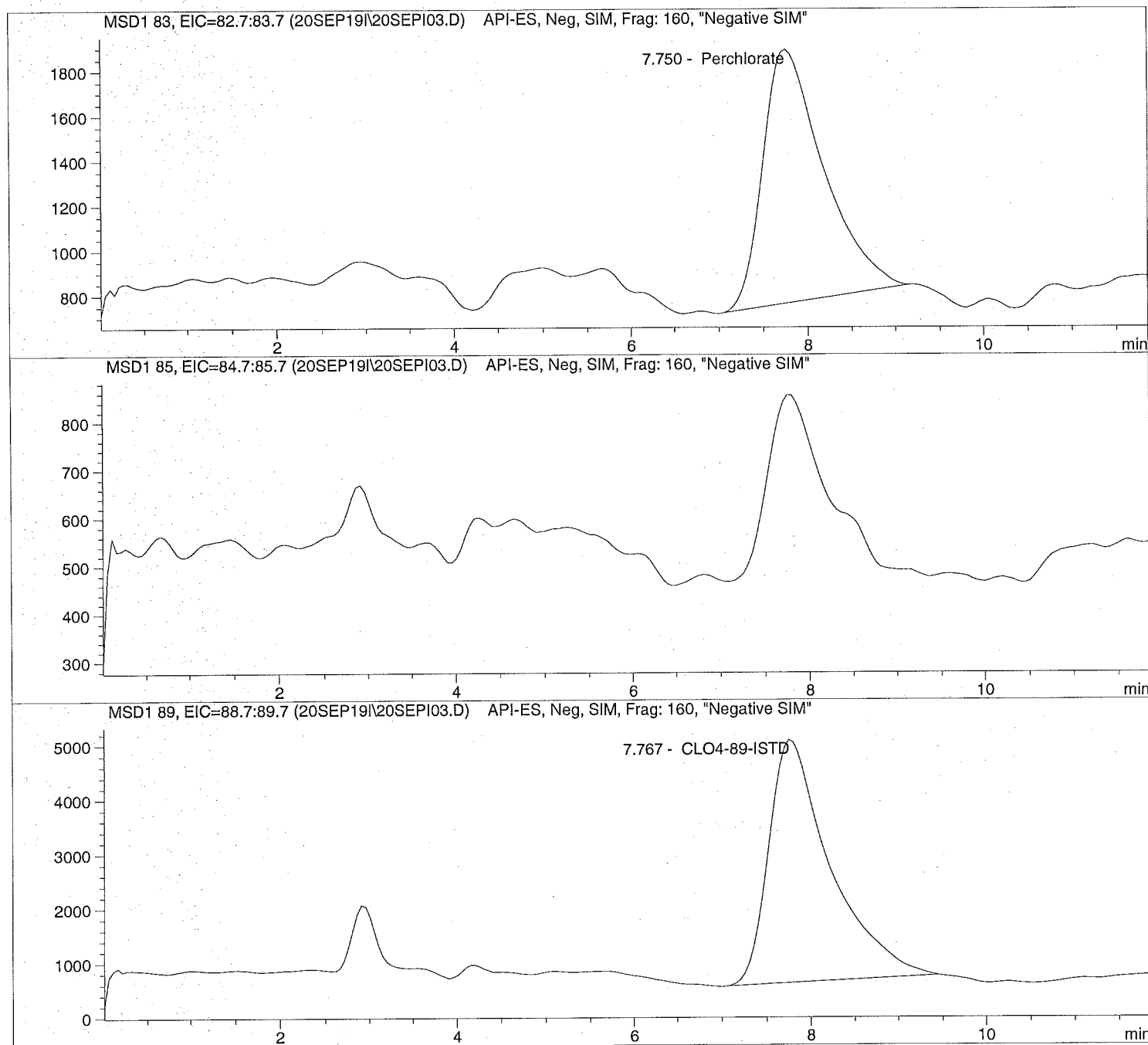
Sample Name: CLO4@ 1.0ug/L

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 12:27:11

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\20SEP19I\20SEPI03.D

Sample Name: CLO4@ 1.0ug/L

```

=====
Injection Date: 9/20/2019 09:24:05      Seq Line: 3
Sample Name:    CLO4@ 1.0ug/L           Location:  Vial 73
Acq Operator:  TNB                      Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   9/23/2019 12:27:11
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  1.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.750	PBA	53921.8	0.8760	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

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

```

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

```

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD02.D

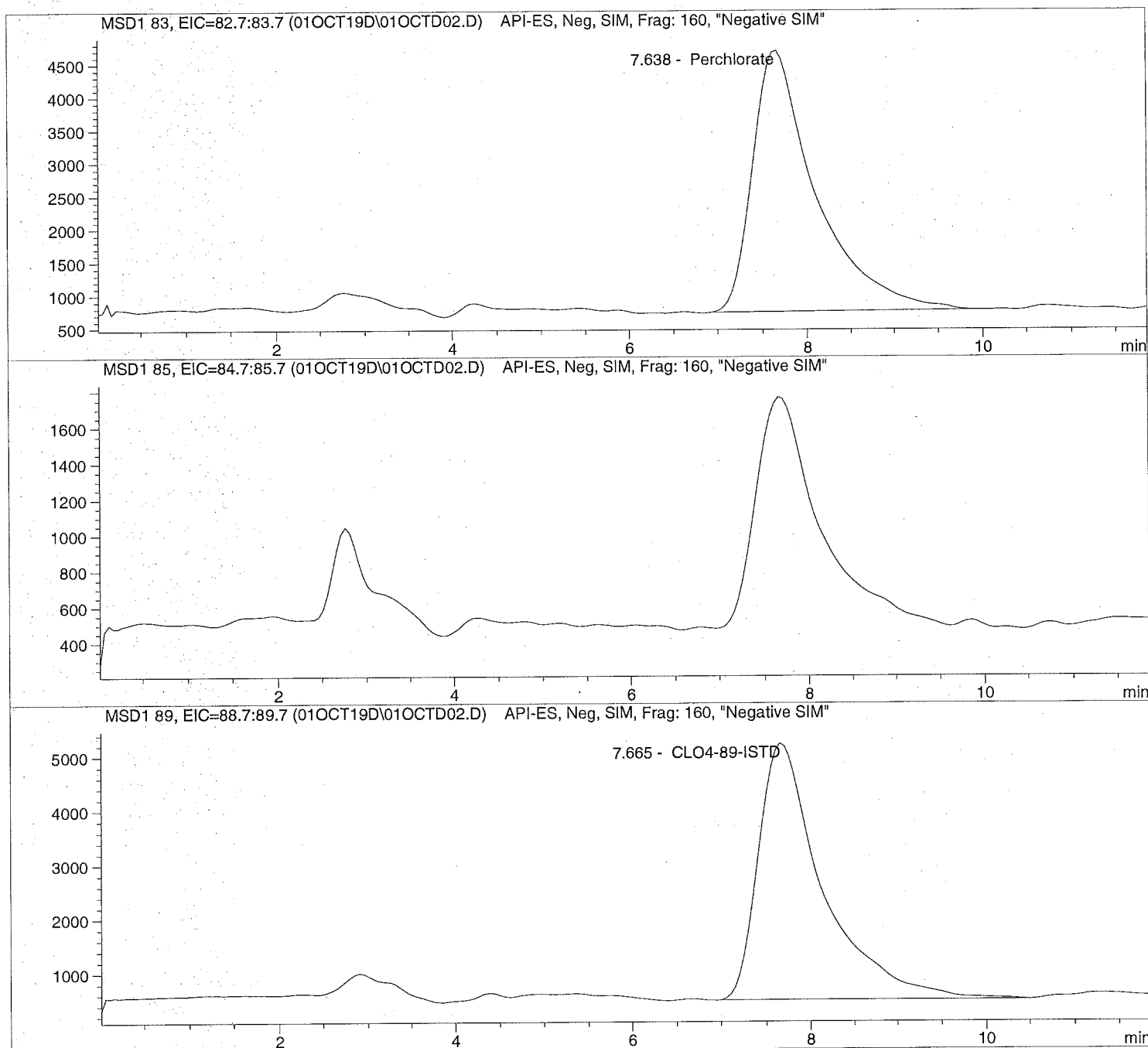
Sample Name: 676592 QC@3.0

Injection Date: 10/01/2019 10:56:09
Sample Name: 676592 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: 10/2/2019 09:16:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD02.D Sample Name: 676592 QC@3.0

=====
 Injection Date: 10/01/2019 10:56:09 Seq Line: 2
 Sample Name: 676592 QC@3.0 Location: Vial 72
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 10/2/2019 09:16:52

Perchlorate analysis

=====
 Sample Information
 =====

Sorted By: Signal
 Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
 Multiplier: 1.000000
 Dilution: 1.000000
 Sample Amount: 3.000

=====
 LCMS Results
 =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.638	BB S	195089.7	3.0114	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.665	PB S	238378.3	5.0000	CLO4-89-ISTD

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

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD05.D

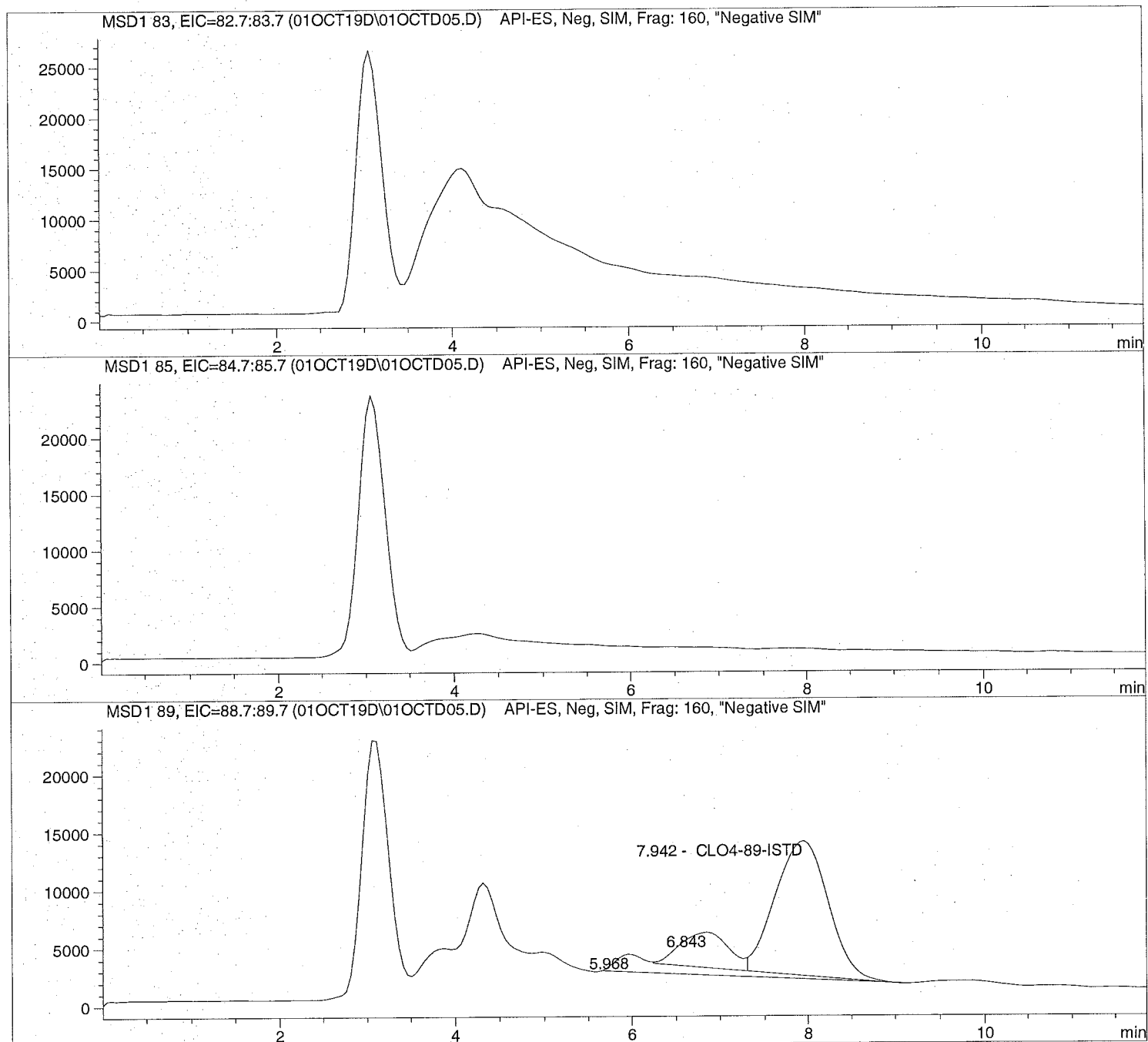
Sample Name: 1927220001

Injection Date: 10/01/2019 11:37:35
Sample Name: 1927220001
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: 10/2/2019 09:16:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD05.D Sample Name: 1927220001

```

=====
Injection Date: 10/01/2019 11:37:35      Seq Line: 5
Sample Name: 1927220001                  Location: Vial 75
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 09:16:52
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
5.968	PB S	100244.2	0.0000	
6.843	BB T	116415.9	0.0000	
7.942	PBAT	488651.6	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD06.D

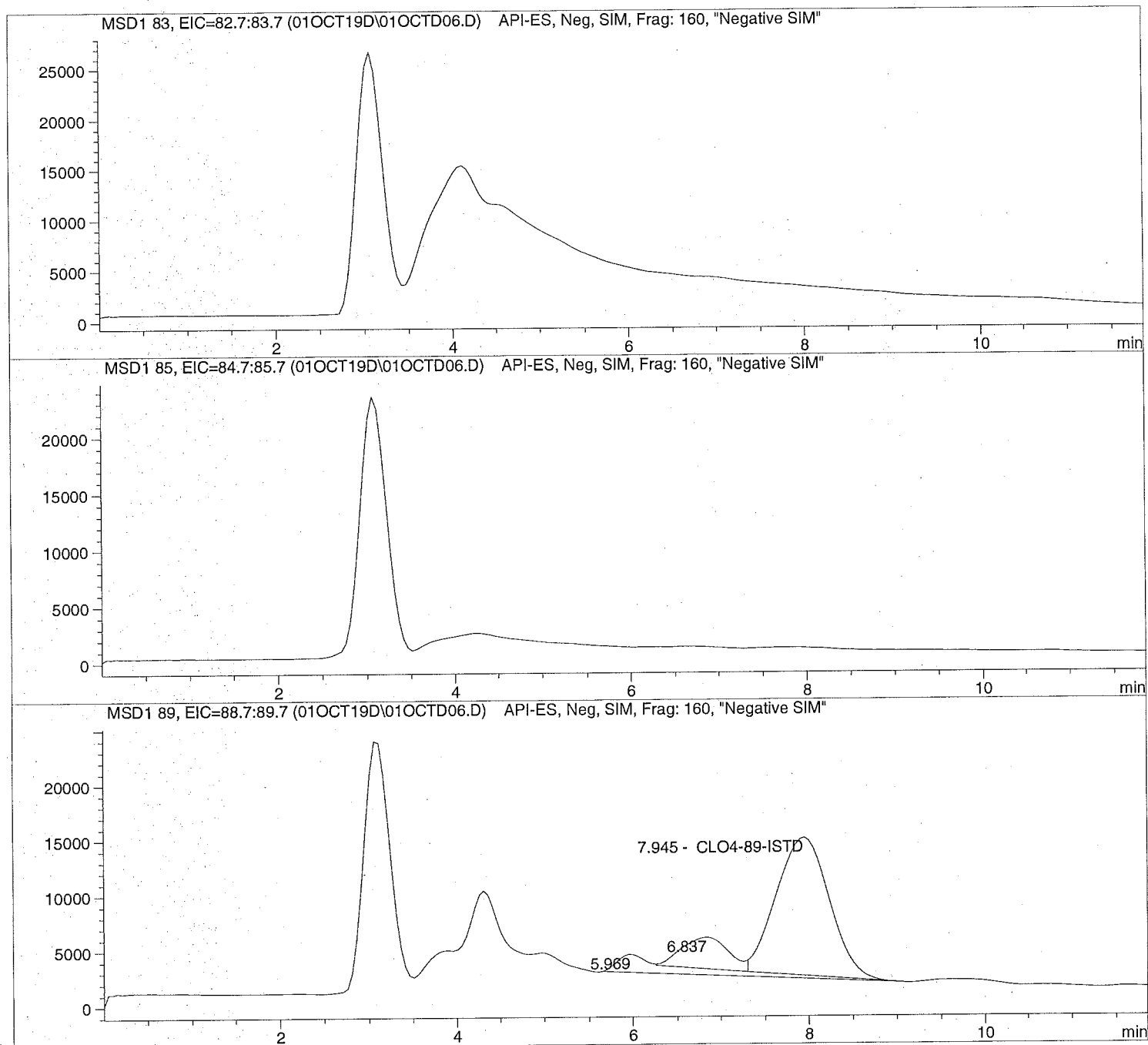
Sample Name: 1927220002

Injection Date: 10/01/2019 11:51:24
Sample Name: 1927220002
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: 10/2/2019 09:16:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD06.D Sample Name: 1927220002

```

=====
Injection Date: 10/01/2019 11:51:24      Seq Line: 6
Sample Name: 1927220002                  Location: Vial 76
Acq Operator: TNB                        Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 09:16:52
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
5.969	PB S	94987.9	0.0000	
6.837	BB T	106969.7	0.0000	
7.945	PBAT	520312.7	5.0000	CLO4-89-ISTD

*** End of Report ***



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

October 09, 2019

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

Work Order: **HS19091234**

Laboratory Results for: **Groundwater Treatment Plant Quarterly Influent Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Sep 25, 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 simple oval.

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
Work Order: HS19091234

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19091234-01	LH18/24-SP650_092419	Water		24-Sep-2019 14:00	25-Sep-2019 08:50	<input type="checkbox"/>
HS19091234-02	Trip Blank	Water		24-Sep-2019 14:00	25-Sep-2019 08:50	<input type="checkbox"/>

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
Work Order: HS19091234

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: 145678****Sample ID: LCS-145678**

- LCS/LCSD were analyzed and reported in lieu of an MS/MSD for this batch. The batch quality control criteria were met.
-

GCMS Volatiles by Method SW8260**Batch ID: R347193****Sample ID: HS19090962-10MSD**

- MSD was performed on unrelated sample
-

Metals by Method SW6020**Batch ID: 146020****Sample ID: HS19091233-01MS**

- MS/MSD and DUPs are for an unrelated sample
-

Metals by Method SW7470**Batch ID: 145884**

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

WetChemistry by Method E1664A**Batch ID: R347939**

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

WetChemistry by Method SW9056**Batch ID: R347908**

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

WetChemistry by Method E410.4**Batch ID: R347382**

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

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Influent Samples
 Sample ID: LH18/24-SP650_092419
 Collection Date: 24-Sep-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19091234
 Lab ID:HS19091234-01
 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	27-Sep-2019 17:32	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Sep-2019 17:32	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Sep-2019 17:32	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Sep-2019 17:32	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	27-Sep-2019 17:32	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Sep-2019 17:32	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:32	

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

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Influent Samples
 Sample ID: LH18/24-SP650_092419
 Collection Date: 24-Sep-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19091234
 Lab ID:HS19091234-01
 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	27-Sep-2019 17:32	
cis-1,2-Dichloroethene	1.7		0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Sep-2019 17:32	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Sep-2019 17:32	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Sep-2019 17:32	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Trichloroethene	1.0		0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 17:32	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>83.4</i>			0	<i>81-118</i>	%REC	1	27-Sep-2019 17:32	
<i>Surr: 4-Bromofluorobenzene</i>	<i>106</i>			0	<i>85-114</i>	%REC	1	27-Sep-2019 17:32	
<i>Surr: Dibromofluoromethane</i>	<i>90.4</i>			0	<i>80-119</i>	%REC	1	27-Sep-2019 17:32	
<i>Surr: Toluene-d8</i>	<i>96.0</i>			0	<i>89-112</i>	%REC	1	27-Sep-2019 17:32	
SEMIVOLATILES SIM		Method:SW8270SIM						Prep:SW3510 / 26-Sep-2019 Analyst: LG	
1,4-Dioxane	12		0.50	0.50	0.50	ug/L	50	01-Oct-2019 12:43	
<i>Surr: 2-Fluorobiphenyl</i>	<i>102</i>			0	<i>40-140</i>	%REC	50	01-Oct-2019 12:43	
<i>Surr: 4-Terphenyl-d14</i>	<i>101</i>			0	<i>40-140</i>	%REC	50	01-Oct-2019 12:43	
<i>Surr: Nitrobenzene-d5</i>	<i>102</i>			0	<i>40-140</i>	%REC	50	01-Oct-2019 12:43	

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

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Influent Samples
 Sample ID: LH18/24-SP650_092419
 Collection Date: 24-Sep-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19091234
 Lab ID:HS19091234-01
 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A			Method:SW6020			Prep:SW3010A / 04-Oct-2019		Analyst: JC
Aluminum	0.0117		0.00180	0.00500	0.0100	mg/L	1	08-Oct-2019 21:22
Antimony	0.00251		0.000400	0.00100	0.00200	mg/L	1	08-Oct-2019 21:22
Arsenic	0.000691	J	0.000400	0.00100	0.00200	mg/L	1	08-Oct-2019 21:22
Barium	0.104		0.00190	0.00250	0.00400	mg/L	1	08-Oct-2019 21:22
Beryllium	0.00100	U	0.000200	0.00100	0.00200	mg/L	1	08-Oct-2019 21:22
Cadmium	0.00100	U	0.000200	0.00100	0.00200	mg/L	1	08-Oct-2019 21:22
Calcium	6.84		0.0340	0.0500	0.500	mg/L	1	08-Oct-2019 21:22
Chromium	0.000534	J	0.000400	0.00100	0.00400	mg/L	1	08-Oct-2019 21:22
Cobalt	0.000436	J	0.000200	0.00100	0.00500	mg/L	1	08-Oct-2019 21:22
Iron	0.0772	J	0.0120	0.0500	0.200	mg/L	1	08-Oct-2019 21:22
Lead	0.00100	U	0.000600	0.00100	0.00200	mg/L	1	08-Oct-2019 21:22
Magnesium	20.4		0.0100	0.0500	0.200	mg/L	1	08-Oct-2019 21:22
Manganese	0.0231		0.000700	0.00100	0.00500	mg/L	1	08-Oct-2019 21:22
Nickel	0.00102	J	0.000600	0.00100	0.00200	mg/L	1	08-Oct-2019 21:22
Potassium	1.61		0.0180	0.0500	0.200	mg/L	1	08-Oct-2019 21:22
Selenium	0.00250	U	0.00110	0.00250	0.00200	mg/L	1	08-Oct-2019 21:22
Silver	0.00100	U	0.000200	0.00100	0.00200	mg/L	1	08-Oct-2019 21:22
Sodium	504		0.280	1.00	4.00	mg/L	20	09-Oct-2019 11:53
Thallium	0.000337	J	0.000200	0.00100	0.00200	mg/L	1	08-Oct-2019 21:22
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	08-Oct-2019 21:22
Zinc	0.00863		0.00200	0.00250	0.00400	mg/L	1	08-Oct-2019 21:22
MERCURY BY SW7470A			Method:SW7470			Prep:SW7470 / 01-Oct-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	01-Oct-2019 17:03
OIL & GREASE (HEM) BY E1664A			Method:E1664A					Analyst: KAH
Oil and Grease	1.00	U	0.610	1.00	2.00	mg/L	1	08-Oct-2019 14:40
CHEMICAL OXYGEN DEMAND BY E410.4			Method:E410.4					Analyst: MZD
Chemical Oxygen Demand	6.00	J	5.00	15.0	15.0	mg/L	1	01-Oct-2019 15:00
ANIONS BY SW9056A			Method:SW9056					Analyst: KMU
Chloride	538		2.00	5.00	5.00	mg/L	10	07-Oct-2019 22:11
Sulfate	172		2.00	5.00	5.00	mg/L	10	07-Oct-2019 22:11
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Method:NA					Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	04-Oct-2019 09:41

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

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Influent Samples
 Sample ID: Trip Blank
 Collection Date: 24-Sep-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19091234
 Lab ID:HS19091234-02
 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	27-Sep-2019 16:44	
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Sep-2019 16:44	
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Sep-2019 16:44	
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Sep-2019 16:44	
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	27-Sep-2019 16:44	
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Sep-2019 16:44	
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 16:44	

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

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
 Project: Groundwater Treatment Plant Quarterly Influent Samples
 Sample ID: Trip Blank
 Collection Date: 24-Sep-2019 14:00

ANALYTICAL REPORT
 WorkOrder:HS19091234
 Lab ID:HS19091234-02
 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	27-Sep-2019 16:44	
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Sep-2019 16:44	
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Sep-2019 16:44	
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Sep-2019 16:44	
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Sep-2019 16:44	
<i>Surr: 1,2-Dichloroethane-d4</i>	<i>83.1</i>			<i>0</i>	<i>81-118</i>	<i>%REC</i>	<i>1</i>	<i>27-Sep-2019 16:44</i>	
<i>Surr: 4-Bromofluorobenzene</i>	<i>103</i>			<i>0</i>	<i>85-114</i>	<i>%REC</i>	<i>1</i>	<i>27-Sep-2019 16:44</i>	
<i>Surr: Dibromofluoromethane</i>	<i>90.4</i>			<i>0</i>	<i>80-119</i>	<i>%REC</i>	<i>1</i>	<i>27-Sep-2019 16:44</i>	
<i>Surr: Toluene-d8</i>	<i>97.2</i>			<i>0</i>	<i>89-112</i>	<i>%REC</i>	<i>1</i>	<i>27-Sep-2019 16:44</i>	

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

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

Batch ID: 145678 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19091234-01	1	1000	1 (mL)	0.001

Batch ID: 145884 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19091234-01	1	10 (mL)	10 (mL)	1

Batch ID: 146020 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SamplID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19091234-01	1	10	10 (mL)	1

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 145678 (1)		Test Name : SEMIVOLATILES SIM			Matrix: Water	
HS19091234-01	LH18/24-SP650_092419	24 Sep 2019 14:00		26 Sep 2019 08:07	01 Oct 2019 12:43	50
Batch ID: 145884 (0)		Test Name : MERCURY BY SW7470A			Matrix: Water	
HS19091234-01	LH18/24-SP650_092419	24 Sep 2019 14:00		01 Oct 2019 10:00	01 Oct 2019 17:03	1
Batch ID: 146020 (0)		Test Name : ICP-MS METALS BY SW6020A			Matrix: Water	
HS19091234-01	LH18/24-SP650_092419	24 Sep 2019 14:00		04 Oct 2019 12:20	09 Oct 2019 11:53	20
HS19091234-01	LH18/24-SP650_092419	24 Sep 2019 14:00		04 Oct 2019 12:20	08 Oct 2019 21:22	1
Batch ID: R347193 (0)		Test Name : VOLATILES ORGANICS BY METHOD 8260C			Matrix: Water	
HS19091234-01	LH18/24-SP650_092419	24 Sep 2019 14:00			27 Sep 2019 17:32	1
HS19091234-02	Trip Blank	24 Sep 2019 14:00			27 Sep 2019 16:44	1
Batch ID: R347382 (0)		Test Name : CHEMICAL OXYGEN DEMAND BY E410.4			Matrix: Water	
HS19091234-01	LH18/24-SP650_092419	24 Sep 2019 14:00			01 Oct 2019 15:00	1
Batch ID: R347602 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Water	
HS19091234-01	LH18/24-SP650_092419	24 Sep 2019 14:00			04 Oct 2019 09:41	1
Batch ID: R347908 (0)		Test Name : ANIONS BY SW9056A			Matrix: Water	
HS19091234-01	LH18/24-SP650_092419	24 Sep 2019 14:00			07 Oct 2019 22:11	10
Batch ID: R347939 (0)		Test Name : OIL & GREASE (HEM) BY E1664A			Matrix: Water	
HS19091234-01	LH18/24-SP650_092419	24 Sep 2019 14:00			08 Oct 2019 14:40	1

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: 145884 (0)		Instrument: HG03		Method: MERCURY BY SW7470A						
MBLK	Sample ID: MBLK-145884	Units: mg/L		Analysis Date: 01-Oct-2019 16:36						
Client ID:	Run ID: HG03_347401	SeqNo: 5278412		PrepDate: 01-Oct-2019		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-145884	Units: mg/L		Analysis Date: 01-Oct-2019 16:37						
Client ID:	Run ID: HG03_347401	SeqNo: 5278413		PrepDate: 01-Oct-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00541	0.000200	0.005	0	108	80 - 120				
MS	Sample ID: HS19091325-02MS	Units: mg/L		Analysis Date: 01-Oct-2019 16:58						
Client ID:	Run ID: HG03_347401	SeqNo: 5278421		PrepDate: 01-Oct-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00511	0.000200	0.005	0.000131	99.6	75 - 125				
MS	Sample ID: HS19091280-02MS	Units: mg/L		Analysis Date: 01-Oct-2019 16:45						
Client ID:	Run ID: HG03_347401	SeqNo: 5278415		PrepDate: 01-Oct-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00508	0.000200	0.005	0.000002	102	75 - 125				
MSD	Sample ID: HS19091325-02MSD	Units: mg/L		Analysis Date: 01-Oct-2019 16:59						
Client ID:	Run ID: HG03_347401	SeqNo: 5278422		PrepDate: 01-Oct-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00503	0.000200	0.005	0.000131	98.0	75 - 125	0.00511	1.58	20	
MSD	Sample ID: HS19091280-02MSD	Units: mg/L		Analysis Date: 01-Oct-2019 16:47						
Client ID:	Run ID: HG03_347401	SeqNo: 5278416		PrepDate: 01-Oct-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Mercury	0.00501	0.000200	0.005	0.000002	100	75 - 125	0.00508	1.39	20	

The following samples were analyzed in this batch: HS19091234-01

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: 146020 (0)		Instrument: ICPMS04		Method: ICP-MS METALS BY SW6020A						
MBLK	Sample ID: MBLK-146020	Units: mg/L			Analysis Date: 08-Oct-2019 21:06					
Client ID:	Run ID: ICPMS04_347830	SeqNo: 5287987	PrepDate: 04-Oct-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.00500	0.0100								U
Antimony	0.00100	0.00200								U
Arsenic	0.00100	0.00200								U
Barium	0.00250	0.00400								U
Beryllium	0.00100	0.00200								U
Cadmium	0.00100	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.00100	0.00400								U
Cobalt	0.00100	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00200								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00200								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00200								U
Silver	0.00100	0.00200								U
Sodium	0.0500	0.200								U
Thallium	0.00100	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00100	0.00400								U

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: 146020 (0)		Instrument: ICPMS04		Method: ICP-MS METALS BY SW6020A						
LCS	Sample ID: LCS-146020	Units: mg/L			Analysis Date: 08-Oct-2019 21:08					
Client ID:	Run ID: ICPMS04_347830	SeqNo: 5287988	PrepDate: 04-Oct-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1029	0.0100	0.1	0	103	80 - 120				
Antimony	0.04905	0.00200	0.05	0	98.1	80 - 120				
Arsenic	0.04985	0.00200	0.05	0	99.7	80 - 120				
Barium	0.0495	0.00400	0.05	0	99.0	80 - 120				
Beryllium	0.04992	0.00200	0.05	0	99.8	80 - 120				
Cadmium	0.05102	0.00200	0.05	0	102	80 - 120				
Calcium	5.173	0.500	5	0	103	80 - 120				
Chromium	0.04895	0.00400	0.05	0	97.9	80 - 120				
Cobalt	0.04971	0.00500	0.05	0	99.4	80 - 120				
Iron	5.012	0.200	5	0	100	80 - 120				
Lead	0.04838	0.00200	0.05	0	96.8	80 - 120				
Magnesium	5.142	0.200	5	0	103	80 - 120				
Manganese	0.0492	0.00500	0.05	0	98.4	80 - 120				
Nickel	0.04948	0.00200	0.05	0	99.0	80 - 120				
Potassium	4.904	0.200	5	0	98.1	80 - 120				
Selenium	0.04992	0.00200	0.05	0	99.8	80 - 120				
Silver	0.04902	0.00200	0.05	0	98.0	80 - 120				
Sodium	5.087	0.200	5	0	102	80 - 120				
Thallium	0.0465	0.00200	0.05	0	93.0	80 - 120				
Vanadium	0.04843	0.00500	0.05	0	96.9	80 - 120				
Zinc	0.05086	0.00400	0.05	0	102	80 - 120				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: 146020 (0)		Instrument: ICPMS04		Method: ICP-MS METALS BY SW6020A						
MS	Sample ID: HS19091233-01MS	Units: mg/L			Analysis Date: 08-Oct-2019 21:15					
Client ID:	Run ID: ICPMS04_347830	SeqNo: 5287991	PrepDate: 04-Oct-2019	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1476	0.0100	0.1	0.04948	98.1	80 - 120				
Antimony	0.04837	0.00200	0.05	0.000427	95.9	80 - 120				
Arsenic	0.05051	0.00200	0.05	0.001022	99.0	80 - 120				
Barium	1.018	0.00400	0.05	0.973	89.8	80 - 120				O
Beryllium	0.05183	0.00200	0.05	0.000174	103	80 - 120				
Cadmium	0.04922	0.00200	0.05	0.000289	97.9	80 - 120				
Calcium	48.78	0.500	5	44.07	94.4	80 - 120				O
Chromium	0.04971	0.00400	0.05	0.001462	96.5	80 - 120				
Cobalt	0.05936	0.00500	0.05	0.01195	94.8	80 - 120				
Iron	5.782	0.200	5	1.002	95.6	80 - 120				
Lead	0.04769	0.00200	0.05	0.000144	95.1	80 - 120				
Magnesium	40.12	0.200	5	35.32	96.0	80 - 120				O
Manganese	0.7545	0.00500	0.05	0.714	80.9	80 - 120				O
Nickel	0.06196	0.00200	0.05	0.01407	95.8	80 - 120				
Potassium	6.242	0.200	5	1.287	99.1	80 - 120				
Selenium	0.04951	0.00200	0.05	0.000323	98.4	80 - 120				
Silver	0.04623	0.00200	0.05	0.000015	92.4	80 - 120				
Sodium	211.5	0.200	5	209.2	47.3	80 - 120				SEO
Thallium	0.0453	0.00200	0.05	0.000424	89.8	80 - 120				
Vanadium	0.048	0.00500	0.05	0.000182	95.6	80 - 120				
Zinc	0.08459	0.00400	0.05	0.03543	98.3	80 - 120				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: 146020 (0)		Instrument: ICPMS04			Method: ICP-MS METALS BY SW6020A					
MSD	Sample ID: HS19091233-01MSD	Units: mg/L			Analysis Date: 08-Oct-2019 21:17					
Client ID:	Run ID: ICPMS04_347830	SeqNo: 5287992		PrepDate: 04-Oct-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1429	0.0100	0.1	0.04948	93.4	80 - 120	0.1476	3.21	20	
Antimony	0.0465	0.00200	0.05	0.000427	92.2	80 - 120	0.04837	3.92	20	
Arsenic	0.04929	0.00200	0.05	0.001022	96.5	80 - 120	0.05051	2.44	20	
Barium	0.9968	0.00400	0.05	0.973	47.5	80 - 120	1.018	2.1	20	SO
Beryllium	0.05053	0.00200	0.05	0.000174	101	80 - 120	0.05183	2.53	20	
Cadmium	0.04795	0.00200	0.05	0.000289	95.3	80 - 120	0.04922	2.62	20	
Calcium	47.72	0.500	5	44.07	73.2	80 - 120	48.78	2.2	20	SO
Chromium	0.04706	0.00400	0.05	0.001462	91.2	80 - 120	0.04971	5.47	20	
Cobalt	0.05713	0.00500	0.05	0.01195	90.4	80 - 120	0.05936	3.82	20	
Iron	5.573	0.200	5	1.002	91.4	80 - 120	5.782	3.67	20	
Lead	0.0467	0.00200	0.05	0.000144	93.1	80 - 120	0.04769	2.1	20	
Magnesium	37.99	0.200	5	35.32	53.4	80 - 120	40.12	5.45	20	SO
Manganese	0.732	0.00500	0.05	0.714	36.0	80 - 120	0.7545	3.02	20	SO
Nickel	0.05957	0.00200	0.05	0.01407	91.0	80 - 120	0.06196	3.93	20	
Potassium	6.084	0.200	5	1.287	96.0	80 - 120	6.242	2.56	20	
Selenium	0.04666	0.00200	0.05	0.000323	92.7	80 - 120	0.04951	5.93	20	
Silver	0.04401	0.00200	0.05	0.000015	88.0	80 - 120	0.04623	4.92	20	
Sodium	203.6	0.200	5	209.2	-111	80 - 120	211.5	3.81	20	SEO
Thallium	0.04546	0.00200	0.05	0.000424	90.1	80 - 120	0.0453	0.344	20	
Vanadium	0.04651	0.00500	0.05	0.000182	92.6	80 - 120	0.048	3.16	20	
Zinc	0.08182	0.00400	0.05	0.03543	92.8	80 - 120	0.08459	3.33	20	

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: 146020 (0)		Instrument: ICPMS04		Method: ICP-MS METALS BY SW6020A					
PDS	Sample ID: HS19091233-01PDS	Units: mg/L			Analysis Date: 08-Oct-2019 21:20				
Client ID:	Run ID: ICPMS04_347830	SeqNo: 5287993		PrepDate: 04-Oct-2019		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Aluminum	0.1404	0.0100	0.1	0.04948	90.9	75 - 125			
Antimony	0.08891	0.00200	0.1	0.000427	88.5	75 - 125			
Arsenic	0.1016	0.00200	0.1	0.001022	101	75 - 125			
Barium	1.044	0.00400	0.1	0.973	71.2	75 - 125			SO
Beryllium	0.09989	0.00200	0.1	0.000174	99.7	75 - 125			
Cadmium	0.09913	0.00200	0.1	0.000289	98.8	75 - 125			
Calcium	52.51	0.500	10	44.07	84.5	75 - 125			O
Chromium	0.09727	0.00400	0.1	0.001462	95.8	75 - 125			
Cobalt	0.1054	0.00500	0.1	0.01195	93.4	75 - 125			
Iron	10.6	0.200	10	1.002	96.0	75 - 125			
Lead	0.09861	0.00200	0.1	0.000144	98.5	75 - 125			
Magnesium	43.77	0.200	10	35.32	84.5	75 - 125			
Manganese	0.769	0.00500	0.1	0.714	55.0	75 - 125			SO
Nickel	0.108	0.00200	0.1	0.01407	93.9	75 - 125			
Potassium	11.03	0.200	10	1.287	97.5	75 - 125			
Selenium	0.09848	0.00200	0.1	0.000323	98.2	75 - 125			
Silver	0.08536	0.00200	0.1	0.000015	85.3	75 - 125			
Thallium	0.0969	0.00200	0.1	0.000424	96.5	75 - 125			
Vanadium	0.0977	0.00500	0.1	0.000182	97.5	75 - 125			
Zinc	0.1314	0.00400	0.1	0.03543	96.0	75 - 125			
PDS	Sample ID: HS19091233-01PDS	Units: mg/L			Analysis Date: 09-Oct-2019 11:51				
Client ID:	Run ID: ICPMS04_347919	SeqNo: 5288626		PrepDate: 04-Oct-2019		DF: 20			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual
Sodium	417.8	4.00	200	222.6	97.6	75 - 125			

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: 146020 (0)		Instrument: ICPMS04		Method: ICP-MS METALS BY SW6020A						
SD	Sample ID: HS19091233-01SD	Units: mg/L			Analysis Date: 08-Oct-2019 21:13					
Client ID:	Run ID: ICPMS04_347830	SeqNo: 5287990		PrepDate: 04-Oct-2019		DF: 5				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.05235	0.0500					0.04948	0	10	
Antimony	0.00500	0.0100					0.000427	0	10	U
Arsenic	0.00500	0.0100					0.001022	0	10	U
Barium	0.8963	0.0200					0.973	7.88	10	
Beryllium	0.00500	0.0100					0.000174	0	10	U
Cadmium	0.00500	0.0100					0.000289	0	10	U
Calcium	43.92	2.50					44.07	0.329	10	
Chromium	0.00500	0.0200					0.001462	0	10	U
Cobalt	0.01189	0.0250					0.01195	0	10	J
Iron	0.9582	1.00					1.002	4.35	10	J
Lead	0.00500	0.0100					0.000144	0	10	U
Magnesium	36.58	1.00					35.32	3.57	10	
Manganese	0.6636	0.0250					0.714	7.05	10	
Nickel	0.0136	0.0100					0.01407	3.34	10	
Potassium	1.278	1.00					1.287	0.668	10	
Selenium	0.0125	0.0100					0.000323	0	10	U
Silver	0.00500	0.0100					0.000015	0	10	U
Thallium	0.00500	0.0100					0.000424	0	10	U
Vanadium	0.00500	0.0250					0.000182	0	10	U
Zinc	0.03378	0.0200					0.03543	4.65	10	
SD	Sample ID: HS19091233-01SD	Units: mg/L			Analysis Date: 09-Oct-2019 11:48					
Client ID:	Run ID: ICPMS04_347919	SeqNo: 5288625		PrepDate: 04-Oct-2019		DF: 100				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	229.9	20.0					222.6	3.29	10	

The following samples were analyzed in this batch: HS19091234-01

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: 145678 (1)		Instrument: SV-6		Method: SEMIVOLATILES SIM						
MBLK	Sample ID: MBLK-145678	Units: ug/L		Analysis Date: 01-Oct-2019 10:46						
Client ID:	Run ID: SV-6_347402	SeqNo: 5277874		PrepDate: 26-Sep-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	0.08117	0	0.08	0	101	40 - 140				
Surr: 4-Terphenyl-d14	0.101	0	0.08	0	126	40 - 140				
Surr: Nitrobenzene-d5	0.07768	0	0.08	0	97.1	40 - 140				
LCS	Sample ID: LCS-145678	Units: ug/L		Analysis Date: 01-Oct-2019 11:06						
Client ID:	Run ID: SV-6_347402	SeqNo: 5277875		PrepDate: 26-Sep-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.08772	0.010	0.08	0	110	40 - 140				
Surr: 2-Fluorobiphenyl	0.09312	0	0.08	0	116	40 - 140				
Surr: 4-Terphenyl-d14	0.08862	0	0.08	0	111	40 - 140				
Surr: Nitrobenzene-d5	0.08759	0	0.08	0	109	40 - 140				
LCSD	Sample ID: LCSD-145678	Units: ug/L		Analysis Date: 01-Oct-2019 11:25						
Client ID:	Run ID: SV-6_347402	SeqNo: 5277876		PrepDate: 26-Sep-2019		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
1,4-Dioxane	0.0791	0.010	0.08	0	98.9	40 - 140	0.08772	10.3	20	
Surr: 2-Fluorobiphenyl	0.09612	0	0.08	0	120	40 - 140	0.09312	3.17	20	
Surr: 4-Terphenyl-d14	0.08439	0	0.08	0	105	40 - 140	0.08862	4.89	20	
Surr: Nitrobenzene-d5	0.0895	0	0.08	0	112	40 - 140	0.08759	2.15	20	
The following samples were analyzed in this batch: HS19091234-01										

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: R347193 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-190927	Units: UG/L			Analysis Date: 27-Sep-2019 12:20					
Client ID:	Run ID: VOA6_347193	SeqNo: 5273201	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-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: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: R347193 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MBLK	Sample ID: VBLKW-190927	Units: UG/L			Analysis Date: 27-Sep-2019 12:20					
Client ID:	Run ID: VOA6_347193	SeqNo: 5273201	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	41.29	1.0	50	0	82.6	81 - 118				
Surr: 4-Bromofluorobenzene	50.75	1.0	50	0	101	85 - 114				
Surr: Dibromofluoromethane	44.75	1.0	50	0	89.5	80 - 119				
Surr: Toluene-d8	49.34	1.0	50	0	98.7	89 - 112				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: R347193 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-190927	Units: UG/L			Analysis Date: 27-Sep-2019 11:32					
Client ID:	Run ID: VOA6_347193	SeqNo: 5273200	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.73	1.0	20	0	93.7	78 - 124				
1,1,1-Trichloroethane	17.29	1.0	20	0	86.5	74 - 131				
1,1,2,2-Tetrachloroethane	18.58	1.0	20	0	92.9	71 - 121				
1,1,2-Trichloroethane	18.91	1.0	20	0	94.5	80 - 119				
1,1-Dichloroethane	17.12	1.0	20	0	85.6	77 - 125				
1,1-Dichloroethene	18.82	1.0	20	0	94.1	71 - 131				
1,1-Dichloropropene	17.7	1.0	20	0	88.5	78 - 125				
1,2,3-Trichlorobenzene	19.88	1.0	20	0	99.4	69 - 129				
1,2,3-Trichloropropane	18.15	1.0	20	0	90.8	73 - 122				
1,2,4-Trichlorobenzene	19.55	1.0	20	0	97.7	69 - 130				
1,2,4-Trimethylbenzene	19.19	1.0	20	0	96.0	76 - 124				
1,2-Dibromo-3-chloropropane	18.58	1.0	20	0	92.9	62 - 128				
1,2-Dibromoethane	18.41	1.0	20	0	92.0	77 - 121				
1,2-Dichlorobenzene	19.48	1.0	20	0	97.4	80 - 119				
1,2-Dichloroethane	17.88	1.0	20	0	89.4	73 - 128				
1,2-Dichloropropane	18.09	1.0	20	0	90.4	78 - 122				
1,3,5-Trimethylbenzene	19.05	1.0	20	0	95.3	75 - 124				
1,3-Dichlorobenzene	19.57	1.0	20	0	97.9	80 - 119				
1,3-Dichloropropane	17.96	1.0	20	0	89.8	80 - 119				
1,4-Dichlorobenzene	19.54	1.0	20	0	97.7	79 - 118				
2,2-Dichloropropane	18.09	1.0	20	0	90.4	60 - 139				
2-Butanone	33.9	2.0	40	0	84.7	56 - 143				
2-Chlorotoluene	18.67	1.0	20	0	93.4	79 - 122				
2-Hexanone	35.56	2.0	40	0	88.9	57 - 139				
4-Chlorotoluene	18.74	1.0	20	0	93.7	78 - 122				
4-Isopropyltoluene	19.51	1.0	20	0	97.6	77 - 127				
4-Methyl-2-pentanone	34.63	2.0	40	0	86.6	67 - 130				
Acetone	35.18	2.0	40	0	88.0	39 - 160				
Benzene	17.97	1.0	20	0	89.9	79 - 120				
Bromobenzene	18.25	1.0	20	0	91.3	80 - 120				
Bromochloromethane	18.48	1.0	20	0	92.4	78 - 123				
Bromodichloromethane	17.84	1.0	20	0	89.2	79 - 125				
Bromoform	19.45	1.0	20	0	97.2	66 - 130				
Bromomethane	20.24	1.0	20	0	101	53 - 141				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: R347193 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
LCS	Sample ID: VLCSW-190927	Units: UG/L			Analysis Date: 27-Sep-2019 11:32					
Client ID:	Run ID: VOA6_347193	SeqNo: 5273200		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.17	2.0	40	0	87.9	64 - 133				
Carbon tetrachloride	17.78	1.0	20	0	88.9	72 - 136				
Chlorobenzene	19.57	1.0	20	0	97.9	82 - 118				
Chloroethane	18.56	1.0	20	0	92.8	60 - 138				
Chloroform	17.47	1.0	20	0	87.3	79 - 124				
Chloromethane	19.65	1.0	20	0	98.2	50 - 139				
cis-1,2-Dichloroethene	17.62	1.0	20	0	88.1	78 - 123				
cis-1,3-Dichloropropene	18.22	1.0	20	0	91.1	75 - 124				
Dibromochloromethane	18.47	1.0	20	0	92.4	74 - 126				
Dibromomethane	18.19	1.0	20	0	91.0	79 - 123				
Dichlorodifluoromethane	17.59	1.0	20	0	87.9	32 - 152				
Ethylbenzene	19.71	1.0	20	0	98.6	79 - 121				
Hexachlorobutadiene	20.5	1.0	20	0	103	66 - 134				
Isopropylbenzene	20.05	1.0	20	0	100	72 - 131				
m,p-Xylene	39.75	2.0	40	0	99.4	80 - 121				
Methylene chloride	18.5	2.0	20	0	92.5	74 - 124				
Naphthalene	19.2	1.0	20	0	96.0	61 - 128				
n-Butylbenzene	19.58	1.0	20	0	97.9	75 - 128				
n-Propylbenzene	18.64	1.0	20	0	93.2	76 - 126				
o-Xylene	20.08	1.0	20	0	100	78 - 122				
sec-Butylbenzene	19.35	1.0	20	0	96.8	77 - 126				
Styrene	18.72	1.0	20	0	93.6	78 - 123				
tert-Butylbenzene	19.47	1.0	20	0	97.3	78 - 124				
Tetrachloroethene	18.65	1.0	20	0	93.3	74 - 129				
Toluene	19.63	1.0	20	0	98.2	80 - 121				
trans-1,2-Dichloroethene	18	1.0	20	0	90.0	75 - 124				
trans-1,3-Dichloropropene	17.98	1.0	20	0	89.9	73 - 127				
Trichloroethene	18.29	1.0	20	0	91.4	79 - 123				
Trichlorofluoromethane	18.17	1.0	20	0	90.9	65 - 141				
Vinyl chloride	18.06	1.0	20	0	90.3	58 - 137				
Surr: 1,2-Dichloroethane-d4	48.59	1.0	50	0	97.2	81 - 118				
Surr: 4-Bromofluorobenzene	53.49	1.0	50	0	107	85 - 114				
Surr: Dibromofluoromethane	50.11	1.0	50	0	100	80 - 119				
Surr: Toluene-d8	48.05	1.0	50	0	96.1	89 - 112				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: R347193 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19090962-10MS	Units: UG/L			Analysis Date: 27-Sep-2019 15:08					
Client ID:	Run ID: VOA6_347193	SeqNo: 5273208		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.48	1.0	20	0	92.4	78 - 124				
1,1,1-Trichloroethane	16.46	1.0	20	0	82.3	74 - 131				
1,1,2,2-Tetrachloroethane	19.19	1.0	20	0	96.0	71 - 121				
1,1,2-Trichloroethane	18.87	1.0	20	0	94.3	80 - 119				
1,1-Dichloroethane	15.47	1.0	20	0	77.4	77 - 125				
1,1-Dichloroethene	17.17	1.0	20	0	85.8	71 - 131				
1,1-Dichloropropene	18.06	1.0	20	0	90.3	78 - 125				
1,2,3-Trichlorobenzene	19.08	1.0	20	0	95.4	69 - 129				
1,2,3-Trichloropropane	18.7	1.0	20	0	93.5	73 - 122				
1,2,4-Trichlorobenzene	19.48	1.0	20	0	97.4	69 - 130				
1,2,4-Trimethylbenzene	20.47	1.0	20	0	102	76 - 124				
1,2-Dibromo-3-chloropropane	18.27	1.0	20	0	91.4	62 - 128				
1,2-Dibromoethane	17.95	1.0	20	0	89.8	77 - 121				
1,2-Dichlorobenzene	20.28	1.0	20	0	101	80 - 119				
1,2-Dichloroethane	16.27	1.0	20	0	81.4	73 - 128				
1,2-Dichloropropane	16.99	1.0	20	0	84.9	78 - 122				
1,3,5-Trimethylbenzene	20.56	1.0	20	0	103	75 - 124				
1,3-Dichlorobenzene	20.5	1.0	20	0	103	80 - 119				
1,3-Dichloropropane	17.84	1.0	20	0	89.2	80 - 119				
1,4-Dichlorobenzene	20.19	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	16.92	1.0	20	0	84.6	60 - 139				
2-Butanone	27	2.0	40	0	67.5	56 - 143				
2-Chlorotoluene	19.91	1.0	20	0	99.6	79 - 122				
2-Hexanone	33.67	2.0	40	0	84.2	57 - 139				
4-Chlorotoluene	19.89	1.0	20	0	99.4	78 - 122				
4-Isopropyltoluene	21.09	1.0	20	0	105	77 - 127				
4-Methyl-2-pentanone	33.07	2.0	40	0	82.7	67 - 130				
Acetone	23.95	2.0	40	0	59.9	39 - 160				
Benzene	17.38	1.0	20	0	86.9	79 - 120				
Bromobenzene	18.84	1.0	20	0	94.2	80 - 120				
Bromochloromethane	16.58	1.0	20	0	82.9	78 - 123				
Bromodichloromethane	16.99	1.0	20	0	85.0	79 - 125				
Bromoform	19.02	1.0	20	0	95.1	66 - 130				
Bromomethane	15.6	1.0	20	0	78.0	53 - 141				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: R347193 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MS	Sample ID: HS19090962-10MS	Units: UG/L			Analysis Date: 27-Sep-2019 15:08					
Client ID:	Run ID: VOA6_347193	SeqNo: 5273208	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	31.25	2.0	40	0	78.1	64 - 133				
Carbon tetrachloride	17.8	1.0	20	0	89.0	72 - 136				
Chlorobenzene	19.74	1.0	20	0	98.7	82 - 118				
Chloroethane	19.09	1.0	20	0	95.5	60 - 138				
Chloroform	15.89	1.0	20	0	79.4	79 - 124				
Chloromethane	13.47	1.0	20	0	67.4	50 - 139				
cis-1,2-Dichloroethene	16.64	1.0	20	0	83.2	78 - 123				
cis-1,3-Dichloropropene	17.11	1.0	20	0	85.6	75 - 124				
Dibromochloromethane	18.23	1.0	20	0	91.1	74 - 126				
Dibromomethane	16.62	1.0	20	0	83.1	79 - 123				
Dichlorodifluoromethane	8.147	1.0	20	0	40.7	32 - 152				
Ethylbenzene	20.17	1.0	20	0	101	79 - 121				
Hexachlorobutadiene	21.21	1.0	20	0	106	66 - 134				
Isopropylbenzene	20.75	1.0	20	0	104	72 - 131				
m,p-Xylene	40.23	2.0	40	0	101	80 - 121				
Methylene chloride	15.64	2.0	20	0	78.2	74 - 124				
Naphthalene	18.22	1.0	20	0	91.1	61 - 128				
n-Butylbenzene	20.74	1.0	20	0	104	75 - 128				
n-Propylbenzene	20.11	1.0	20	0	101	76 - 126				
o-Xylene	20.13	1.0	20	0	101	78 - 122				
sec-Butylbenzene	20.82	1.0	20	0	104	77 - 126				
Styrene	18.86	1.0	20	0	94.3	78 - 123				
tert-Butylbenzene	21.3	1.0	20	0	106	78 - 124				
Tetrachloroethene	19.74	1.0	20	0	98.7	74 - 129				
Toluene	20.06	1.0	20	0	100	80 - 121				
trans-1,2-Dichloroethene	16.53	1.0	20	0	82.7	75 - 124				
trans-1,3-Dichloropropene	16.66	1.0	20	0	83.3	73 - 127				
Trichloroethene	20.62	1.0	20	2.663	89.8	79 - 123				
Trichlorofluoromethane	16.49	1.0	20	0	82.5	65 - 141				
Vinyl chloride	13.68	1.0	20	0	68.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	42.73	1.0	50	0	85.5	81 - 118				
Surr: 4-Bromofluorobenzene	50.9	1.0	50	0	102	85 - 114				
Surr: Dibromofluoromethane	45.37	1.0	50	0	90.7	80 - 119				
Surr: Toluene-d8	49.06	1.0	50	0	98.1	89 - 112				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: R347193 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19090962-10MSD	Units: UG/L			Analysis Date: 27-Sep-2019 15:32					
Client ID:	Run ID: VOA6_347193	SeqNo: 5273209		PrepDate:		DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.79	1.0	20	0	88.9	78 - 124	18.48	3.81	20	
1,1,1-Trichloroethane	15.51	1.0	20	0	77.5	74 - 131	16.46	5.99	20	
1,1,2,2-Tetrachloroethane	18.02	1.0	20	0	90.1	71 - 121	19.19	6.32	20	
1,1,2-Trichloroethane	18.6	1.0	20	0	93.0	80 - 119	18.87	1.45	20	
1,1-Dichloroethane	14.66	1.0	20	0	73.3	77 - 125	15.47	5.37	20	S
1,1-Dichloroethene	16.04	1.0	20	0	80.2	71 - 131	17.17	6.81	20	
1,1-Dichloropropene	16.79	1.0	20	0	83.9	78 - 125	18.06	7.28	20	
1,2,3-Trichlorobenzene	18.82	1.0	20	0	94.1	69 - 129	19.08	1.34	20	
1,2,3-Trichloropropane	17.51	1.0	20	0	87.6	73 - 122	18.7	6.55	20	
1,2,4-Trichlorobenzene	18.37	1.0	20	0	91.9	69 - 130	19.48	5.84	20	
1,2,4-Trimethylbenzene	18.37	1.0	20	0	91.8	76 - 124	20.47	10.8	20	
1,2-Dibromo-3-chloropropane	17.67	1.0	20	0	88.3	62 - 128	18.27	3.37	20	
1,2-Dibromoethane	17.46	1.0	20	0	87.3	77 - 121	17.95	2.78	20	
1,2-Dichlorobenzene	18.51	1.0	20	0	92.6	80 - 119	20.28	9.11	20	
1,2-Dichloroethane	15.91	1.0	20	0	79.5	73 - 128	16.27	2.26	20	
1,2-Dichloropropane	16.33	1.0	20	0	81.6	78 - 122	16.99	3.99	20	
1,3,5-Trimethylbenzene	18.53	1.0	20	0	92.6	75 - 124	20.56	10.4	20	
1,3-Dichlorobenzene	18.59	1.0	20	0	92.9	80 - 119	20.5	9.81	20	
1,3-Dichloropropane	17.06	1.0	20	0	85.3	80 - 119	17.84	4.44	20	
1,4-Dichlorobenzene	18.22	1.0	20	0	91.1	79 - 118	20.19	10.2	20	
2,2-Dichloropropane	15.77	1.0	20	0	78.8	60 - 139	16.92	7.04	20	
2-Butanone	27.15	2.0	40	0	67.9	56 - 143	27	0.575	20	
2-Chlorotoluene	17.75	1.0	20	0	88.8	79 - 122	19.91	11.5	20	
2-Hexanone	33.23	2.0	40	0	83.1	57 - 139	33.67	1.31	20	
4-Chlorotoluene	17.95	1.0	20	0	89.8	78 - 122	19.89	10.2	20	
4-Isopropyltoluene	18.75	1.0	20	0	93.8	77 - 127	21.09	11.7	20	
4-Methyl-2-pentanone	32.94	2.0	40	0	82.4	67 - 130	33.07	0.385	20	
Acetone	23.98	2.0	40	0	60.0	39 - 160	23.95	0.127	20	
Benzene	16.4	1.0	20	0	82.0	79 - 120	17.38	5.84	20	
Bromobenzene	17.16	1.0	20	0	85.8	80 - 120	18.84	9.3	20	
Bromochloromethane	16.05	1.0	20	0	80.3	78 - 123	16.58	3.23	20	
Bromodichloromethane	16.53	1.0	20	0	82.6	79 - 125	16.99	2.76	20	
Bromoform	18.43	1.0	20	0	92.1	66 - 130	19.02	3.15	20	
Bromomethane	14.98	1.0	20	0	74.9	53 - 141	15.6	4.04	20	

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: R347193 (0)		Instrument: VOA6		Method: VOLATILES ORGANICS BY METHOD 8260C						
MSD	Sample ID: HS19090962-10MSD	Units: UG/L			Analysis Date: 27-Sep-2019 15:32					
Client ID:	Run ID: VOA6_347193	SeqNo: 5273209	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	29.09	2.0	40	0	72.7	64 - 133	31.25	7.14	20	
Carbon tetrachloride	16.93	1.0	20	0	84.7	72 - 136	17.8	4.97	20	
Chlorobenzene	18.44	1.0	20	0	92.2	82 - 118	19.74	6.85	20	
Chloroethane	18	1.0	20	0	90.0	60 - 138	19.09	5.91	20	
Chloroform	15.23	1.0	20	0	76.2	79 - 124	15.89	4.23	20	S
Chloromethane	12.42	1.0	20	0	62.1	50 - 139	13.47	8.13	20	
cis-1,2-Dichloroethene	15.78	1.0	20	0	78.9	78 - 123	16.64	5.31	20	
cis-1,3-Dichloropropene	16.48	1.0	20	0	82.4	75 - 124	17.11	3.8	20	
Dibromochloromethane	17.71	1.0	20	0	88.5	74 - 126	18.23	2.89	20	
Dibromomethane	16.66	1.0	20	0	83.3	79 - 123	16.62	0.27	20	
Dichlorodifluoromethane	7.601	1.0	20	0	38.0	32 - 152	8.147	6.93	20	
Ethylbenzene	19.03	1.0	20	0	95.2	79 - 121	20.17	5.78	20	
Hexachlorobutadiene	19.1	1.0	20	0	95.5	66 - 134	21.21	10.5	20	
Isopropylbenzene	19.43	1.0	20	0	97.2	72 - 131	20.75	6.55	20	
m,p-Xylene	37.51	2.0	40	0	93.8	80 - 121	40.23	7.01	20	
Methylene chloride	15.13	2.0	20	0	75.6	74 - 124	15.64	3.35	20	
Naphthalene	18.15	1.0	20	0	90.7	61 - 128	18.22	0.375	20	
n-Butylbenzene	18.58	1.0	20	0	92.9	75 - 128	20.74	11	20	
n-Propylbenzene	18.1	1.0	20	0	90.5	76 - 126	20.11	10.5	20	
o-Xylene	18.86	1.0	20	0	94.3	78 - 122	20.13	6.52	20	
sec-Butylbenzene	18.81	1.0	20	0	94.1	77 - 126	20.82	10.1	20	
Styrene	17.58	1.0	20	0	87.9	78 - 123	18.86	7.05	20	
tert-Butylbenzene	18.78	1.0	20	0	93.9	78 - 124	21.3	12.6	20	
Tetrachloroethene	18.4	1.0	20	0	92.0	74 - 129	19.74	7.05	20	
Toluene	18.62	1.0	20	0	93.1	80 - 121	20.06	7.44	20	
trans-1,2-Dichloroethene	15.63	1.0	20	0	78.2	75 - 124	16.53	5.59	20	
trans-1,3-Dichloropropene	16.28	1.0	20	0	81.4	73 - 127	16.66	2.31	20	
Trichloroethene	19.11	1.0	20	2.663	82.2	79 - 123	20.62	7.61	20	
Trichlorofluoromethane	15.47	1.0	20	0	77.4	65 - 141	16.49	6.36	20	
Vinyl chloride	12.88	1.0	20	0	64.4	58 - 137	13.68	6.03	20	
Surr: 1,2-Dichloroethane-d4	42.41	1.0	50	0	84.8	81 - 118	42.73	0.745	20	
Surr: 4-Bromofluorobenzene	52.29	1.0	50	0	105	85 - 114	50.9	2.69	20	
Surr: Dibromofluoromethane	45.64	1.0	50	0	91.3	80 - 119	45.37	0.581	20	
Surr: Toluene-d8	48.45	1.0	50	0	96.9	89 - 112	49.06	1.25	20	

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: R347193 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C
--------------------------------	-------------------------	---

The following samples were analyzed in this batch:

HS19091234-01	HS19091234-02
---------------	---------------

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: R347382 (0)		Instrument: WetChem_HS		Method: CHEMICAL OXYGEN DEMAND BY E410.4						
MBLK	Sample ID: MBLK-347382	Units: mg/L			Analysis Date: 01-Oct-2019 15:00					
Client ID:	Run ID: WetChem_HS_347382	SeqNo: 5277359			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chemical Oxygen Demand	15.0	15.0							U	
LCS	Sample ID: LCS4-347382	Units: mg/L			Analysis Date: 01-Oct-2019 15:00					
Client ID:	Run ID: WetChem_HS_347382	SeqNo: 5277366			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chemical Oxygen Demand	99	15.0	100	0	99.0	85 - 115				
LCS	Sample ID: LCS3-347382	Units: mg/L			Analysis Date: 01-Oct-2019 15:00					
Client ID:	Run ID: WetChem_HS_347382	SeqNo: 5277365			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chemical Oxygen Demand	104	15.0	100	0	104	85 - 115				
LCS	Sample ID: LCS2-347382	Units: mg/L			Analysis Date: 01-Oct-2019 15:00					
Client ID:	Run ID: WetChem_HS_347382	SeqNo: 5277364			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chemical Oxygen Demand	103	15.0	100	0	103	85 - 115				
LCS	Sample ID: LCS1-347382	Units: mg/L			Analysis Date: 01-Oct-2019 15:00					
Client ID:	Run ID: WetChem_HS_347382	SeqNo: 5277360			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chemical Oxygen Demand	102	15.0	100	0	102	85 - 115				
MS	Sample ID: HS19091488-01MS	Units: mg/L			Analysis Date: 01-Oct-2019 15:00					
Client ID:	Run ID: WetChem_HS_347382	SeqNo: 5277362			PrepDate:		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit Qual	
Chemical Oxygen Demand	76	15.0	50	22	108	80 - 120				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: R347382 (0)		Instrument: WetChem_HS		Method: CHEMICAL OXYGEN DEMAND BY E410.4						
MSD	Sample ID: HS19091488-01MSD	Units: mg/L			Analysis Date: 01-Oct-2019 15:00					
Client ID:	Run ID: WetChem_HS_347382	SeqNo: 5277363	PrepDate:	DF: 1						
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chemical Oxygen Demand	82	15.0	50	22	120	80 - 120	76	7.59	20	

The following samples were analyzed in this batch:

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: R347908 (0)		Instrument: ICS-Integrion		Method: ANIONS BY SW9056A						
MBLK	Sample ID: WBLKW1-100719	Units: mg/L			Analysis Date: 07-Oct-2019 20:48					
Client ID:	Run ID: ICS-Integrion_347908	SeqNo: 5288352		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: WLCSW1-100719	Units: mg/L			Analysis Date: 07-Oct-2019 21:05					
Client ID:	Run ID: ICS-Integrion_347908	SeqNo: 5288353		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	19.56	0.500	20	0	97.8	80 - 120				
Sulfate	19.63	0.500	20	0	98.1	80 - 120				
LCSD	Sample ID: WLCSDW1-100719	Units: mg/L			Analysis Date: 07-Oct-2019 21:21					
Client ID:	Run ID: ICS-Integrion_347908	SeqNo: 5288354		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	19.46	0.500	20	0	97.3	80 - 120	19.56	0.528	20	
Sulfate	19.49	0.500	20	0	97.4	80 - 120	19.63	0.729	20	
MS	Sample ID: HS19091343-09MS	Units: mg/L			Analysis Date: 08-Oct-2019 00:57					
Client ID:	Run ID: ICS-Integrion_347908	SeqNo: 5288364		PrepDate:			DF: 10			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	606.3	5.00	100	517.6	88.7	80 - 120			O	
Sulfate	318	5.00	100	222.7	95.3	80 - 120				
MS	Sample ID: HS19091343-02MS	Units: mg/L			Analysis Date: 07-Oct-2019 23:01					
Client ID:	Run ID: ICS-Integrion_347908	SeqNo: 5288359		PrepDate:			DF: 20			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Chloride	1181	10.0	200	1016	82.4	80 - 120			O	
Sulfate	616.8	10.0	200	436.1	90.3	80 - 120				

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: R347908 (0)		Instrument: ICS-Integrion		Method: ANIONS BY SW9056A						
MSD	Sample ID: HS19091343-09MSD	Units: mg/L			Analysis Date: 08-Oct-2019 01:14					
Client ID:	Run ID: ICS-Integrion_347908	SeqNo: 5288365		PrepDate:			DF: 10			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	605.5	5.00	100	517.6	87.9	80 - 120	606.3	0.132	20	O
Sulfate	315.3	5.00	100	222.7	92.6	80 - 120	318	0.861	20	
MSD	Sample ID: HS19091343-02MSD	Units: mg/L			Analysis Date: 07-Oct-2019 23:17					
Client ID:	Run ID: ICS-Integrion_347908	SeqNo: 5288360		PrepDate:			DF: 20			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1189	10.0	200	1016	86.6	80 - 120	1181	0.712	20	O
Sulfate	625.2	10.0	200	436.1	94.5	80 - 120	616.8	1.35	20	

The following samples were analyzed in this batch: HS19091234-01

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
WorkOrder: HS19091234

QC BATCH REPORT

Batch ID: R347939 (0)		Instrument: Balance1		Method: OIL & GREASE (HEM) BY E1664A						
MBLK	Sample ID: WBLKW-100819	Units: mg/L		Analysis Date: 08-Oct-2019 14:40						
Client ID:	Run ID: Balance1_347939	SeqNo: 5288873		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-100819	Units: mg/L		Analysis Date: 08-Oct-2019 14:40						
Client ID:	Run ID: Balance1_347939	SeqNo: 5288875		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	100.0	78 - 114				
LCSD	Sample ID: WLCSDW-100819	Units: mg/L		Analysis Date: 08-Oct-2019 14:40						
Client ID:	Run ID: Balance1_347939	SeqNo: 5288874		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Oil and Grease	38.4	2.00	40	0	96.0	78 - 114	40	4.08	18	
MS	Sample ID: HS19100083-01MS	Units: mg/L		Analysis Date: 08-Oct-2019 14:40						
Client ID:	Run ID: Balance1_347939	SeqNo: 5288864		PrepDate:			DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit Qual	
Oil and Grease	38.75	2.00	40	-0.4167	97.9	78 - 114				

The following samples were analyzed in this batch: HS19091234-01

ALS Houston, US

Date: 09-Oct-19

Client:	Bhate Environmental Associates, Inc.	QUALIFIERS, ACRONYMS, UNITS
Project:	Groundwater Treatment Plant Quarterly Influent Samples	
WorkOrder:	HS19091234	

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	2019-141	31-Aug-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US

Date: 09-Oct-19

Client: Bhate Environmental Associates, Inc.
Project: Groundwater Treatment Plant Quarterly Influent Samples
Work Order: HS19091234

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19091234-01	LH18/24-SP650_092419	Login	9/25/2019 5:35:08 PM	AC	Sub
HS19091234-01	LH18/24-SP650_092419	Login	9/25/2019 5:35:08 PM	AC	WET100
HS19091234-01	LH18/24-SP650_092419	Login	9/25/2019 5:35:08 PM	AC	EXT090
HS19091234-01	LH18/24-SP650_092419	Login	9/25/2019 5:35:08 PM	AC	WET100
HS19091234-01	LH18/24-SP650_092419	Login	9/25/2019 5:35:08 PM	AC	WET100
HS19091234-01	LH18/24-SP650_092419	Login	9/25/2019 5:35:08 PM	AC	MET037
HS19091234-01	LH18/24-SP650_092419	Login	9/25/2019 5:35:08 PM	AC	VOA006
HS19091234-02	Trip Blank	Login	9/25/2019 5:35:08 PM	AC	VOA006

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19091234

Date/Time Received: **25-Sep-2019 08:50**
 Received by: **JRM**

Checklist completed by: Asad Chaudhry 25-Sep-2019
 eSignature Date
 Reviewed by: RJ Modashia 25-Sep-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 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): 1.8c C/UC IR 25
 Cooler(s)/Kit(s): 5161
 Date/Time sample(s) sent to storage: 09/25/2019 18:00

- 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: Trip Blank received 2 vials, 2 COC. Logged in 1 vials per COC.
 Trip Blanks split between W/O HS19091233

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stanchiff Rd., Suite 210 Houston, Tx, 77099 ATTN: RJ Modashia
1

Page 1 of

HS19091234

Bhate Environmental Associates, Inc.
 Groundwater Treatment Plant Quarterly Influent Sarr




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 QUARTERLY EFFLUENT 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-SP650_092419	Water	09/24/19 / 14:00		4	3		1							HCL	
LH18/24-SP650_092419	Water	09/24/19 / 14:00		1		1								HNO3	
LH18/24-SP650_092419	Water	09/24/19 / 14:00		2						1	1			NONE	
LH18/24-SP650_092419	Water	09/24/19 / 14:00		1				1						H2SO4	
LH18/24-SP650_092419 Blank IX	Water	09/24/19 / 14:00		1								1		NONE	
Trip Blank	Water	09/24/19		2	2									HCL	

Additional Remarks: **STANDARD TURN AROUND TIME**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
<i>Scott Beesinger</i>	09/24/19	14:30									

Received At Lab By:	Date	Time	Airbill No.	For Lab Use Only							
				Opened By:	Date	Time	Temp of Container	Seal No.	Condition		
J. MAUN	9/25/19	08:50									
Remarks: <i>Order 5161 Temp 1.8 1125 CFO-0</i>											

(Word) S-11-(es)Forms\Chain of Custody - BiWeekly

 ALS 10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5856 Fax. +1 281 530 5887	CUSTODY SEAL		Seal Broken By: <i>am</i>
	Date: <i>9/25/19</i>	Time: <i>14:30</i>	Date:
	Name: <i>Scott Beesinger</i>	Company: <i>BH&A</i>	Date: <i>09/25/19</i>

5161 SEP 25 2019



Must Deliver Next Business Day
Time and Temperature Sensitive!

5161

ORIGIN: SGRA (803) 930-6193
SCOTT BEESINGER
BH&E ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PR0202

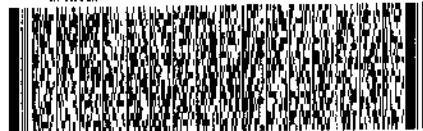
SHIP DATE: 19 JUL 18
ACTWGT: 1.00 LB PAN
CAD: 300130/CNFE3111
DIMS: 25x14x14 IN

MARSHALL, TX 75670
UNITED STATES US

TO
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099

(281) 530-6656
REF: LHAAP 59 - RJ

RMA: ||| ||| |||



FedEx
Express



FedEx
TRK# 4380 9530 9412
[0221]

WED - 25 SEP 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH



4475872 09/24 54711/9004/05A2



Case Narrative

Method: 6850

Analysis: Perchlorate

Analysis SOP: LC-MS-CLO4

ALS WO ID(s): 1927220; 1927568; 1927591;
1927596

Client: ALS Laboratories (Houston, TX)

Matrix: Water

ELMS Batch (HBN): 2298 (248917)

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

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

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 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 1927568001 was analyzed and reported from 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 676591) was less than 1/2 the CRDL. The recovery for the LCS (676592) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on samples 1927220005/06 (Client ID: 16WW58-190918). 3.0 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 $(A) \times (B)$,

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 – 676589) is reported from the analysis of the Laboratory Control Sample (LCS – 676592) 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) along with datafiles 01OCTD02/05/06. Samples 1927220001/02 failed the 50-150% method requirement for ISTD recoveries. These samples were re-prepped, re-analyzed and reported.

Thomas Bosch October 03, 2019
Analyst Date



ANALYTICAL REPORT

Report Date: October 03, 2019

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

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1927596**

Project ID: HS19091234

Purchase Order: HS19091234

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_092419	1927596001	09/24/19	09/26/19	



ANALYTICAL REPORT

Workorder: 34-1927596

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: LH18/24-SP650_092419	Sampling Site: NA	Collected: 09/24/2019				
Lab ID: 1927596001	Media: 125 mL Nalgene	Received: 09/26/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2298 (HBN: 248917) Analyzed: 10/01/2019 15:04	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: 248917)

Field sample 1927568001 was analyzed and reported from 1:1,000 dilution. The reporting limit has been adjusted accordingly.

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

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 10/03/2019 09:55	/S/ Stephen Brose 10/03/2019 13:30

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123Phone: (801) 266-7700
Email: alsst.lab@ALSGlobal.com
Web: www.alssl.com



ANALYTICAL REPORT

Workorder: 34-1927596

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

00953102

Analysis Information

Workorder: 1927596

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2298 (HBN: 248917)
Analyzed By: Thomas Bosch

Blank

LMB: 676591 Analyzed: 10/01/2019 11:23 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 676592 Analyzed: 10/01/2019 10:56 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.01	3.00	100	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1927220004 Analyzed: 10/01/2019 12:19 Dilution: 1 Units: ug/L		MS: 1927220005 Analyzed: 10/01/2019 12:32 Dilution: 1 Units: ug/L				MSD: 1927220006 Analyzed: 10/01/2019 12:46 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	2.94	3	97.8	78.8 123.8	2.93	97.7	0.157	0.0 20.0

Comments

Field sample 1927568001 was analyzed and reported from 1:1,000 dilution. The reporting limit has been adjusted accordingly.

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

Analyst	Peer Review
/S/ Thomas Bosch 10/03/2019 11:24	/S/ Stephen Brose 10/03/2019 13:30

Symbols and Definitions

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

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



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

Subcontract Chain of Custody

18698/#2

SAMPLING STATE: Colorado

COC ID: 12240

SUBCONTRACT TO:

1927596

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: HS19091234
TSR: Danielle Winnings

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
1. HS19091234-01	LH18/24-SP650_092419	Water	24 Sep 2019 14:00
SUB_Perch-6850			09 Oct 2019

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

QC Level: DOD IV (DoD Data Package)

Relinquished By: S. MURPHY
Received By: [Signature]
Cooler ID(s): _____

Date/Time: 9/25/19 18:00
Date/Time: 9/26/19 09:54
Temperature(s): _____

COPIER FOR CUMULATIVE RECORDS (FORM NO. 101)

Client Name: <u>ALS Houston</u>		Project/Task/Site: <u>10275AL</u>							
Date/Time of Receipt: _____		Number of Coolers Received: _____							
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							
Intact/Broken/NA		Are all temperatures within project specific guidelines? <u>Yes</u> /No/NA							
Container Custody Seals: Present <u>Absent</u> /NA		VOA Headspace Present? <u>Yes</u> /No/NA							
Intact/Broken/NA									
Ice Present: <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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	
1	C19 <u>9895</u>	<u>3</u> °C	4	C19	°C	7	C19	°C	
2	C19	°C	5	C19	°C	8	C19	°C	
3	C19	°C	6	C19	°C	9	C19	°C	
Taken By: <u>Jaylynn Johnson</u> Signature		<u>Jaylynn Johnson</u> Printed Name		<u>9/26/19</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 # 159469-434 RTT2 EXP 05/20 **

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

SHIP DATE: 25SEP19
NET WT: 9.60 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN
BILL THIRD PARTY

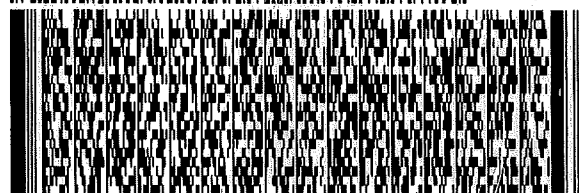
30174006/13155

TO **SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE**

SALT LAKE CITY UT 84123

(801) 286-7700

REF: HS19091201/1233/1234 RJ

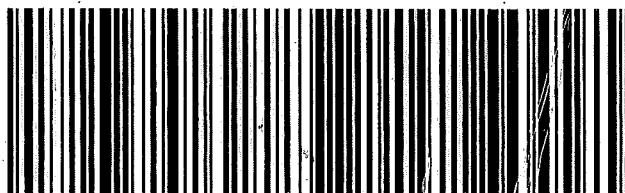


**THU - 26 SEP 3:00P
STANDARD OVERNIGHT**

TRK# 1251 0289 9683
0201

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: _____
Company: _____



ALS Environmental
CHAIN-OF-CUSTODY

Project / Job / Task: HS19091234		Split:		Workorder ID: 1927596		Level: ENV_LVL4		Requested Analysis	
Client: ALS Environmental (Houston)		Account: 8101		Type: 125Poly		Preservatives		EPA 6850, DOD QSM	
Comments:		Sample ID		Lab ID		QC		Matrix	
Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Containers	Count	
1	09/24/2019 14:00	LH18/24-SP650_092419	1927596001		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				
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>Warath Jullie</i>	09/26/2019 09:54	ALS Sample Receiving	Sample Login						
<i>Warath Jullie</i>	09/26/2019 15:00	<i>GB</i>	<i>Storage</i>						
<i>R-33-1</i>	10/19/2019 07:50	<i>T. Bond</i>	<i>at day analysis</i>						



Batch Worklist

Batch: ELMS/ 2298

Created: 10/1/2019 10:29

Instrument:

Rule: EPA 6850, DoD QSM Water

Analyst: T. Bosch

Status: WP



Workorder: 1927220 [ENV_LVL4]
 Workorder: 1927568 [ENV_LVL4]
 Workorder: 1927591 [ENV_LVL4]
 Workorder: 1927596 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	676588	CCV for HBN 248917 [ELMS/2298]				CCV	3	E685041C3Q	5311		10/3/2019	
2	676589	RLVS for HBN 248917 [ELMS/2298]				RLVS	3	E685041C3Q	5311		10/3/2019	
3	676590	ICS for HBN 248917 [ELMS/2298]				ICS	3	E6850_D3Q	5311		10/3/2019	
4	676591	LMB for HBN 248917 [ELMS/2298]				LMB	3	E6850Q413Q	5311		10/3/2019	
5	676592	LCS for HBN 248917 [ELMS/2298]				LCS	3	E6850Q413Q	5311		10/3/2019	
6	1927220001	16WW25-190919				SAMPLE	3	1927220001-A E6850Q41.3	5480	10/17/2019	10/3/2019	
7	1927220002	16WW25-190919-FD				FLDDUP	3	1927220002-A E6850Q41.3	5480	10/17/2019	10/3/2019	
8	1927220003	16WW49-190919				SAMPLE	3	1927220003-A E6850Q41.3	5480	10/17/2019	10/3/2019	
9	1927220004	16WW58-190918				SAMPLE	3	1927220004-A E6850Q41.3	5480	10/16/2019	10/3/2019	
10	1927220005	16WW58-190918MS				MS	3	1927220005-A E6850Q413Q	5480		10/3/2019	
11	1927220006	16WW58-190918MSD				MSD	3	1927220006-A E6850Q413Q	5480		10/3/2019	
12	1927220007	16WW58-190918-FD				FLDDUP	3	1927220007-A E6850Q41.3	5480	10/16/2019	10/3/2019	
13	1927220008	16WW51-190919				SAMPLE	3	1927220008-A E6850Q41.3	5480	10/16/2019	10/3/2019	
14	1927568001	LH18/24-SP140_092419				SAMPLE	3	1927568001-A E6850Q41.3	5480	10/22/2019	10/9/2019	
15	1927591001	LH18/24-SP650_092419_AIX				SAMPLE	3	1927591001-A E6850Q41.3	5480	10/22/2019	10/9/2019	
16	676593	CCV for HBN 248917 [ELMS/2298]				CCV	3	E685041C3Q	5311		10/3/2019	
17	1927596001	LH18/24-SP650_092419				SAMPLE	3	1927596001-A E6850Q41.3	5480	10/22/2019	10/9/2019	
18	676594	CCV for HBN 248917 [ELMS/2298]				CCV	3	E685041C3Q	5311		10/3/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-upALS Work Order #'s & Sample #()'s: 1927220 (001-08); 1927568 (001); 1927591 (001); 1927596 (001)ELMS Batch/HBN ID: 2296 (248804)Prep Date: 09/30/2019 Analysis Date: 10/01/2019 Analyst: T. BoschAnalyte: **Perchlorate** Matrix: **Water** Method: **6850**Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\OCT\01OCT19D.sReported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**SAMPLE PREPARATION/ANALYSIS:

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

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/5%ACN (B&J Lot DU461-US)/0.1% glacial acetic acid (JT-Baker Lot 122550).
Eluent B1: 95% ACN (B&J Lot DU461-US)/5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 122550).

STANDARDS: Internal Standard Spiking Solution Horizon# 47863. Dilutions of Working Standards (Horizon: 49947/48) used for ICAL, CCV's, RLVS and ICS.

CALIBRATION CURVE: Used curve from 09/20/2019, sequence 20SEP19D.s Offline Quantitation Method: CLO4-DP3.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.

Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 8 Injection Volume: 30µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1 Run time: 12.0min.

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 3.0µL of QC Solution Horizon ID 47516 was used for LCS 676592; Target = 3.0µg/L. ASTM type II water was used for LMB 676591.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) was performed on samples 1927220005/06 (Client ID's: 16WW58-190918). 3.0µL of Working Standard Solution Horizon ID 49947 was added to 10.0mL of sample preparation. Spike target = 3.0µg/L.

COMMENTS:

- 1) Results reported in µg/L. Field sample 1927568001 was analyzed and reported from 1:1,000 dilution. The reporting limit has been adjusted accordingly. Samples 1927220001/02 failed the 50-150% method requirement for ISTD recoveries. These samples were re-prepped, re-analyzed and reported.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\OCT\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\248917-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 676589) is reported from the analysis of the Laboratory Control Sample (LCS – 676592) at a level of 3.0µg/L.
- 6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 20SEPI03) along with datafiles 01OCT19D02/05/06.

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

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

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria	Analyst Initials	Reviewer Initials
Batch(es)/SDG: <u>ELMS. 2298 HBN: 248917</u> <u>1927591 / 19275.96</u>		
Sample Set IDs if Applicable: <u>WV^S 1927220 / 1927568</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 Intrmtd 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



S

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

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/NCCL 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

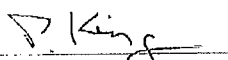


ISO Guide 34 Reference Material

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

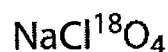
Catalog Number: OLM-7310-S

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	
#*	676588	CCV@25	Vial 71	1	Control	1	1.54525e6	7.598	25.01921
#*	676592	QC@3.0	Vial 72	1	Control	2	1.95090e5	7.638	3.01143
#*	676590	ICS@3.0	Vial 73	1	Control	3	1.58401e5	7.470	2.89276
#*	676591	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1927220001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
#*	1927220002		Vial 76	1	Sample	6	0.00000	0.000	0.00000
#*	1927220003		Vial 77	1	Sample	7	0.00000	0.000	0.00000
#*	1927220004		Vial 78	1	Sample	8	0.00000	0.000	0.00000
#*	1927220005	MS	Vial 79	1	Sample	9	1.24857e5	7.081	2.93501
#*	1927220006	MSD	Vial 80	1	Sample	10	1.25081e5	7.109	2.93042
#*	1927220007		Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1927220008		Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1927220001	RE	Vial 86	1	Sample	13	0.00000	0.000	0.00000
#*	1927220002	RE	Vial 87	1	Sample	14	0.00000	0.000	0.00000
#*	676593	CCV@25	Vial 71	1	Control	15	1.16163e6	7.635	24.36237
#*	1927568001	1K	Vial 83	1	Sample	16	7.34459e5	7.710	1.48902e4
#*	1927591001		Vial 84	1	Sample	17	0.00000	0.000	0.00000
#*	1927596001		Vial 85	1	Sample	18	0.00000	0.000	0.00000
#*	676594	CCV@25	Vial 71	1	Control	19	1.23687e6	7.622	25.30819

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
#*	676588	CCV@25	Vial 71	1	Control	1	2.11020e5	7.618	5.00000
#*	676592	QC@3.0	Vial 72	1	Control	2	2.38378e5	7.665	5.00000
#*	676590	ICS@3.0	Vial 73	1	Control	3	2.01376e5	7.487	5.00000
#*	676591	LMB	Vial 74	1	Control	4	2.07694e5	7.734	5.00000
#*	1927220001		Vial 75	1	Sample	5	4.33588e5	7.953	5.00000
#*	1927220002		Vial 76	1	Sample	6	4.80845e5	7.953	5.00000
#*	1927220003		Vial 77	1	Sample	7	1.29768e5	7.177	5.00000
#*	1927220004		Vial 78	1	Sample	8	1.55844e5	7.141	5.00000
#*	1927220005	MS	Vial 79	1	Sample	9	1.56479e5	7.113	5.00000
#*	1927220006	MSD	Vial 80	1	Sample	10	1.57002e5	7.138	5.00000
#*	1927220007		Vial 81	1	Sample	11	1.53526e5	7.105	5.00000
#*	1927220008		Vial 82	1	Sample	12	1.25991e5	7.173	5.00000
#*	1927220001	RE	Vial 86	1	Sample	13	2.84559e5	7.943	5.00000
#*	1927220002	RE	Vial 87	1	Sample	14	2.52777e5	7.981	5.00000
#*	676593	CCV@25	Vial 71	1	Control	15	1.63352e5	7.642	5.00000
#*	1927568001	1K	Vial 83	1	Sample	16	1.75719e5	7.734	5000.00000
#*	1927591001		Vial 84	1	Sample	17	1.54254e5	7.342	5.00000
#*	1927596001		Vial 85	1	Sample	18	1.53002e5	7.317	5.00000
#*	676594	CCV@25	Vial 71	1	Control	19	1.66780e5	7.660	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
#*	676588	CCV@25	Vial 71	1	Control	1	4.70692e5	7.614	24.99478
#*	676592	QC@3.0	Vial 72	1	Control	2	6.47386e4	7.668	3.18858
#*	676590	ICS@3.0	Vial 73	1	Control	3	5.51383e4	7.474	3.21571
#*	676591	LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1927220001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
#*	1927220002		Vial 76	1	Sample	6	0.00000	0.000	0.00000
#*	1927220003		Vial 77	1	Sample	7	0.00000	0.000	0.00000
#*	1927220004		Vial 78	1	Sample	8	0.00000	0.000	0.00000
#*	1927220005	MS	Vial 79	1	Sample	9	4.29875e4	7.108	3.22679
#*	1927220006	MSD	Vial 80	1	Sample	10	4.26524e4	7.129	3.18966

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	1927220007	Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1927220008	Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1927220001 RE	Vial 86	1	Sample	13	0.00000	0.000	0.00000
#*	1927220002 RE	Vial 87	1	Sample	14	0.00000	0.000	0.00000
#*	676593 CCV@25	Vial 71	1	Control	15	3.50571e5	7.646	24.12639
#*	1927568001 1K	Vial 83	1	Sample	16	2.20256e5	7.727	1.45858e4
#*	1927591001	Vial 84	1	Sample	17	0.00000	0.000	0.00000
#*	1927596001	Vial 85	1	Sample	18	0.00000	0.000	0.00000
#*	676594 CCV@25	Vial 71	1	Control	19	3.71181e5	7.641	24.94374

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

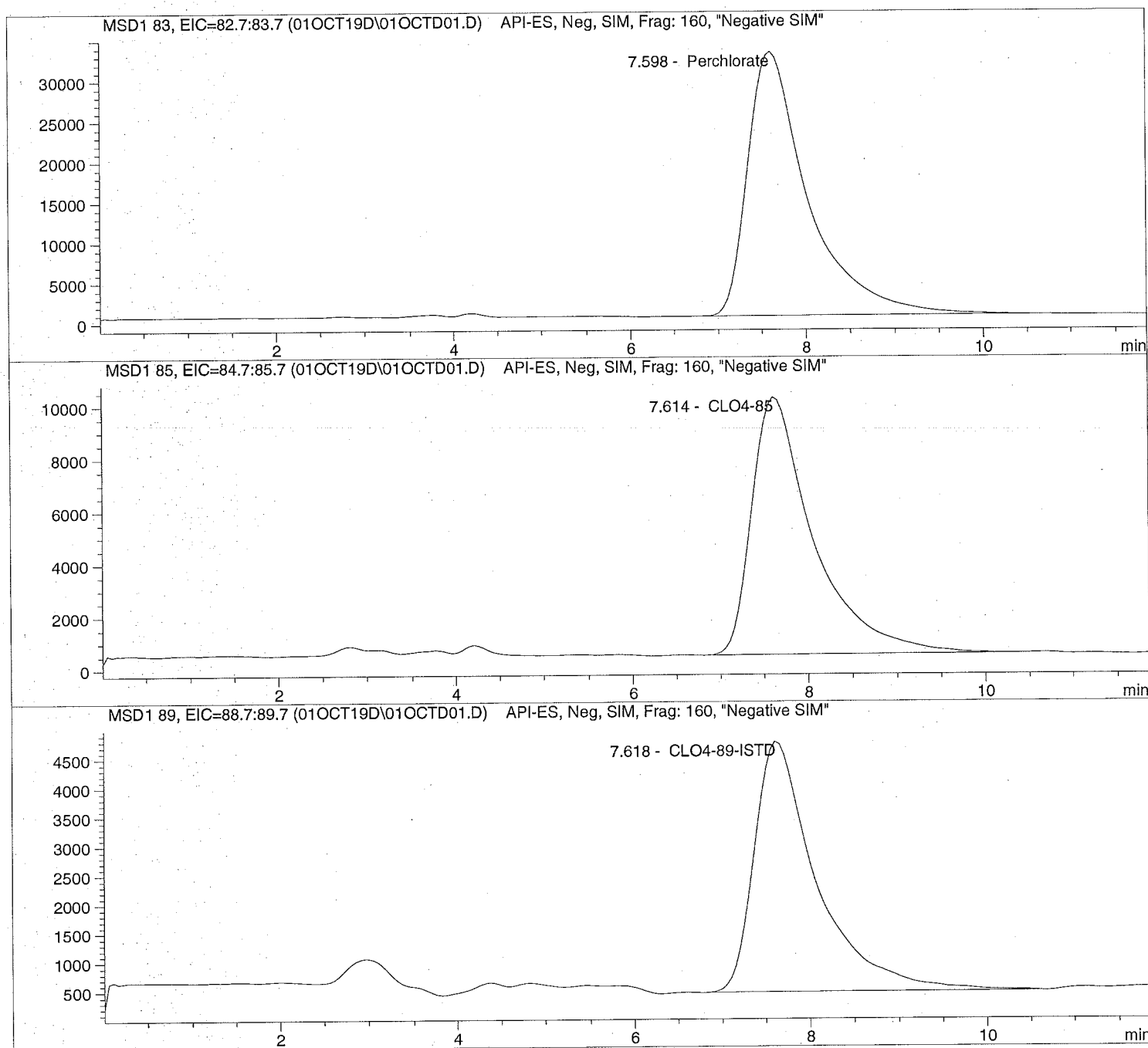
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	==	=====	=====	=====
1	Vial 71	676588	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	676592	QC@3.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	676590	ICS@3.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	676591	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1927220001		CLO4-AQN	1	Sample	
6	Vial 76	1927220002		CLO4-AQN	1	Sample	
7	Vial 77	1927220003		CLO4-AQN	1	Sample	
8	Vial 78	1927220004		CLO4-AQN	1	Sample	
9	Vial 79	1927220005	MS	CLO4-AQN	1	Sample	
10	Vial 80	1927220006	MSD	CLO4-AQN	1	Sample	
11	Vial 81	1927220007		CLO4-AQN	1	Sample	
12	Vial 82	1927220008		CLO4-AQN	1	Sample	
13	Vial 86	1927220001	RE	CLO4-AQN	1	Sample	
14	Vial 87	1927220002	RE	CLO4-AQN	1	Sample	
15	Vial 71	676593	CCV@25	CLO4-AQN	1	Ctrl Samp	
16	Vial 83	1927568001	1K	CLO4-AQN	1	Sample	
17	Vial 84	1927591001		CLO4-AQN	1	Sample	
18	Vial 85	1927596001		CLO4-AQN	1	Sample	
19	Vial 71	676594	CCV@25	CLO4-AQN	1	Ctrl Samp	

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD01.D Sample Name: 676588 CCV@25

=====
Injection Date: 10/01/2019 10:42:23 Seq Line: 1
Sample Name: 676588 CCV@25 Location: Vial 71
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD01.D Sample Name: 676588 CCV@25

=====
 Injection Date: 10/01/2019 10:42:23 Seq Line: 1
 Sample Name: 676588 CCV@25 Location: Vial 71
 Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
 Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
 Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

=====
 Sample Information
 =====

Sorted By: Signal
 Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
 Multiplier: 1.000000
 Dilution: 1.000000
 Sample Amount: 25.000

=====
 LCMS Results
 =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.598	BB S	1545248.1	25.0192	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.614	BB S	470692.3	24.9948	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.618	PB S	211020.1	5.0000	CLO4-89-ISTD

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

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD02.D

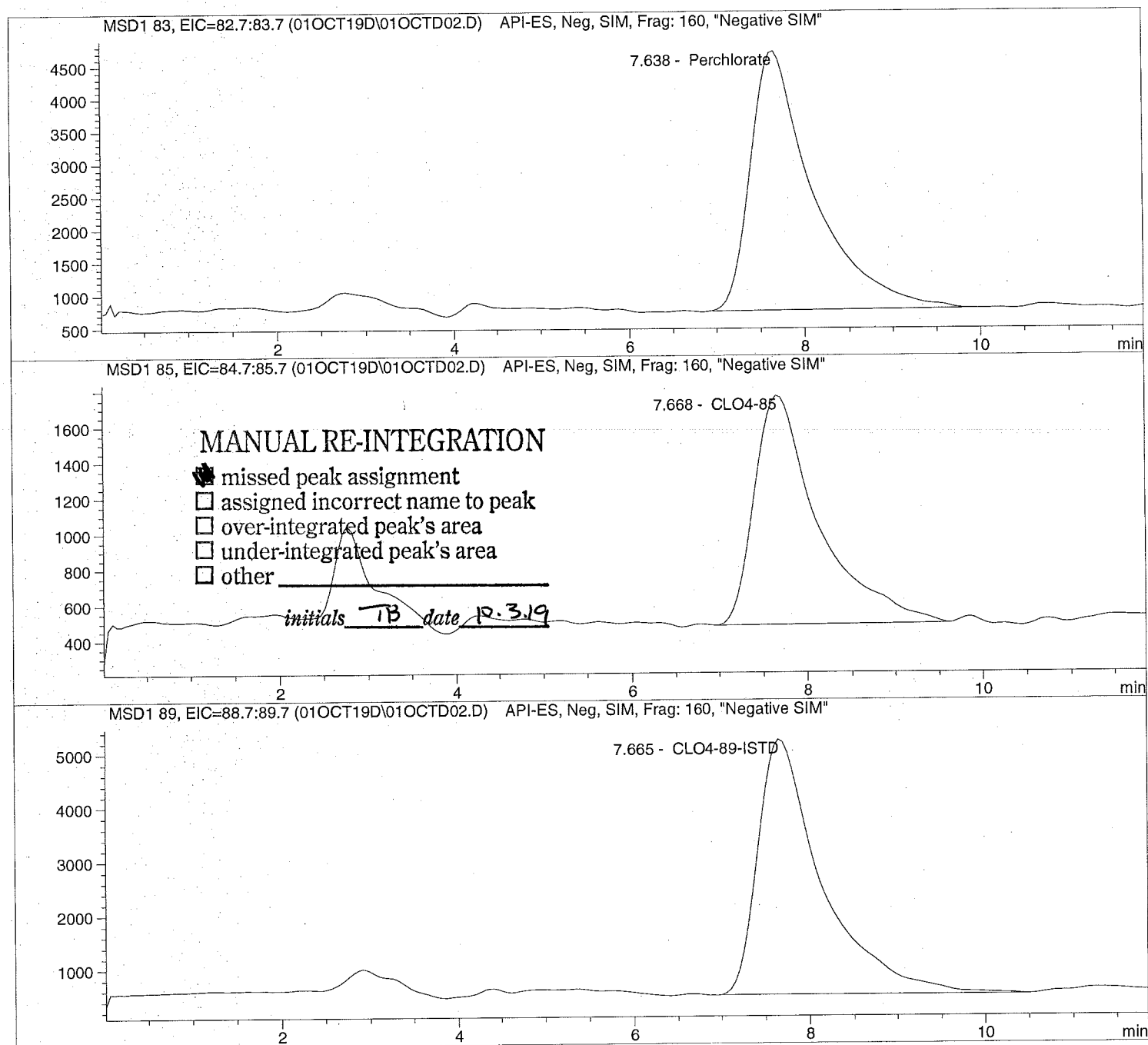
Sample Name: 676592 QC@3.0

Injection Date: 10/01/2019 10:56:09
 Sample Name: 676592 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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD03.D

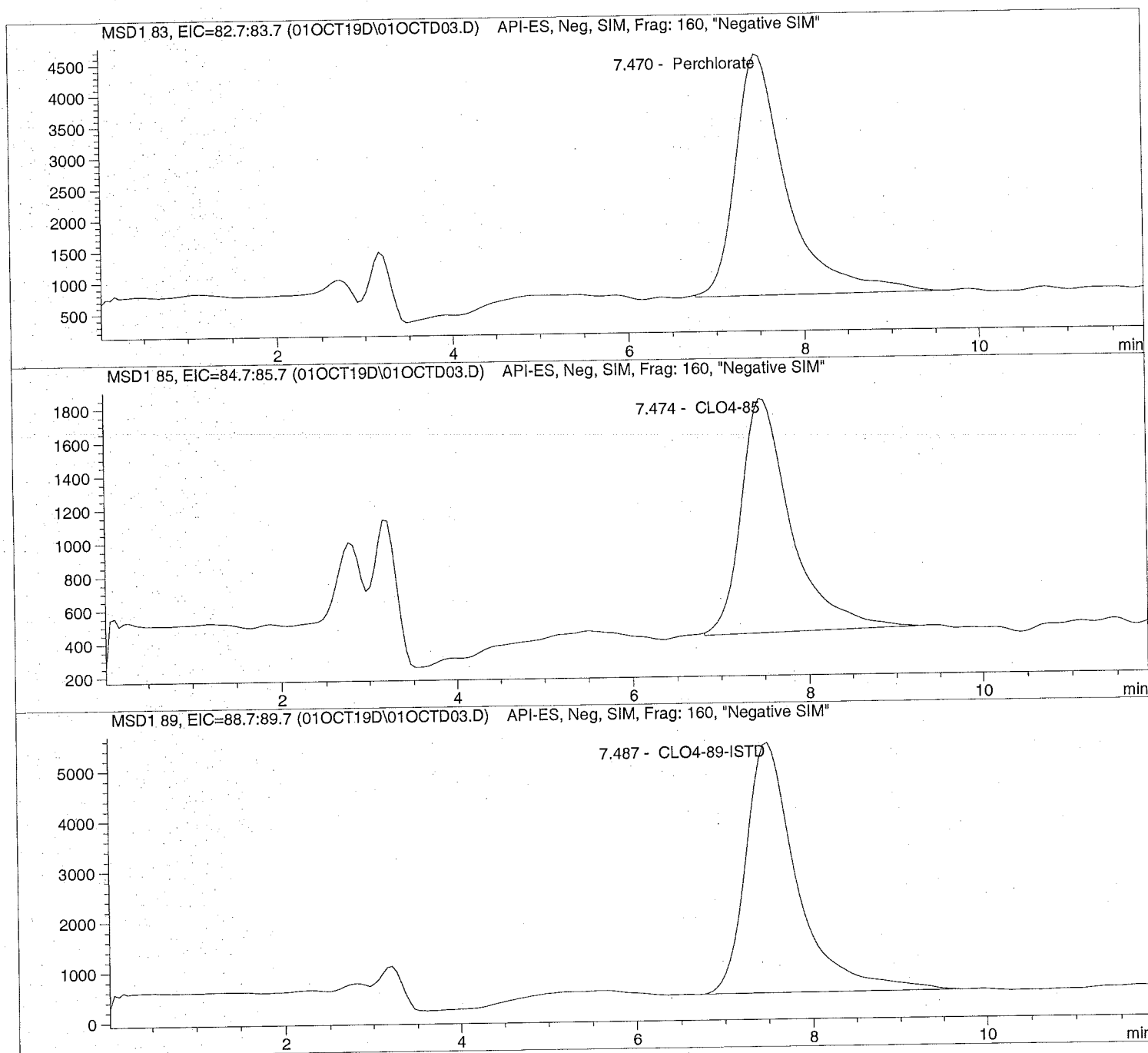
Sample Name: 676590 ICS@3.0

Injection Date: 10/01/2019 11:09:58
Sample Name: 676590 ICS@3.0
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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD04.D

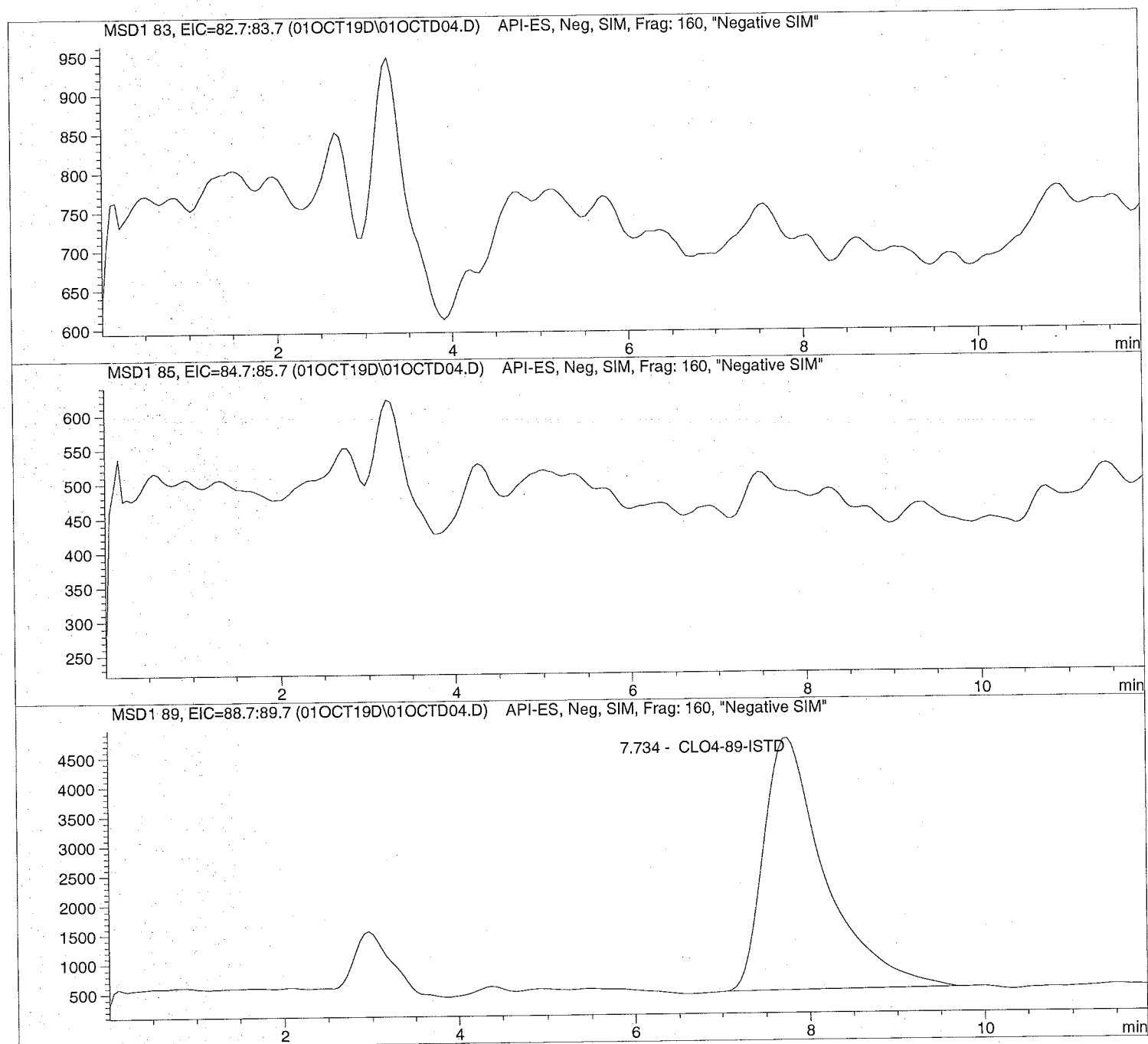
Sample Name: 676591 LMB

=====
Injection Date: 10/01/2019 11:23:50
Sample Name: 676591 LMB
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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD04.D Sample Name: 676591 LMB

=====
Injection Date: 10/01/2019 11:23:50 Seq Line: 4
Sample Name: 676591 LMB Location: Vial 74
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

=====
Sample Information
=====

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.734	PB S	207693.8	5.0000	CLO4-89-ISTD

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

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD05.D

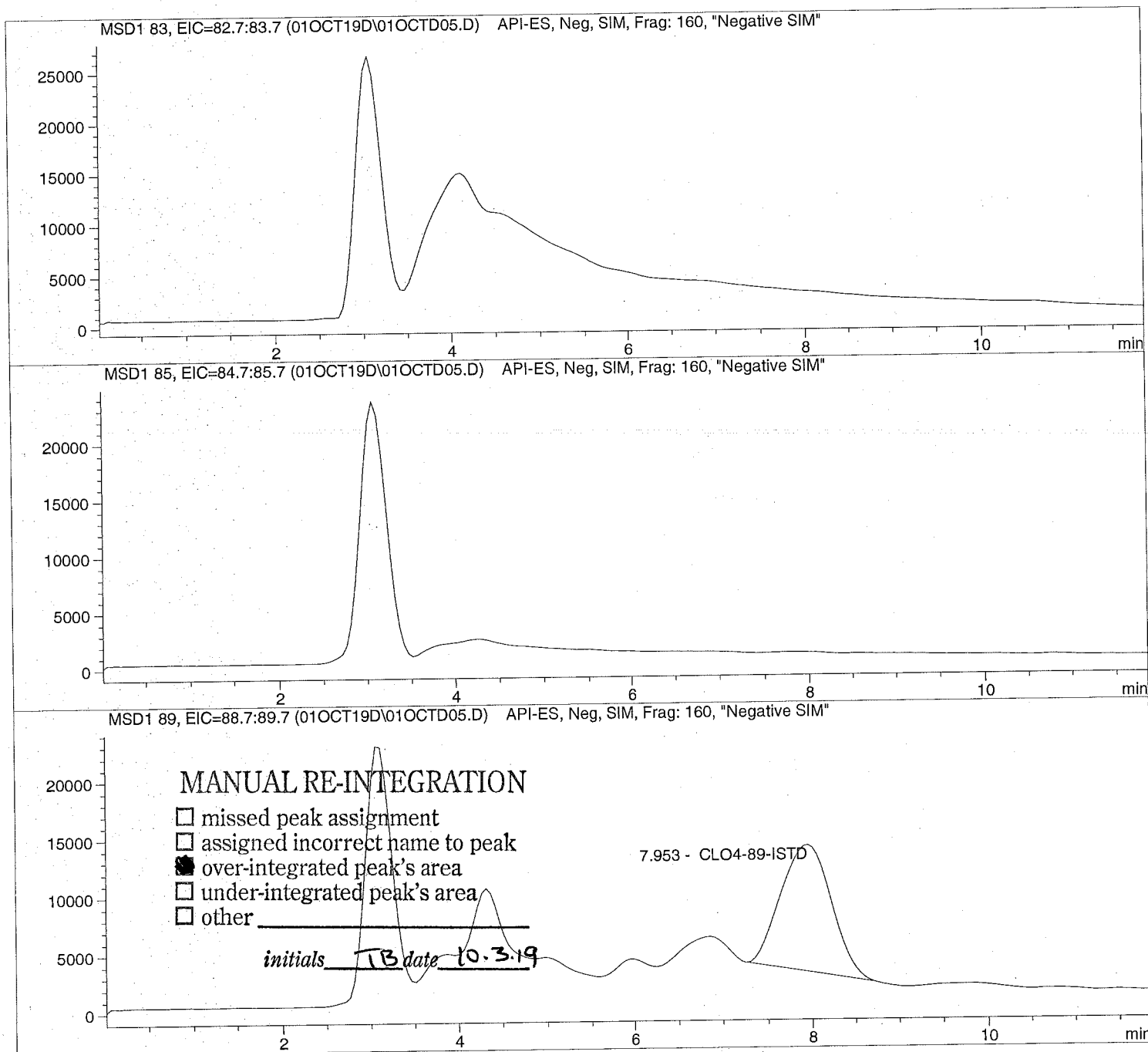
Sample Name: 1927220001

Injection Date: 10/01/2019 11:37:35
 Sample Name: 1927220001
 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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD05.D

Sample Name: 1927220001

```

=====
Injection Date: 10/01/2019 11:37:35      Seq Line: 5
Sample Name: 1927220001                  Location: Vial 75
Acq Operator: TNB                         Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.953	MM	433588.3	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD06.D

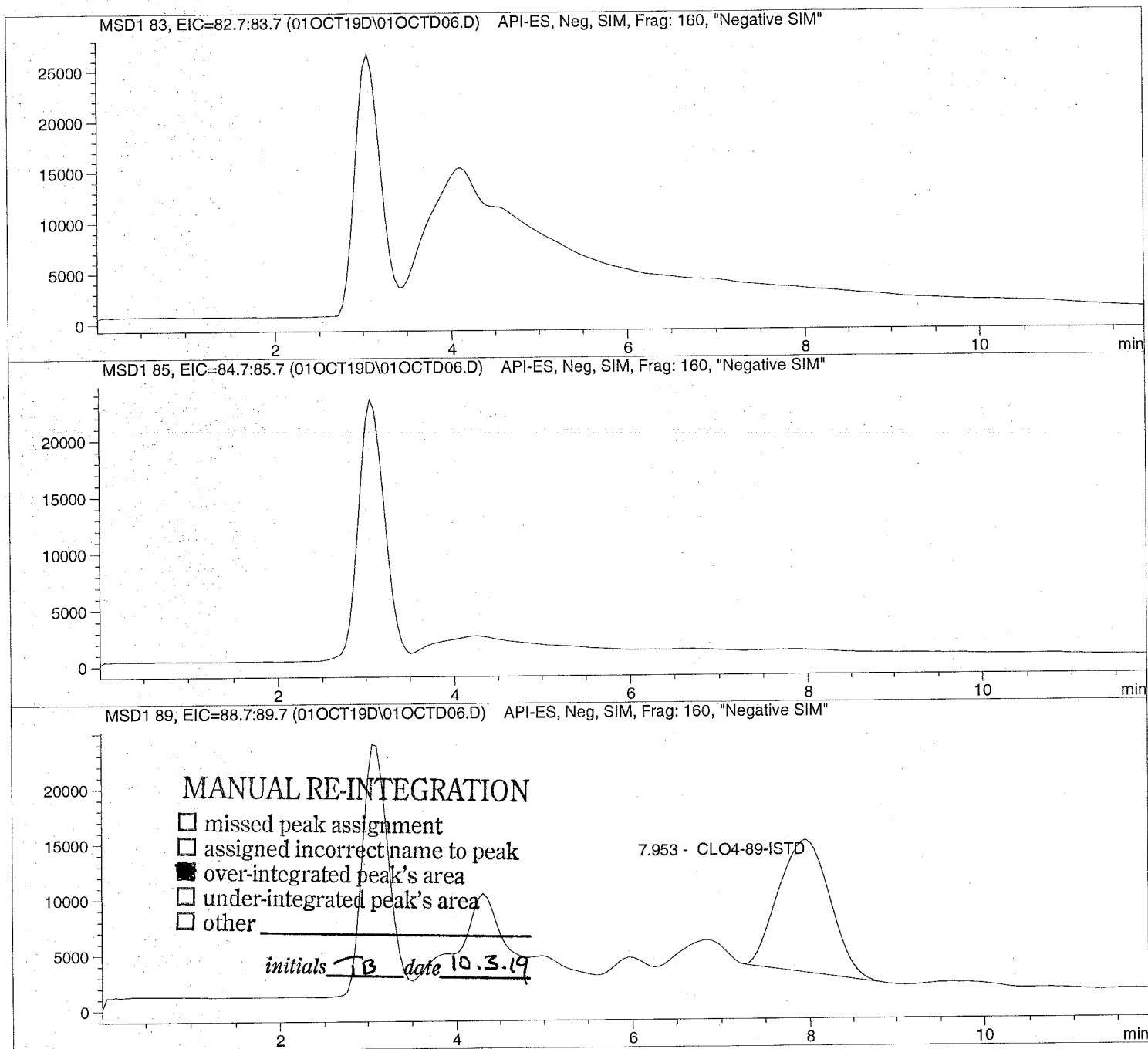
Sample Name: 1927220002

Injection Date: 10/01/2019 11:51:24
 Sample Name: 1927220002
 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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD06.D Sample Name: 1927220002

```

=====
Injection Date: 10/01/2019 11:51:24      Seq Line:                    6
Sample Name:    1927220002                Location:                Vial 76
Acq Operator:   TNB                        Inj. No.:                1
                                          Inj. Vol.:               30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
=====

```

Perchlorate analysis

Sample Information

```

Sorted By:                    Signal
Calib. Data Modified:      Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:                1.000000
Dilution:                  1.000000
Sample Amount:             0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.953	MM	480844.6	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD07.D

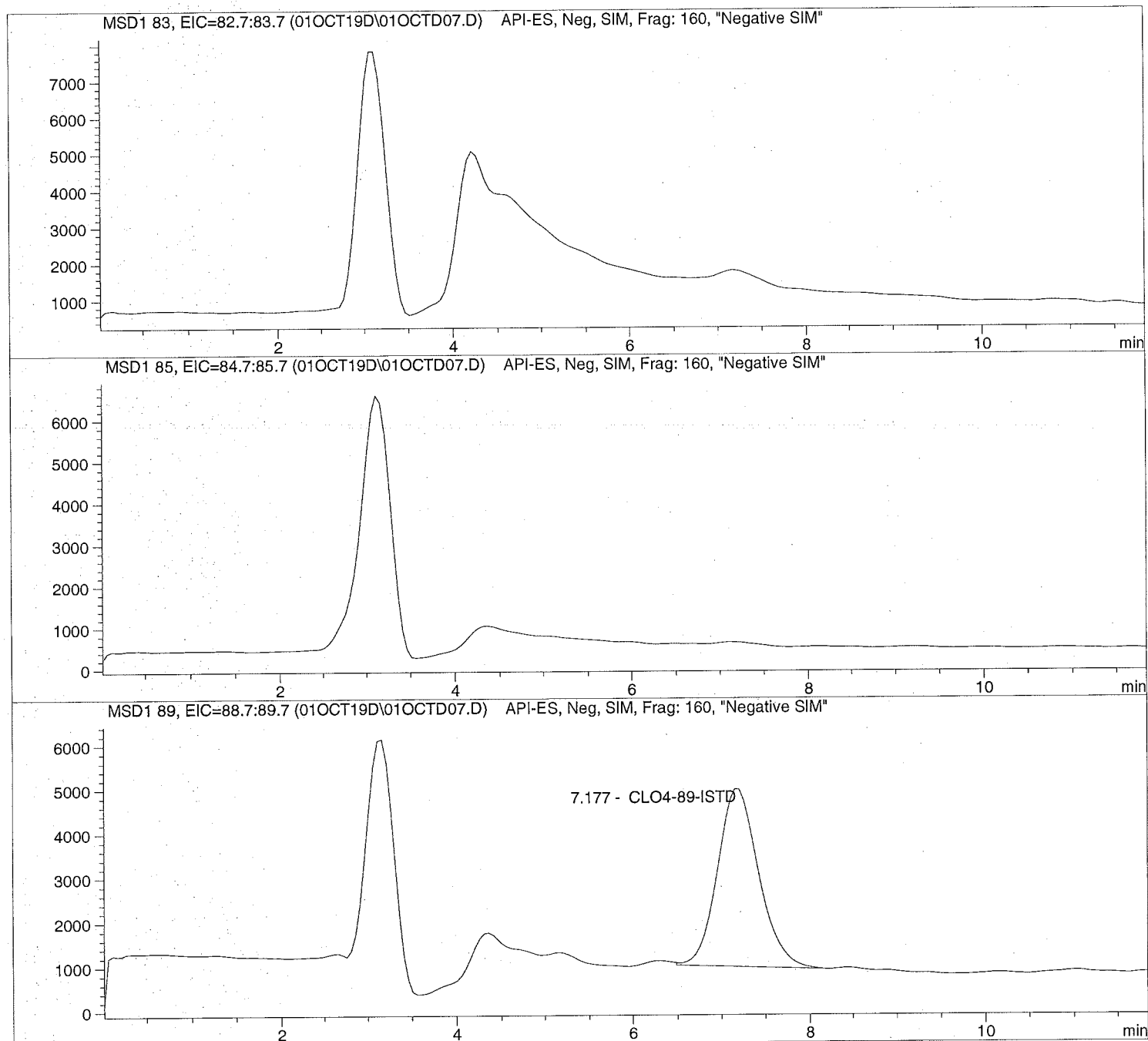
Sample Name: 1927220003

=====
Injection Date: 10/01/2019 12:05:17
Sample Name: 1927220003
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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD07.D

Sample Name: 1927220003

```

=====
Injection Date: 10/01/2019 12:05:17      Seq Line: 7
Sample Name:    1927220003                Location:  Vial 77
Acq Operator:   TNB                       Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:   0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.177	BBA	129768.3	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD08.D

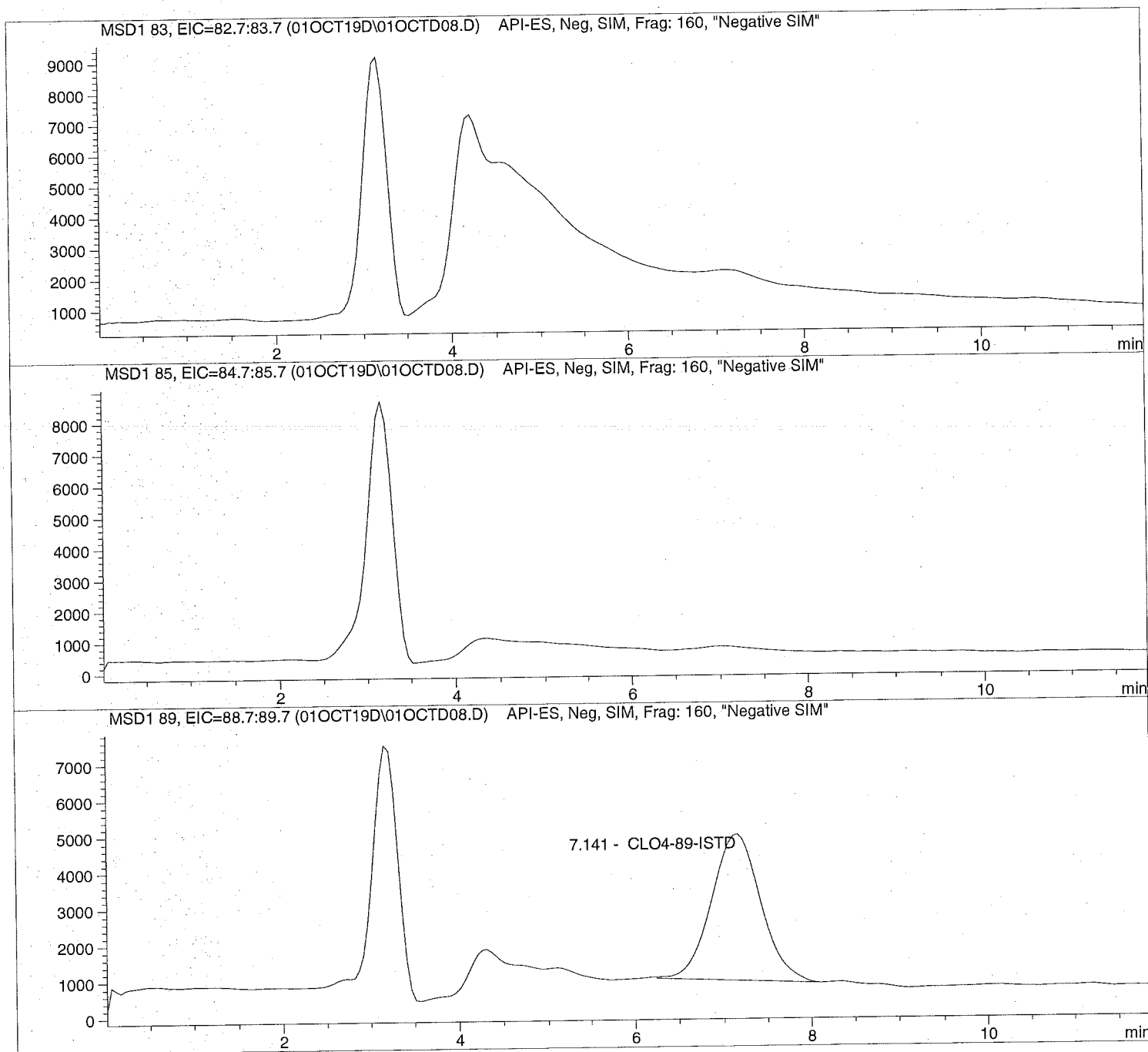
Sample Name: 1927220004

Injection Date: 10/01/2019 12:19:05
Sample Name: 1927220004
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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD08.D Sample Name: 1927220004

```

=====
Injection Date: 10/01/2019 12:19:05      Seq Line: 8
Sample Name: 1927220004      Location: Vial 78
Acq Operator: TNB      Inj. No.: 1
                                         Inj. Vol.: 30 µl

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

```

Perchlorate analysis

Sample Information

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.141	BBA	155843.6	5.0000	CLO4-89-ISTD

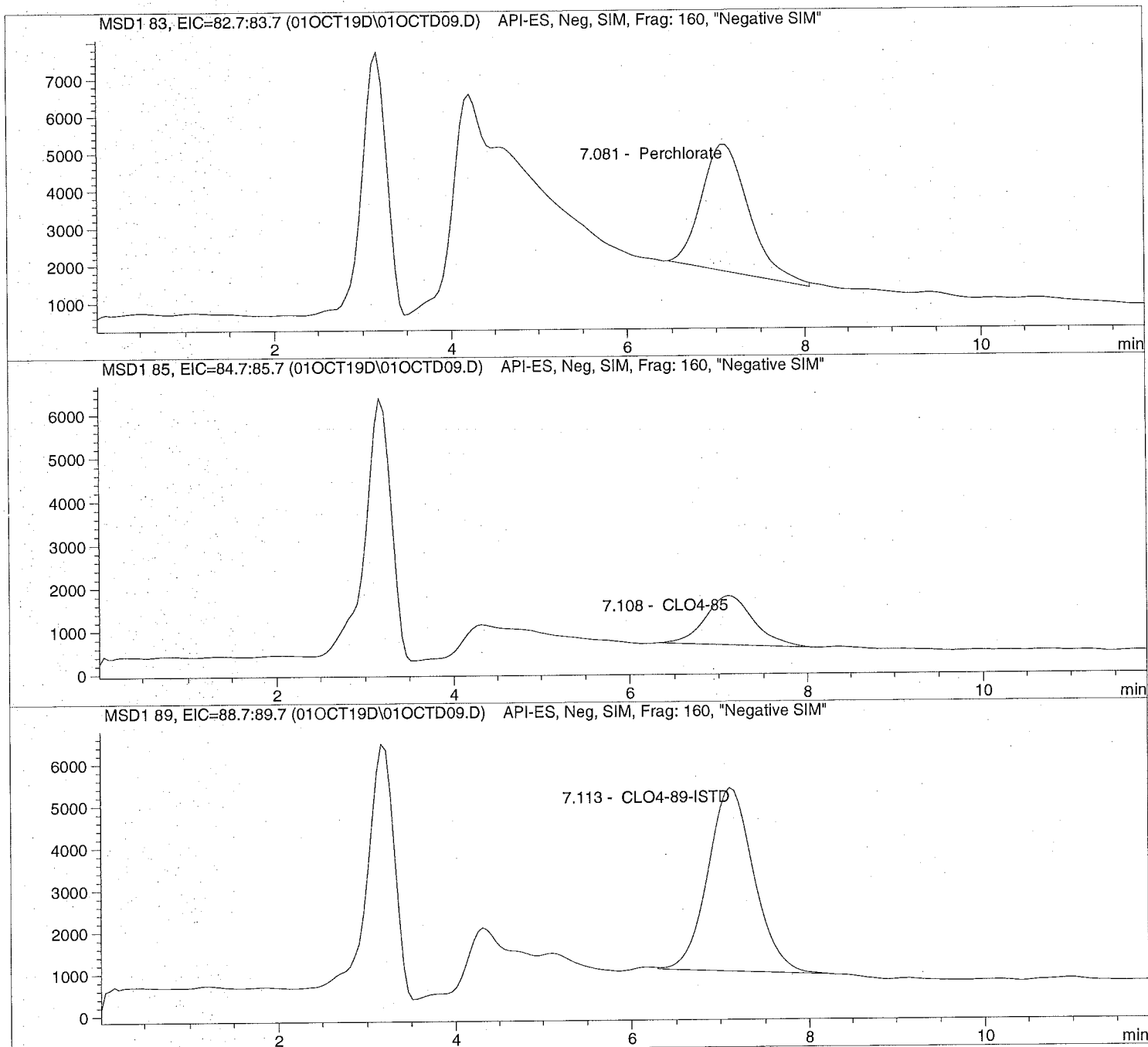
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD09.D Sample Name: 1927220005 MS

=====
Injection Date: 10/01/2019 12:32:51 Seq Line: 9
Sample Name: 1927220005 MS Location: Vial 79
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD09.D Sample Name: 1927220005 MS

```

=====
Injection Date: 10/01/2019 12:32:51 Seq Line: 9
Sample Name: 1927220005 MS Location: Vial 79
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

```

Perchlorate analysis

Sample Information

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.081	PBA	124857.0	2.9350	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.108	PBA	42987.5	3.2268	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.113	BBA	156479.1	5.0000	CLO4-89-ISTD

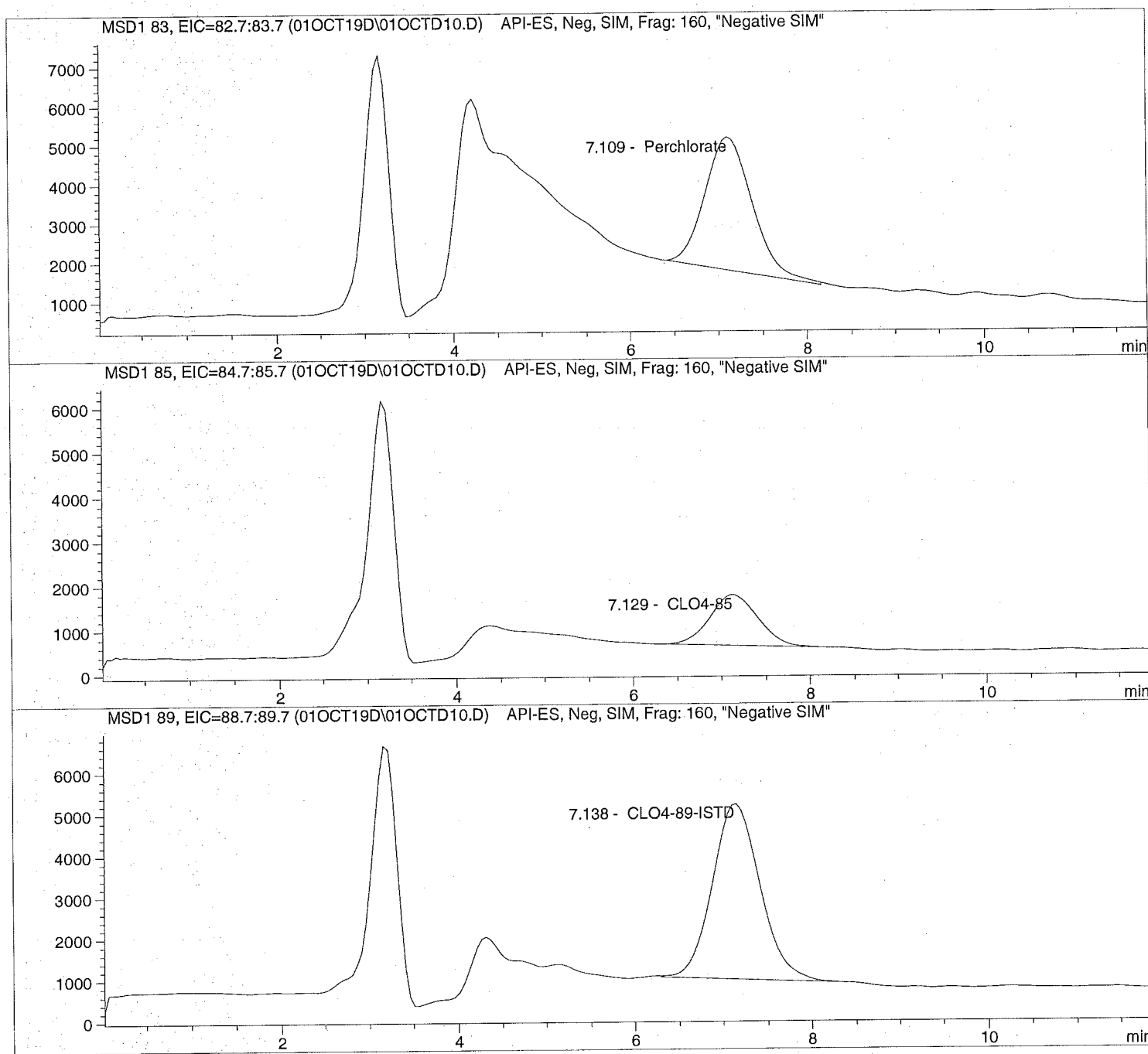
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD10.D Sample Name: 1927220006 MSD

=====
Injection Date: 10/01/2019 12:46:41 Seq Line: 10
Sample Name: 1927220006 MSD Location: Vial 80
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD10.D Sample Name: 1927220006 MSD

```
=====
Injection Date: 10/01/2019 12:46:41 Seq Line: 10
Sample Name: 1927220006 MSD Location: Vial 80
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl
=====
```

```
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58
```

Perchlorate analysis

Sample Information

```
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.109	PBA	125081.4	2.9304	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.129	PBA	42652.4	3.1897	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.138	BBA	157002.2	5.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD11.D

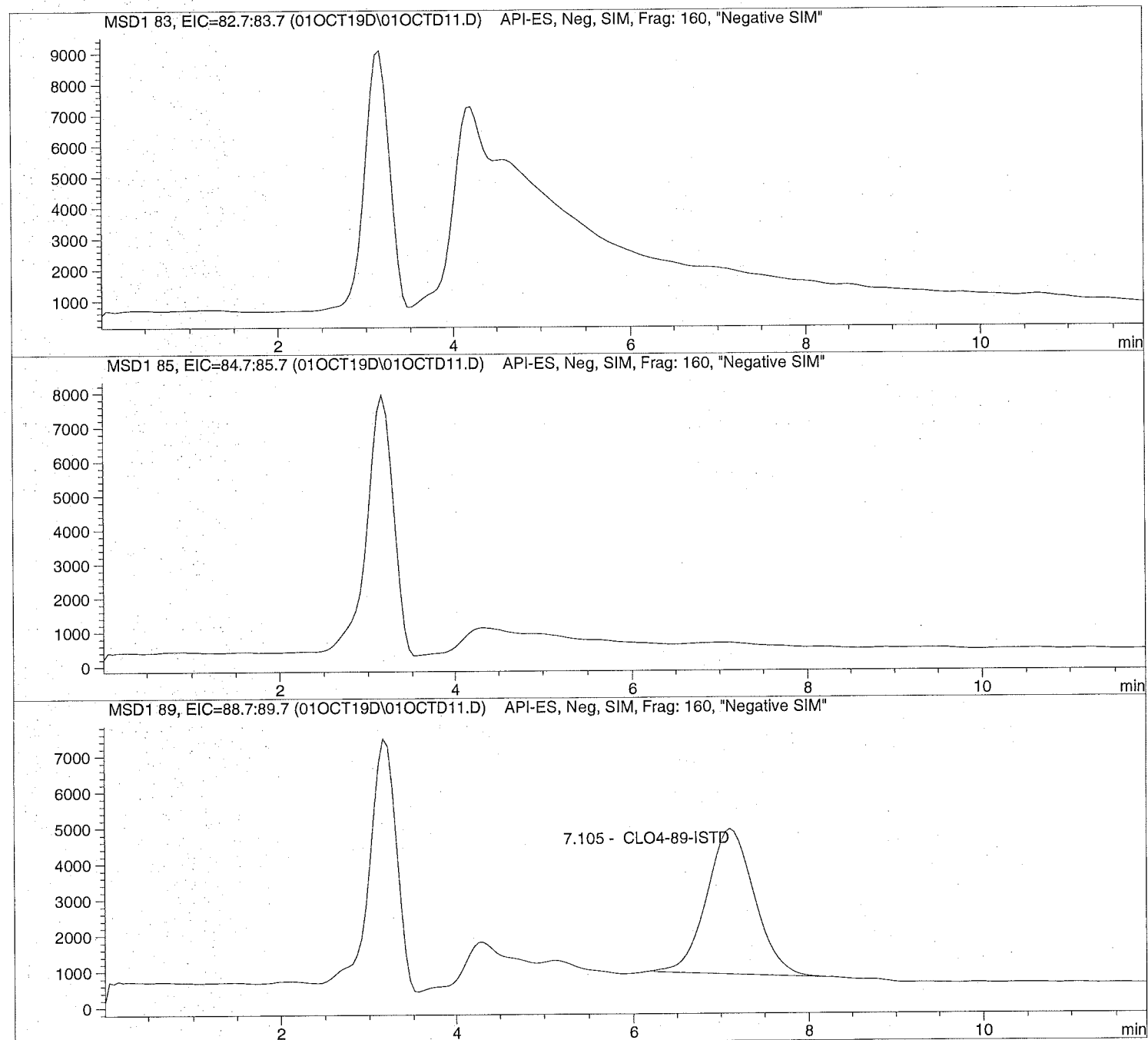
Sample Name: 1927220007

=====
Injection Date: 10/01/2019 13:00:30
Sample Name: 1927220007
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
Inj. No.: 1
Inj. Vol.: 30 μ l

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD11.D Sample Name: 1927220007

=====
Injection Date: 10/01/2019 13:00:30 Seq Line: 11
Sample Name: 1927220007 Location: Vial 81
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis

=====
Sample Information
=====

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.105	BBA	153526.1	5.0000	CLO4-89-ISTD

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

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD12.D

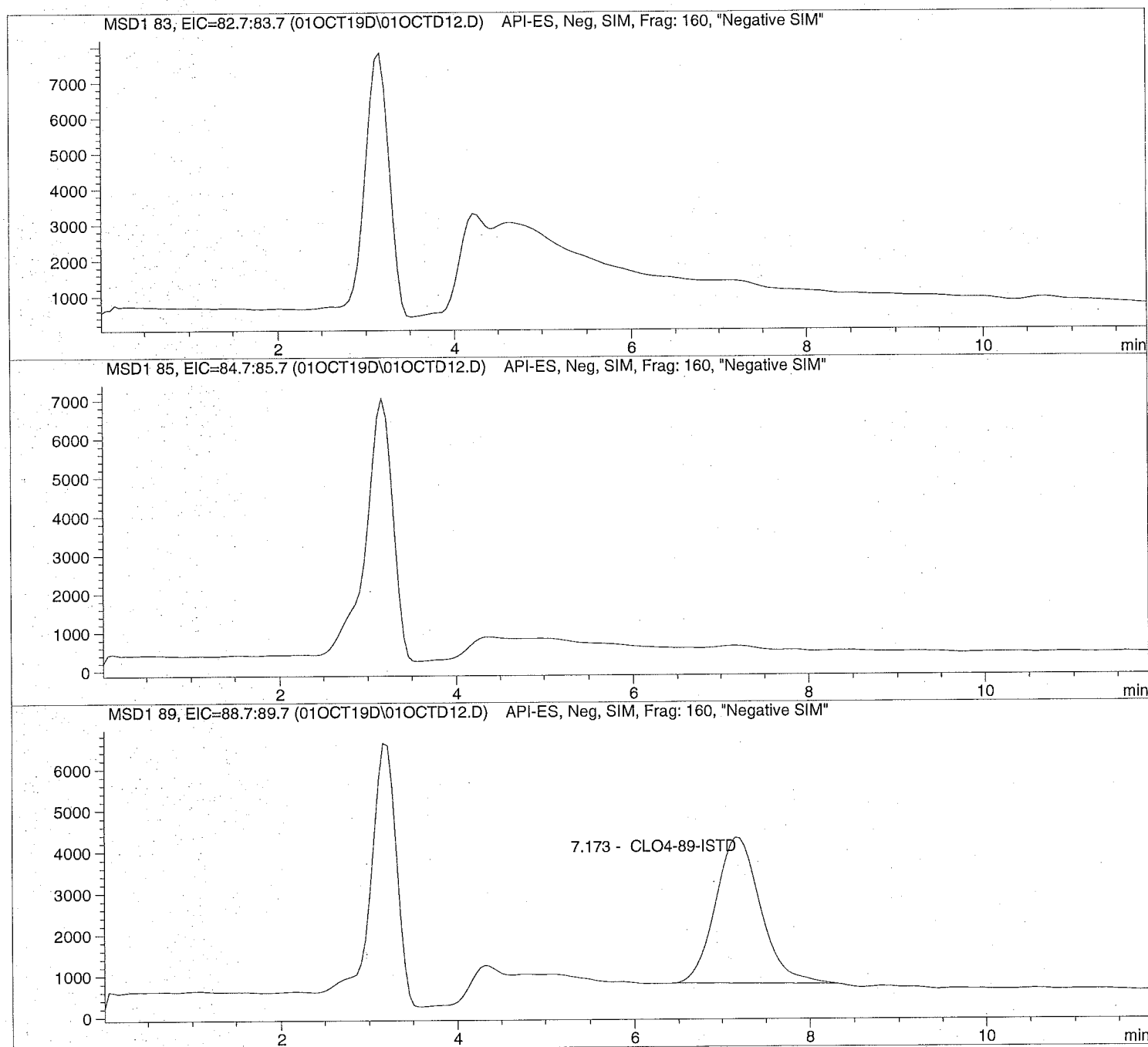
Sample Name: 1927220008

Injection Date: 10/01/2019 13:14:17
Sample Name: 1927220008
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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD12.D

Sample Name: 1927220008

```

=====
Injection Date: 10/01/2019 13:14:17      Seq Line:      12
Sample Name:    1927220008              Location:      Vial 82
Acq Operator:   TNB                     Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.173	PBA	125991.0	5.0000	CLO4-89-ISTD

```

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

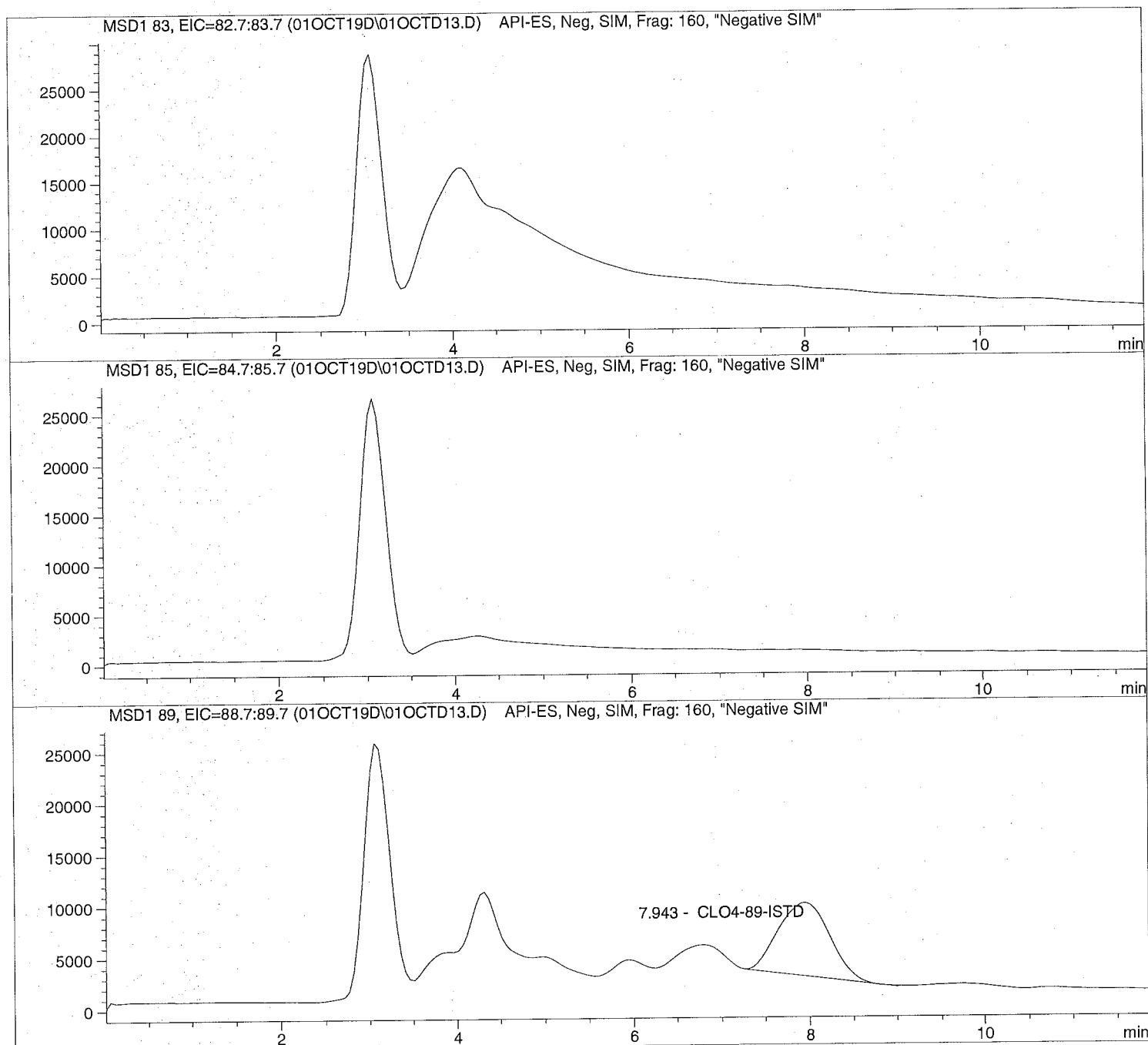
```

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD13.D Sample Name: 1927220001 RE

=====
Injection Date: 10/01/2019 13:49:07 Seq Line: 13
Sample Name: 1927220001 RE Location: Vial 86
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD13.D Sample Name: 1927220001 RE

```
=====
Injection Date: 10/01/2019 13:49:07      Seq Line:            13
Sample Name:    1927220001 RE            Location:            Vial 86
Acq Operator:    TNB                    Inj. No.:            1
                                         Inj. Vol.:            30 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
```

Perchlorate analysis

=====

Sample Information

=====

```
Sorted By:            Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:           1.000000
Dilution:             1.000000
Sample Amount:        0.000
```

=====

LCMS Results

=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.943	VBA	284558.6	5.0000	CLO4-89-ISTD

=====

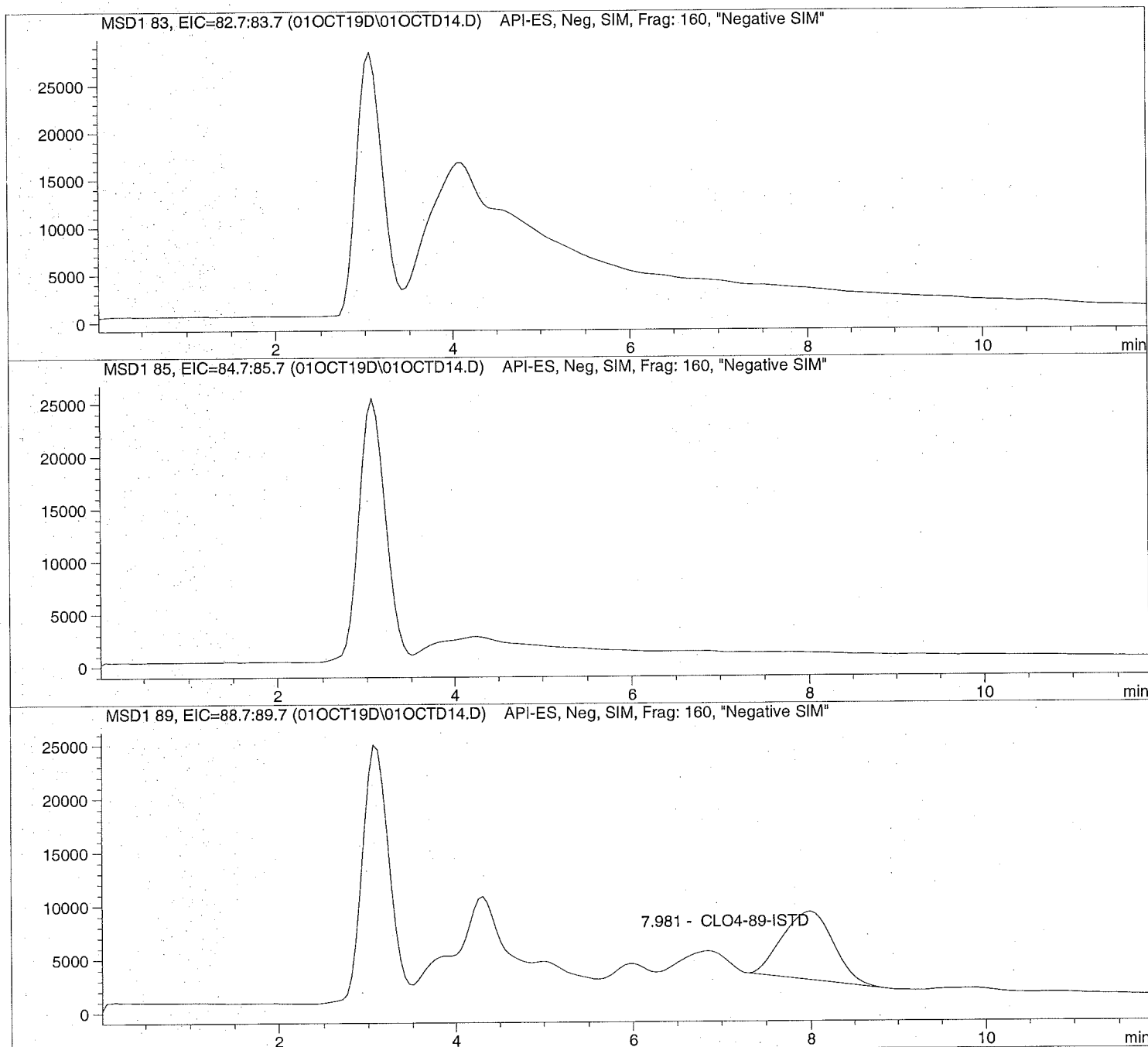
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD14.D Sample Name: 1927220002 RE

=====
Injection Date: 10/01/2019 14:09:00 Seq Line: 14
Sample Name: 1927220002 RE Location: Vial 87
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD15.D

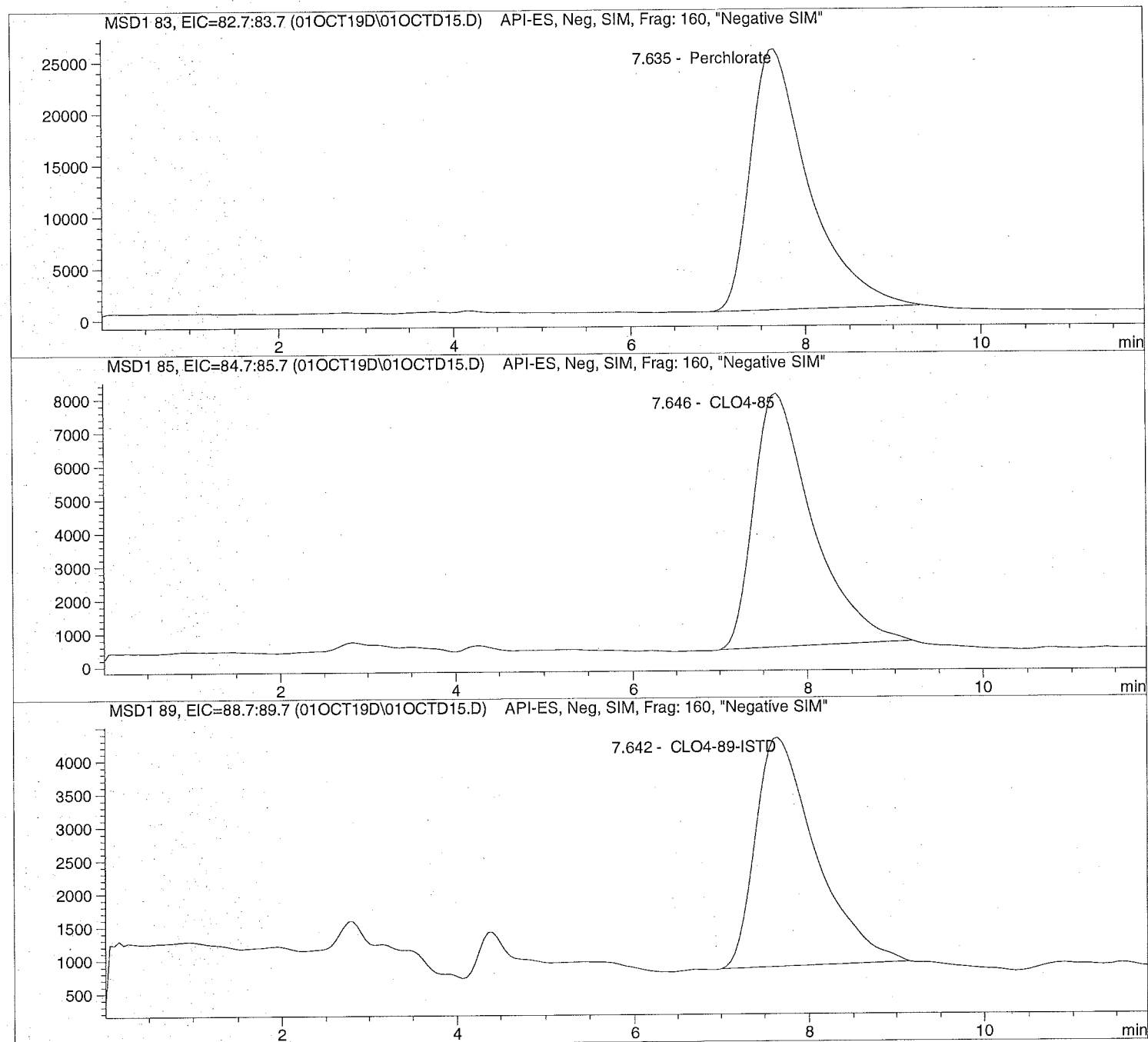
Sample Name: 676593 CCV@25

=====
Injection Date: 10/01/2019 14:22:50
Sample Name: 676593 CCV@25
Acq Operator: TNB

Seq Line: 15
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD16.D

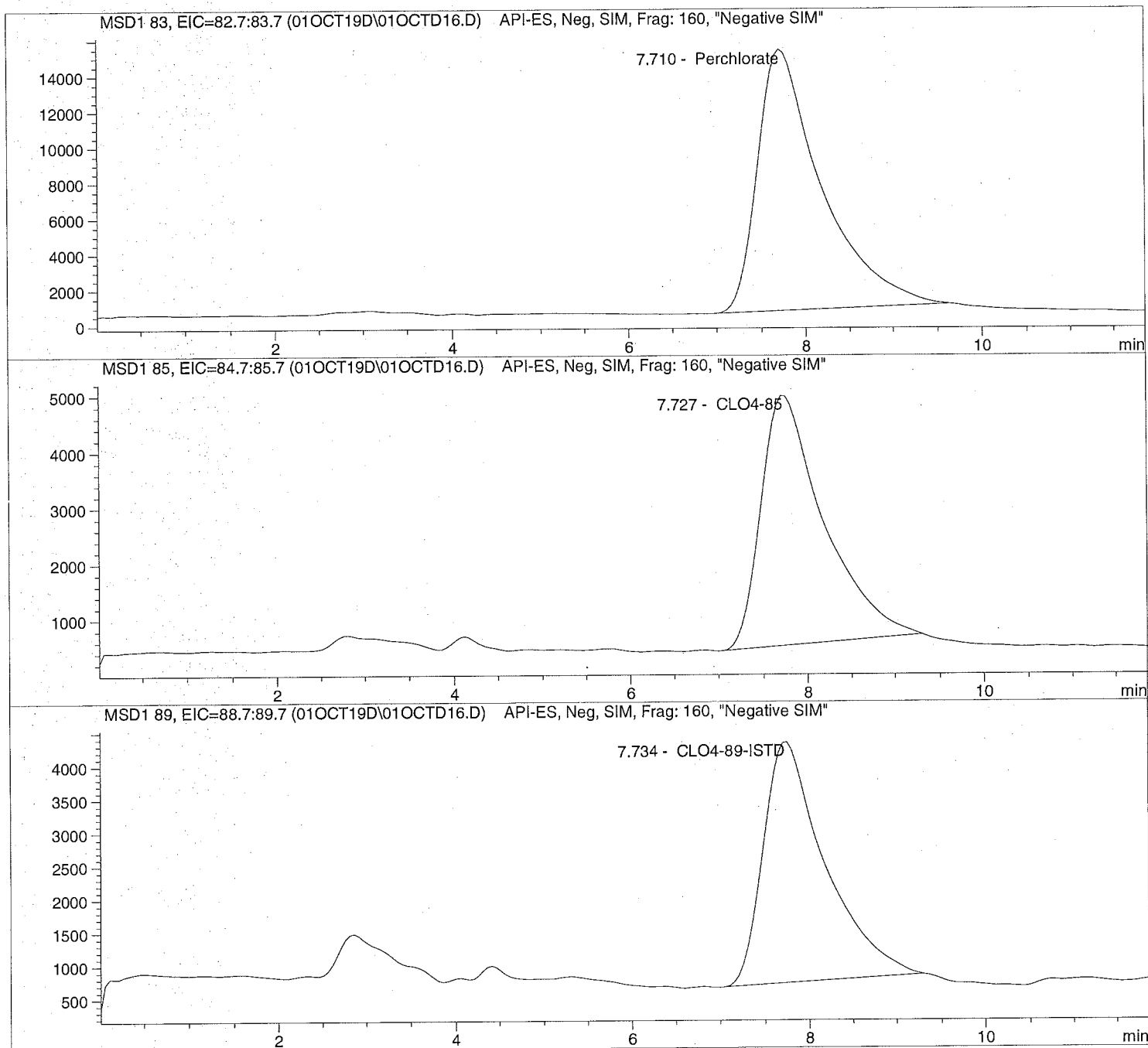
Sample Name: 1927568001 1K

Injection Date: 10/01/2019 14:36:36
Sample Name: 1927568001 1K
Acq Operator: TNB

Seq Line: 16
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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD16.D Sample Name: 1927568001 1K

```

=====
Injection Date: 10/01/2019 14:36:36      Seq Line:      16
Sample Name:    1927568001 1K            Location:      Vial 83
Acq Operator:   TNB                      Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1000.000000
Sample Amount:  0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.710	PBA	734459.3	14890.2051	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.727	PBA	220255.9	14585.8174	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.734	PBA	175719.3	5000.0000	CLO4-89-ISTD

*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD17.D

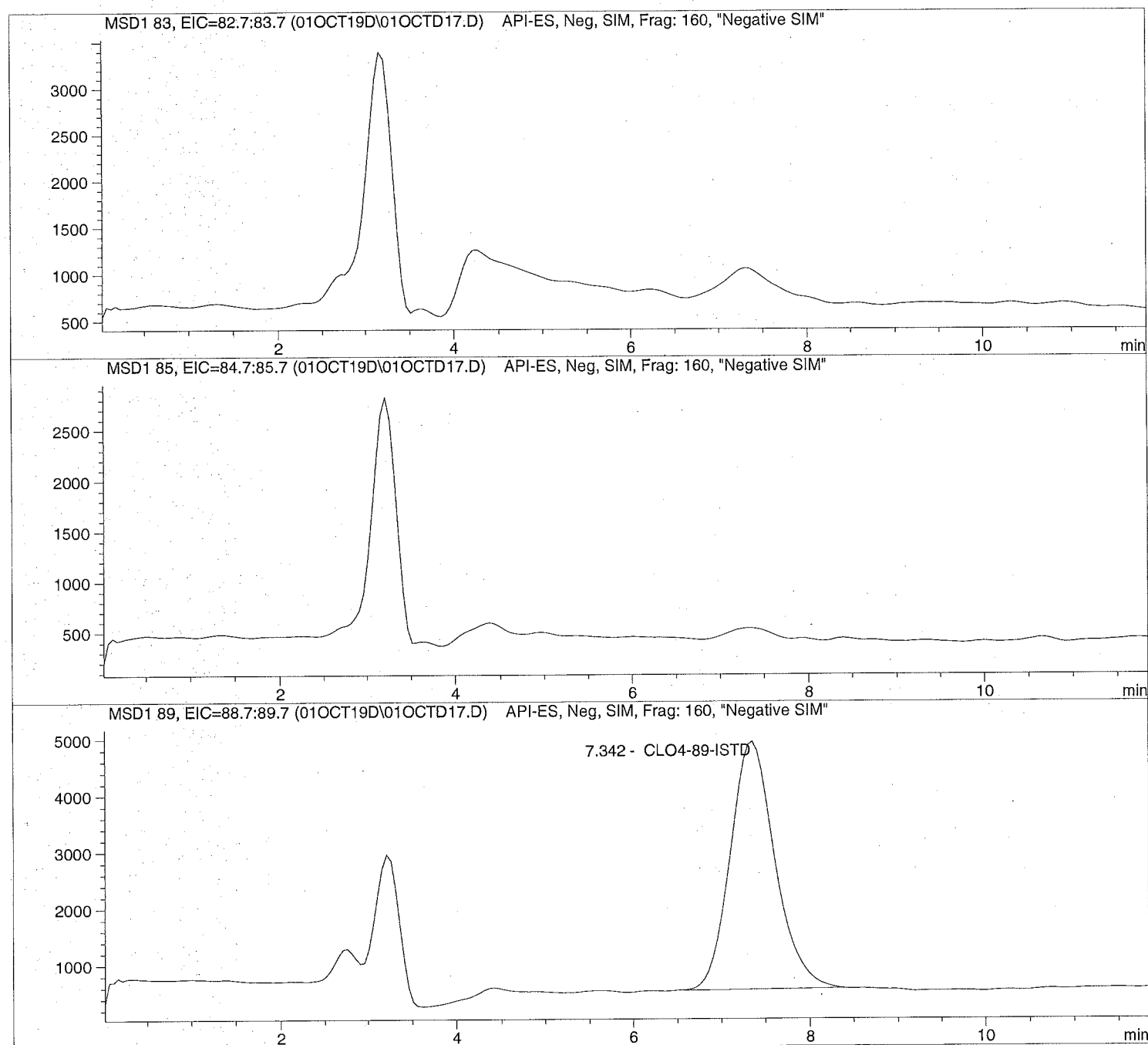
Sample Name: 1927591001

Injection Date: 10/01/2019 14:50:25
Sample Name: 1927591001
Acq Operator: TNB

Seq Line: 17
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: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD17.D Sample Name: 1927591001

```

=====
Injection Date: 10/01/2019 14:50:25      Seq Line:          17
Sample Name:    1927591001                Location:          Vial 84
Acq Operator:   TNB                       Inj. No.:         1
                                           Inj. Vol.:        30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:     1.000000
Dilution:       1.000000
Sample Amount:  0.000
=====

```

```

=====
                          LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.342	BBA	154253.7	5.0000	CLO4-89-ISTD

```

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

```

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD18.D

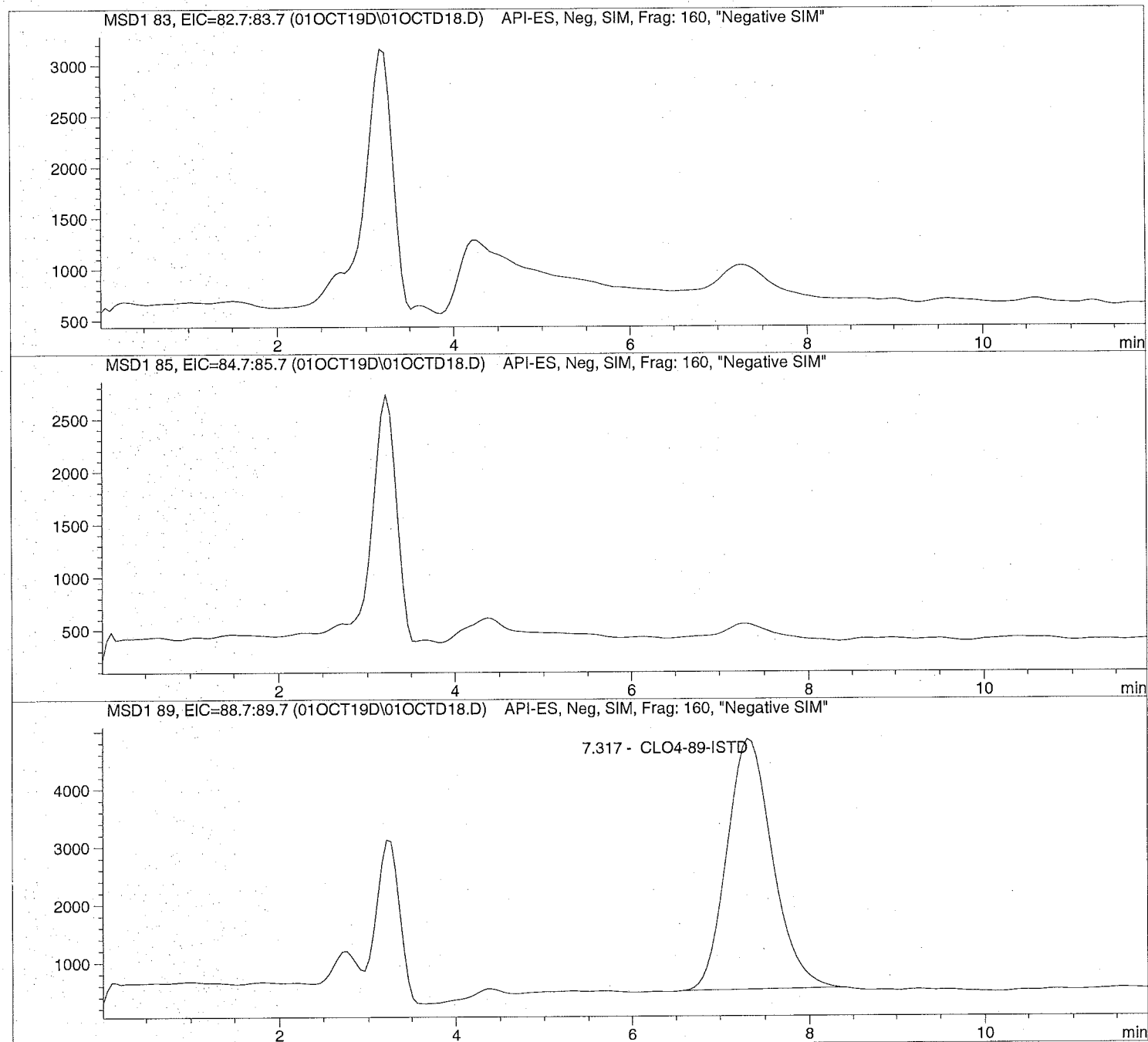
Sample Name: 1927596001

=====
Injection Date: 10/01/2019 15:04:19
Sample Name: 1927596001
Acq Operator: TNB

Seq Line: 18
Location: Vial 85
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 08:05:58

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD18.D Sample Name: 1927596001

```

=====
Injection Date: 10/01/2019 15:04:19      Seq Line:      18
Sample Name:    1927596001                Location:      Vial 85
Acq Operator:   TNB                       Inj. No.:     1
                                           Inj. Vol.:    30 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.317	BBA	153001.9	5.0000	CLO4-89-ISTD

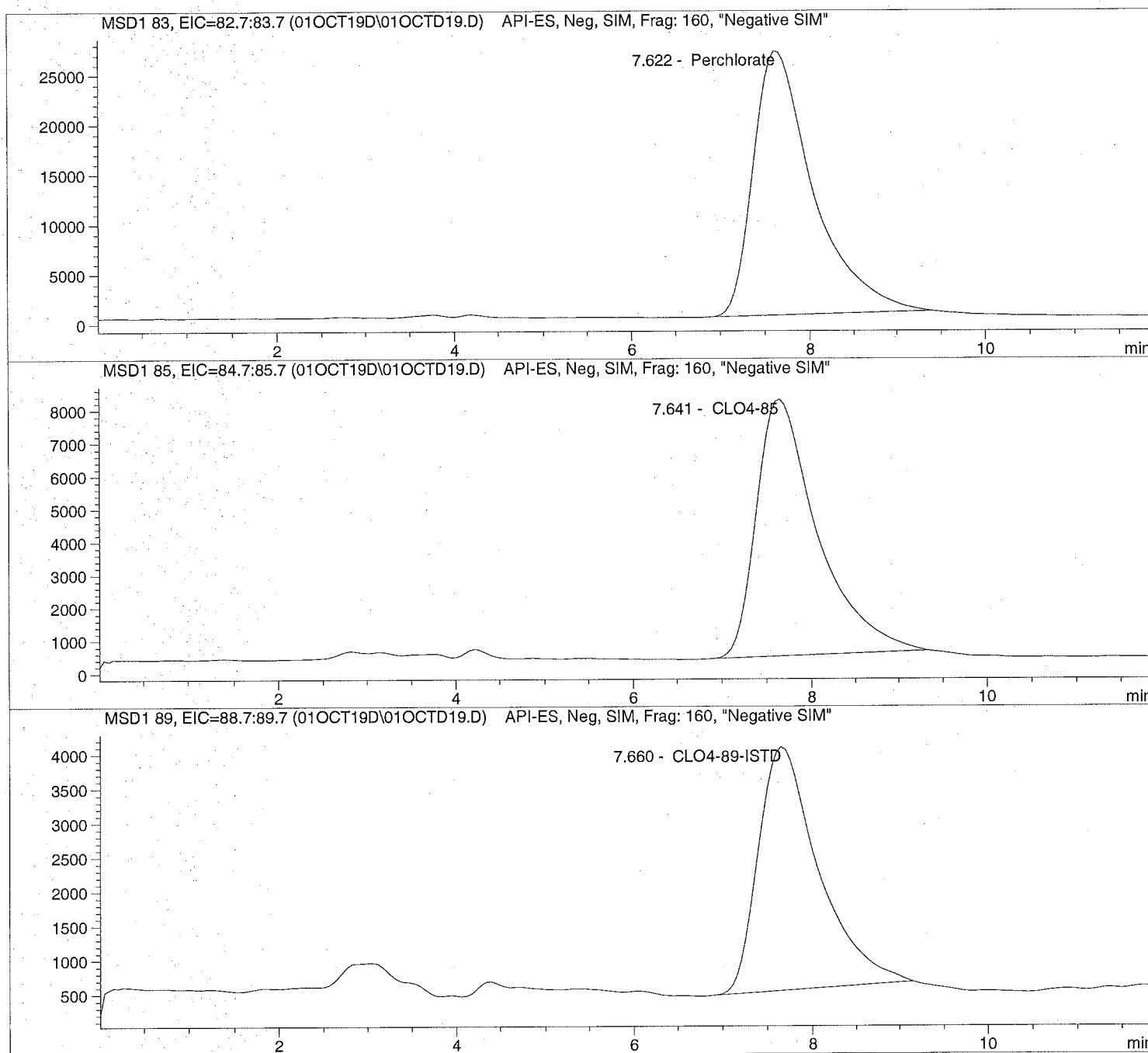
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD19.D Sample Name: 676594 CCV@25

```
=====
Injection Date: 10/01/2019 15:18:13      Seq Line:      19
Sample Name:    676594   CCV@25           Location:      Vial 71
Acq Operator:   TNB                Inj. No.:     1
                                           Inj. Vol.:   30 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:   10/2/2019 08:05:58
=====
```

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD19.D Sample Name: 676594 CCV@25

```

=====
Injection Date: 10/01/2019 15:18:13      Seq Line:          19
Sample Name:   676594   CCV@25           Location:          Vial 71
Acq Operator:  TNB                Inj. No.:         1
                                           Inj. Vol.:       30 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed:  10/2/2019 08:05:58
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By:      Signal
Calib. Data Modified: Mon, 23. Sep. 2019, 00:20:59 pm
Multiplier:    1.000000
Dilution:      1.000000
Sample Amount: 25.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.622	PBA	1236865.2	25.3082	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.641	PBA	371181.1	24.9437	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.660	PBA	166779.7	5.0000	CLO4-89-ISTD

*** End of Report ***



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

=====
 Calibration Table
 =====

Perchlorate

Calib. Data Modified : 9/23/2019 12:20:59 PM
 Calculate : Internal Standard
 Based on : Peak Area
 Rel. Reference Window : 20.000 %
 Abs. Reference Window : 0.000 min
 Rel. Non-ref. Window : 20.000 %
 Abs. Non-ref. Window : 0.000 min
 Use Multiplier & Dilution Factor with ISTDs
 Uncalibrated Peaks : not reported
 Partial Calibration : No recalibration if peaks missing
 Curve Type : Quadratic (some peaks differ, see below)
 Origin : Ignored (some peaks differ, see below)
 Weight : Linear (Amnt) (some peaks differ, see below)
 Recalibration Settings:
 Average Response : Average all calibrations
 Average Retention Time: Floating Average New 75%

Calibration Report Options :
 Printout of recalibrations within a sequence:
 Calibration Table after Recalibration
 Normal Report after Recalibration
 If the sequence is done with bracketing:
 Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD ISTD Amount Name
 #

#	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: CLO4-89-ISTD

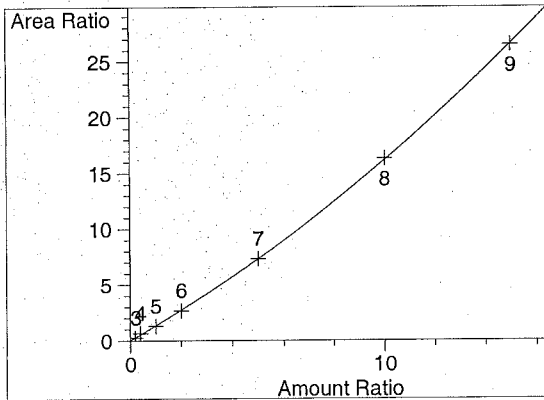
Time Window : From 3.581 min To 11.896 min
 Curve Type : Linear
 Origin : Included
 Calibration Level Weights:/
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1
 Level 8 : 1
 Level 9 : 1

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

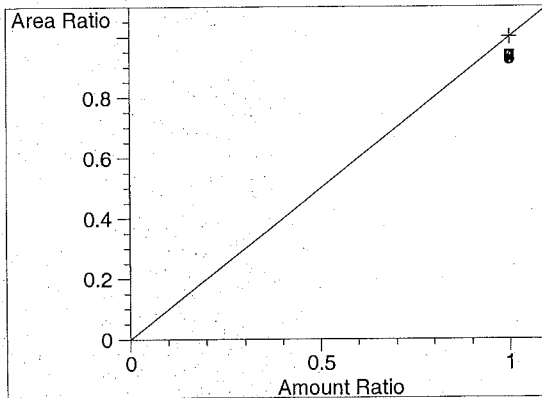
=====
 Peak Sum Table
 =====

No Entries in table
 =====

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


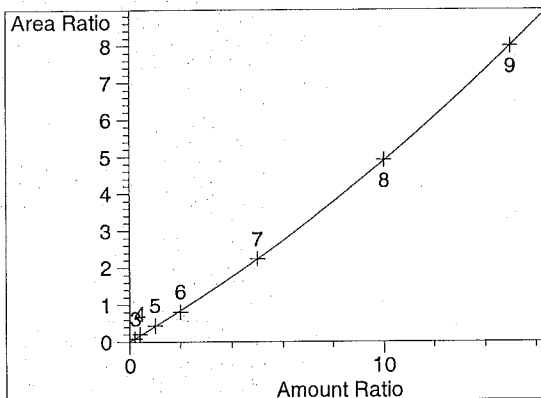
Perchlorate at exp. RT: 7.750
 MSD1 83, EIC=82.7:83.7
 Correlation: 0.99975
 Residual Std. Dev.: 0.10284
 Formula: $y = ax^2 + bx + c$
 a: 3.10463e-2
 b: 1.30369
 c: 2.19496e-2
 x: Amount Ratio
 y: Area Ratio

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

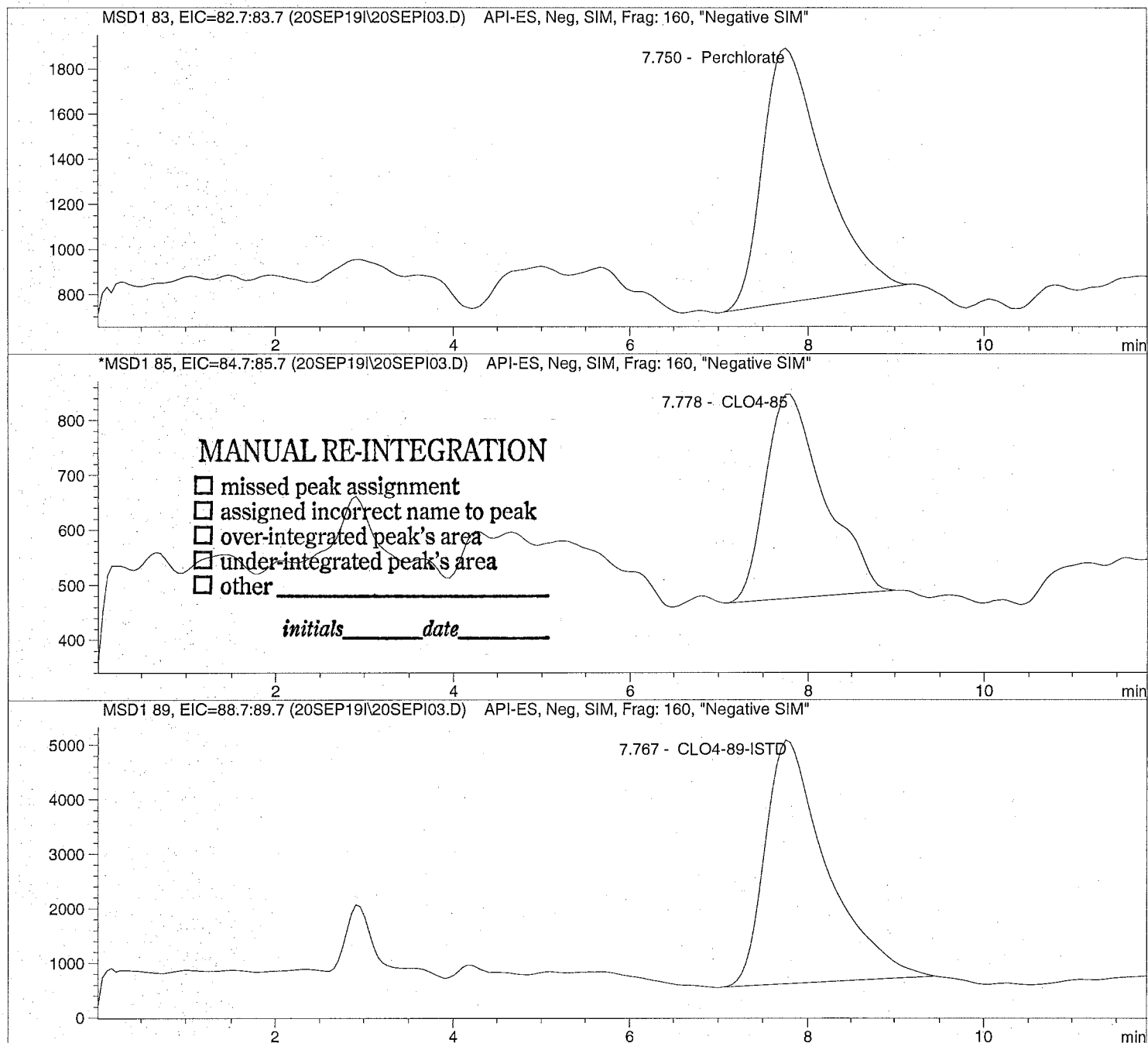
Sample Name: CLO4@ 1.0ug/L

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

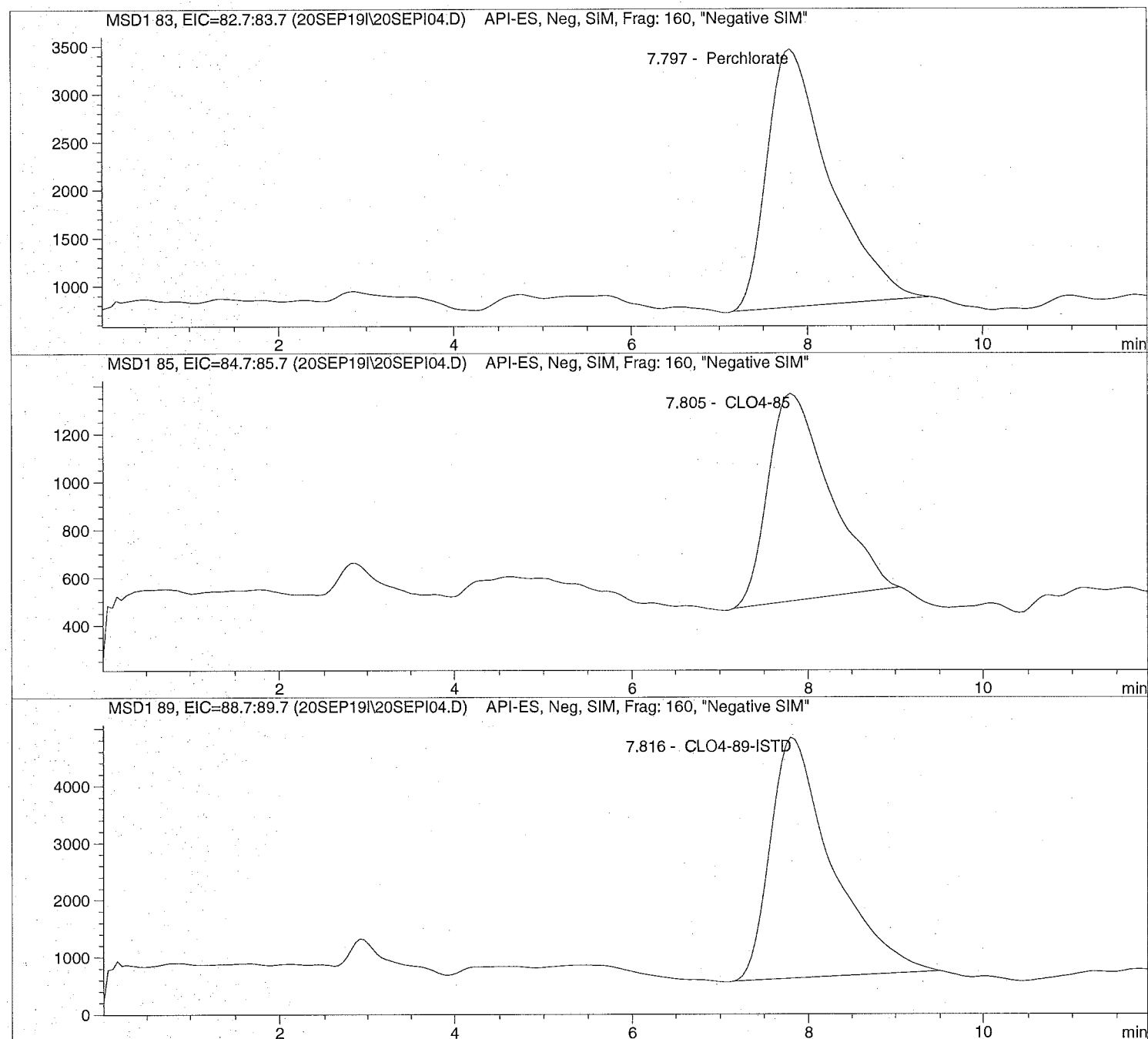
Sample Name: CLO4@ 2.0ug/L

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

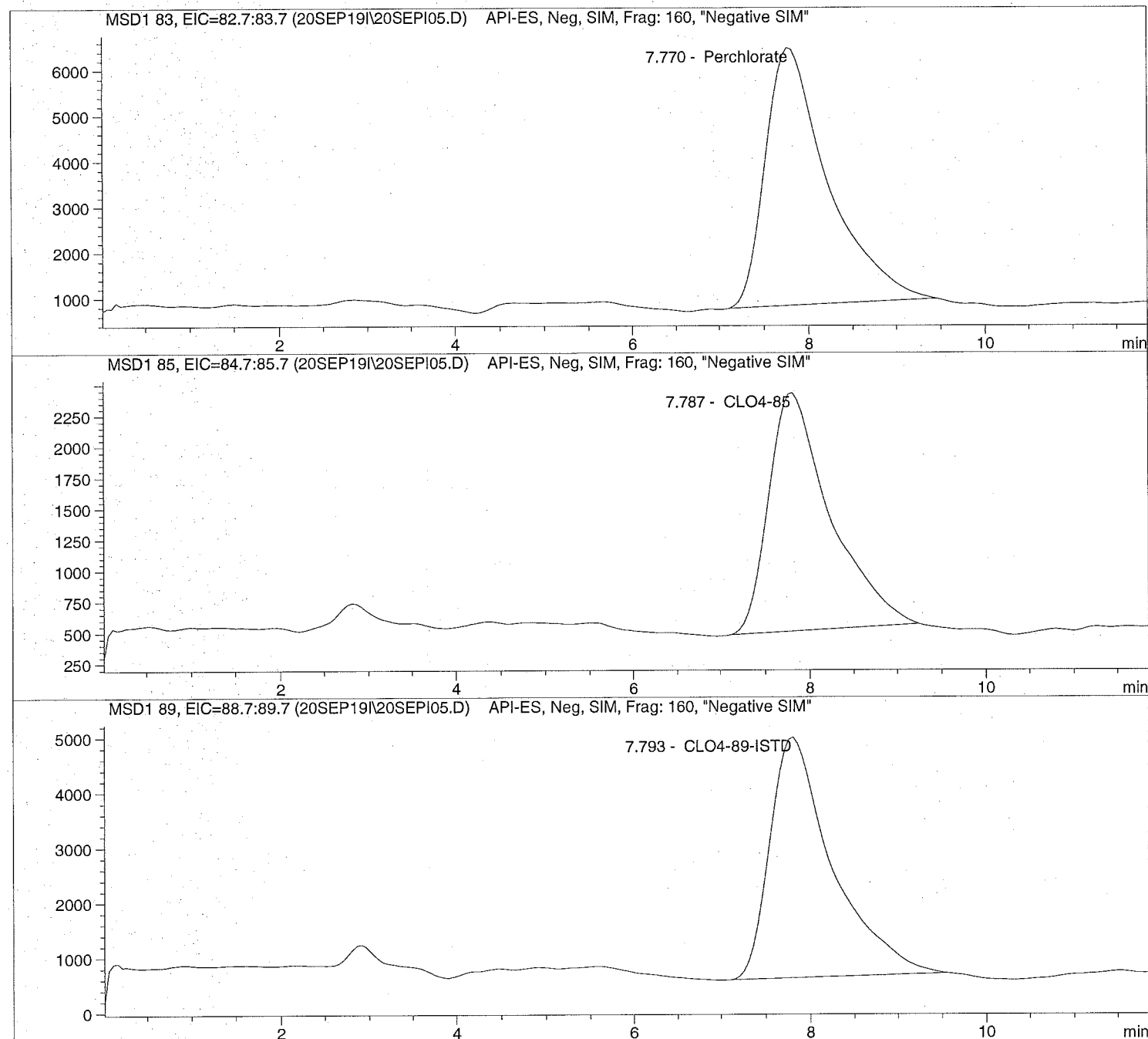
Sample Name: CLO4@ 5.0ug/L

Injection Date: 9/20/2019 09:51:49
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

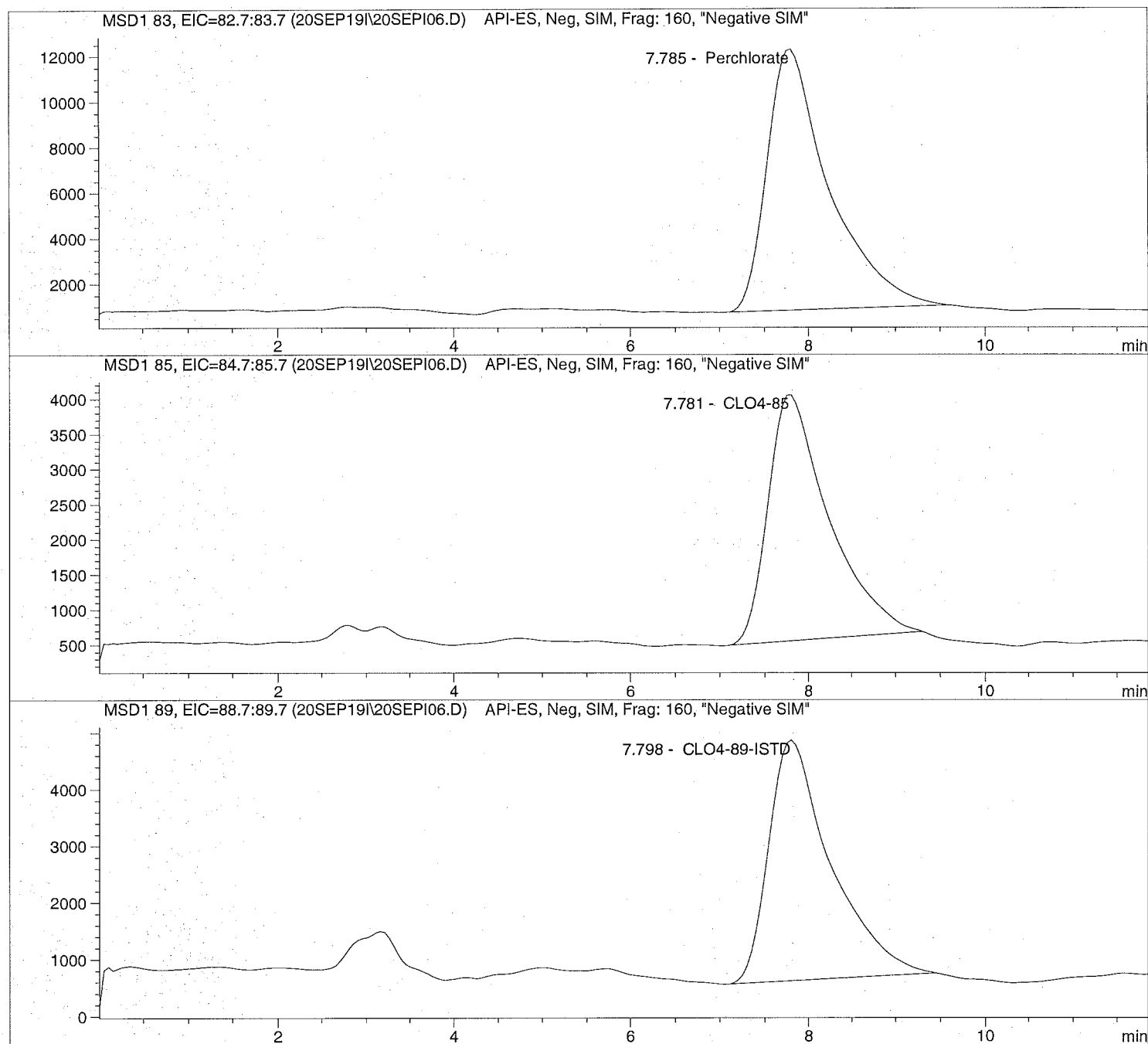
Sample Name: CLO4@ 10.ug/L

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: CL04@ 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

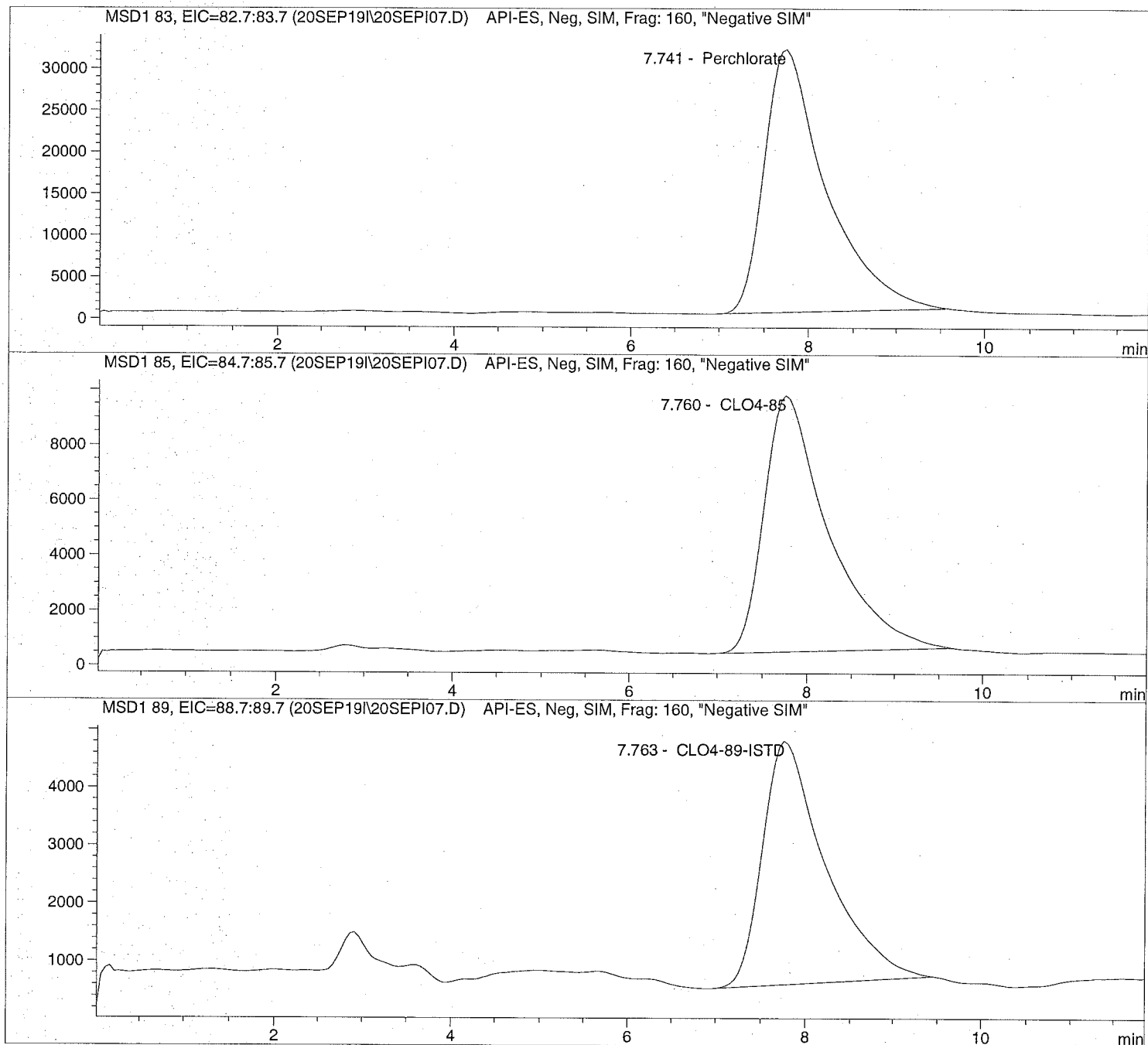
Inj. Vol.: 30 µl

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

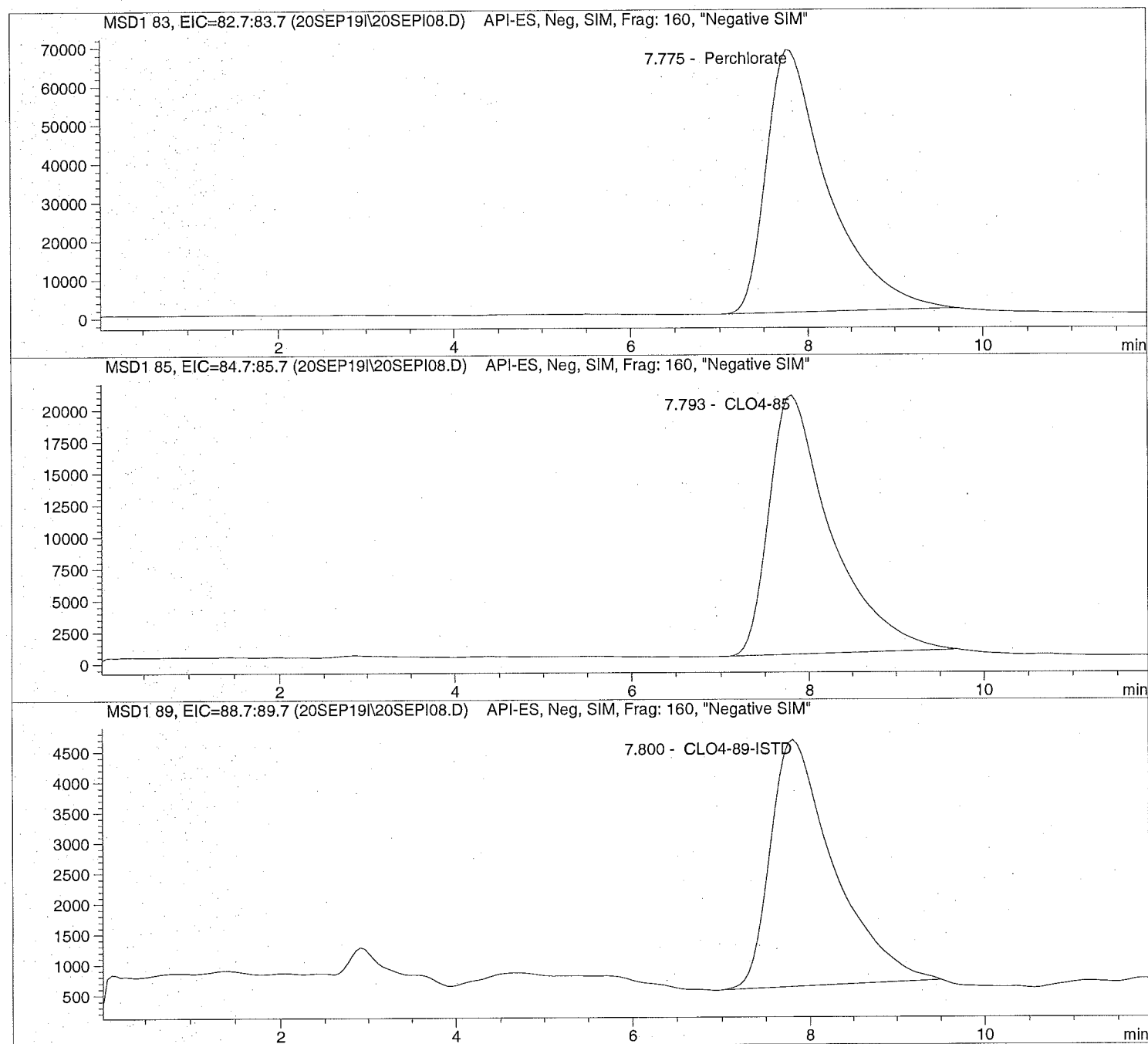
Sample Name: CLO4@ 50.ug/L

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

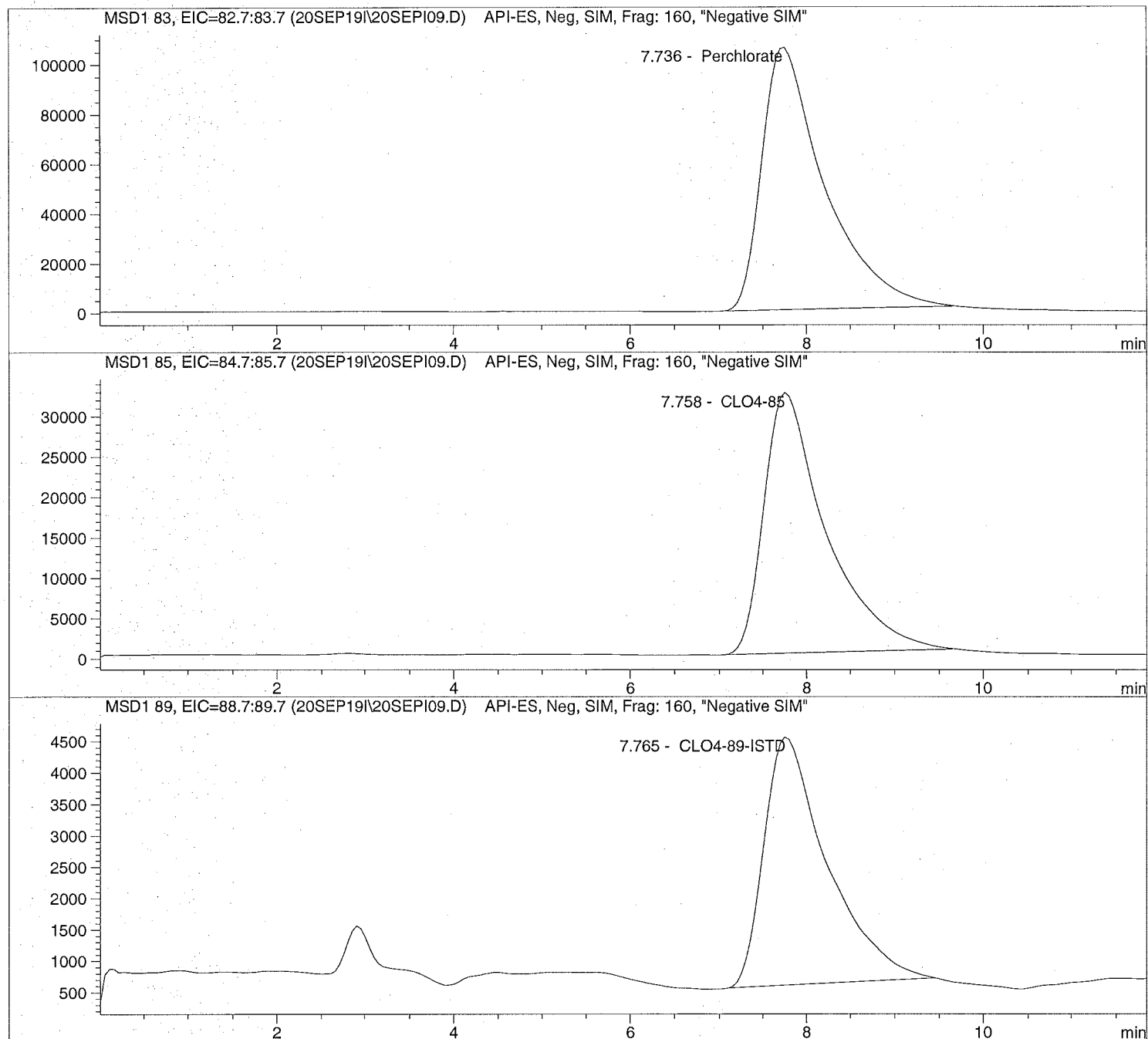
Inj. Vol.: 30 µl

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

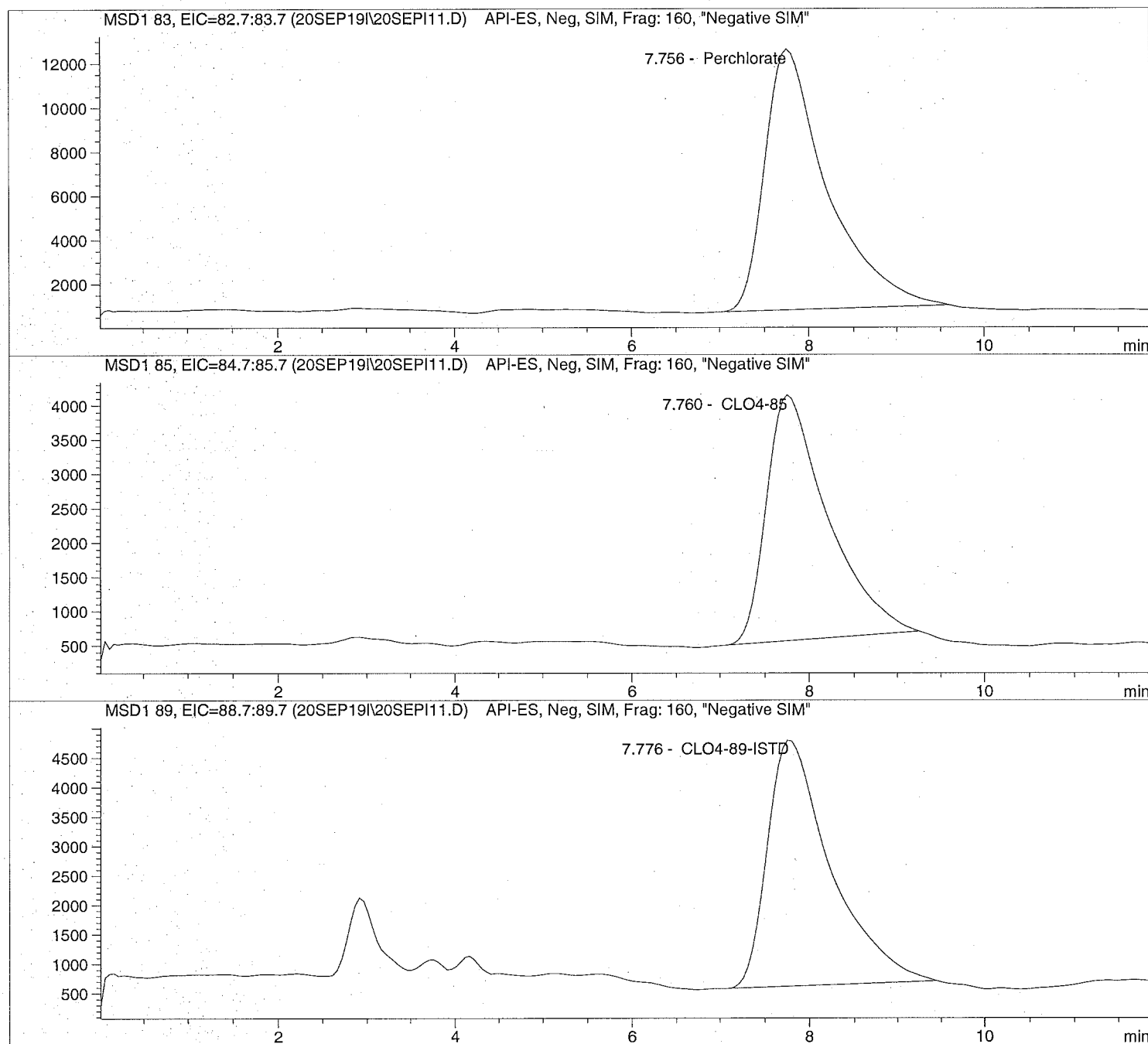
Sample Name: ICAL Verf@10ug/L

Injection Date: 9/20/2019 11:14:45
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

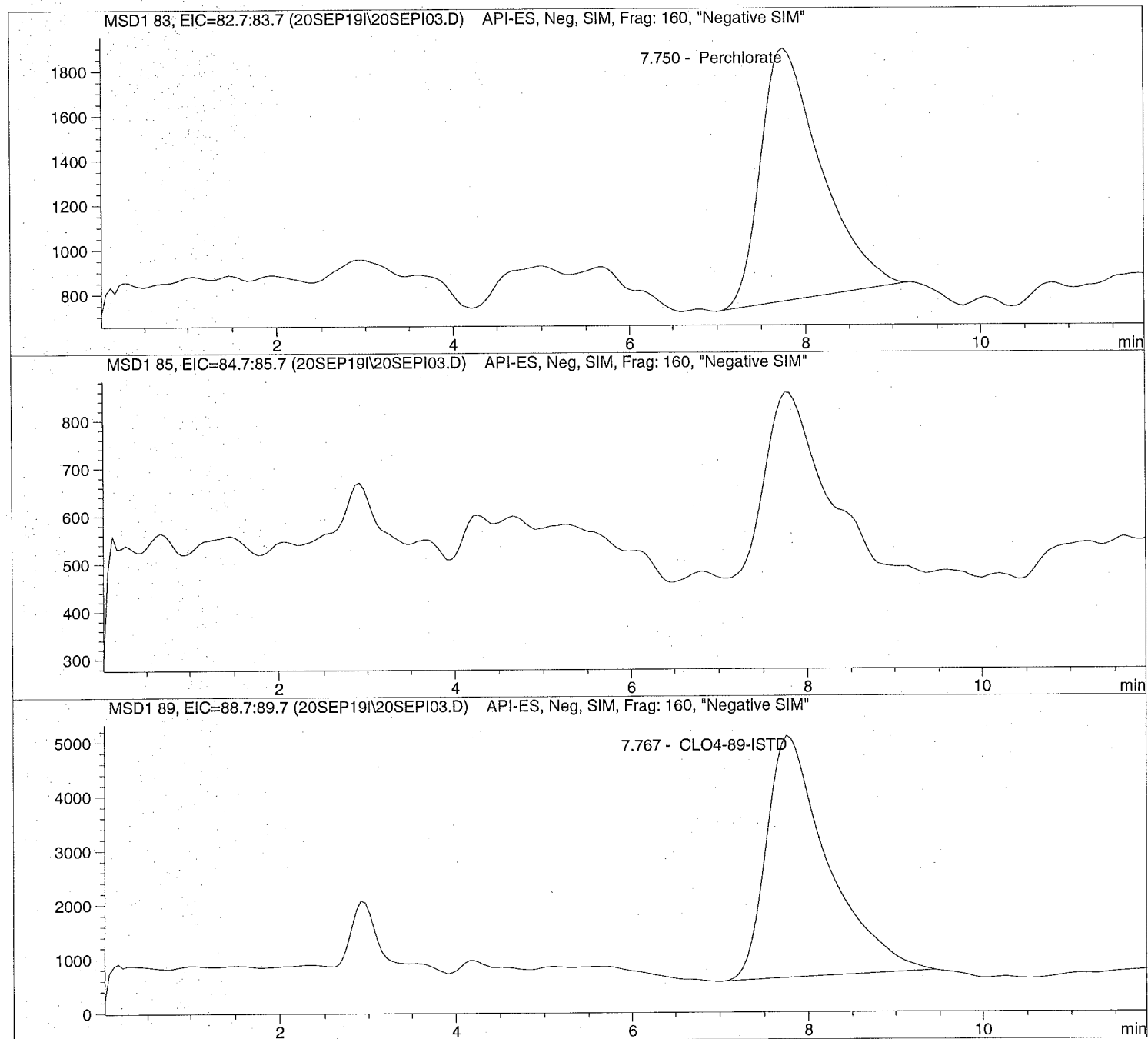
Sample Name: CLO4@ 1.0ug/L

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 ***

```

Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD02.D

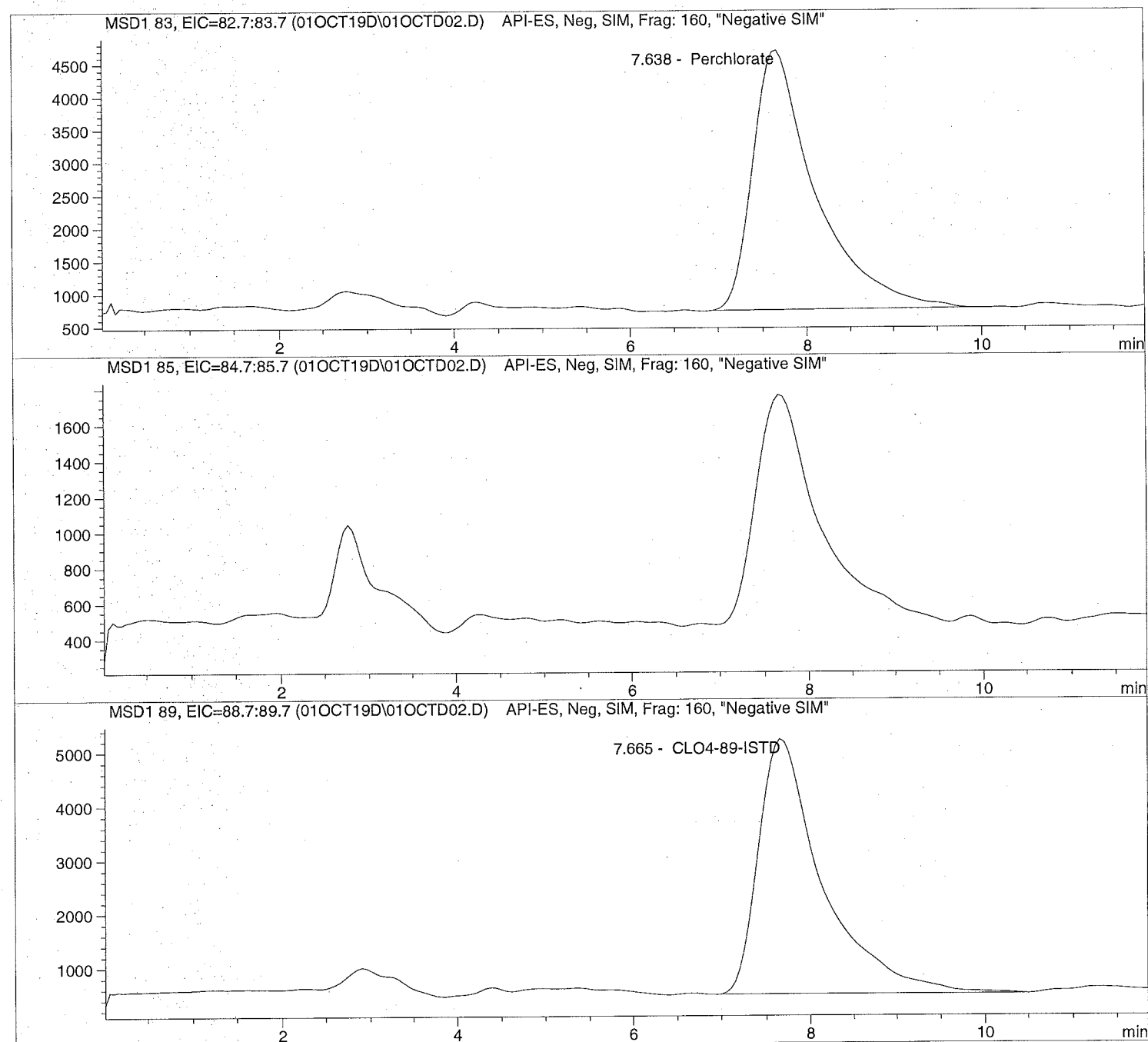
Sample Name: 676592 QC03.0

Injection Date: 10/01/2019 10:56:09
Sample Name: 676592 QC03.0
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: 10/2/2019 09:16:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD05.D

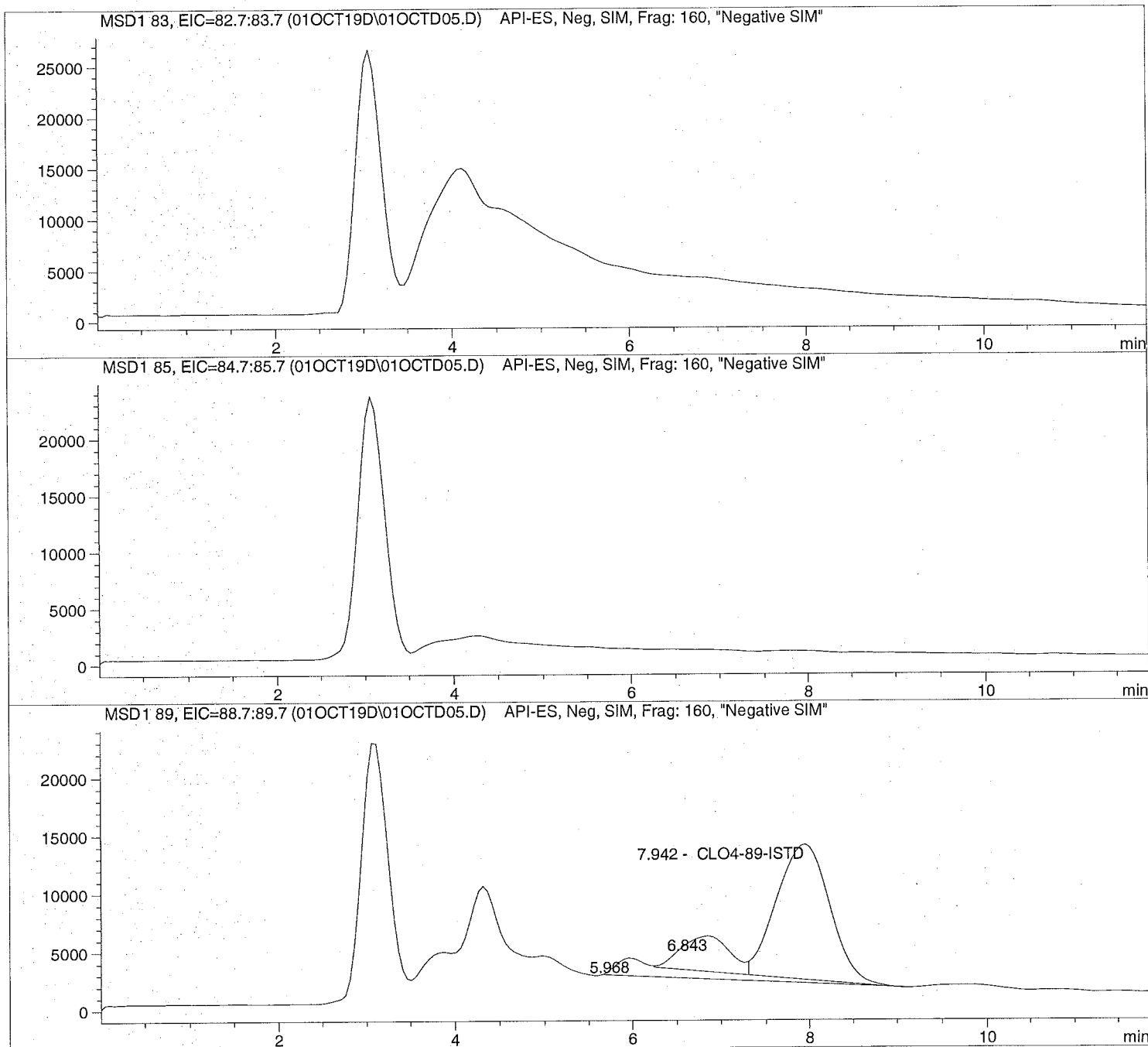
Sample Name: 1927220001

Injection Date: 10/01/2019 11:37:35
Sample Name: 1927220001
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: 10/2/2019 09:16:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD05.D Sample Name: 1927220001

```

=====
Injection Date: 10/01/2019 11:37:35      Seq Line: 5
Sample Name: 1927220001                  Location: Vial 75
Acq Operator: TNB                         Inj. No.: 1
                                           Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 09:16:52
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
5.968	PB S	100244.2	0.0000	
6.843	BB T	116415.9	0.0000	
7.942	PBAT	488651.6	5.0000	CLO4-89-ISTD

```

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

```


Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD06.D

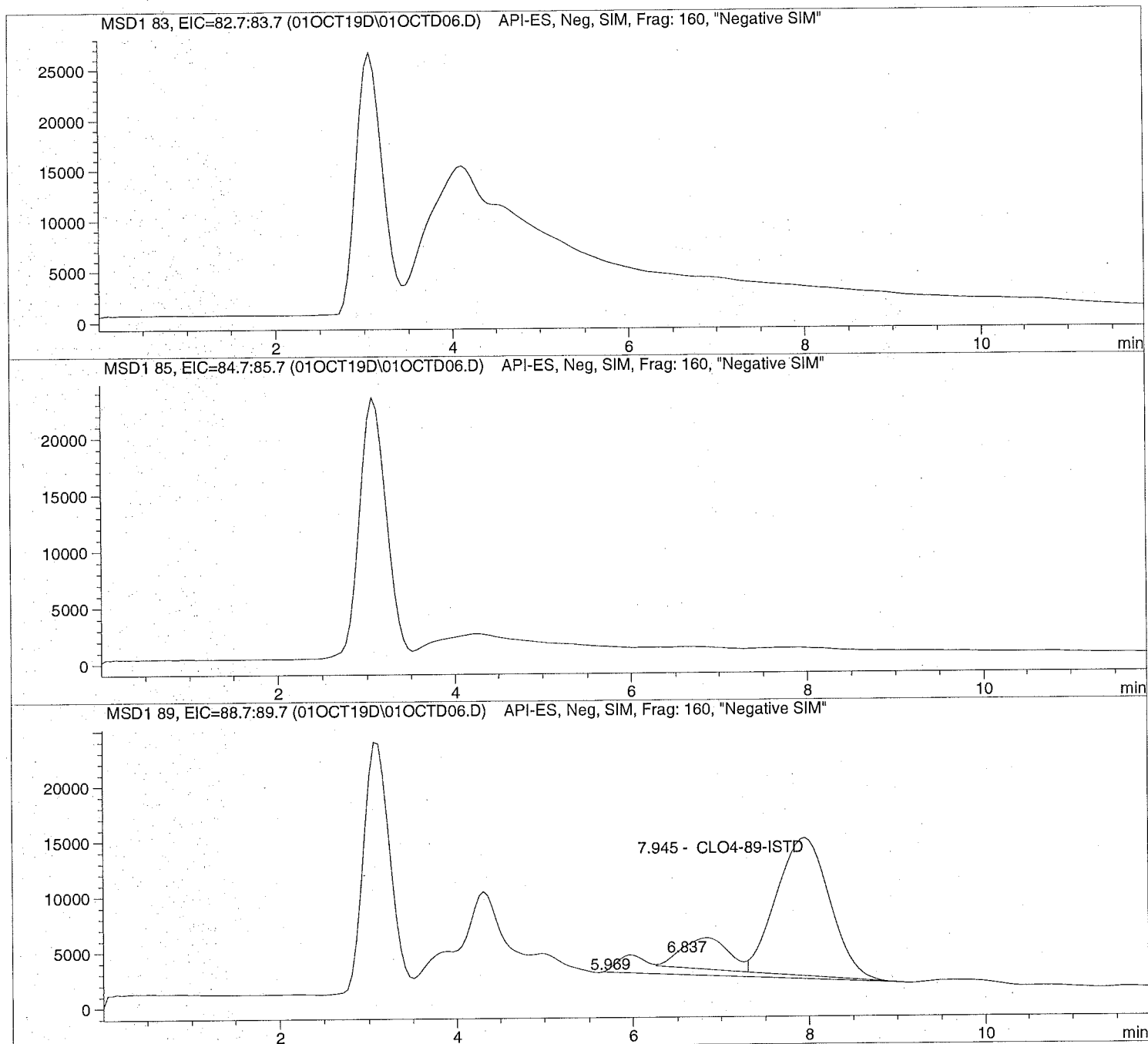
Sample Name: 1927220002

Injection Date: 10/01/2019 11:51:24
Sample Name: 1927220002
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: 10/2/2019 09:16:52

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\01OCT19D\01OCTD06.D Sample Name: 1927220002

```

=====
Injection Date: 10/01/2019 11:51:24      Seq Line: 6
Sample Name: 1927220002      Location: Vial 76
Acq Operator: TNB      Inj. No.: 1
                                 Inj. Vol.: 30 µl
=====

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP3.M
Last Changed: 10/2/2019 09:16:52
=====

```

Perchlorate analysis

Sample Information

```

=====
Sorted By: Signal
Calib. Data Modified: Mon, 23. Sep. 2019,00:20:59 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000
=====

```

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
5.969	PB S	94987.9	0.0000	
6.837	BB T	106969.7	0.0000	
7.945	PBAT	520312.7	5.0000	CLO4-89-ISTD

*** End of Report ***

GWTP QUARTERLY EVALUATION REPORT – 3RD QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

APPENDIX D
PROTOCOL FOR DISCHARGING GWTP EFFLUENT

GWTP QUARTERLY EVALUATION REPORT – 3RD QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

This page intentionally left blank.

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.

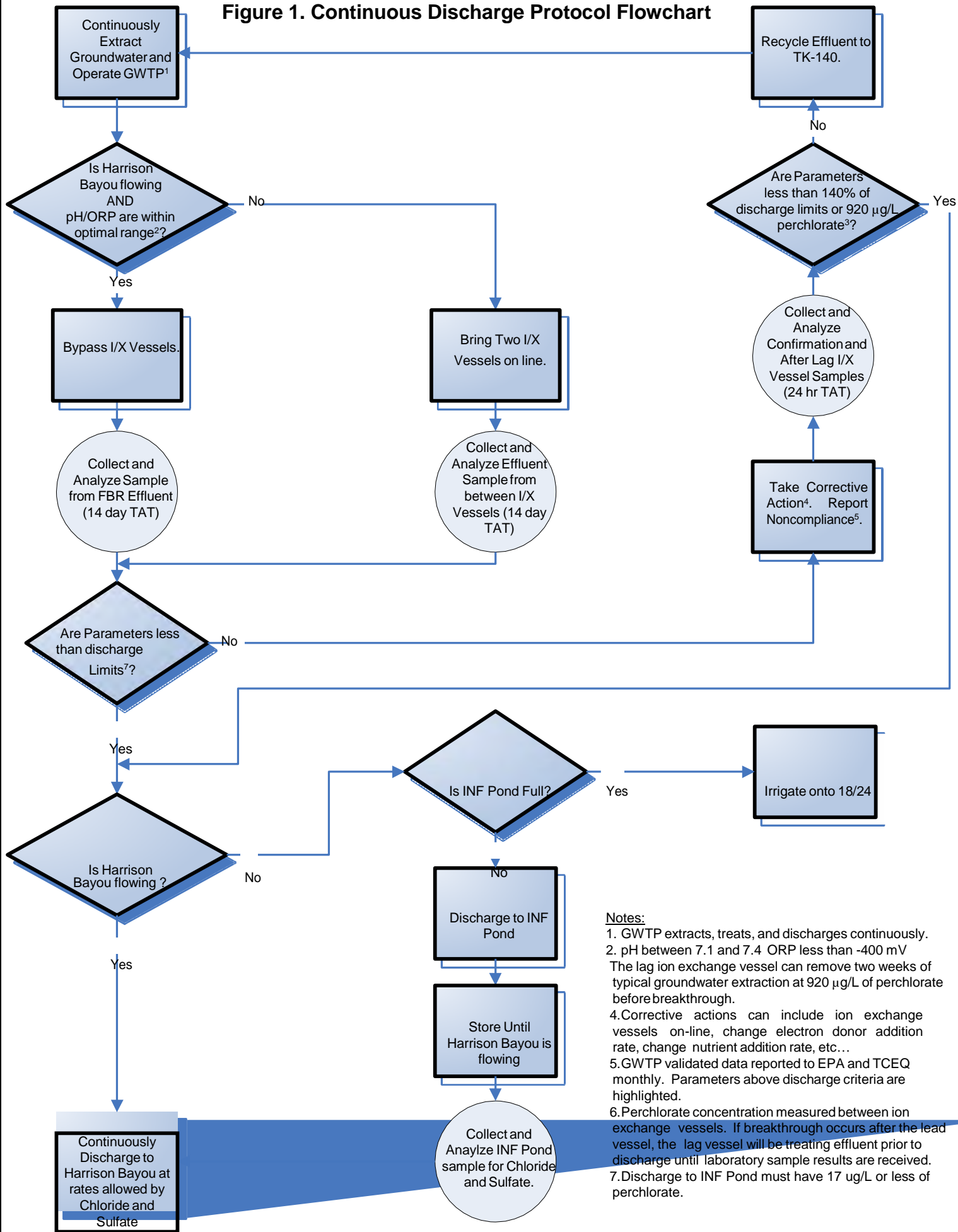
As soon as flow in Harrison Bayou returns, stored GWTP effluent from the INF Pond will be discharged. As with direct discharges from the GWTP to Harrison Bayou, the allowable flowrate of effluent from the INF Pond is calculated based upon the chloride and sulfate concentrations in the pond and the flow 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 µg/L or less of perchlorate.

GWTP QUARTERLY EVALUATION REPORT – 3RD QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

APPENDIX E
QUALITY CONTROL SUMMARY REPORT

GWTP QUARTERLY EVALUATION REPORT – 3RD QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

This page intentionally left blank.

**QUALITY CONTROL SUMMARY REPORT
3rd QUARTER (JULY-SEPTEMBER) 2019
GROUNDWATER TREATMENT PLANT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS**

December 2019

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:

 bhate

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

Table of Contents

1 INTRODUCTION	3
1.1 Intended Use of Data	3
1.2 Preservation and Holding Times	4
1.3 Calibrations	4
1.3.1 Continuing Calibration Verifications (CCV)	4
1.4 Blanks	4
1.5 Surrogates	4
1.6 Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)	4
1.7 Matrix Spike (MS)/Matrix Spike Duplicate Sample (MSD)	5
1.8 Internal Standards	5
1.9 Precision	5
1.9.1 Laboratory Duplicate	5
1.9.2 Field Duplicate	5
2 DATA USABILITY SUMMARY	5

Tables

Table 1: Field Sample Identification and Laboratory Packages

Table 2: Qualified Analytical Data

Table 3: Completeness by Method

1 INTRODUCTION

Bhate reviewed 28 data packages from ALS Environmental, Houston, Texas. Groundwater samples were collected from July 9, 2019, through September 24, 2019, at the Groundwater Treatment Plant (GWTP) 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:

- SW6850 – Perchlorate
- E350.3/SM4500 NH₃ – Nitrogen, Ammonia
- E365.3/SM4500 P – Orthophosphate
- SM5310C – Total Organic Carbon
- SW8260C - Volatile Organic Compounds (VOCs)
- SW8270D Selected Ion Monitoring (SIM) - 1,4-Dioxane
- SW6020A/7470 – 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 (CCV)

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.

All compounds were within calibration recovery limits.

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.

No compounds were detected in the quality control blanks.

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.

No qualification was required of the MS data.

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 samples LH18/24-SP-650_070919 and LH18/24-SP650_092419 was outside control limits. TOC has been flagged as estimated "J".

1.9.2 Field Duplicate

The RPD between the LH18/24 air stripper and duplicate was outside control limits for vinyl chloride; cis-1,2-dichloroethene; 1,2-dichloroethane; trichloroethene; and tetrachloroethene. These compounds have been flagged as estimated, "J", in both samples.

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	SW6850	E350.3	E365.3	SMS310C	SW8270D SIM	SW8260C	SW6020A	SW9056A	SW7196A	E410.4	1664A	TO-15
GWTP Samples													
LH18/24-SP650_070919/BIX	HS19070423	X	X	X	X								
LH18/24-SP650_070919	HS19070432						X		X				
LH18/24-SP650_071619/BIX	HS19070824	X				X	X	X		X			
LH18/24-SP140_071619	HS19070822	X						X		X			
LH18/24-SP650_071619/BIX	HS19070827	X	X	X	X								
LH18/24-SP650_072319/BIX	HS19071160	X	X	X	X								
LH18/24-SP650_072319	HS19071164						X		X				
LH18/24-SP650_073019/BIX	HS19071544	X	X	X	X								
LH18/24-SP650_080619	HS19080343						X		X				
LH18/24-SP650_080619/BIX	HS19080284	X	X	X	X								
LH18/24-SP140_081419	HS19080735	X						X		X			
LH18/24-SP650_081419/BIX	HS19080732	X				X	X	X		X			
LH18/24-SP650_081419/BIX	HS19080736	X	X	X	X								
LH18/24-SP650_082019/BIX	HS19081044	X	X	X	X								
LH18/24-SP650_082019	HS19081048						X		X				
LH18/24-SP650_082019_AIX	HS19081046	X											
LH18/24-SP650_082719/AIX	HS19081495	X	X	X	X								
LH18/24-SP650_090419/AIX	HS19090166	X	X	X	X								
LH18/24-SP650_090419	HS19090191						X		X				
LH18/24-SP650_091019/AIX	HS19090454	X				X	X	X		X			
LH18/24-SP140_091019	HS19090455	X						X		X			
LH18/24-SP650_091019/AIX	HS19090456	X	X	X	X								
LH18/24-SP650_091719/AIX	HS19090804	X	X	X	X								
LH18/24-SP650_091719	HS19090847						X		X				
LH18/24-SP650_092419/AIX	HS19091201	X	X	X	X								
LH18/24-SP650_092419/AIX	HS19091234	X				X	X	X	X		X	X	
LH18/24-SP140_092419	HS19091233	X				X	X	X	X		X	X	
Air Samples													
LH18/24-Air_090919_Stripper	P1905498												X
LH18/24-Air_090919_Stripper_a	P1905498												X
LH18/24-Air_090919_GWTP	P1905498												X
LH18/24-Air_090919_Downwind	P1905498												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													

Table 2: Qualified Analytical Data

Client Sample ID Laboratory	Laboratory Package	Analyte Name	Data Validation Qualifier ($\mu\text{g}/\text{m}^3$)	Reason for Qualification
LH18/24-SP650_070919	HS19070423	TOC (mg/L)	5.09 J	Lab RPD
LH18/24-Air_090919_Stripper	P1905498	Vinyl Chloride cis-1,2-Dichloroethene 1,2-Dichloroethane Trichloroethene Tetrachloroethene	320 J 18,000 J 230 J 30,000 J 260 J	FD RPD
LH18/24- Air_090919_Stripper_a	P1905498	Vinyl Chloride cis-1,2-Dichloroethene 1,2-Dichloroethane Trichloroethene Tetrachloroethene	490 J 25,000 J 350 J 41,000 J 360 J	FD RPD
LH18/24-SP650_092419	HS19091201	TOC (mg/L)	1.64 J	Lab RPD
Notes: mg/L – milligrams per liter $\mu\text{g}/\text{m}^3$ – micrograms per cubic meter J – Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria. Lab RPD – Laboratory Duplicate Relative Percent Difference outside control limits FD RPD – the relative percent difference between the field duplicate and parent was outside control limits				

Table 3: Completeness by Method

Method	No. of Rejected Results	% Completeness
SW6850	0	100
E350.1	0	100
E365.2	0	100
SM5310C	0	100
SW8270D	0	100
SW8260B	0	100
SW6020A	0	100
SW9056	0	100
SW7196A	0	100
E410.4	0	100
E1664	0	100
TO-15	0	100

GWTP QUARTERLY EVALUATION REPORT – 3RD QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

APPENDIX F
AIR MONITORING DATA – 3RD QUARTER 2019

GWTP QUARTERLY EVALUATION REPORT – 3RD QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

This page intentionally left blank.

GWTP QUARTERLY EVALUATION REPORT – 3RD QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

ATTACHMENT 1: AIR MONITORING CALCULATIONS

**Table 1. Ambient Air Data - September 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)	
		µg/m ³	µg/m ³	µg/m ³		µg/m ³	
1,1-Dichloroethane	75-34-3	4,000	4,047	0.71 U	PASS	0.66 U	PASS
1,1-Dichloroethene	75-35-4	210	714	0.74 U	PASS	0.69 U	PASS
1,2-Dichloroethane	107-06-2	160	162	0.73 U	PASS	0.67 U	PASS
Acetone	67-64-1	5,900	NA	20.0	PASS	21.0	PASS
Benzene	71-43-2	170	575	1.20	PASS	0.95	PASS
Carbon disulfide	75-15-0	30	NA	1.5 U	PASS	1.4 U	PASS
Chloroform	67-66-3	100	98	0.74 U	PASS	0.69 U	PASS
cis-1,2-Dichloroethene	156-59-2	7,900	NA	7.4	PASS	0.76	PASS
Methylene chloride	75-09-2	3,600	12,158	1.1	PASS	0.69 U	PASS
Tetrachloroethene	127-18-4	2,000	6,782	0.73 U	PASS	0.67 U	PASS
trans-1,2-Dichloroethene	156-60-5	7,900	NA	0.73 U	PASS	0.67 U	PASS
Trichloroethene	79-01-6	540	537	13.0	PASS	1.10	PASS
Vinyl chloride	75-01-4	20,000	66,460	0.73 U	PASS	0.67 U	PASS
n-Hexane	110-54-3	5,300	6,336	2.60	PASS	1.90	PASS
Styrene	100-42-5	110	21,725	0.73 U	PASS	0.67 U	PASS
Toluene	108-88-3	640	15,074	3.0	PASS	2.3	PASS
Ethylbenzene	100-41-4	740	86,844	0.71 U	PASS	0.66 U	PASS
m,p-Xylenes	179601-23-1	180	7,382	2.0	PASS	1.6	PASS
o-Xylene	95-47-6	1,600	7,382	0.73	PASS	0.67 U	PASS
1,3-Dichlorobenzene	541-73-1	720	NA	0.74 U	PASS	0.69 U	PASS
Propene (C3 H6)	115-07-1	Asphyxiant	Asphyxiant	0.71 U	NA	0.66 U	NA
Dichlorodifluoromethane (CCl2F2)	75-71-8	50,000	49,452	2.9	PASS	3.4	PASS
Ethanol	64-17-5	18,800	NA	14.0	PASS	12.0	PASS
Trichlorofluoromethane (CCl3F)	75-69-4	28,000	56,184	2.4	PASS	2.2	PASS
Trichlorotrifluoroethane (C2Cl3F3)	76-13-1	38,000	NA	19	PASS	4.7	PASS
alpha-Pinene	80-56-8	60	3,499	2.10	PASS	3.50	PASS
d-Limonene	5989-27-5	1,100	NA	0.70 U	PASS	1.80	PASS

Notes:

(1) Sample collected over an 8-hour period on September 9, 2019, between 8 AM and 4 PM

(2) Sample collected over a 24-hour period beginning on September 10, 2019, at 7:00 AM and ending on September 11, 2019 at 7:00 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

J = estimated value

U = non-detect

µg/m³ = micrograms per cubic meter

Table 2. Emission Stack Air Data - September 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	U								
1,1-Dichloroethane	75-34-3	200	U	1.64E-03	U	1.07E-03	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	390	U	6.39E-03	U	4.16E-03	U	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	350	J	5.74E-03	U	3.73E-03	U	5	PASS		40	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	2.9	PASS
Acetone	67-64-1	2,100	U	1.72E-02	U	1.12E-02	U	5	PASS		590	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Benzene	71-43-2	200	U	1.64E-03	U	1.07E-03	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	430	U	3.52E-03	U	2.29E-03	U	5	PASS		430	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	2.2	PASS
Chloroform	67-66-3	210	U	1.72E-03	U	1.12E-03	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	25,000	J	4.10E-01	U	2.66E-01	U	5	PASS		793	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Methylene chloride	75-09-2	3,200	U	5.25E-02	U	3.41E-02	U	5	PASS		26	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.9	PASS
Tetrachloroethene	127-18-4	360	J	5.90E-03	U	3.84E-03	U	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	210	U	1.72E-03	U	1.12E-03	U	5	PASS		793	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Trichloroethene	79-01-6	41,000	J	6.72E-01	U	4.37E-01	U	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	490	J	8.03E-03	U	5.22E-03	U	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	210	U	1.72E-03	U	1.12E-03	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	210	U	1.72E-03	U	1.12E-03	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	210	U	1.72E-03	U	1.12E-03	U	5	PASS		188	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	6.0	PASS
Ethylbenzene	100-41-4	200	U	1.64E-03	U	1.07E-03	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	430	U	3.52E-03	U	2.29E-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	210	U	1.72E-03	U	1.12E-03	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	210	U	1.72E-03	U	1.12E-03	U	5	PASS		(5)	--	30 TAC 106.533(f)(1)(A)(i)	2,000	14	1.0	PASS
Propene (C3 H6)	115-07-1	200	U	1.64E-03	U	1.07E-03	U	5	PASS		(5)	--	30 TAC 106.533(f)(1)(A)(i)	2,000	14	6.0	PASS
Dichlorodifluoromethane (CCl2F2)	75-71-8	200	U	1.64E-03	U	1.07E-03	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	2,000	U	1.64E-02	U	1.07E-02	U	5	PASS		1,880	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Trichlorofluoromethane (CCl3F)	75-69-4	210	U	1.72E-03	U	1.12E-03	U	5	PASS		5,620	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Trichlorotrifluoroethane (C2Cl3F3)	76-13-1	35,000	U	5.74E-01	U	3.73E-01	U	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	200	U	1.64E-03	U	1.07E-03	U	5	PASS		(5)	--	30 TAC 106.533(f)(1)(A)(i)	2,000	14	1.0	PASS
d-Limonene	5989-27-5	200	U	1.64E-03	U	1.07E-03	U	5	PASS		(5)	--	30 TAC 106.533(f)(1)(A)(i)	2,000	14	1.0	PASS
TOTAL				1.800													

Notes:

- (1) Sample collected on September 9, 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

GWTP QUARTERLY EVALUATION REPORT – 3RD QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

ATTACHMENT 2: PID READINGS AND CALIBRATION LOGS

Table 3. PID Readings - July 2019 - September 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant

Date	Time	Location	Air Flow Rate at Blower	Instrument ID	Person Collecting	PID Reading	Weather Conditions
7/3/2019	11:00	Outside GWTP Office	3870 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 86°F
7/3/2019	11:00	Downwind	3870 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 86°F
7/3/2019	11:00	Stripper	3870 ACFM	MiniRAE 3000	Kennie Moore	Max. 20.6 ppm Steady State 6.3 ppm	Clear 86°F
7/3/2019	14:00	Outside GWTP Office	3745 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 91°F
7/3/2019	14:00	Downwind	3745 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 91°F
7/3/2019	14:00	Stripper	3745 ACFM	MiniRAE 3000	Kennie Moore	Max. 19.2 ppm Steady State 6.6 ppm	Clear 91°F
7/8/2019	8:00	Outside GWTP Office	3805 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 76°F
7/8/2019	8:00	Downwind	3805 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 76°F
7/8/2019	8:00	Stripper	3805 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.4 ppm Steady State 7.9 ppm	Clear 76°F
7/8/2019	14:00	Outside GWTP Office	3682 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 95°F
7/8/2019	14:00	Downwind	3682 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 95°F
7/8/2019	14:00	Stripper	3682 ACFM	MiniRAE 3000	Scott Beesinger	Max. 20.7 ppm Steady State 5.4 ppm	Clear 95°F
7/11/2019	8:00	Outside GWTP Office	3780 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 77°F
7/11/2019	8:00	Downwind	3780 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 77°F
7/11/2019	8:00	Stripper	3780 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.3 ppm Steady State 7.7 ppm	Clear 77°F
7/11/2019	13:00	Outside GWTP Office	3604 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 91°F
7/11/2019	13:00	Downwind	3604 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 91°F
7/11/2019	13:00	Stripper	3604 ACFM	MiniRAE 3000	Scott Beesinger	Max. 23.3 ppm Steady State 8.2 ppm	Clear 91°F
7/15/2019	8:00	Outside GWTP Office	3706 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 75°F
7/15/2019	8:00	Downwind	3706 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 75°F
7/15/2019	8:00	Stripper	3706 ACFM	MiniRAE 3000	Kennie Moore	Max. 24.6 ppm Steady State 8.3 ppm	Clear 75°F
7/15/2019	14:00	Outside GWTP Office	3663 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 88°F
7/15/2019	14:00	Downwind	3663 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 88°F
7/15/2019	14:00	Stripper	3663 ACFM	MiniRAE 3000	Scott Beesinger	Max. 22.4 ppm Steady State 6.9 ppm	Clear 88°F
7/18/2019	8:00	Outside GWTP Office	3736 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 79°F
7/18/2019	8:00	Downwind	3736 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 79°F
7/18/2019	8:00	Stripper	3736 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.6 ppm Steady State 5.9 ppm	Clear 79°F
7/18/2019	13:00	Outside GWTP Office	3564 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 92°F
7/18/2019	13:00	Downwind	3564 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 92°F
7/18/2019	13:00	Stripper	3564 ACFM	MiniRAE 3000	Scott Beesinger	Max. 20.1 ppm Steady State 5.1 ppm	Clear 92°F
7/22/2019	8:00	Outside GWTP Office	3715 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 78°F
7/22/2019	8:00	Downwind	3715 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 78°F
7/22/2019	8:00	Stripper	3715 ACFM	MiniRAE 3000	Kennie Moore	Max. 24.2 ppm Steady State 8.3 ppm	Clear 78°F
7/22/2019	14:00	Outside GWTP Office	3559 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 94°F
7/22/2019	14:00	Downwind	3559 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 94°F
7/22/2019	14:00	Stripper	3559 ACFM	MiniRAE 3000	Scott Beesinger	Max. 21.9 ppm Steady State 7.2 ppm	Clear 94°F

Table 3. PID Readings - July 2019 - September 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant

Date	Time	Location	Air Flow Rate at Blower	Instrument ID	Person Collecting	PID Reading	Weather Conditions
7/25/2019	8:00	Outside GWTP Office	3736 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 75°F
7/25/2019	8:00	Downwind	3736 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 75°F
7/25/2019	8:00	Stripper	3736 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.6 ppm Steady State 6.0 ppm	Clear 75°F
7/25/2019	13:00	Outside GWTP Office	3564 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 85°F
7/25/2019	13:00	Downwind	3564 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 85°F
7/25/2019	13:00	Stripper	3564 ACFM	MiniRAE 3000	Scott Beesinger	Max. 24.2 ppm Steady State 7.3 ppm	Clear 85°F
7/29/2019	8:00	Outside GWTP Office	3739 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 77°F
7/29/2019	8:00	Downwind	3739 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 77°F
7/29/2019	8:00	Stripper	3739 ACFM	MiniRAE 3000	Scott Beesinger	Max. 22.9 ppm Steady State 5.3 ppm	Clear 77°F
7/29/2019	14:00	Outside GWTP Office	3601 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 89°F
7/29/2019	14:00	Downwind	3601 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 89°F
7/29/2019	14:00	Stripper	3601 ACFM	MiniRAE 3000	Scott Beesinger	Max. 24.5 ppm Steady State 6.6 ppm	Clear 89°F
8/1/2019	8:00	Outside GWTP Office	3717 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 76°F
8/1/2019	8:00	Downwind	3717 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 76°F
8/1/2019	8:00	Stripper	3717 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.1 ppm Steady State 6.9 ppm	Clear 76°F
8/1/2019	13:00	Outside GWTP Office	3580 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 91°F
8/1/2019	13:00	Downwind	3580 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 91°F
8/1/2019	13:00	Stripper	3580 ACFM	MiniRAE 3000	Scott Beesinger	Max. 21.9 ppm Steady State 5.7 ppm	Clear 91°F
8/5/2019	10:00	Outside GWTP Office	3785 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 83°F
8/5/2019	10:00	Downwind	3785 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 83°F
8/5/2019	10:00	Stripper	3785 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.6 ppm Steady State 5.7 ppm	Clear 83°F
8/5/2019	14:00	Outside GWTP Office	3559 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 96°F
8/5/2019	14:00	Downwind	3559 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 96°F
8/5/2019	14:00	Stripper	3559 ACFM	MiniRAE 3000	Kennie Moore	Max. 24.2 ppm Steady State 7.4 ppm	Clear 96°F
8/8/2019	8:00	Outside GWTP Office	3716 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 80°F
8/8/2019	8:00	Downwind	3716 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 80°F
8/8/2019	8:00	Stripper	3716 ACFM	MiniRAE 3000	Kennie Moore	Max. 24.9 ppm Steady State 8.1 ppm	Clear 80°F
8/8/2019	13:00	Outside GWTP Office	3563 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 96°F
8/8/2019	13:00	Downwind	3563 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 96°F
8/8/2019	13:00	Stripper	3563 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.7 ppm Steady State 6.3 ppm	Clear 96°F
8/12/2019	8:00	Outside GWTP Office	3785 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 84°F
8/12/2019	8:00	Downwind	3785 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 84°F
8/12/2019	8:00	Stripper	3785 ACFM	MiniRAE 3000	Kennie Moore	Max. 20.9 ppm Steady State 7.4 ppm	Clear 84°F
8/12/2019	14:00	Outside GWTP Office	3530 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 98°F
8/12/2019	14:00	Downwind	3530 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 98°F

Table 3. PID Readings - July 2019 - September 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant

Date	Time	Location	Air Flow Rate at Blower	Instrument ID	Person Collecting	PID Reading	Weather Conditions
8/12/2019	14:00	Stripper	3530 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.4 ppm Steady State 7.9 ppm	Clear 98°F
8/15/2019	8:00	Outside GWTP Office	3741 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 82°F
8/15/2019	8:00	Downwind	3741 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 82°F
8/15/2019	8:00	Stripper	3741 ACFM	MiniRAE 3000	Kennie Moore	Max.19.4 ppm Steady State 5.2 ppm	Clear 82°F
8/15/2019	13:00	Outside GWTP Office	3551 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 95°F
8/15/2019	13:00	Downwind	3551 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 95°F
8/15/2019	13:00	Stripper	3551 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.2 ppm Steady State 6.3 ppm	Clear 95°F
8/19/2019	8:00	Outside GWTP Office	3569 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 83°F
8/19/2019	8:00	Downwind	3569 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 83°F
8/19/2019	8:00	Stripper	3569 ACFM	MiniRAE 3000	Kennie Moore	Max. 20.1 ppm Steady State 5.4 ppm	Clear 83°F
8/19/2019	14:00	Outside GWTP Office	3575 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 97°F
8/19/2019	14:00	Downwind	3575 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 97°F
8/19/2019	14:00	Stripper	3575 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.2 ppm Steady State 6.9 ppm	Clear 97°F
8/26/2019	8:00	Outside GWTP Office	3775 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 78°F
8/26/2019	8:00	Downwind	3775 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 78°F
8/26/2019	8:00	Stripper	3775 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.2 ppm Steady State 6.7 ppm	Clear 78°F
8/26/2019	14:00	Outside GWTP Office	3670 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 95°F
8/26/2019	14:00	Downwind	3670 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 95°F
8/26/2019	14:00	Stripper	3670 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.7 ppm Steady State 5.3 ppm	Clear 95°F
8/29/2019	8:00	Outside GWTP Office	3775 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 78°F
8/29/2019	8:00	Downwind	3775 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 78°F
8/29/2019	8:00	Stripper	3775 ACFM	MiniRAE 3000	Kennie Moore	Max.20.1 ppm Steady State 6.6 ppm	Clear 78°F
8/29/2019	13:00	Outside GWTP Office	3620 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 92°F
8/29/2019	13:00	Downwind	3620 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 92°F
8/29/2019	13:00	Stripper	3620 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.7 ppm Steady State 7.4 ppm	Clear 92°F
9/3/2019	8:00	Outside GWTP Office	3682 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 75°F
9/3/2019	8:00	Downwind	3682 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 75°F
9/3/2019	8:00	Stripper	3682 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.5 ppm Steady State 4.9 ppm	Clear 75°F
9/3/2019	14:00	Outside GWTP Office	3524 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 95°F
9/3/2019	14:00	Downwind	3524 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 95°F
9/3/2019	14:00	Stripper	3524 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.2 ppm Steady State 5.8 ppm	Clear 95°F
9/9/2019	8:00	Outside GWTP Office	3721 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 77°F
9/9/2019	8:00	Downwind	3721 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 77°F
9/9/2019	8:00	Stripper	3721 ACFM	MiniRAE 3000	Kennie Moore	Max. 19.5 ppm Steady State 4.5 ppm	Clear 77°F
9/9/2019	14:00	Outside GWTP Office	3504 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 97°F

Table 3. PID Readings - July 2019 - September 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant

Date	Time	Location	Air Flow Rate at Blower	Instrument ID	Person Collecting	PID Reading	Weather Conditions
9/9/2019	14:00	Downwind	3504 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 97°F
9/9/2019	14:00	Stripper	3504 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.2 ppm Steady State 5.8 ppm	Clear 97°F
9/12/2019	8:00	Outside GWTP Office	3578 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 70°F
9/12/2019	8:00	Downwind	3578 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 70°F
9/12/2019	8:00	Stripper	3578 ACFM	MiniRAE 3000	Kennie Moore	Max. 20.3 ppm Steady State 5.5 ppm	Clear 70°F
9/12/2019	13:00	Outside GWTP Office	3500 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 92°F
9/12/2019	13:00	Downwind	3500 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 92°F
9/12/2019	13:00	Stripper	3500 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.9 ppm Steady State 8.0 ppm	Clear 92°F
9/16/2019	8:00	Outside GWTP Office	3785 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 82°F
9/16/2019	8:00	Downwind	3785 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 82°F
9/16/2019	8:00	Stripper	3785 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.1 ppm Steady State 6.6 ppm	Clear 82°F
9/16/2019	14:00	Outside GWTP Office	3570 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 95°F
9/16/2019	14:00	Downwind	3570 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 95°F
9/16/2019	14:00	Stripper	3570 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.6 ppm Steady State 5.2 ppm	Clear 95°F
9/19/2019	8:00	Outside GWTP Office	3785 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 75°F
9/19/2019	8:00	Downwind	3785 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 75°F
9/19/2019	8:00	Stripper	3785 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.9 ppm Steady State 7.1 ppm	Clear 75°F
9/19/2019	13:00	Outside GWTP Office	3640 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 82°F
9/19/2019	13:00	Downwind	3640 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 82°F
9/19/2019	13:00	Stripper	3640 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.2 ppm Steady State 6.4 ppm	Clear 82°F
9/23/2019	8:00	Outside GWTP Office	3920 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 75°F
9/23/2019	8:00	Downwind	3920 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 75°F
9/23/2019	8:00	Stripper	3920 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.8 ppm Steady State 7.2 ppm	Clear 75°F
9/23/2019	14:00	Outside GWTP Office	3770 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 88°F
9/23/2019	14:00	Downwind	3770 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 88°F
9/23/2019	14:00	Stripper	3770 ACFM	MiniRAE 3000	Kennie Moore	Max. 20.9 ppm Steady State 6.3 ppm	Clear 88°F
9/30/2019	8:00	Outside GWTP Office	3482 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 75°F
9/30/2019	8:00	Downwind	3482 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 75°F
9/30/2019	8:00	Stripper	3482 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.1 ppm Steady State 6.7 ppm	Clear 75°F
9/30/2019	14:00	Outside GWTP Office	3405 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 92°F
9/30/2019	14:00	Downwind	3405 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 92°F
9/30/2019	14:00	Stripper	3405 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.5 ppm Steady State 6.1 ppm	Clear 92°F

EQUIPMENT CALIBRATION DAILY LOG

Date: 8/1/19
 Project Number: NW01312.0150 Project Name: LHAAP - GwTP
 Recorded By: Scott Bassinger

PID	Model: <u>Mini RA4 3000</u>		Bulb: <u>11.7</u> <u>10.6 meV</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #:						
	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:
					Value: <u>To 2420</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: <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: 8/5/19
 Project Number: NW01312.0150 Project Name: LHAAP - GWTP
 Recorded By: Scott Bassinger

PID	Model: <u>Mini RA4 3000</u>		Bulb: <u>11.7</u> <u>10.6 meV</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time: <u>0640</u>	Time:	Time:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Initials: <u>SB</u>	Initials:	Initials:
					Value: <u>To 2420</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-</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			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: **8/8/19** Project Name: **LHAAP - GwTP**
 Project Number: **NW01312, 0150** Recorded By: **Scott Baesinger**

PID	Model: Mini RAe 3000		Bulb: 11.7		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time: 0715	Time:	Time:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Initials: SB	Initials:	Initials:
					Value: To 2420	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	JBH-248-100-19	Value: SB	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: 8/12/19 Project Name: LHAAP - GWTP
 Project Number: NW01312.0150 Recorded By: Scott Bassinger

PID	Model: <u>Mini Rae 3000</u>		Bulb: <u>11.7</u> <u>10.6 meV</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #:						
	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 2420</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>JBH-248-100-19</u>	Value:	Value:	Value:
					<u>SB</u>		

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: 8/15/19
 Project Number: NW01312.0150 Project Name: LHAAP - GwTP
 Recorded By: SCOTT BAESINGER

PID	Model: <u>Mini RA4 3000</u>		Bulb: <u>11:7</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time: <u>0735</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 2420</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:

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: 8/19/19
 Project Number: NW01312, 0150 Project Name: LHAAP - GwTP
 Recorded By: Scott Baesinger

PID	Model: <u>Mini RAe 3000</u> Bulb: <u>11.7</u> <u>10.6 meV</u>				Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #:						
	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:
					Value: <u>To 2400</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: <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: 8/26/19 Project Name: LHAAP - GwTP
 Project Number: NW01312.0150 Recorded By: SCOTT BAESINGER

PID	Model: <u>Mini RA4 3000</u>		Bulb: <u>11.7</u> <u>10.6 meV</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #:				Time: <u>0610</u>	Time:	Time:
	Parameter	Standard	Exp. Date	Lot #	Initials: <u>SB</u>	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	<u>0.0 (ambient air)</u>	<u>NA</u>	<u>NA</u>	Value: <u>To 2400</u>	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	<u>100 ppm (isobutylene)</u>	<u>10/5/21</u>	<u>JBH-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 #	Time:	Time:	Time:
	Parameter	Standard	Exp. Date	Lot #	Initials:	Initials:	Initials:
First Point Calibration	O ₂ (%)				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 #	Time:	Time:	Time:
	Parameter	Standard	Exp. Date	Lot #	Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	<u>4.00</u>			Value:	Value:	Value:
	Conductivity (mS/cm)	<u>4.49</u>			Value:	Value:	Value:
	Turbidity (NTU)	<u>0</u>			Value:	Value:	Value:
	DO (mg/L)	<u>8.9-9.1 (ambient air)</u>	<u>NA</u>	<u>NA</u>	Value:	Value:	Value:
Second Point Calibration	pH	<u>6.86</u>			Value:	Value:	Value:
	Conductivity (mS/cm)	<u>53.7</u>			Value:	Value:	Value:
	Turbidity (NTU)	<u>100</u>			Value:	Value:	Value:
Third Point Calibration	pH	<u>9.18</u>			Value:	Value:	Value:
	Conductivity (mS/cm)	<u>53.7</u>			Value:	Value:	Value:
	Turbidity (NTU)	<u>100</u>			Value:	Value:	Value:

Additional Remarks:

EQUIPMENT CALIBRATION DAILY LOG

Date: 8/29/19

Project Number: NW01312.0150

Project Name: LHAAP - GwTP

Recorded By: SCOTT BRESINGER

PID	Model: <u>Mini RAe 3000</u>		Bulb: <u>11.7</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time: <u>0610</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:
Second Point Calibration	Vapor conc. (ppm)	<u>100 ppm</u> (isobutylene)	<u>10/5/21</u>	<u>JBH-248-100-19</u>	Initials: <u>SB</u>	Initials:	Initials:
					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: 9/3/19 Project Name: LHAAP - GwTP
 Project Number: NW01312, 0150 Recorded By: Scott Baesinger

PID	Model: <u>Mini RAe 3000</u> Bulb: <u>U-7</u> 10.6 meV				Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time: <u>0610</u>	Time:	Time:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Initials: <u>SB</u> Value: <u>To zero</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>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: 9/19/19
 Project Number: NW01312.0150 Project Name: LHAAP - GwTP
 Recorded By: Scott Baesinger

PID	Model: <u>Mini RAE 3000</u>		Bulb: <u>11.7</u> <u>10.6 meV</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #:				Time: <u>0615</u>	Time:	Time:
	Parameter	Standard	Exp. Date	Lot #	Initials: <u>SB</u>	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: <u>To 2420</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:		Equipment ID #:		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Parameter	Standard	Exp. Date	Lot #	Time:	Time:	Time:
	Parameter	Standard	Exp. Date	Lot #	Initials:	Initials:	Initials:
First Point Calibration	O ₂ (%)				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 #	Time:	Time:	Time:
	Parameter	Standard	Exp. Date	Lot #	Initials:	Initials:	Initials:
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: 9/12/19
 Project Number: NW01312, 0150 Project Name: LHAAP - GWTP
 Recorded By: SCOTT BAESINGER

PID	Model: <u>Mini RAe 3000</u>		Bulb: <u>11.7</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time: <u>0610</u>	Time:	Time:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Initials: <u>SB</u>	Initials:	Initials:
					Value: <u>To 2420</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: <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: 9/16/19
 Project Number: NW01312.0150 Project Name: LHAAP - GwTP
 Recorded By: SCOTT BASSINGER

PID	Model: <u>Mini RAe 3000</u>		Eulb: <u>11.7</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time: <u>0605</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</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:

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: 9/19/19 Project Name: LHAAP - GwTP
 Project Number: NW01312.0150 Recorded By: Scott Baesinger

PID	Model: <u>Mini RA4 3000</u>		Bulb: <u>11.7</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time: <u>0610</u>	Time:	Time:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Initials: <u>SB</u>	Initials:	Initials:
					Value: <u>To 2420</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>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:
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: 9/23/19
 Project Number: NWD1312.0150 Project Name: LHAAP - GWTP
 Recorded By: Scott Baesinger

PID	Model: <u>Mini RAe 3000</u>		Bulb: <u>11:7</u> <u>10:6 meV</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #:				Time: <u>0610</u>	Time:	Time:
	Parameter	Standard	Exp. Date	Lot #	Initials: <u>SB</u>	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: <u>To zero</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:		Equipment ID #:		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Parameter	Standard	Exp. Date	Lot #	Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O ₂ (%)				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 #	Time:	Time:	Time:
					Initials:	Initials:	Initials:
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: 9/30/19 Project Name: LHAAP - GWTP
 Project Number: NW01312.0150 Recorded By: Scott Baesinger

PID	Model: <u>Mini RA4 3000</u>		Bulb: <u>11.7</u> <u>10.6 meV</u>		Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
	Equipment ID #:						
	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:
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 2420</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:

GWTP QUARTERLY EVALUATION REPORT – 3RD QUARTER 2019
LONGHORN ARMY AMMUNITION PLANT

ATTACHMENT 3: AIR ANALYTICAL LABORATORY REPORT



2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

LABORATORY REPORT

October 7, 2019

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 September 16, 2019. For your reference, these analyses have been assigned our service request number P1905498.

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 Sue Anderson at 9:25 am, Oct 07, 2019

Sue Anderson
Project Manager



2655 Park Center Dr., Suite A
 Simi Valley, CA 93065
 T: +1 805 526 7161
www.alsglobal.com

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

Service Request No: P1905498

CASE NARRATIVE

The samples were received intact under chain of custody on September 16, 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 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.



2655 Park Center Dr., Suite A
 Simi Valley, CA 93065
 T: +1 805 526 7161
www.alsglobal.com

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1521096
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-006
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413- 19-10
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	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: P1905498

Date Received: 9/16/2019
 Time Received: 09:00

TO-15 - VOC Cans

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
LH18/24-Air_090919_Stripper	P1905498-001	Air	9/9/2019	14:00	AS01006	-0.24	3.61	X
LH18/24-Air_090919_Stripper_a	P1905498-002	Air	9/9/2019	14:00	AS01152	-0.46	4.82	X
LH18/24-Air_090919_GWTP	P1905498-003	Air	9/9/2019	14:15	AS00593	-1.03	4.06	X
LH18/24-Air_090919_Downwind	P1905498-004	Air	9/10/2019	07:00	AS01110	0.47	4.64	X

Air - Chain of Custody Record & Analytical Service Request

2655 Park Center Drive, Suite A
 Simi Valley, California 93065
 Phone (805) 526-7161

Company Name & Address (Reporting Information) BHATE ENVIRONMENTAL 485 UNION BLVD. STE. 129 LAKELAND, CO. 80228		Requested Turnaround Time in Business Days (Surcharges) please circle 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard		ALS Project No. 91905498	
Project Name LHAAP - GWTP		ALS Contact:			
Project Number NW01312.0150		Analysis Method			
P.O. # / Billing Information		10-15			
Sampler (Print & Sign) Scott Beesinger		Canister Start Pressure "Hg Canister End Pressure "Hg/psig Sample Volume		Comments e.g. Actual Preservative or specific instructions	
Client Sample ID HW121-AIR-090919-STIRPAC	Laboratory ID Number	Date Collected 9/10/19	Time Collected 1400	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg -30
HW121-AIR-090919-STIRPAC		9/10/19	1400	SFL00043	0
HW121-AIR-090919-GWTP		9/10/19	1435	SFL00043	0
HW121-AIR-090919-DUMMIND		9/10/19	0700	SFL00229	0
Report Tier Levels - please select Tier I - Results (Default if not specified) _____ Tier II (Results + QC Summaries) _____ Tier III (Results + QC & Calibration Summaries) _____ Tier IV (Data Validation Package) 10% Surcharge _____					
Received by: (Signature) Scott Beesinger			Received by: (Signature) RS		
Date: 9/10/19			Date: 9/11/19		
Time: 0730			Time: 900		
Chain of Custody Seal: (Circle) INTACT _____ BROKEN _____ ABSENT _____					
Project Requirements (MRLs, QAPP)					
Cooler / Blank Temperature _____ °C					

ALS Environmental Sample Acceptance Check Form

Client: Bhate Environmental Associates, Inc. Work order: P1905498
 Project: LHAAP - GWTP / NW01312.0150
 Sample(s) received on: 09/16/19 Date opened: 09/16/19 by: DENISE.POSADA

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

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

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1905498-001.01	6.0 L Silonite Can					
P1905498-002.01	6.0 L Silonite Can					
P1905498-003.01	6.0 L Silonite Can					
P1905498-004.01	6.0 L Silonite Can					

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 3

Client: **Bhate Environmental Associates, Inc.**Client Sample ID: **LH18/24-Air_090919_Stripper**Client Project ID: **LHAAP - GWTP / NW01312.0150**

ALS Project ID: P1905498

ALS Sample ID: P1905498-001

Test Code: EPA TO-15

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

Analyst: Wida Ang

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: AS01006

Date Collected: 9/9/19

Date Received: 9/16/19

Date Analyzed: 9/27/19

Volume(s) Analyzed: 0.0040 Liter(s)

Initial Pressure (psig): -0.24 Final Pressure (psig): 3.61

Container Dilution Factor: 1.27

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	ND	170	ND	96	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	170	ND	33	
74-87-3	Chloromethane	ND	160	ND	77	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	160	ND	23	
75-01-4	Vinyl Chloride	320	170	130	66	
106-99-0	1,3-Butadiene	ND	170	ND	75	
74-83-9	Bromomethane	ND	160	ND	41	
75-00-3	Chloroethane	ND	160	ND	61	
64-17-5	Ethanol	ND	1,600	ND	860	
75-05-8	Acetonitrile	ND	170	ND	98	
107-02-8	Acrolein	ND	320	ND	140	
67-64-1	Acetone	ND	1,700	ND	720	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	170	ND	30	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	670	ND	270	
107-13-1	Acrylonitrile	ND	170	ND	76	
75-35-4	1,1-Dichloroethene	290	170	74	43	
75-09-2	Methylene Chloride	2,400	170	700	49	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	170	ND	54	
76-13-1	Trichlorotrifluoroethane (CFC 113)	29,000	170	3,800	22	
75-15-0	Carbon Disulfide	ND	350	ND	110	
156-60-5	trans-1,2-Dichloroethene	ND	170	ND	42	
75-34-3	1,1-Dichloroethane	ND	170	ND	41	
1634-04-4	Methyl tert-Butyl Ether	ND	170	ND	48	
108-05-4	Vinyl Acetate	ND	1,700	ND	480	
78-93-3	2-Butanone (MEK)	ND	320	ND	110	

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_090919_Stripper**Client Project ID: **LHAAP - GWTP / NW01312.0150**

ALS Project ID: P1905498

ALS Sample ID: P1905498-001

Test Code: EPA TO-15

Date Collected: 9/9/19

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

Date Received: 9/16/19

Analyst: Wida Ang

Date Analyzed: 9/27/19

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 0.0040 Liter(s)

Test Notes:

Container ID: AS01006

Initial Pressure (psig): -0.24 Final Pressure (psig): 3.61

Container Dilution Factor: 1.27

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	18,000	170	4,700	42	
141-78-6	Ethyl Acetate	ND	350	ND	97	
110-54-3	n-Hexane	ND	170	ND	49	
67-66-3	Chloroform	ND	170	ND	35	
109-99-9	Tetrahydrofuran (THF)	ND	170	ND	57	
107-06-2	1,2-Dichloroethane	230	170	58	42	
71-55-6	1,1,1-Trichloroethane	ND	170	ND	31	
71-43-2	Benzene	ND	170	ND	52	
56-23-5	Carbon Tetrachloride	ND	170	ND	26	
110-82-7	Cyclohexane	ND	320	ND	92	
78-87-5	1,2-Dichloropropane	ND	170	ND	37	
75-27-4	Bromodichloromethane	ND	170	ND	25	
79-01-6	Trichloroethene	30,000	170	5,600	31	
123-91-1	1,4-Dioxane	ND	170	ND	47	
80-62-6	Methyl Methacrylate	ND	350	ND	85	
142-82-5	n-Heptane	ND	170	ND	42	
10061-01-5	cis-1,3-Dichloropropene	ND	180	ND	39	
108-10-1	4-Methyl-2-pentanone	ND	170	ND	41	
10061-02-6	trans-1,3-Dichloropropene	ND	170	ND	37	
79-00-5	1,1,2-Trichloroethane	ND	170	ND	31	
108-88-3	Toluene	ND	170	ND	45	
591-78-6	2-Hexanone	ND	170	ND	42	
124-48-1	Dibromochloromethane	ND	170	ND	20	
106-93-4	1,2-Dibromoethane	ND	170	ND	22	
123-86-4	n-Butyl Acetate	ND	170	ND	36	

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_090919_Stripper**Client Project ID: **LHAAP - GWTP / NW01312.0150**

ALS Project ID: P1905498

ALS Sample ID: P1905498-001

Test Code: EPA TO-15

Date Collected: 9/9/19

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

Date Received: 9/16/19

Analyst: Wida Ang

Date Analyzed: 9/27/19

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 0.0040 Liter(s)

Test Notes:

Container ID: AS01006

Initial Pressure (psig): -0.24 Final Pressure (psig): 3.61

Container Dilution Factor: 1.27

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	170	ND	37	
127-18-4	Tetrachloroethene	260	170	38	25	
108-90-7	Chlorobenzene	ND	170	ND	37	
100-41-4	Ethylbenzene	ND	170	ND	38	
179601-23-1	m,p-Xylenes	ND	350	ND	80	
75-25-2	Bromoform	ND	170	ND	16	
100-42-5	Styrene	ND	170	ND	40	
95-47-6	o-Xylene	ND	170	ND	39	
111-84-2	n-Nonane	ND	170	ND	33	
79-34-5	1,1,2,2-Tetrachloroethane	ND	170	ND	25	
98-82-8	Cumene	ND	170	ND	34	
80-56-8	alpha-Pinene	ND	170	ND	30	
103-65-1	n-Propylbenzene	ND	170	ND	35	
622-96-8	4-Ethyltoluene	ND	170	ND	34	
108-67-8	1,3,5-Trimethylbenzene	ND	170	ND	34	
95-63-6	1,2,4-Trimethylbenzene	ND	170	ND	34	
100-44-7	Benzyl Chloride	ND	350	ND	67	
541-73-1	1,3-Dichlorobenzene	ND	170	ND	29	
106-46-7	1,4-Dichlorobenzene	ND	170	ND	29	
95-50-1	1,2-Dichlorobenzene	ND	170	ND	29	
5989-27-5	d-Limonene	ND	160	ND	29	
96-12-8	1,2-Dibromo-3-chloropropane	ND	170	ND	17	
120-82-1	1,2,4-Trichlorobenzene	ND	170	ND	23	
91-20-3	Naphthalene	ND	160	ND	31	
87-68-3	Hexachlorobutadiene	ND	170	ND	16	

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_090919_Stripper_a**Client Project ID: **LHAAP - GWTP / NW01312.0150**

ALS Project ID: P1905498

ALS Sample ID: P1905498-002

Test Code: EPA TO-15

Date Collected: 9/9/19

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

Date Received: 9/16/19

Analyst: Wida Ang

Date Analyzed: 9/27/19

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 0.0035 Liter(s)

Test Notes:

Container ID: AS01152

Initial Pressure (psig): -0.46 Final Pressure (psig): 4.82

Container Dilution Factor: 1.37

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	200	ND	120	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	200	ND	41	
74-87-3	Chloromethane	ND	200	ND	95	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	200	ND	29	
75-01-4	Vinyl Chloride	490	210	190	81	
106-99-0	1,3-Butadiene	ND	200	ND	92	
74-83-9	Bromomethane	ND	200	ND	50	
75-00-3	Chloroethane	ND	200	ND	76	
64-17-5	Ethanol	ND	2,000	ND	1,100	
75-05-8	Acetonitrile	ND	200	ND	120	
107-02-8	Acrolein	ND	390	ND	170	
67-64-1	Acetone	ND	2,100	ND	890	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	210	ND	37	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	820	ND	330	
107-13-1	Acrylonitrile	ND	200	ND	94	
75-35-4	1,1-Dichloroethene	390	210	98	53	
75-09-2	Methylene Chloride	3,200	210	930	61	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	210	ND	66	
76-13-1	Trichlorotrifluoroethane (CFC 113)	35,000	210	4,600	27	
75-15-0	Carbon Disulfide	ND	430	ND	140	
156-60-5	trans-1,2-Dichloroethene	ND	210	ND	52	
75-34-3	1,1-Dichloroethane	ND	200	ND	50	
1634-04-4	Methyl tert-Butyl Ether	ND	210	ND	59	
108-05-4	Vinyl Acetate	ND	2,100	ND	590	
78-93-3	2-Butanone (MEK)	ND	390	ND	130	

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_090919_Stripper_a**Client Project ID: **LHAAP - GWTP / NW01312.0150**

ALS Project ID: P1905498

ALS Sample ID: P1905498-002

Test Code: EPA TO-15

Date Collected: 9/9/19

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

Date Received: 9/16/19

Analyst: Wida Ang

Date Analyzed: 9/27/19

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 0.0035 Liter(s)

Test Notes:

Container ID: AS01152

Initial Pressure (psig): -0.46 Final Pressure (psig): 4.82

Container Dilution Factor: 1.37

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	25,000	210	6,400	52	
141-78-6	Ethyl Acetate	ND	430	ND	120	
110-54-3	n-Hexane	ND	210	ND	60	
67-66-3	Chloroform	ND	210	ND	43	
109-99-9	Tetrahydrofuran (THF)	ND	210	ND	70	
107-06-2	1,2-Dichloroethane	350	210	86	51	
71-55-6	1,1,1-Trichloroethane	ND	210	ND	39	
71-43-2	Benzene	ND	200	ND	64	
56-23-5	Carbon Tetrachloride	ND	200	ND	32	
110-82-7	Cyclohexane	ND	390	ND	110	
78-87-5	1,2-Dichloropropane	ND	210	ND	46	
75-27-4	Bromodichloromethane	ND	210	ND	31	
79-01-6	Trichloroethene	41,000	210	7,600	39	
123-91-1	1,4-Dioxane	ND	210	ND	58	
80-62-6	Methyl Methacrylate	ND	430	ND	110	
142-82-5	n-Heptane	ND	210	ND	52	
10061-01-5	cis-1,3-Dichloropropene	ND	220	ND	48	
108-10-1	4-Methyl-2-pentanone	ND	210	ND	51	
10061-02-6	trans-1,3-Dichloropropene	ND	210	ND	46	
79-00-5	1,1,2-Trichloroethane	ND	210	ND	39	
108-88-3	Toluene	ND	210	ND	55	
591-78-6	2-Hexanone	ND	210	ND	52	
124-48-1	Dibromochloromethane	ND	210	ND	25	
106-93-4	1,2-Dibromoethane	ND	210	ND	28	
123-86-4	n-Butyl Acetate	ND	210	ND	45	

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_090919_Stripper_a**Client Project ID: **LHAAP - GWTP / NW01312.0150**

ALS Project ID: P1905498

ALS Sample ID: P1905498-002

Test Code: EPA TO-15

Date Collected: 9/9/19

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

Date Received: 9/16/19

Analyst: Wida Ang

Date Analyzed: 9/27/19

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 0.0035 Liter(s)

Test Notes:

Container ID: AS01152

Initial Pressure (psig): -0.46 Final Pressure (psig): 4.82

Container Dilution Factor: 1.37

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	210	ND	45	
127-18-4	Tetrachloroethene	360	210	53	31	
108-90-7	Chlorobenzene	ND	210	ND	45	
100-41-4	Ethylbenzene	ND	200	ND	47	
179601-23-1	m,p-Xylenes	ND	430	ND	99	
75-25-2	Bromoform	ND	210	ND	20	
100-42-5	Styrene	ND	210	ND	49	
95-47-6	o-Xylene	ND	210	ND	48	
111-84-2	n-Nonane	ND	210	ND	40	
79-34-5	1,1,2,2-Tetrachloroethane	ND	210	ND	30	
98-82-8	Cumene	ND	210	ND	42	
80-56-8	alpha-Pinene	ND	200	ND	37	
103-65-1	n-Propylbenzene	ND	210	ND	43	
622-96-8	4-Ethyltoluene	ND	210	ND	42	
108-67-8	1,3,5-Trimethylbenzene	ND	210	ND	42	
95-63-6	1,2,4-Trimethylbenzene	ND	210	ND	42	
100-44-7	Benzyl Chloride	ND	430	ND	83	
541-73-1	1,3-Dichlorobenzene	ND	210	ND	35	
106-46-7	1,4-Dichlorobenzene	ND	210	ND	35	
95-50-1	1,2-Dichlorobenzene	ND	210	ND	35	
5989-27-5	d-Limonene	ND	200	ND	36	
96-12-8	1,2-Dibromo-3-chloropropane	ND	200	ND	21	
120-82-1	1,2,4-Trichlorobenzene	ND	210	ND	28	
91-20-3	Naphthalene	ND	200	ND	38	
87-68-3	Hexachlorobutadiene	ND	210	ND	19	

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_090919_GWTP**Client Project ID: **LHAAP - GWTP / NW01312.0150**

ALS Project ID: P1905498

ALS Sample ID: P1905498-003

Test Code: EPA TO-15

Date Collected: 9/9/19

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

Date Received: 9/16/19

Analyst: Wida Ang

Date Analyzed: 9/27/19

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: AS00593

Initial Pressure (psig): -1.03 Final Pressure (psig): 4.06

Container Dilution Factor: 1.37

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	ND	0.71	ND	0.41	
75-71-8	Dichlorodifluoromethane (CFC 12)	2.9	0.71	0.59	0.14	
74-87-3	Chloromethane	ND	0.69	ND	0.33	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.70	ND	0.10	
75-01-4	Vinyl Chloride	ND	0.73	ND	0.28	
106-99-0	1,3-Butadiene	ND	0.71	ND	0.32	
74-83-9	Bromomethane	ND	0.69	ND	0.18	
75-00-3	Chloroethane	ND	0.70	ND	0.26	
64-17-5	Ethanol	14	7.0	7.3	3.7	
75-05-8	Acetonitrile	ND	0.71	ND	0.42	
107-02-8	Acrolein	ND	1.4	ND	0.60	
67-64-1	Acetone	20	7.4	8.4	3.1	
75-69-4	Trichlorofluoromethane (CFC 11)	2.4	0.73	0.43	0.13	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	2.9	ND	1.2	
107-13-1	Acrylonitrile	ND	0.71	ND	0.33	
75-35-4	1,1-Dichloroethene	ND	0.74	ND	0.19	
75-09-2	Methylene Chloride	1.1	0.74	0.33	0.21	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.73	ND	0.23	
76-13-1	Trichlorotrifluoroethane (CFC 113)	19	0.73	2.5	0.095	
75-15-0	Carbon Disulfide	ND	1.5	ND	0.48	
156-60-5	trans-1,2-Dichloroethene	ND	0.73	ND	0.18	
75-34-3	1,1-Dichloroethane	ND	0.71	ND	0.18	
1634-04-4	Methyl tert-Butyl Ether	ND	0.74	ND	0.21	
108-05-4	Vinyl Acetate	ND	7.3	ND	2.1	
78-93-3	2-Butanone (MEK)	3.2	1.4	1.1	0.46	

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_090919_GWTP**Client Project ID: **LHAAP - GWTP / NW01312.0150**

ALS Project ID: P1905498

ALS Sample ID: P1905498-003

Test Code: EPA TO-15

Date Collected: 9/9/19

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

Date Received: 9/16/19

Analyst: Wida Ang

Date Analyzed: 9/27/19

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: AS00593

Initial Pressure (psig): -1.03 Final Pressure (psig): 4.06

Container Dilution Factor: 1.37

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	7.4	0.73	1.9	0.18	
141-78-6	Ethyl Acetate	3.0	1.5	0.84	0.42	
110-54-3	n-Hexane	2.6	0.74	0.73	0.21	
67-66-3	Chloroform	ND	0.74	ND	0.15	
109-99-9	Tetrahydrofuran (THF)	4.7	0.73	1.6	0.25	
107-06-2	1,2-Dichloroethane	ND	0.73	ND	0.18	
71-55-6	1,1,1-Trichloroethane	ND	0.74	ND	0.14	
71-43-2	Benzene	1.2	0.71	0.39	0.22	
56-23-5	Carbon Tetrachloride	ND	0.71	ND	0.11	
110-82-7	Cyclohexane	ND	1.4	ND	0.40	
78-87-5	1,2-Dichloropropane	ND	0.74	ND	0.16	
75-27-4	Bromodichloromethane	ND	0.73	ND	0.11	
79-01-6	Trichloroethene	13	0.73	2.5	0.14	
123-91-1	1,4-Dioxane	ND	0.73	ND	0.20	
80-62-6	Methyl Methacrylate	1.6	1.5	0.38	0.37	
142-82-5	n-Heptane	1.1	0.74	0.27	0.18	
10061-01-5	cis-1,3-Dichloropropene	ND	0.77	ND	0.17	
108-10-1	4-Methyl-2-pentanone	ND	0.73	ND	0.18	
10061-02-6	trans-1,3-Dichloropropene	ND	0.73	ND	0.16	
79-00-5	1,1,2-Trichloroethane	ND	0.74	ND	0.14	
108-88-3	Toluene	3.0	0.73	0.80	0.19	
591-78-6	2-Hexanone	ND	0.74	ND	0.18	
124-48-1	Dibromochloromethane	ND	0.74	ND	0.087	
106-93-4	1,2-Dibromoethane	ND	0.74	ND	0.096	
123-86-4	n-Butyl Acetate	2.3	0.74	0.48	0.16	

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_090919_GWTP**Client Project ID: **LHAAP - GWTP / NW01312.0150**

ALS Project ID: P1905498

ALS Sample ID: P1905498-003

Test Code: EPA TO-15

Date Collected: 9/9/19

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

Date Received: 9/16/19

Analyst: Wida Ang

Date Analyzed: 9/27/19

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: AS00593

Initial Pressure (psig): -1.03 Final Pressure (psig): 4.06

Container Dilution Factor: 1.37

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.74	ND	0.16	
127-18-4	Tetrachloroethene	ND	0.73	ND	0.11	
108-90-7	Chlorobenzene	ND	0.73	ND	0.16	
100-41-4	Ethylbenzene	ND	0.71	ND	0.16	
179601-23-1	m,p-Xylenes	2.0	1.5	0.47	0.35	
75-25-2	Bromoform	ND	0.73	ND	0.070	
100-42-5	Styrene	ND	0.73	ND	0.17	
95-47-6	o-Xylene	0.73	0.73	0.17	0.17	
111-84-2	n-Nonane	ND	0.74	ND	0.14	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.73	ND	0.11	
98-82-8	Cumene	ND	0.73	ND	0.15	
80-56-8	alpha-Pinene	2.1	0.71	0.38	0.13	
103-65-1	n-Propylbenzene	ND	0.74	ND	0.15	
622-96-8	4-Ethyltoluene	ND	0.73	ND	0.15	
108-67-8	1,3,5-Trimethylbenzene	ND	0.73	ND	0.15	
95-63-6	1,2,4-Trimethylbenzene	ND	0.73	ND	0.15	
100-44-7	Benzyl Chloride	ND	1.5	ND	0.29	
541-73-1	1,3-Dichlorobenzene	ND	0.74	ND	0.12	
106-46-7	1,4-Dichlorobenzene	ND	0.74	ND	0.12	
95-50-1	1,2-Dichlorobenzene	ND	0.74	ND	0.12	
5989-27-5	d-Limonene	ND	0.70	ND	0.13	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.71	ND	0.074	
120-82-1	1,2,4-Trichlorobenzene	ND	0.73	ND	0.098	
91-20-3	Naphthalene	ND	0.70	ND	0.13	
87-68-3	Hexachlorobutadiene	ND	0.73	ND	0.068	

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_090919_Downwind**Client Project ID: **LHAAP - GWTP / NW01312.0150**

ALS Project ID: P1905498

ALS Sample ID: P1905498-004

Test Code: EPA TO-15

Date Collected: 9/10/19

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

Date Received: 9/16/19

Analyst: Wida Ang

Date Analyzed: 9/27/19

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: AS01110

Initial Pressure (psig): 0.47 Final Pressure (psig): 4.64

Container Dilution Factor: 1.27

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	0.66	ND	0.38	
75-71-8	Dichlorodifluoromethane (CFC 12)	3.4	0.66	0.68	0.13	
74-87-3	Chloromethane	ND	0.64	ND	0.31	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.65	ND	0.093	
75-01-4	Vinyl Chloride	ND	0.67	ND	0.26	
106-99-0	1,3-Butadiene	ND	0.66	ND	0.30	
74-83-9	Bromomethane	ND	0.64	ND	0.16	
75-00-3	Chloroethane	ND	0.65	ND	0.25	
64-17-5	Ethanol	12	6.5	6.6	3.4	
75-05-8	Acetonitrile	ND	0.66	ND	0.39	
107-02-8	Acrolein	ND	1.3	ND	0.55	
67-64-1	Acetone	21	6.9	8.6	2.9	
75-69-4	Trichlorofluoromethane (CFC 11)	2.2	0.67	0.40	0.12	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	2.7	ND	1.1	
107-13-1	Acrylonitrile	ND	0.66	ND	0.30	
75-35-4	1,1-Dichloroethene	ND	0.69	ND	0.17	
75-09-2	Methylene Chloride	ND	0.69	ND	0.20	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.67	ND	0.22	
76-13-1	Trichlorotrifluoroethane (CFC 113)	4.7	0.67	0.62	0.088	
75-15-0	Carbon Disulfide	ND	1.4	ND	0.45	
156-60-5	trans-1,2-Dichloroethene	ND	0.67	ND	0.17	
75-34-3	1,1-Dichloroethane	ND	0.66	ND	0.16	
1634-04-4	Methyl tert-Butyl Ether	ND	0.69	ND	0.19	
108-05-4	Vinyl Acetate	ND	6.7	ND	1.9	
78-93-3	2-Butanone (MEK)	3.2	1.3	1.1	0.43	

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_090919_Downwind**Client Project ID: **LHAAP - GWTP / NW01312.0150**

ALS Project ID: P1905498

ALS Sample ID: P1905498-004

Test Code: EPA TO-15

Date Collected: 9/10/19

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

Date Received: 9/16/19

Analyst: Wida Ang

Date Analyzed: 9/27/19

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: AS01110

Initial Pressure (psig): 0.47 Final Pressure (psig): 4.64

Container Dilution Factor: 1.27

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	0.76	0.67	0.19	0.17	
141-78-6	Ethyl Acetate	4.2	1.4	1.2	0.39	
110-54-3	n-Hexane	1.9	0.69	0.55	0.19	
67-66-3	Chloroform	ND	0.69	ND	0.14	
109-99-9	Tetrahydrofuran (THF)	3.4	0.67	1.2	0.23	
107-06-2	1,2-Dichloroethane	ND	0.67	ND	0.17	
71-55-6	1,1,1-Trichloroethane	ND	0.69	ND	0.13	
71-43-2	Benzene	0.95	0.66	0.30	0.21	
56-23-5	Carbon Tetrachloride	ND	0.66	ND	0.11	
110-82-7	Cyclohexane	ND	1.3	ND	0.37	
78-87-5	1,2-Dichloropropane	ND	0.69	ND	0.15	
75-27-4	Bromodichloromethane	ND	0.67	ND	0.10	
79-01-6	Trichloroethene	1.1	0.67	0.21	0.13	
123-91-1	1,4-Dioxane	ND	0.67	ND	0.19	
80-62-6	Methyl Methacrylate	1.4	1.4	0.35	0.34	
142-82-5	n-Heptane	1.4	0.69	0.34	0.17	
10061-01-5	cis-1,3-Dichloropropene	ND	0.71	ND	0.16	
108-10-1	4-Methyl-2-pentanone	ND	0.67	ND	0.16	
10061-02-6	trans-1,3-Dichloropropene	ND	0.67	ND	0.15	
79-00-5	1,1,2-Trichloroethane	ND	0.69	ND	0.13	
108-88-3	Toluene	2.3	0.67	0.62	0.18	
591-78-6	2-Hexanone	ND	0.69	ND	0.17	
124-48-1	Dibromochloromethane	ND	0.69	ND	0.081	
106-93-4	1,2-Dibromoethane	ND	0.69	ND	0.089	
123-86-4	n-Butyl Acetate	2.7	0.69	0.57	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.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 3 of 3

Client: **Bhate Environmental Associates, Inc.**Client Sample ID: **LH18/24-Air_090919_Downwind**Client Project ID: **LHAAP - GWTP / NW01312.0150**

ALS Project ID: P1905498

ALS Sample ID: P1905498-004

Test Code: EPA TO-15

Date Collected: 9/10/19

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

Date Received: 9/16/19

Analyst: Wida Ang

Date Analyzed: 9/27/19

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: AS01110

Initial Pressure (psig): 0.47 Final Pressure (psig): 4.64

Container Dilution Factor: 1.27

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.69	ND	0.15	
127-18-4	Tetrachloroethene	ND	0.67	ND	0.099	
108-90-7	Chlorobenzene	ND	0.67	ND	0.15	
100-41-4	Ethylbenzene	ND	0.66	ND	0.15	
179601-23-1	m,p-Xylenes	1.6	1.4	0.36	0.32	
75-25-2	Bromoform	ND	0.67	ND	0.065	
100-42-5	Styrene	ND	0.67	ND	0.16	
95-47-6	o-Xylene	ND	0.67	ND	0.16	
111-84-2	n-Nonane	ND	0.69	ND	0.13	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.67	ND	0.098	
98-82-8	Cumene	ND	0.67	ND	0.14	
80-56-8	alpha-Pinene	3.5	0.66	0.63	0.12	
103-65-1	n-Propylbenzene	ND	0.69	ND	0.14	
622-96-8	4-Ethyltoluene	ND	0.67	ND	0.14	
108-67-8	1,3,5-Trimethylbenzene	ND	0.67	ND	0.14	
95-63-6	1,2,4-Trimethylbenzene	ND	0.67	ND	0.14	
100-44-7	Benzyl Chloride	ND	1.4	ND	0.27	
541-73-1	1,3-Dichlorobenzene	ND	0.69	ND	0.11	
106-46-7	1,4-Dichlorobenzene	ND	0.69	ND	0.11	
95-50-1	1,2-Dichlorobenzene	ND	0.69	ND	0.11	
5989-27-5	d-Limonene	1.8	0.65	0.32	0.12	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.66	ND	0.068	
120-82-1	1,2,4-Trichlorobenzene	ND	0.67	ND	0.091	
91-20-3	Naphthalene	ND	0.65	ND	0.12	
87-68-3	Hexachlorobutadiene	ND	0.67	ND	0.063	

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:** Method Blank**Client Project ID:** LHAAP - GWTP / NW01312.0150

ALS Project ID: P1905498

ALS Sample ID: P190927-MB

Test Code: EPA TO-15

Date Collected: NA

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

Date Received: NA

Analyst: Wida Ang

Date Analyzed: 9/27/19

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container Dilution Factor: 1.00

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	0.52	ND	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.52	ND	0.11	
74-87-3	Chloromethane	ND	0.50	ND	0.24	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.51	ND	0.073	
75-01-4	Vinyl Chloride	ND	0.53	ND	0.21	
106-99-0	1,3-Butadiene	ND	0.52	ND	0.24	
74-83-9	Bromomethane	ND	0.50	ND	0.13	
75-00-3	Chloroethane	ND	0.51	ND	0.19	
64-17-5	Ethanol	ND	5.1	ND	2.7	
75-05-8	Acetonitrile	ND	0.52	ND	0.31	
107-02-8	Acrolein	ND	1.0	ND	0.44	
67-64-1	Acetone	ND	5.4	ND	2.3	
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	0.52	ND	0.24	
75-35-4	1,1-Dichloroethene	ND	0.54	ND	0.14	
75-09-2	Methylene Chloride	ND	0.54	ND	0.16	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.53	ND	0.17	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	0.53	ND	0.069	
75-15-0	Carbon Disulfide	ND	1.1	ND	0.35	
156-60-5	trans-1,2-Dichloroethene	ND	0.53	ND	0.13	
75-34-3	1,1-Dichloroethane	ND	0.52	ND	0.13	
1634-04-4	Methyl tert-Butyl Ether	ND	0.54	ND	0.15	
108-05-4	Vinyl Acetate	ND	5.3	ND	1.5	
78-93-3	2-Butanone (MEK)	ND	1.0	ND	0.34	

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:** Method Blank**Client Project ID:** LHAAP - GWTP / NW01312.0150

ALS Project ID: P1905498

ALS Sample ID: P190927-MB

Test Code: EPA TO-15

Date Collected: NA

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

Date Received: NA

Analyst: Wida Ang

Date Analyzed: 9/27/19

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container 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	0.53	ND	0.18	
107-06-2	1,2-Dichloroethane	ND	0.53	ND	0.13	
71-55-6	1,1,1-Trichloroethane	ND	0.54	ND	0.099	
71-43-2	Benzene	ND	0.52	ND	0.16	
56-23-5	Carbon Tetrachloride	ND	0.52	ND	0.083	
110-82-7	Cyclohexane	ND	1.0	ND	0.29	
78-87-5	1,2-Dichloropropane	ND	0.54	ND	0.12	
75-27-4	Bromodichloromethane	ND	0.53	ND	0.079	
79-01-6	Trichloroethene	ND	0.53	ND	0.099	
123-91-1	1,4-Dioxane	ND	0.53	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	0.56	ND	0.12	
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	0.53	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	0.54	ND	0.11	

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:** Method Blank**Client Project ID:** LHAAP - GWTP / NW01312.0150

ALS Project ID: P1905498

ALS Sample ID: P190927-MB

Test Code: EPA TO-15

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

Analyst: Wida Ang

Sample Type: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 9/27/19

Volume(s) Analyzed: 1.00 Liter(s)

Container 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	0.53	ND	0.078	
108-90-7	Chlorobenzene	ND	0.53	ND	0.12	
100-41-4	Ethylbenzene	ND	0.52	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.1	ND	0.25	
75-25-2	Bromoform	ND	0.53	ND	0.051	
100-42-5	Styrene	ND	0.53	ND	0.12	
95-47-6	o-Xylene	ND	0.53	ND	0.12	
111-84-2	n-Nonane	ND	0.54	ND	0.10	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.53	ND	0.077	
98-82-8	Cumene	ND	0.53	ND	0.11	
80-56-8	alpha-Pinene	ND	0.52	ND	0.093	
103-65-1	n-Propylbenzene	ND	0.54	ND	0.11	
622-96-8	4-Ethyltoluene	ND	0.53	ND	0.11	
108-67-8	1,3,5-Trimethylbenzene	ND	0.53	ND	0.11	
95-63-6	1,2,4-Trimethylbenzene	ND	0.53	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	0.51	ND	0.092	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.52	ND	0.054	
120-82-1	1,2,4-Trichlorobenzene	ND	0.53	ND	0.071	
91-20-3	Naphthalene	ND	0.51	ND	0.097	
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: P1905498

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

Date(s) Collected: 9/9 - 9/10/19

Date(s) Received: 9/16/19

Date(s) Analyzed: 9/27/19

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	P190927-MB	108	98	96	70-130	
Lab Control Sample	P190927-LCS	108	106	100	70-130	
LH18/24-Air_090919_Stripper	P1905498-001	101	111	96	70-130	
LH18/24-Air_090919_Stripper_a	P1905498-002	123	110	102	70-130	
LH18/24-Air_090919_Stripper_a	P1905498-002DUP	109	100	87	70-130	
LH18/24-Air_090919_GWTP	P1905498-003	120	99	92	70-130	
LH18/24-Air_090919_Downwind	P1905498-004	129	98	89	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: P1905498

ALS Sample ID: P190927-LCS

Test Code: EPA TO-15

Date Collected: NA

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

Date Received: NA

Analyst: Wida Ang

Date Analyzed: 9/27/19

Sample Type: 6.0 L Silonite 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	211	213	101	53-112	
75-71-8	Dichlorodifluoromethane (CFC 12)	210	205	98	62-103	
74-87-3	Chloromethane	211	181	86	51-121	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	211	203	96	56-111	
75-01-4	Vinyl Chloride	214	246	115	57-117	
106-99-0	1,3-Butadiene	210	254	121	53-134	
74-83-9	Bromomethane	212	220	104	65-110	
75-00-3	Chloroethane	214	218	102	64-111	
64-17-5	Ethanol	1,020	1030	101	57-124	
75-05-8	Acetonitrile	206	213	103	57-126	
107-02-8	Acrolein	205	205	100	62-121	
67-64-1	Acetone	1,060	1060	100	60-113	
75-69-4	Trichlorofluoromethane (CFC 11)	211	215	102	63-104	
67-63-0	2-Propanol (Isopropyl Alcohol)	413	424	103	60-124	
107-13-1	Acrylonitrile	207	225	109	66-125	
75-35-4	1,1-Dichloroethene	218	208	95	68-107	
75-09-2	Methylene Chloride	217	205	94	66-105	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	216	238	110	63-127	
76-13-1	Trichlorotrifluoroethane (CFC 113)	216	195	90	59-109	
75-15-0	Carbon Disulfide	218	197	90	67-109	
156-60-5	trans-1,2-Dichloroethene	214	214	100	70-115	
75-34-3	1,1-Dichloroethane	216	210	97	66-106	
1634-04-4	Methyl tert-Butyl Ether	214	222	104	67-109	
108-05-4	Vinyl Acetate	1,060	1000	94	68-136	
78-93-3	2-Butanone (MEK)	208	215	103	71-116	

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: P1905498

ALS Sample ID: P190927-LCS

Test Code: EPA TO-15

Date Collected: NA

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

Date Received: NA

Analyst: Wida Ang

Date Analyzed: 9/27/19

Sample Type: 6.0 L Silonite 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	211	210	100	67-110	
141-78-6	Ethyl Acetate	436	441	101	64-127	
110-54-3	n-Hexane	216	211	98	60-115	
67-66-3	Chloroform	217	214	99	66-105	
109-99-9	Tetrahydrofuran (THF)	216	197	91	65-110	
107-06-2	1,2-Dichloroethane	215	217	101	60-110	
71-55-6	1,1,1-Trichloroethane	215	213	99	64-108	
71-43-2	Benzene	211	198	94	67-106	
56-23-5	Carbon Tetrachloride	212	214	101	64-112	
110-82-7	Cyclohexane	416	402	97	67-110	
78-87-5	1,2-Dichloropropane	216	206	95	66-112	
75-27-4	Bromodichloromethane	215	218	101	67-113	
79-01-6	Trichloroethene	213	203	95	66-108	
123-91-1	1,4-Dioxane	214	204	95	70-116	
80-62-6	Methyl Methacrylate	431	426	99	73-118	
142-82-5	n-Heptane	215	209	97	66-110	
10061-01-5	cis-1,3-Dichloropropene	214	213	100	75-120	
108-10-1	4-Methyl-2-pentanone	209	216	103	65-124	
10061-02-6	trans-1,3-Dichloropropene	213	224	105	77-123	
79-00-5	1,1,2-Trichloroethane	215	207	96	68-112	
108-88-3	Toluene	212	207	98	62-111	
591-78-6	2-Hexanone	214	231	108	59-128	
124-48-1	Dibromochloromethane	213	230	108	67-123	
106-93-4	1,2-Dibromoethane	216	212	98	66-122	
123-86-4	n-Butyl Acetate	219	229	105	64-128	

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: P1905498

ALS Sample ID: P190927-LCS

Test Code: EPA TO-15

Date Collected: NA

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

Date Received: NA

Analyst: Wida Ang

Date Analyzed: 9/27/19

Sample Type: 6.0 L Silonite 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	217	216	100	65-114	
127-18-4	Tetrachloroethene	213	199	93	55-120	
108-90-7	Chlorobenzene	215	198	92	61-114	
100-41-4	Ethylbenzene	212	198	93	64-113	
179601-23-1	m,p-Xylenes	426	402	94	64-114	
75-25-2	Bromoform	213	215	101	65-132	
100-42-5	Styrene	212	208	98	67-124	
95-47-6	o-Xylene	214	201	94	65-114	
111-84-2	n-Nonane	215	217	101	64-117	
79-34-5	1,1,2,2-Tetrachloroethane	214	206	96	66-119	
98-82-8	Cumene	214	198	93	61-116	
80-56-8	alpha-Pinene	211	218	103	65-120	
103-65-1	n-Propylbenzene	218	229	105	63-117	
622-96-8	4-Ethyltoluene	214	219	102	63-124	
108-67-8	1,3,5-Trimethylbenzene	214	206	96	60-117	
95-63-6	1,2,4-Trimethylbenzene	215	231	107	61-122	
100-44-7	Benzyl Chloride	217	229	106	77-142	
541-73-1	1,3-Dichlorobenzene	216	224	104	61-125	
106-46-7	1,4-Dichlorobenzene	216	211	98	59-123	
95-50-1	1,2-Dichlorobenzene	216	219	101	61-126	
5989-27-5	d-Limonene	211	235	111	66-124	
96-12-8	1,2-Dibromo-3-chloropropane	209	220	105	67-138	
120-82-1	1,2,4-Trichlorobenzene	214	187	87	62-141	
91-20-3	Naphthalene	203	171	84	62-145	
87-68-3	Hexachlorobutadiene	209	189	90	49-131	

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 DUPLICATE SUMMARY RESULTS

Page 1 of 3

Client: Bhate Environmental Associates, Inc.**Client Sample ID:** LH18/24-Air_090919_Stripper_a**Client Project ID:** LHAAP - GWTP / NW01312.0150

ALS Project ID: P1905498

ALS Sample ID: P1905498-002DUP

Test Code: EPA TO-15

Date Collected: 9/9/19

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

Date Received: 9/16/19

Analyst: Wida Ang

Date Analyzed: 9/27/19

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 0.0035 Liter(s)

Test Notes:

Container ID: AS01152

Initial Pressure (psig): -0.46

Final Pressure (psig): 4.82

Container Dilution Factor: 1.37

Compound	Sample Result		Duplicate Sample Result		Average µg/m ³	% RPD	RPD Limit	Data Qualifier
	µg/m ³	ppbV	µg/m ³	ppbV				
Propene	ND	ND	ND	ND	-	-	25	
Dichlorodifluoromethane (CFC 12)	ND	ND	ND	ND	-	-	25	
Chloromethane	ND	ND	ND	ND	-	-	25	
1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	ND	ND	ND	-	-	25	
Vinyl Chloride	486	190	386	151	436	23	25	
1,3-Butadiene	ND	ND	ND	ND	-	-	25	
Bromomethane	ND	ND	ND	ND	-	-	25	
Chloroethane	ND	ND	ND	ND	-	-	25	
Ethanol	ND	ND	ND	ND	-	-	25	
Acetonitrile	ND	ND	ND	ND	-	-	25	
Acrolein	ND	ND	ND	ND	-	-	25	
Acetone	ND	ND	ND	ND	-	-	25	
Trichlorofluoromethane	ND	ND	ND	ND	-	-	25	
2-Propanol (Isopropyl Alcohol)	ND	ND	ND	ND	-	-	25	
Acrylonitrile	ND	ND	ND	ND	-	-	25	
1,1-Dichloroethene	390	98.4	405	102	397.5	4	25	
Methylene Chloride	3,220	928	3,260	939	3240	1	25	
3-Chloro-1-propene (Allyl Chloride)	ND	ND	ND	ND	-	-	25	
Trichlorotrifluoroethane	35,300	4,610	36,100	4,710	35700	2	25	
Carbon Disulfide	ND	ND	ND	ND	-	-	25	
trans-1,2-Dichloroethene	ND	ND	ND	ND	-	-	25	
1,1-Dichloroethane	ND	ND	ND	ND	-	-	25	
Methyl tert-Butyl Ether	ND	ND	ND	ND	-	-	25	
Vinyl Acetate	ND	ND	ND	ND	-	-	25	
2-Butanone (MEK)	ND	ND	ND	ND	-	-	25	

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

ALS ENVIRONMENTAL

LABORATORY DUPLICATE SUMMARY RESULTS

Page 2 of 3

Client: Bhate Environmental Associates, Inc.**Client Sample ID:** LH18/24-Air_090919_Stripper_a**Client Project ID:** LHAAP - GWTP / NW01312.0150

ALS Project ID: P1905498

ALS Sample ID: P1905498-002DUP

Test Code: EPA TO-15

Date Collected: 9/9/19

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

Date Received: 9/16/19

Analyst: Wida Ang

Date Analyzed: 9/27/19

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 0.0035 Liter(s)

Test Notes:

Container ID: AS01152

Initial Pressure (psig): -0.46

Final Pressure (psig): 4.82

Container Dilution Factor: 1.37

Compound	Sample Result		Duplicate Sample Result		Average µg/m ³	% RPD	RPD Limit	Data Qualifier
	µg/m ³	ppbV	µg/m ³	ppbV				
cis-1,2-Dichloroethene	25,500	6,420	24,500	6,190	25000	4	25	
Ethyl Acetate	ND	ND	ND	ND	-	-	25	
n-Hexane	ND	ND	ND	ND	-	-	25	
Chloroform	ND	ND	ND	ND	-	-	25	
Tetrahydrofuran (THF)	ND	ND	ND	ND	-	-	25	
1,2-Dichloroethane	350	86.4	330	81.7	340	6	25	
1,1,1-Trichloroethane	ND	ND	ND	ND	-	-	25	
Benzene	ND	ND	ND	ND	-	-	25	
Carbon Tetrachloride	ND	ND	ND	ND	-	-	25	
Cyclohexane	ND	ND	ND	ND	-	-	25	
1,2-Dichloropropane	ND	ND	ND	ND	-	-	25	
Bromodichloromethane	ND	ND	ND	ND	-	-	25	
Trichloroethene	40,600	7,550	39,900	7,430	40250	2	25	
1,4-Dioxane	ND	ND	ND	ND	-	-	25	
Methyl Methacrylate	ND	ND	ND	ND	-	-	25	
n-Heptane	ND	ND	ND	ND	-	-	25	
cis-1,3-Dichloropropene	ND	ND	ND	ND	-	-	25	
4-Methyl-2-pentanone	ND	ND	ND	ND	-	-	25	
trans-1,3-Dichloropropene	ND	ND	ND	ND	-	-	25	
1,1,2-Trichloroethane	ND	ND	ND	ND	-	-	25	
Toluene	ND	ND	ND	ND	-	-	25	
2-Hexanone	ND	ND	ND	ND	-	-	25	
Dibromochloromethane	ND	ND	ND	ND	-	-	25	
1,2-Dibromoethane	ND	ND	ND	ND	-	-	25	
n-Butyl Acetate	ND	ND	ND	ND	-	-	25	

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

ALS ENVIRONMENTAL

LABORATORY DUPLICATE SUMMARY RESULTS

Page 3 of 3

Client: Bhate Environmental Associates, Inc.**Client Sample ID:** LH18/24-Air_090919_Stripper_a**Client Project ID:** LHAAP - GWTP / NW01312.0150

ALS Project ID: P1905498

ALS Sample ID: P1905498-002DUP

Test Code: EPA TO-15

Date Collected: 9/9/19

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

Date Received: 9/16/19

Analyst: Wida Ang

Date Analyzed: 9/27/19

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 0.0035 Liter(s)

Test Notes:

Container ID: AS01152

Initial Pressure (psig): -0.46

Final Pressure (psig): 4.82

Container Dilution Factor: 1.37

Compound	Sample Result		Duplicate Sample Result		Average µg/m ³	% RPD	RPD Limit	Data Qualifier
	µg/m ³	ppbV	µg/m ³	ppbV				
n-Octane	ND	ND	ND	ND	-	-	25	
Tetrachloroethene	357	52.6	321	47.3	339	11	25	
Chlorobenzene	ND	ND	ND	ND	-	-	25	
Ethylbenzene	ND	ND	ND	ND	-	-	25	
m,p-Xylenes	ND	ND	ND	ND	-	-	25	
Bromoform	ND	ND	ND	ND	-	-	25	
Styrene	ND	ND	ND	ND	-	-	25	
o-Xylene	ND	ND	ND	ND	-	-	25	
n-Nonane	ND	ND	ND	ND	-	-	25	
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	-	-	25	
Cumene	ND	ND	ND	ND	-	-	25	
alpha-Pinene	ND	ND	ND	ND	-	-	25	
n-Propylbenzene	ND	ND	ND	ND	-	-	25	
4-Ethyltoluene	ND	ND	ND	ND	-	-	25	
1,3,5-Trimethylbenzene	ND	ND	ND	ND	-	-	25	
1,2,4-Trimethylbenzene	ND	ND	ND	ND	-	-	25	
Benzyl Chloride	ND	ND	ND	ND	-	-	25	
1,3-Dichlorobenzene	ND	ND	ND	ND	-	-	25	
1,4-Dichlorobenzene	ND	ND	ND	ND	-	-	25	
1,2-Dichlorobenzene	ND	ND	ND	ND	-	-	25	
d-Limonene	ND	ND	ND	ND	-	-	25	
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	-	-	25	
1,2,4-Trichlorobenzene	ND	ND	ND	ND	-	-	25	
Naphthalene	ND	ND	ND	ND	-	-	25	
Hexachlorobutadiene	ND	ND	ND	ND	-	-	25	

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

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

ALS Project ID: P1905498

Internal Standard Area and RT Summary

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

Lab File ID: 09271902.D
Date Analyzed: 9/27/19
Time Analyzed: 03:52

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA #	RT #	AREA #	RT #	AREA #	RT #
24 Hour Standard	124391	11.25	607287	13.36	282247	17.68
Upper Limit	174147	11.58	850202	13.69	395146	18.01
Lower Limit	74635	10.92	364372	13.03	169348	17.35

Client Sample ID		IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
01	Method Blank	110150	11.24	512397	13.36	231473	17.68
02	Lab Control Sample	120313	11.25	543235	13.37	224369	17.68
03	LH18/24-Air_090919_Stripper	125776	11.24	546888	13.36	222314	17.68
04	LH18/24-Air_090919_Stripper_a	111520	11.25	541056	13.36	217558	17.68
05	LH18/24-Air_090919_Stripper_a (Lab Duplicate)	123786	11.24	534088	13.36	234486	17.68
06	LH18/24-Air_090919_GWTP	99055	11.24	456394	13.36	210915	17.68
07	LH18/24-Air_090919_Downwind	96199	11.24	481821	13.36	218626	17.68
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\2019_09\27\09271910.D
 Acq On : 27 Sep 2019 8:34
 Sample : P1905498-001 (4.0mL)
 Misc : S31-06261901

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Sep 30 13:53:02 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

DA 9/30/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	125776	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.36	114	546888	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.68	82	222314	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	260997	12.617	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	100.96%	
57) Toluene-d8 (SS2)	15.82	98	626427	13.833	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	110.64%	
73) Bromofluorobenzene (SS3)	19.06	174	118749	11.938	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	95.52%	

Target Compounds

						Qvalue
2) Propene	4.22	42	804	N.D.		
3) Dichlorodifluoromethan...	4.35	85	1021	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	5.11	62	21136	1.016	ng	93
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	6.51	45	3554	N.D.		
11) Acetonitrile	6.81	41	116	N.D.		
12) Acrolein	0.00	56	0	N.D.		
13) Acetone	7.13	58	110	N.D.		
14) Trichlorofluoromethane	7.36	101	615	N.D.		
15) 2-Propanol (Isopropanol)	7.77	45	582	N.D.		
16) Acrylonitrile	8.10	53	585	N.D.		
17) 1,1-Dichloroethene	8.32	96	11921	0.924	ng	# 85
18) 2-Methyl-2-Propanol (t...	8.36	59	62	N.D.		
19) Methylene Chloride	8.53	84	99273	7.643	ng	94
20) 3-Chloro-1-propene (Al...	8.53	41	3176	N.D.		
21) Trichlorotrifluoroethane	8.95	151	1127290	91.346	ng	99
22) Carbon Disulfide	8.84	76	1756	N.D.		
23) trans-1,2-Dichloroethene	9.80	61	3356	N.D.		
24) 1,1-Dichloroethane	10.06	63	3307	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)	10.66	72	456	N.D.		
28) cis-1,2-Dichloroethene	11.06	61	1188383	58.266	ng	95
29) Diisopropyl Ether	11.41	87	319	N.D.		
30) Ethyl Acetate	11.33	61	687	N.D.		
31) n-Hexane	11.35	57	1451	N.D.		
32) Chloroform	11.41	83	4650	N.D.		
34) Tetrahydrofuran (THF)	11.90	72	1353	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.22	62	16918	0.736	ng	99
38) 1,1,1-Trichloroethane	12.50	97	979	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	13.10	56	106	N.D.		
41) Benzene	12.98	78	4583	N.D.		
42) Carbon Tetrachloride	13.14	117	1811	N.D.		
43) Cyclohexane	13.27	84	1504	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	14.07	130	1314267	95.536	ng	99
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	14.14	57	3939	N.D.		
50) Methyl Methacrylate	0.00	100	0	N.D.	d	

30 of 144

Data File : I:\MS13\DATA\2019_09\27\09271910.D
 Acq On : 27 Sep 2019 8:34
 Sample : P1905498-001 (4.0mL)
 Misc : S31-06261901

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Sep 30 13:53:02 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

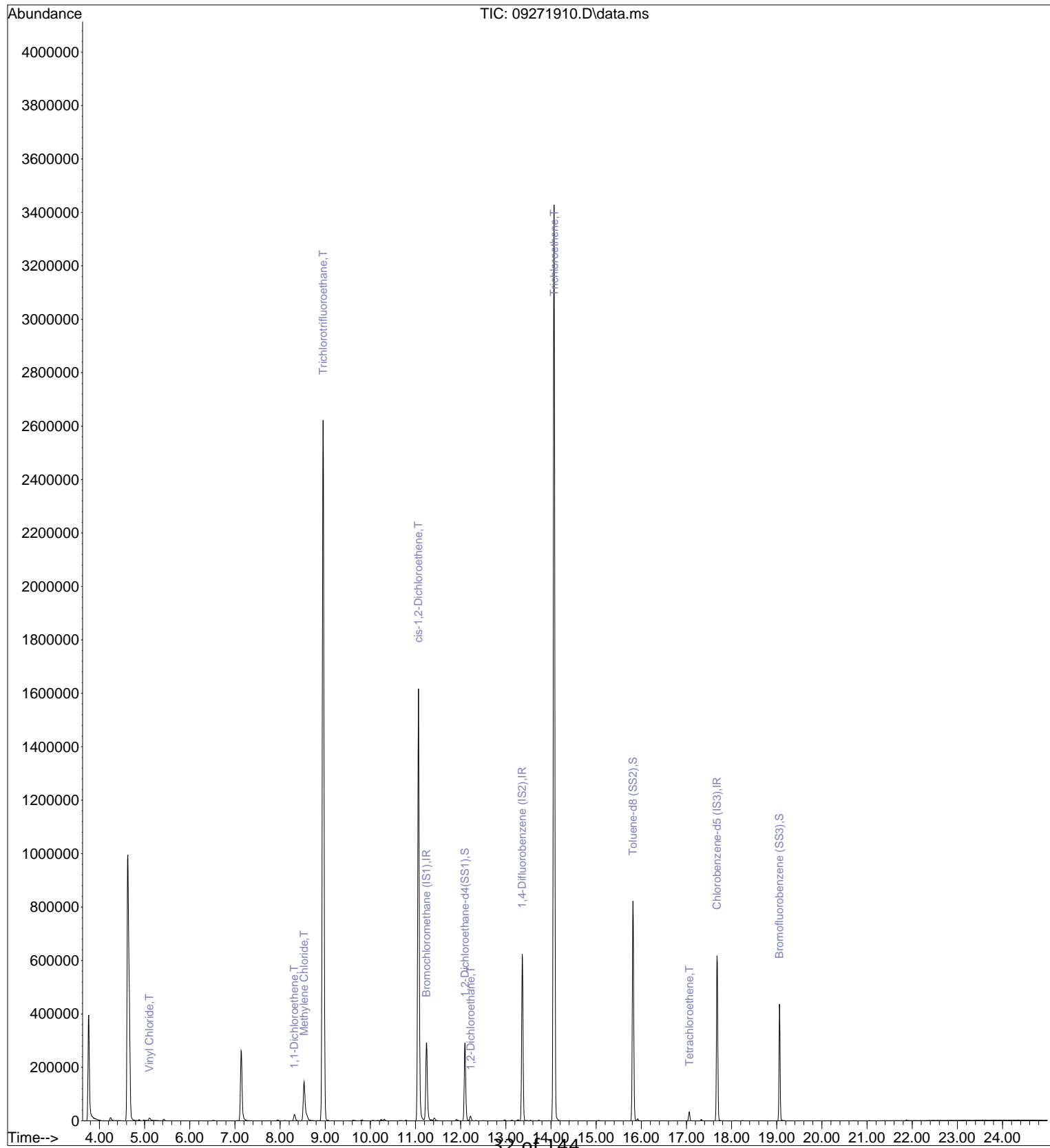
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.40	71	161	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	15.64	97	288	N.D.		
58) Toluene	15.92	91	5744	N.D.		
59) 2-Hexanone	16.13	43	234	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	136	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	17.06	166	10937	0.819	ng	91
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	18.09	91	1363	N.D.		
67) m- & p-Xylenes	18.25	91	1824	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.56	104	426	N.D.		
70) o-Xylene	18.67	91	744	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	0.00	105	0	N.D.		
75) alpha-Pinene	19.53	93	204	N.D.		
76) n-Propylbenzene	19.61	91	273	N.D.		
77) 3-Ethyltoluene	19.74	105	380	N.D.		
78) 4-Ethyltoluene	19.74	105	380	N.D.		
79) 1,3,5-Trimethylbenzene	19.74	105	380	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	20.00	105	128	N.D.		
82) 1,2,4-Trimethylbenzene	20.19	105	422	N.D.		
83) n-Decane	20.29	57	226	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	20.57	105	297	N.D.		
88) 4-Isopropyltoluene (p-...	20.57	119	244	N.D.		
89) 1,2,3-Trimethylbenzene	20.57	105	297	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	20.69	68	436	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	21.39	57	220	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	22.41	128	776	N.D.		
96) n-Dodecane	0.00	57	0	N.D.		
97) Hexachlorobutadiene	22.62	225	303	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.		
99) tert-Butylbenzene	20.20	119	191	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\2019_09\27\09271910.D
 Acq On : 27 Sep 2019 8:34
 Sample : P1905498-001 (4.0mL)
 Misc : S31-06261901

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Sep 30 13:53:02 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019_09\27\09271910.D
 Acq On : 27 Sep 2019 8:34
 Sample : P1905498-001 (4.0mL)
 Misc : S31-06261901

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Sep 30 13:53:02 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

WA 9/30/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	125776	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.36	114	546888	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.68	82	222314	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	260997	12.617	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	100.96%	
57) Toluene-d8 (SS2)	15.82	98	626427	13.833	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	110.64%	
73) Bromofluorobenzene (SS3)	19.06	174	118749	11.938	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	95.52%	

Target Compounds

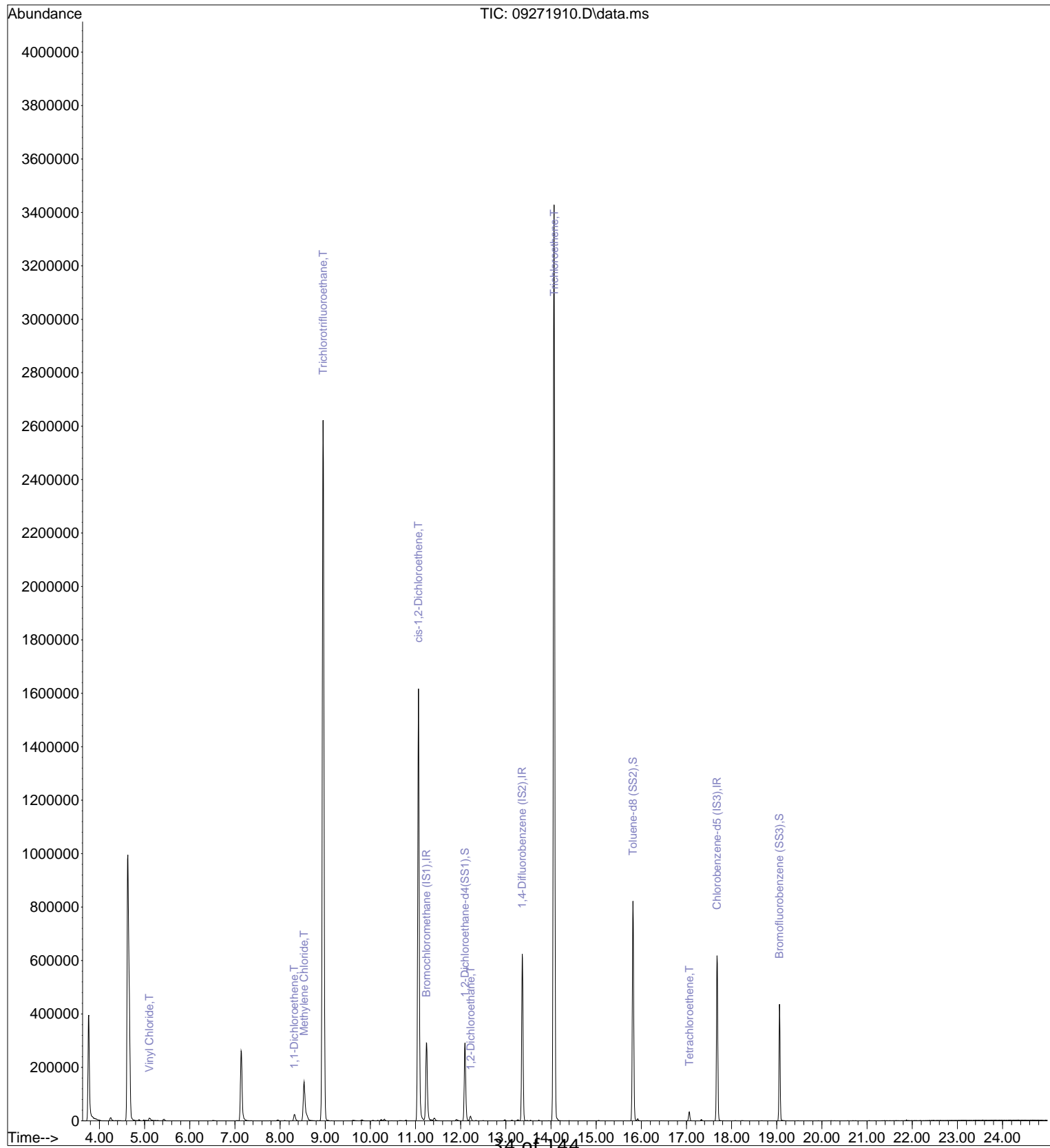
	R.T.	QIon	Response	Conc	Units	Qvalue
6) Vinyl Chloride	5.11	62	21136	1.016	ng	93
17) 1,1-Dichloroethene	8.32	96	11921	0.924	ng	# 85
19) Methylene Chloride	8.53	84	99273	7.643	ng	94
21) Trichlorotrifluoroethane	8.95	151	1127290	91.346	ng	99
28) cis-1,2-Dichloroethene	11.06	61	1188383	58.266	ng	95
36) 1,2-Dichloroethane	12.22	62	16918	0.736	ng	99
47) Trichloroethene	14.07	130	1314267	95.536	ng	99
64) Tetrachloroethene	17.06	166	10937	0.819	ng	91

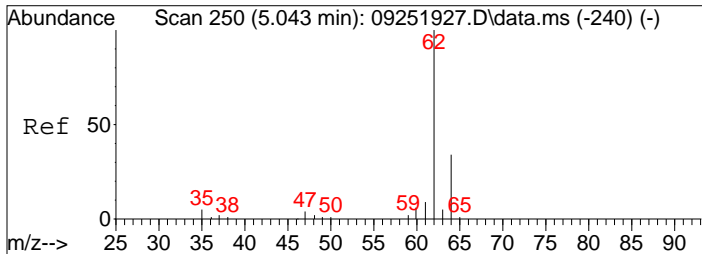
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2019_09\27\09271910.D
 Acq On : 27 Sep 2019 8:34
 Sample : P1905498-001 (4.0mL)
 Misc : S31-06261901

Vial: 3
 Operator: WA
 Inst : MS13

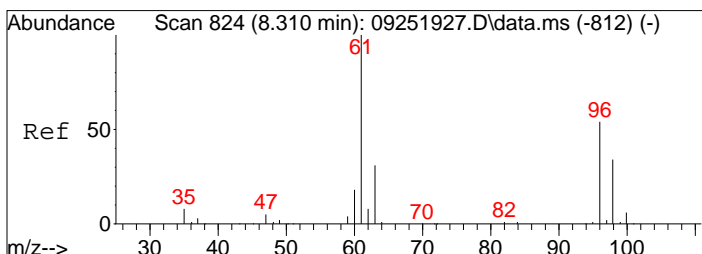
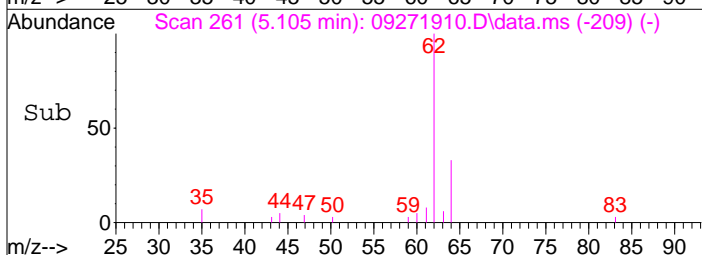
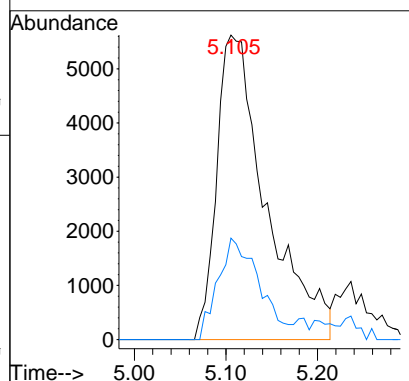
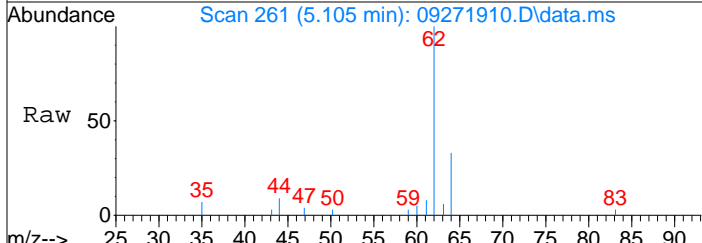
Quant Time: Sep 30 13:53:02 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M





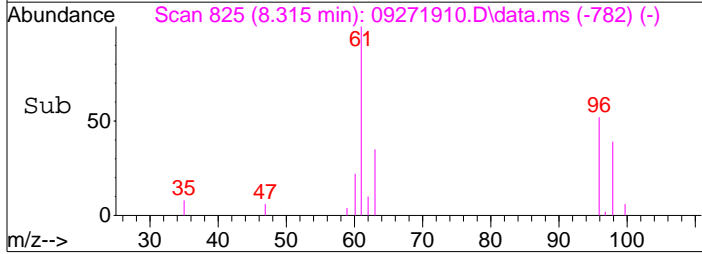
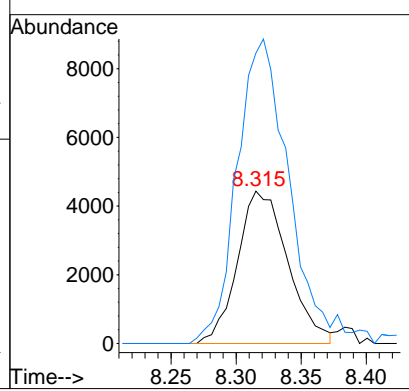
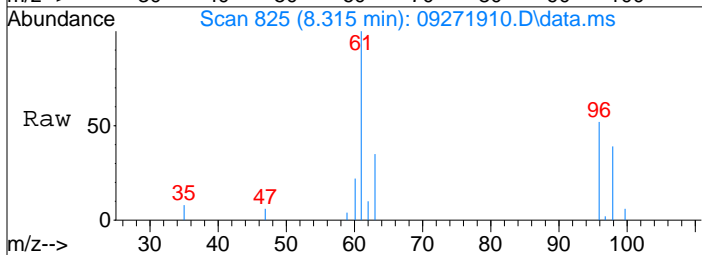
#6
 Vinyl Chloride
 Concen: 1.02 ng
 RT: 5.11 min Scan# 261
 Delta R.T. 0.045 min
 Lab File: 09271910.D
 Acq: 27 Sep 2019 8:34

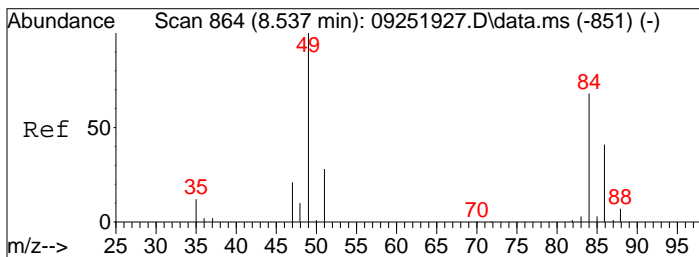
Tgt Ion	Resp	Lower	Upper
62	100		
64	28.2	11.8	51.8



#17
 1,1-Dichloroethene
 Concen: 0.92 ng
 RT: 8.32 min Scan# 825
 Delta R.T. -0.006 min
 Lab File: 09271910.D
 Acq: 27 Sep 2019 8:34

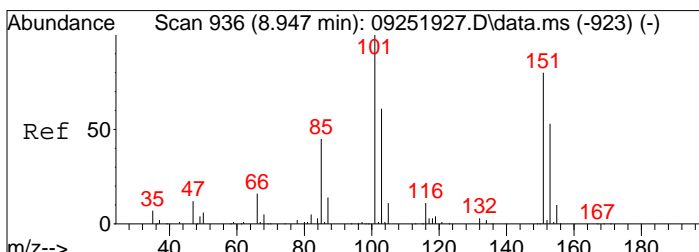
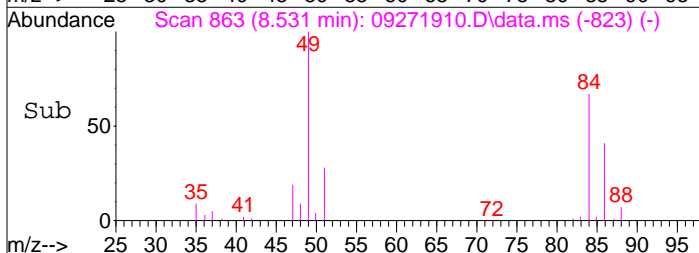
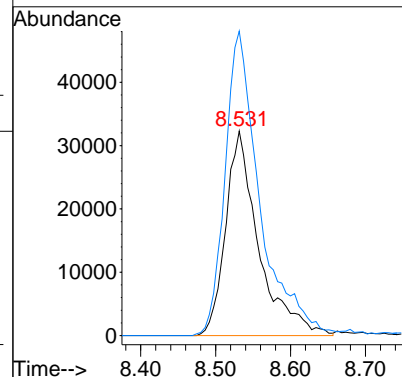
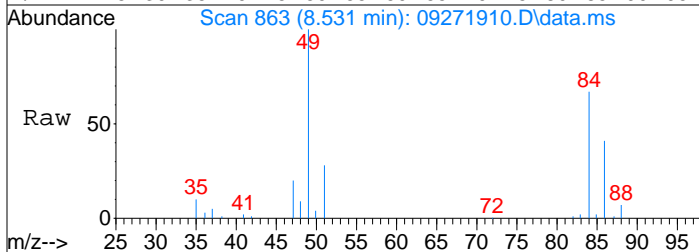
Tgt Ion	Resp	Lower	Upper
96	100		
61	208.0	166.5	206.5#





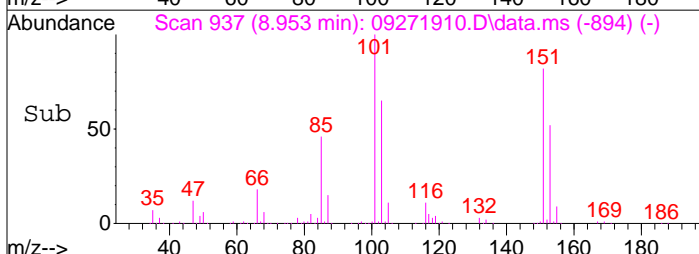
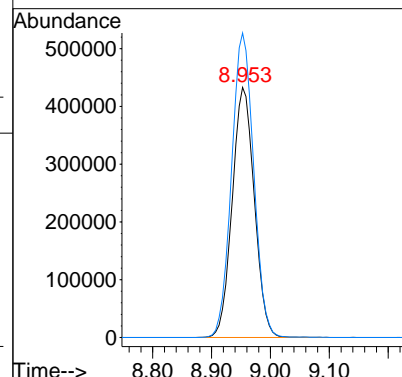
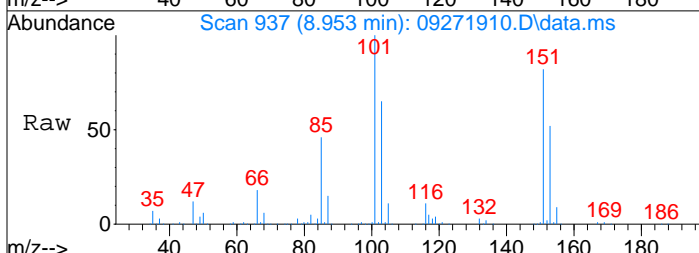
#19
 Methylene Chloride
 Concen: 7.64 ng
 RT: 8.53 min Scan# 863
 Delta R.T. -0.023 min
 Lab File: 09271910.D
 Acq: 27 Sep 2019 8:34

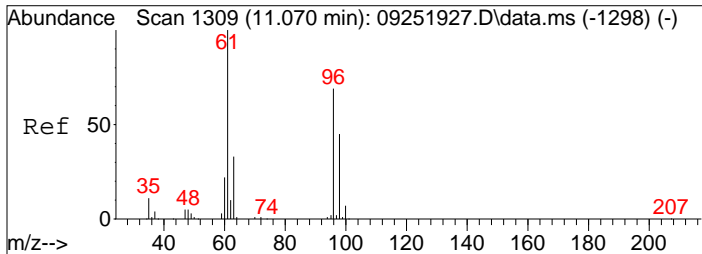
Tgt Ion: 84 Resp: 99273
 Ion Ratio Lower Upper
 84 100
 49 156.2 123.4 173.4



#21
 Trichlorotrifluoroethane
 Concen: 91.35 ng
 RT: 8.95 min Scan# 937
 Delta R.T. -0.006 min
 Lab File: 09271910.D
 Acq: 27 Sep 2019 8:34

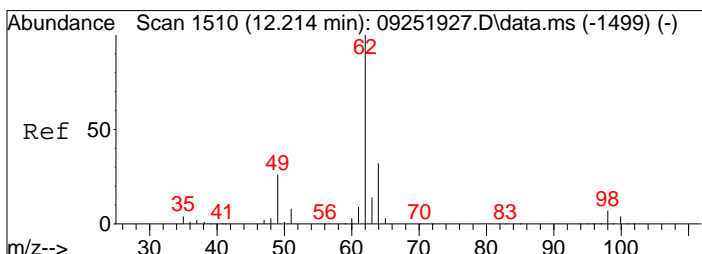
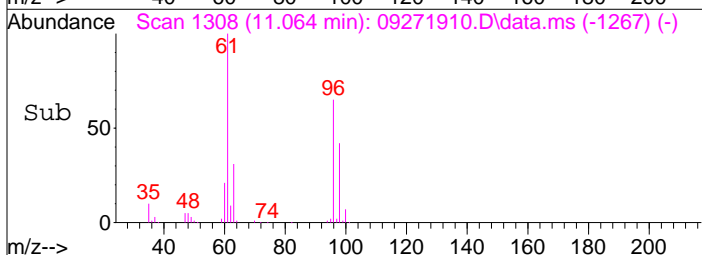
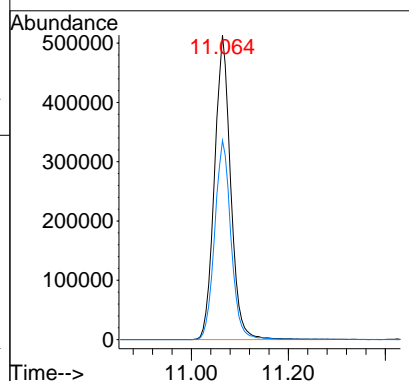
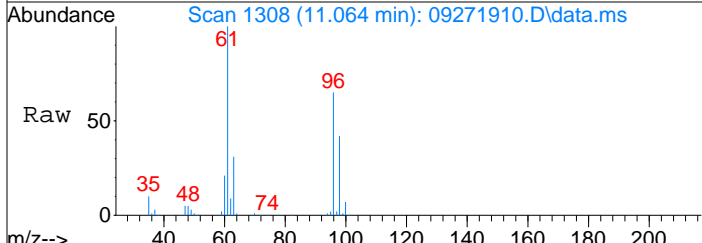
Tgt Ion: 151 Resp: 1127290
 Ion Ratio Lower Upper
 151 100
 101 121.7 100.6 140.6





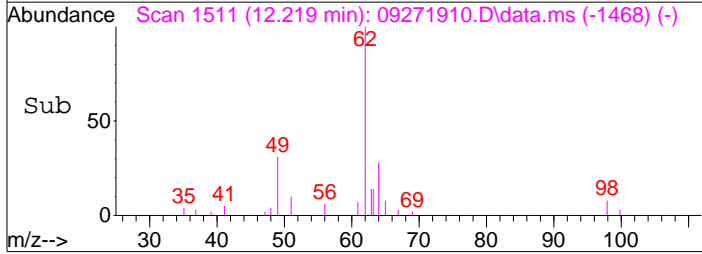
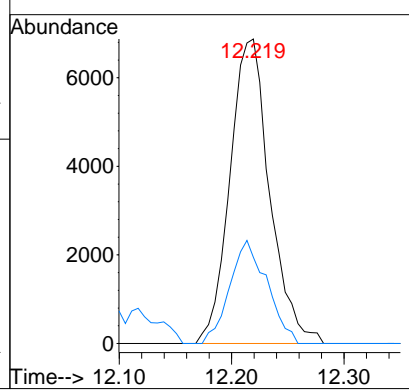
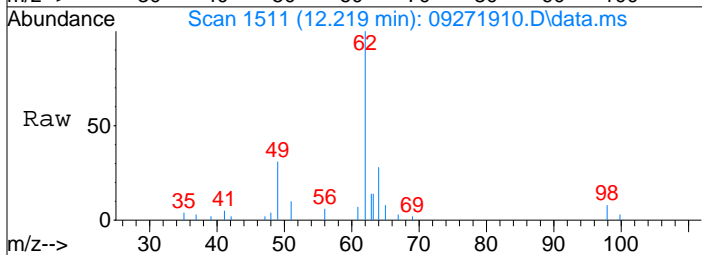
#28
 cis-1,2-Dichloroethene
 Concen: 58.27 ng
 RT: 11.06 min Scan# 1308
 Delta R.T. -0.017 min
 Lab File: 09271910.D
 Acq: 27 Sep 2019 8:34

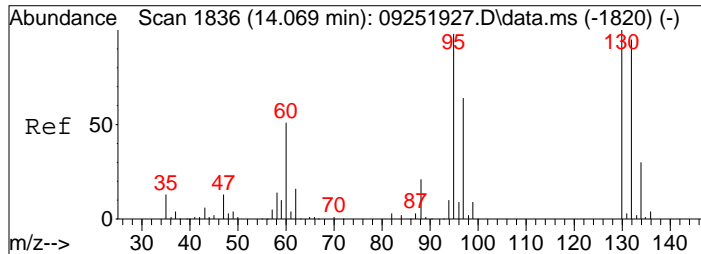
Tgt Ion	Resp	Lower	Upper
61	100		
96	66.1	49.8	89.8



#36
 1,2-Dichloroethane
 Concen: 0.74 ng
 RT: 12.22 min Scan# 1511
 Delta R.T. -0.006 min
 Lab File: 09271910.D
 Acq: 27 Sep 2019 8:34

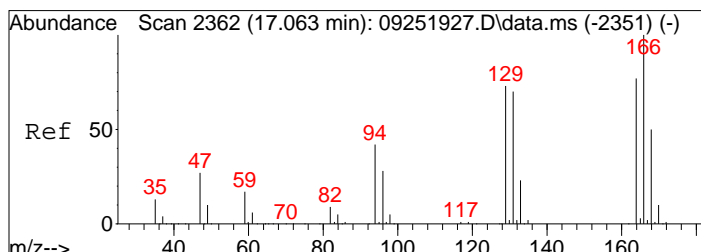
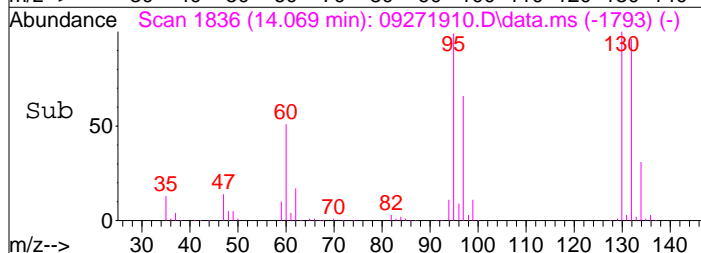
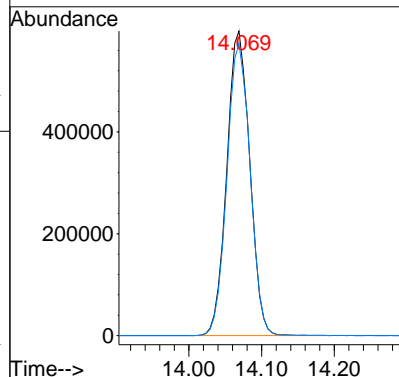
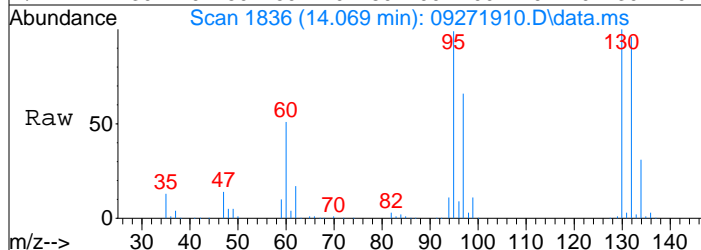
Tgt Ion	Resp	Lower	Upper
62	100		
64	31.8	12.2	52.2





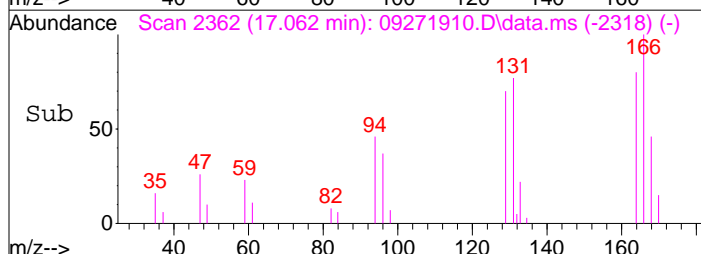
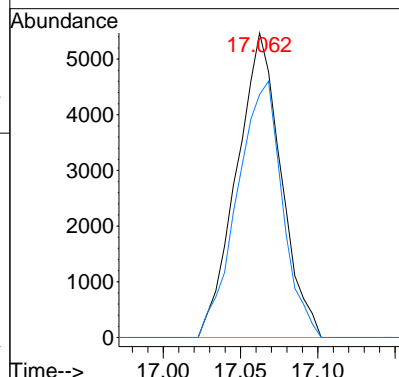
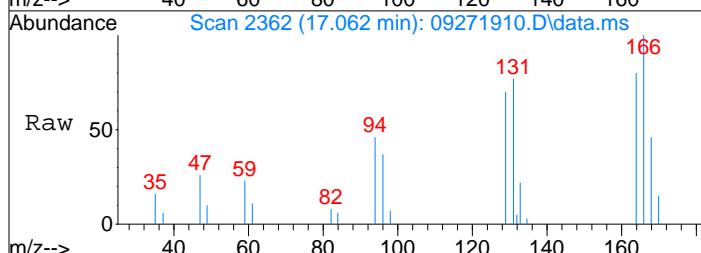
#47
 Trichloroethene
 Concen: 95.54 ng
 RT: 14.07 min Scan# 1836
 Delta R.T. -0.006 min
 Lab File: 09271910.D
 Acq: 27 Sep 2019 8:34

Tgt Ion:130 Resp: 1314267
 Ion Ratio Lower Upper
 130 100
 132 96.5 75.8 115.8



#64
 Tetrachloroethene
 Concen: 0.82 ng
 RT: 17.06 min Scan# 2362
 Delta R.T. -0.000 min
 Lab File: 09271910.D
 Acq: 27 Sep 2019 8:34

Tgt Ion:166 Resp: 10937
 Ion Ratio Lower Upper
 166 100
 164 85.6 58.0 98.0



Data File : I:\MS13\DATA\2019_09\27\09271911.D
 Acq On : 27 Sep 2019 9:08
 Sample : P1905498-002 (3.5mL)
 Misc : S31-06261901

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Sep 30 13:54:27 2019

Quant Method : I:\MS13\METHODS\R13092519A.M

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

QLast Update : Fri Sep 27 06:46:45 2019

Response via : Initial Calibration

DA 9/30/19

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	111520	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.36	114	541056	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.68	82	217558	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	282242	15.388	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	123.12%	
57) Toluene-d8 (SS2)	15.82	98	611470	13.798	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	110.40%	
73) Bromofluorobenzene (SS3)	19.06	174	124305	12.769	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	102.16%	

Target Compounds

						Qvalue
2) Propene	4.27	42	373	N.D.		
3) Dichlorodifluoromethan...	4.31	85	347	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	5.11	62	22896	1.242	ng	91
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	6.52	45	1888	N.D.		
11) Acetonitrile	6.82	41	64	N.D.		
12) Acrolein	6.98	56	54	N.D.		
13) Acetone	7.21	58	6754	0.701	ng	90
14) Trichlorofluoromethane	7.36	101	132	N.D.		
15) 2-Propanol (Isopropanol)	7.80	45	1077	N.D.		
16) Acrylonitrile	8.09	53	148	N.D.		
17) 1,1-Dichloroethene	8.33	96	11401	0.996	ng	91
18) 2-Methyl-2-Propanol (t...	8.32	59	782	N.D.		
19) Methylene Chloride	8.53	84	94769	8.229	ng	96
20) 3-Chloro-1-propene (Al...	8.59	41	225	N.D.		
21) Trichlorotrifluoroethane	8.95	151	986452	90.152	ng	99
22) Carbon Disulfide	8.84	76	8656	N.D.		
23) trans-1,2-Dichloroethene	9.81	61	3523	N.D.		
24) 1,1-Dichloroethane	10.06	63	3217	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)	10.67	72	203	N.D.		
28) cis-1,2-Dichloroethene	11.06	61	1176367	65.050	ng	95
29) Diisopropyl Ether	11.42	87	558	N.D.		
30) Ethyl Acetate	11.39	61	215	N.D.		
31) n-Hexane	11.35	57	127	N.D.		
32) Chloroform	11.42	83	4942	N.D.		
34) Tetrahydrofuran (THF)	11.93	72	269	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.21	62	18204	0.893	ng	100
38) 1,1,1-Trichloroethane	12.49	97	873	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	0.00	56	0	N.D.		
41) Benzene	12.98	78	4282	N.D.		
42) Carbon Tetrachloride	13.14	117	1812	N.D.		
43) Cyclohexane	13.26	84	1564	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	14.07	130	1411014	103.674	ng	99
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	14.14	57	793	N.D.		
50) Methyl Methacrylate	0.00	100	0	N.D. d		

39 of 144

Data File : I:\MS13\DATA\2019_09\27\09271911.D
 Acq On : 27 Sep 2019 9:08
 Sample : P1905498-002 (3.5mL)
 Misc : S31-06261901

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Sep 30 13:54:27 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

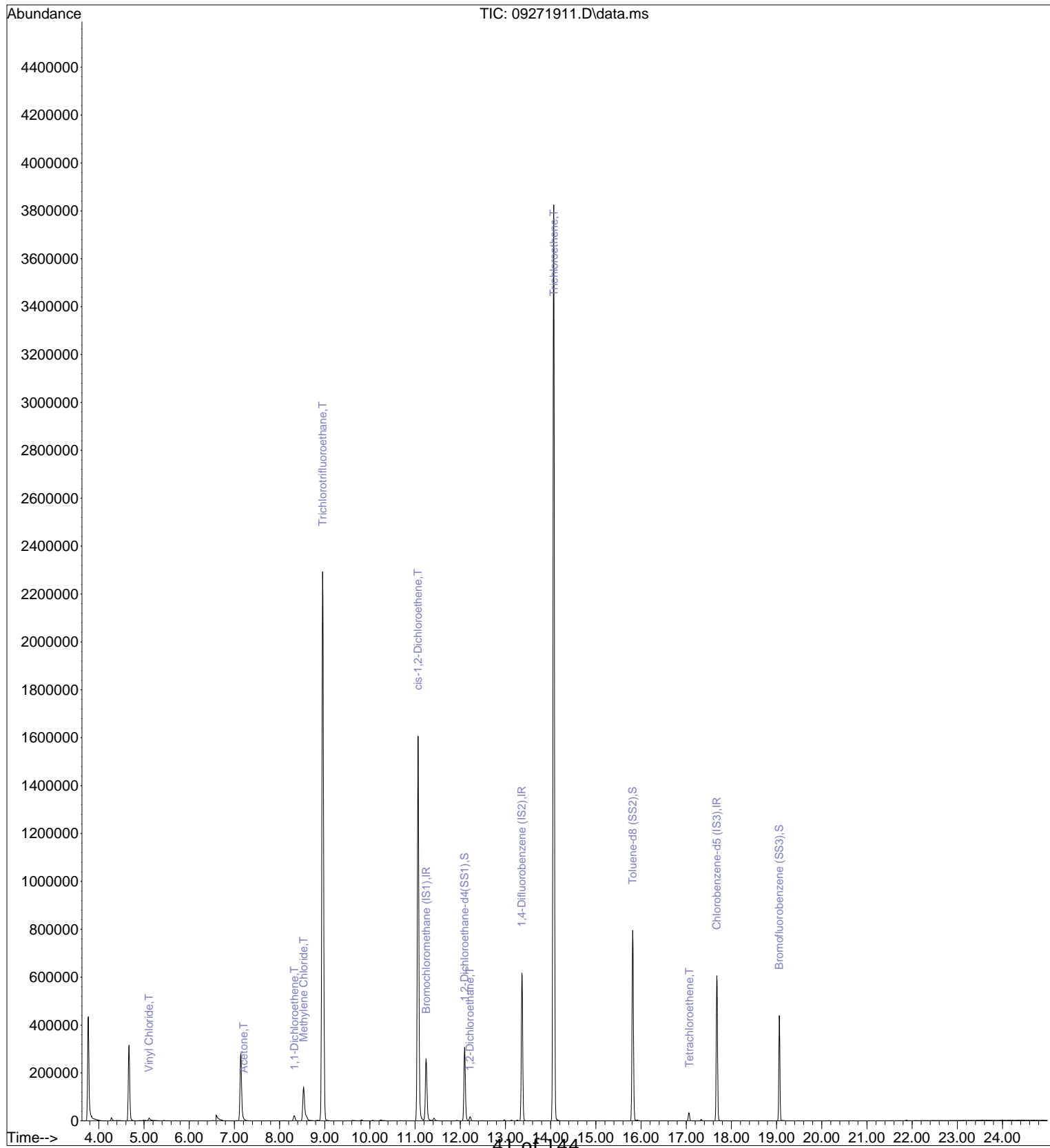
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	15.63	97	131	N.D.		
58) Toluene	15.92	91	3638	N.D.		
59) 2-Hexanone	16.23	43	249	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	17.07	166	11899	0.911 ng		97
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	18.08	91	1026	N.D.		
67) m- & p-Xylenes	18.25	91	1073	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.58	104	238	N.D.		
70) o-Xylene	18.67	91	545	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	0.00	105	0	N.D.		
75) alpha-Pinene	19.53	93	125	N.D.		
76) n-Propylbenzene	0.00	91	0	N.D.		
77) 3-Ethyltoluene	19.73	105	138	N.D.		
78) 4-Ethyltoluene	19.73	105	138	N.D.		
79) 1,3,5-Trimethylbenzene	19.73	105	138	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D.		
82) 1,2,4-Trimethylbenzene	0.00	105	0	N.D.		
83) n-Decane	0.00	57	0	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	0.00	105	0	N.D.		
88) 4-Isopropyltoluene (p-...	20.57	119	227	N.D.		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	20.70	68	131	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	0.00	57	0	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	0.00	128	0	N.D.		
96) n-Dodecane	0.00	57	0	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.		
99) tert-Butylbenzene	0.00	119	0	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\2019_09\27\09271911.D
 Acq On : 27 Sep 2019 9:08
 Sample : P1905498-002 (3.5mL)
 Misc : S31-06261901

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Sep 30 13:54:27 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019_09\27\09271911.D
 Acq On : 27 Sep 2019 9:08
 Sample : P1905498-002 (3.5mL)
 Misc : S31-06261901

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Sep 30 13:54:27 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

 9/30/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	111520	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.36	114	541056	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.68	82	217558	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	282242	15.388	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	123.12%	
57) Toluene-d8 (SS2)	15.82	98	611470	13.798	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	110.40%	
73) Bromofluorobenzene (SS3)	19.06	174	124305	12.769	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	102.16%	

Target Compounds

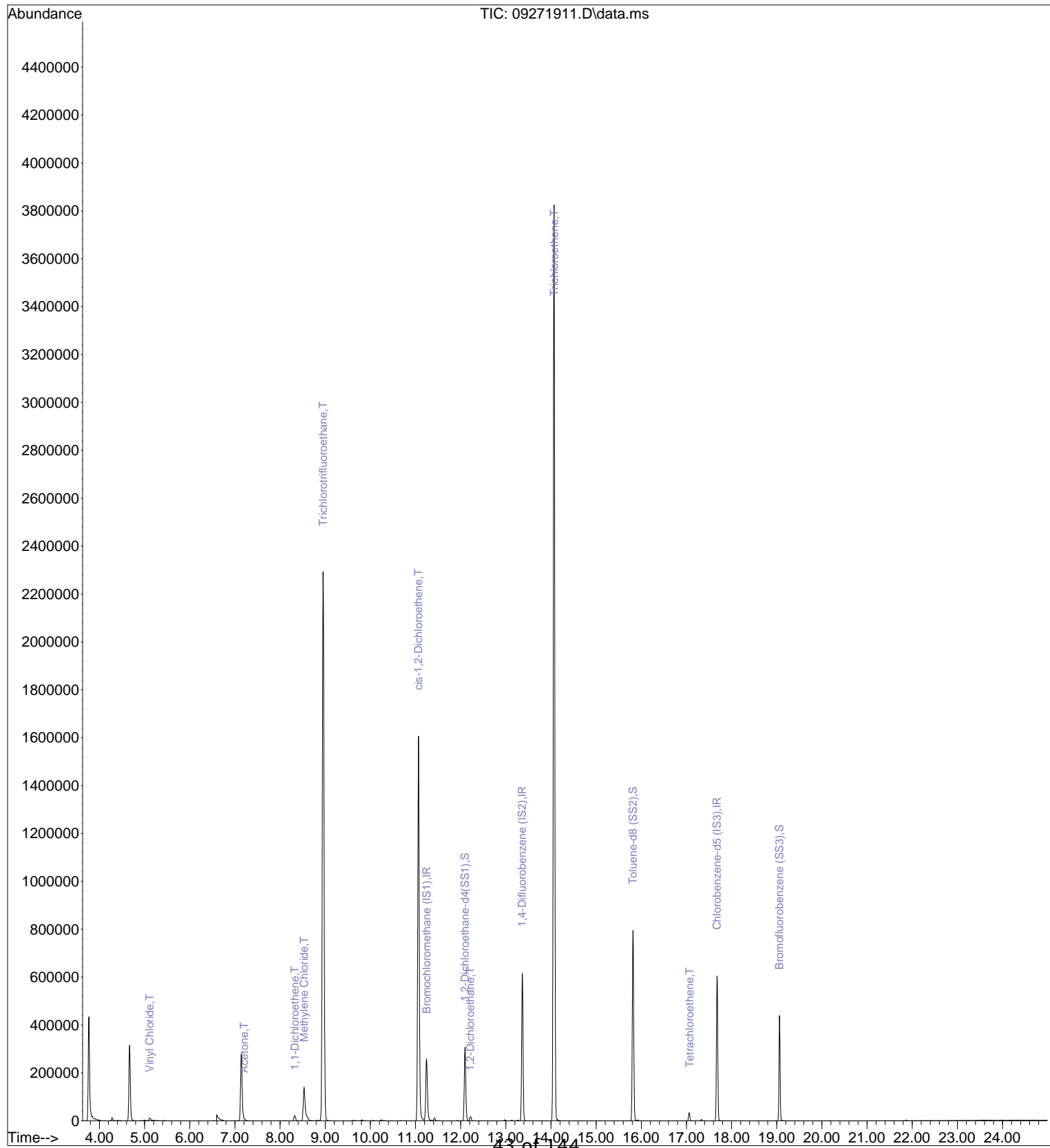
						Qvalue
6) Vinyl Chloride	5.11	62	22896	1.242	ng	91
13) Acetone	7.21	58	6754	0.701	ng	90
17) 1,1-Dichloroethene	8.33	96	11401	0.996	ng	91
19) Methylene Chloride	8.53	84	94769	8.229	ng	96
21) Trichlorotrifluoroethane	8.95	151	986452	90.152	ng	99
28) cis-1,2-Dichloroethene	11.06	61	1176367	65.050	ng	95
36) 1,2-Dichloroethane	12.21	62	18204	0.893	ng	100
47) Trichloroethene	14.07	130	1411014	103.674	ng	99
64) Tetrachloroethene	17.07	166	11899	0.911	ng	97

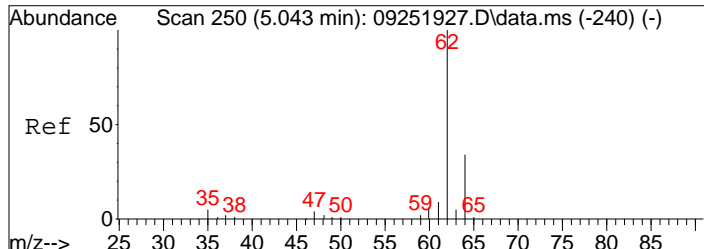
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2019_09\27\09271911.D
 Acq On : 27 Sep 2019 9:08
 Sample : P1905498-002 (3.5mL)
 Misc : S31-06261901

Vial: 3
 Operator: WA
 Inst : MS13

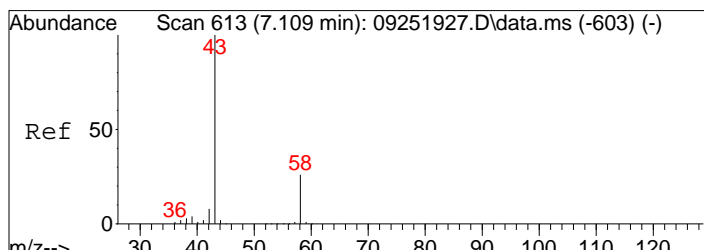
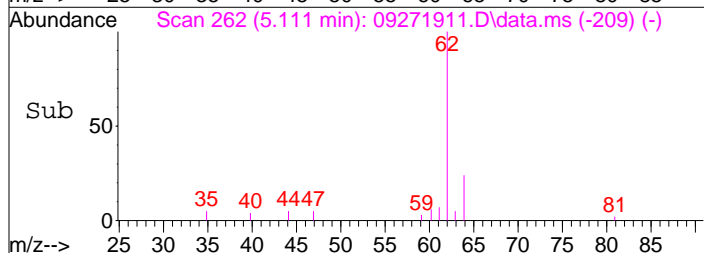
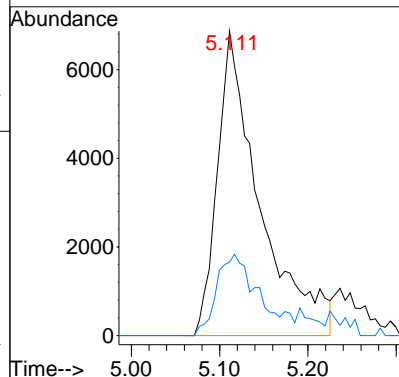
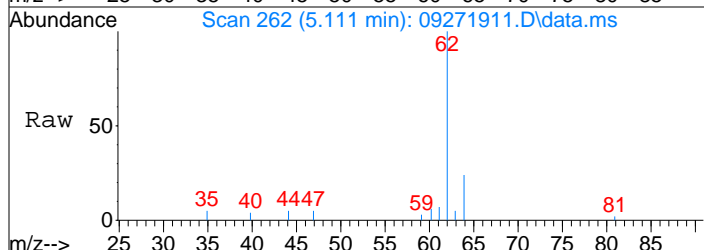
Quant Time: Sep 30 13:54:27 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M





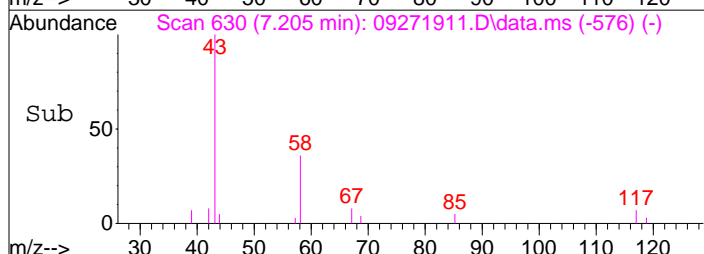
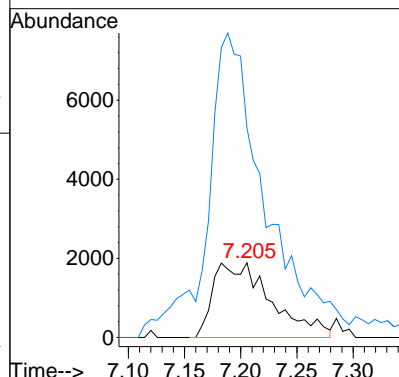
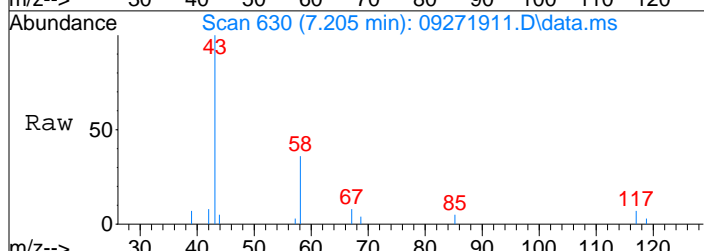
#6
 Vinyl Chloride
 Concen: 1.24 ng
 RT: 5.11 min Scan# 262
 Delta R.T. 0.051 min
 Lab File: 09271911.D
 Acq: 27 Sep 2019 9:08

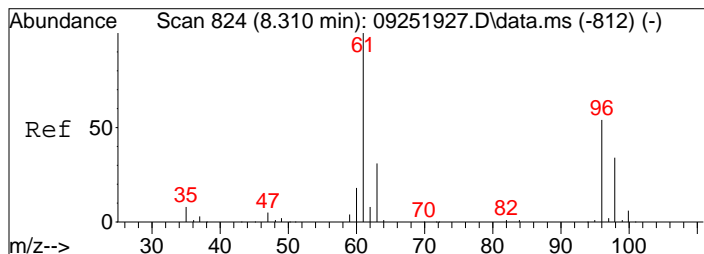
Tgt Ion	Resp	Lower	Upper
62	100		
64	26.9	11.8	51.8



#13
 Acetone
 Concen: 0.70 ng
 RT: 7.21 min Scan# 630
 Delta R.T. 0.057 min
 Lab File: 09271911.D
 Acq: 27 Sep 2019 9:08

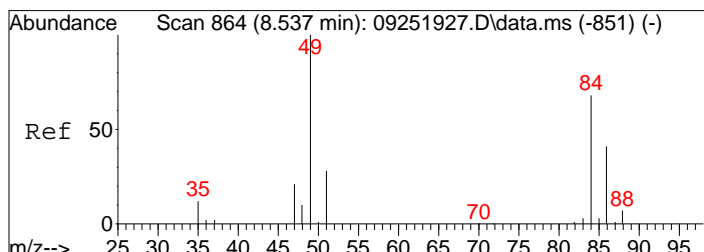
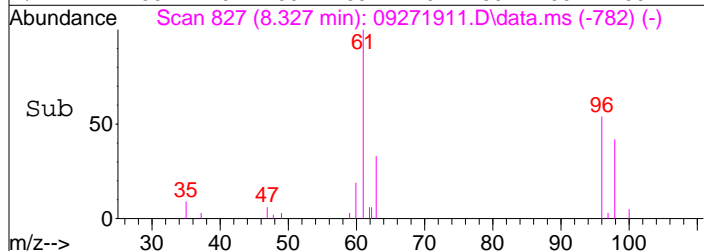
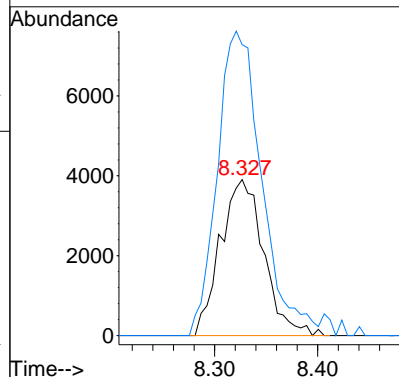
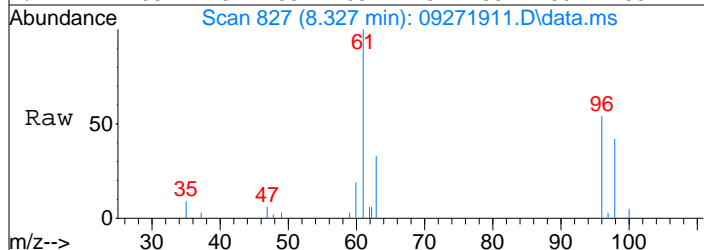
Tgt Ion	Resp	Lower	Upper
58	100		
43	407.9	354.6	414.6





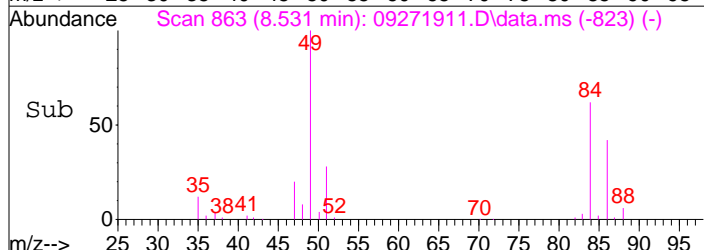
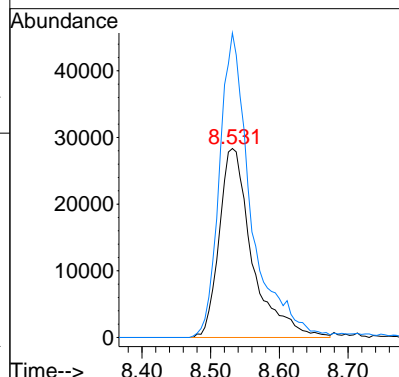
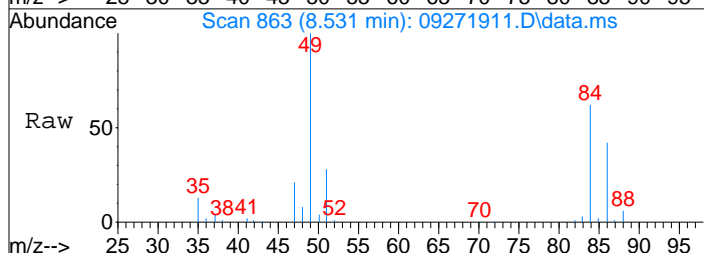
#17
 1,1-Dichloroethene
 Concen: 1.00 ng
 RT: 8.33 min Scan# 827
 Delta R.T. 0.006 min
 Lab File: 09271911.D
 Acq: 27 Sep 2019 9:08

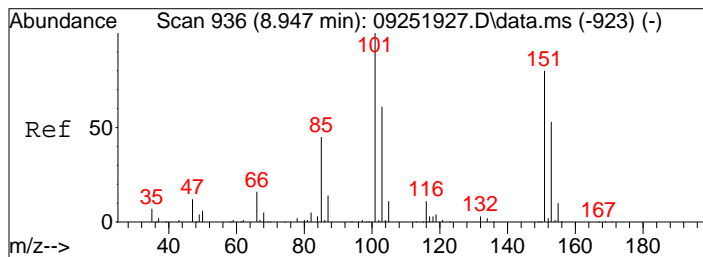
Tgt Ion	Resp	Lower	Upper
96	11401		
61	199.8	166.5	206.5



#19
 Methylene Chloride
 Concen: 8.23 ng
 RT: 8.53 min Scan# 863
 Delta R.T. -0.023 min
 Lab File: 09271911.D
 Acq: 27 Sep 2019 9:08

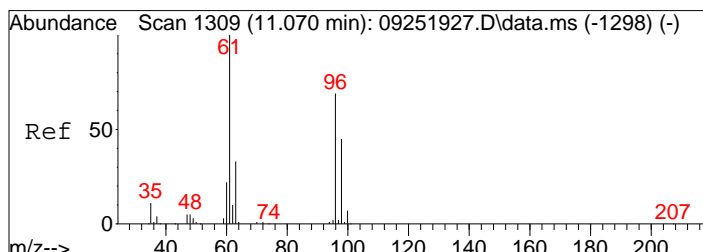
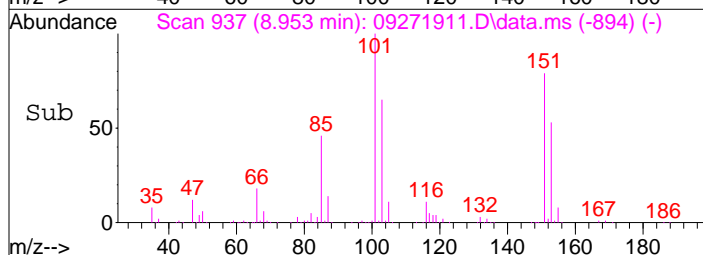
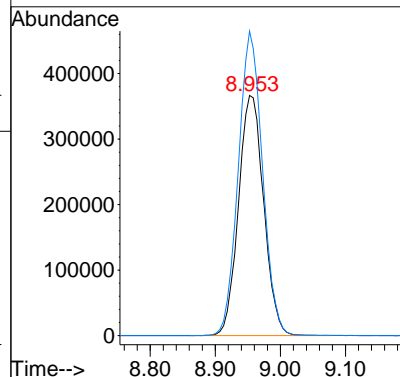
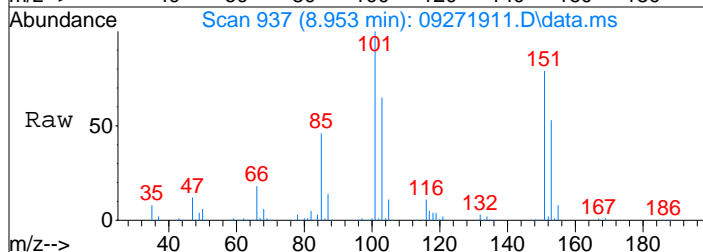
Tgt Ion	Resp	Lower	Upper
84	94769		
49	153.9	123.4	173.4





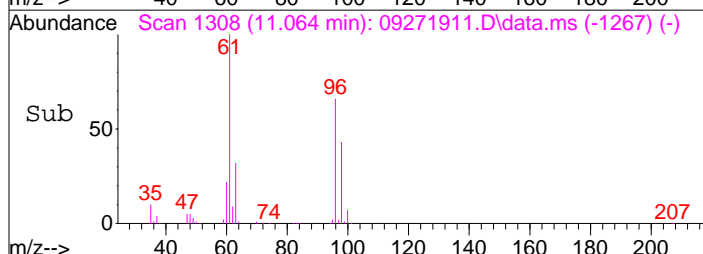
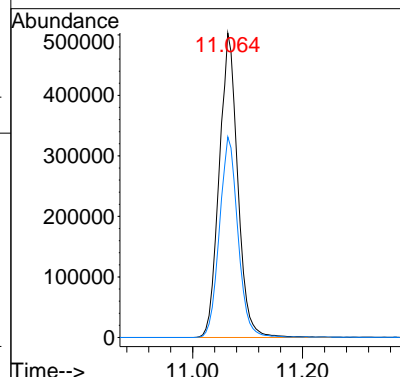
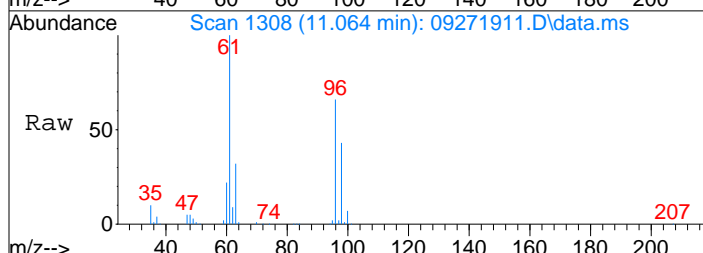
#21
 Trichlorotrifluoroethane
 Concen: 90.15 ng
 RT: 8.95 min Scan# 937
 Delta R.T. -0.006 min
 Lab File: 09271911.D
 Acq: 27 Sep 2019 9:08

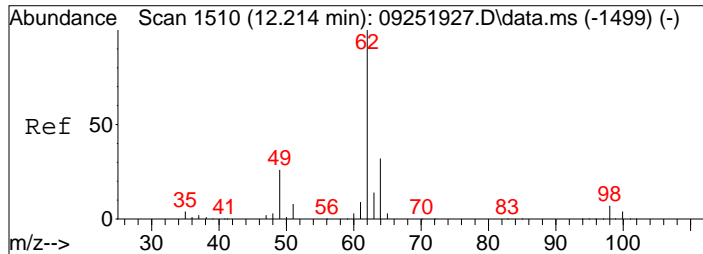
Tgt Ion: 151 Resp: 986452
 Ion Ratio Lower Upper
 151 100
 101 122.0 100.6 140.6



#28
 cis-1,2-Dichloroethene
 Concen: 65.05 ng
 RT: 11.06 min Scan# 1308
 Delta R.T. -0.017 min
 Lab File: 09271911.D
 Acq: 27 Sep 2019 9:08

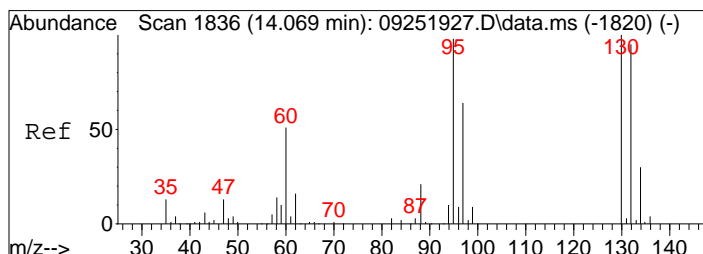
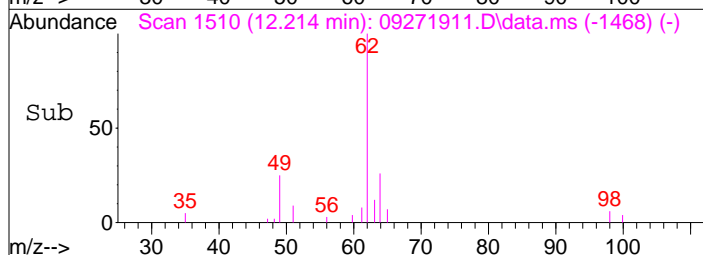
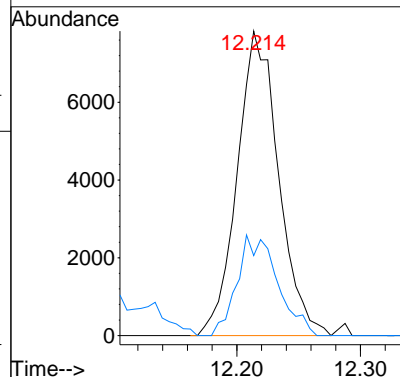
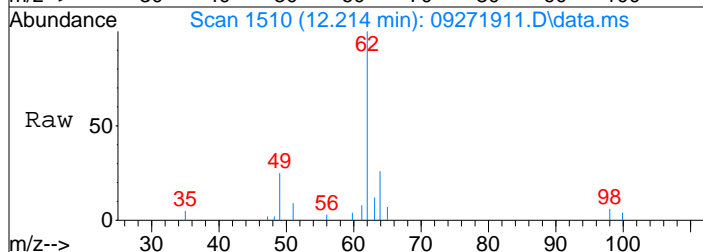
Tgt Ion: 61 Resp: 1176367
 Ion Ratio Lower Upper
 61 100
 96 65.8 49.8 89.8





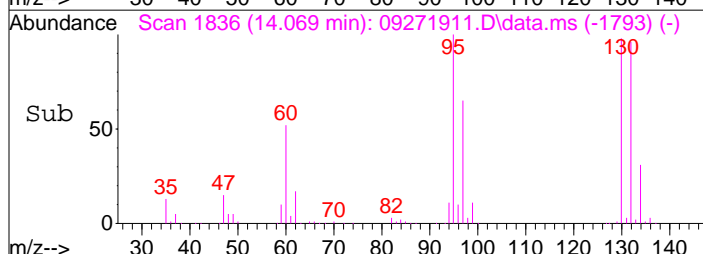
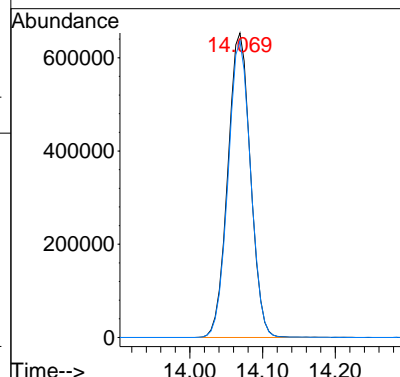
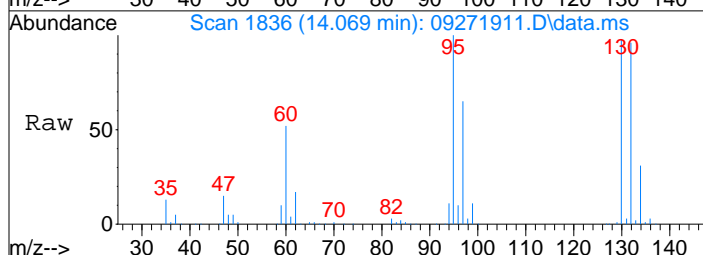
#36
 1,2-Dichloroethane
 Concen: 0.89 ng
 RT: 12.21 min Scan# 1510
 Delta R.T. -0.011 min
 Lab File: 09271911.D
 Acq: 27 Sep 2019 9:08

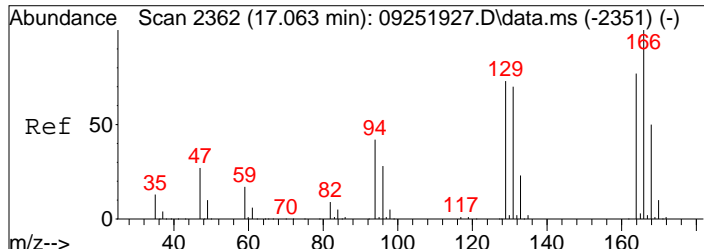
Tgt Ion:	Resp:	Lower	Upper
62	18204		
64	32.2	12.2	52.2



#47
 Trichloroethene
 Concen: 103.67 ng
 RT: 14.07 min Scan# 1836
 Delta R.T. -0.006 min
 Lab File: 09271911.D
 Acq: 27 Sep 2019 9:08

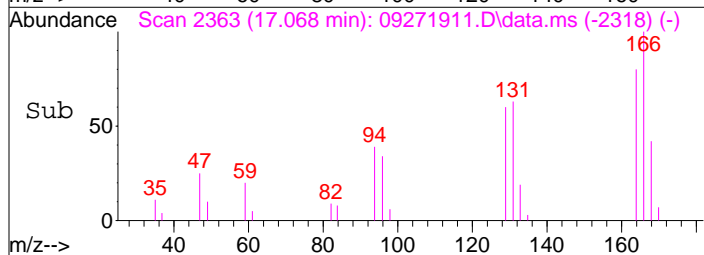
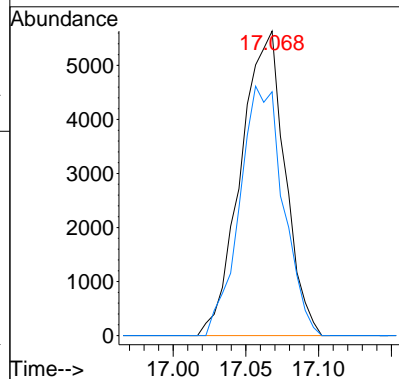
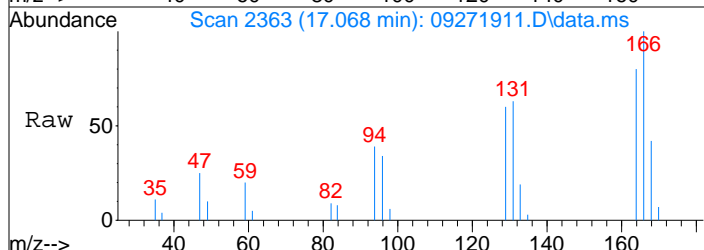
Tgt Ion:	Resp:	Lower	Upper
130	1411014		
132	97.0	75.8	115.8





#64
 Tetrachloroethene
 Concen: 0.91 ng
 RT: 17.07 min Scan# 2363
 Delta R.T. 0.006 min
 Lab File: 09271911.D
 Acq: 27 Sep 2019 9:08

Tgt Ion	Resp	Lower	Upper
166	11899		
166	100		
164	81.0	58.0	98.0



Data File : I:\MS13\DATA\2019_09\27\09271929.D
 Acq On : 27 Sep 2019 19:16
 Sample : P1905498-003 (1000mL)
 Misc : S31-06261901

Vial: 1
 Operator: WA
 Inst : MS13

Quant Time: Sep 30 14:37:19 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

407 9/30/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	99055	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.36	114	456394	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.68	82	210915	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	244367	15.000	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	120.00%	
57) Toluene-d8 (SS2)	15.82	98	529119	12.315	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	98.56%	
73) Bromofluorobenzene (SS3)	19.06	174	108608	11.508	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	92.08%	

Target Compounds

						Qvalue
2) Propene	0.00	42	0	N.D.	d	
3) Dichlorodifluoromethan...	4.35	85	54909	2.124	ng	100
4) Chloromethane	4.66	50	3541	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	4.91	135	1045	N.D.		
6) Vinyl Chloride	5.08	62	2646	N.D.		
7) 1,3-Butadiene	5.41	54	669	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.46	45	95131	10.034	ng	99
11) Acetonitrile	6.75	41	7244	N.D.		
12) Acrolein	6.94	56	1302	N.D.		
13) Acetone	7.12	58	124775	14.571	ng	# 52
14) Trichlorofluoromethane	7.35	101	37471	1.764	ng	96
15) 2-Propanol (Isopropanol)	7.64	45	48411	1.461	ng	89
16) Acrylonitrile	7.94	53	2005	N.D.		
17) 1,1-Dichloroethene	8.33	96	1327	N.D.		
18) 2-Methyl-2-Propanol (t...	8.58	59	1619	N.D.		
19) Methylene Chloride	8.54	84	8500	0.831	ng	86
20) 3-Chloro-1-propene (Al...	8.69	41	115	N.D.		
21) Trichlorotrifluoroethane	8.95	151	137652	14.163	ng	99
22) Carbon Disulfide	8.84	76	3131	N.D.		
23) trans-1,2-Dichloroethene	9.81	61	334	N.D.		
24) 1,1-Dichloroethane	10.04	63	197	N.D.		
25) Methyl tert-Butyl Ether	10.22	73	386	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	10.57	72	15856	2.371	ng	# 72
28) cis-1,2-Dichloroethene	11.06	61	87166	5.427	ng	92
29) Diisopropyl Ether	11.35	87	200	N.D.		
30) Ethyl Acetate	11.39	61	8317	2.196	ng	94
31) n-Hexane	11.35	57	36263	1.885	ng	94
32) Chloroform	11.41	83	1963	N.D.		
34) Tetrahydrofuran (THF)	11.84	72	23633	3.410	ng	# 79
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.22	62	2501	N.D.		
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.		
39) Isopropyl Acetate	12.97	61	456	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	12.97	78	39751	0.903	ng	97
42) Carbon Tetrachloride	13.12	117	6630	N.D.		
43) Cyclohexane	13.26	84	8379	0.495	ng	94
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	13.72	63	861	N.D.		
46) Bromodichloromethane	14.06	83	2728	N.D.		
47) Trichloroethene	14.06	130	112062	9.761	ng	97
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	
50) Methyl Methacrylate	14.29	100	5078	1.140	ng	91

49 of 144

Data File : I:\MS13\DATA\2019_09\27\09271929.D
 Acq On : 27 Sep 2019 19:16
 Sample : P1905498-003 (1000mL)
 Misc : S31-06261901

Vial: 1
 Operator: WA
 Inst : MS13

Quant Time: Sep 30 14:37:19 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

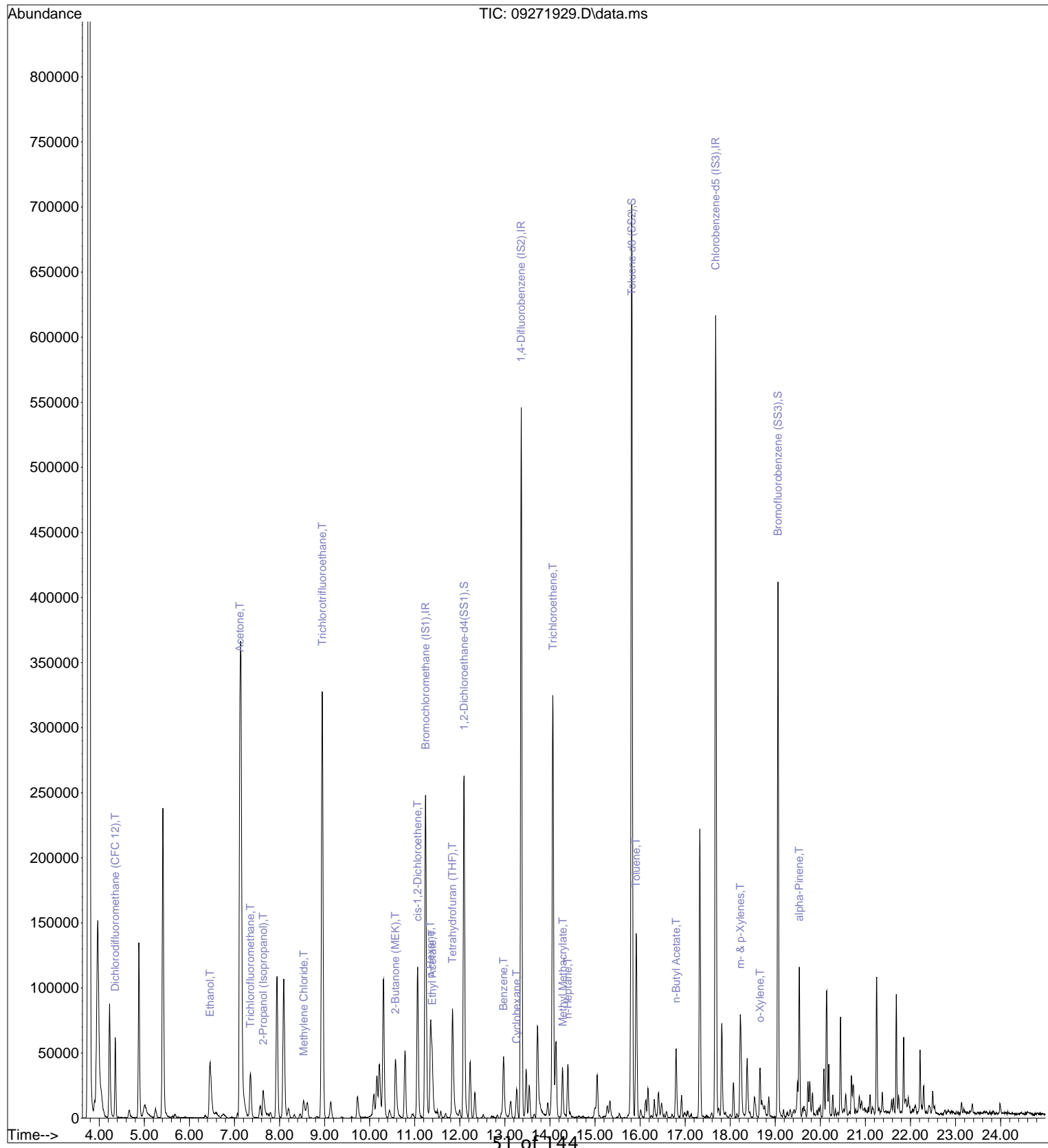
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.40	71	8310	0.801	ng	89
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	14.99	58	1292	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	15.91	91	102389	2.196	ng	100
59) 2-Hexanone	16.17	43	4526	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.80	43	47258	1.673	ng	100
63) n-Octane	16.91	57	3029	N.D.		
64) Tetrachloroethene	17.06	166	1669	N.D.		
65) Chlorobenzene	17.76	112	116	N.D.		
66) Ethylbenzene	18.07	91	21093	N.D.		
67) m- & p-Xylenes	18.22	91	63226	1.478	ng	97
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.56	104	3456	N.D.		
70) o-Xylene	18.66	91	22888	0.534	ng	93
71) n-Nonane	18.85	43	6010	N.D.		
72) 1,1,2,2-Tetrachloroethane	18.70	83	179	N.D.		
74) Cumene	19.18	105	2063	N.D.		
75) alpha-Pinene	19.53	93	41096	1.561	ng	94
76) n-Propylbenzene	19.63	91	9125	N.D.		
77) 3-Ethyltoluene	19.72	105	13071	N.D.		
78) 4-Ethyltoluene	19.76	105	5707	N.D.		
79) 1,3,5-Trimethylbenzene	19.83	105	4855	N.D.		
80) alpha-Methylstyrene	19.96	118	1850	N.D.		
81) 2-Ethyltoluene	19.99	105	4877	N.D.		
82) 1,2,4-Trimethylbenzene	20.19	105	19203	N.D.		
83) n-Decane	20.28	57	5472	N.D.		
84) Benzyl Chloride	20.39	91	878	N.D.		
85) 1,3-Dichlorobenzene	20.37	146	616	N.D.		
86) 1,4-Dichlorobenzene	20.37	146	616	N.D.		
87) sec-Butylbenzene	20.43	105	795	N.D.		
88) 4-Isopropyltoluene (p-...	20.56	119	3553	N.D.		
89) 1,2,3-Trimethylbenzene	20.56	105	5028	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	20.69	68	6790	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	21.37	57	5183	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	22.30	128	5762	N.D.		
96) n-Dodecane	22.29	57	4668	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.	d	
99) tert-Butylbenzene	20.19	119	2198	N.D.		
100) n-Butylbenzene	20.93	91	2843	N.D.		

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

Data File : I:\MS13\DATA\2019_09\27\09271929.D
Acq On : 27 Sep 2019 19:16
Sample : P1905498-003 (1000mL)
Misc : S31-06261901

Vial: 1
Operator: WA
Inst : MS13

Quant Time: Sep 30 14:37:19 2019
Quant Method : I:\MS13\METHODS\R13092519A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Sep 27 06:46:45 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019_09\27\09271929.D
 Acq On : 27 Sep 2019 19:16
 Sample : P1905498-003 (1000mL)
 Misc : S31-06261901

Vial: 1
 Operator: WA
 Inst : MS13

Quant Time: Sep 30 14:37:19 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

WA 9/30/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	99055	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.36	114	456394	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.68	82	210915	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	244367	15.000	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	120.00%	
57) Toluene-d8 (SS2)	15.82	98	529119	12.315	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	98.56%	
73) Bromofluorobenzene (SS3)	19.06	174	108608	11.508	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	92.08%	

Target Compounds

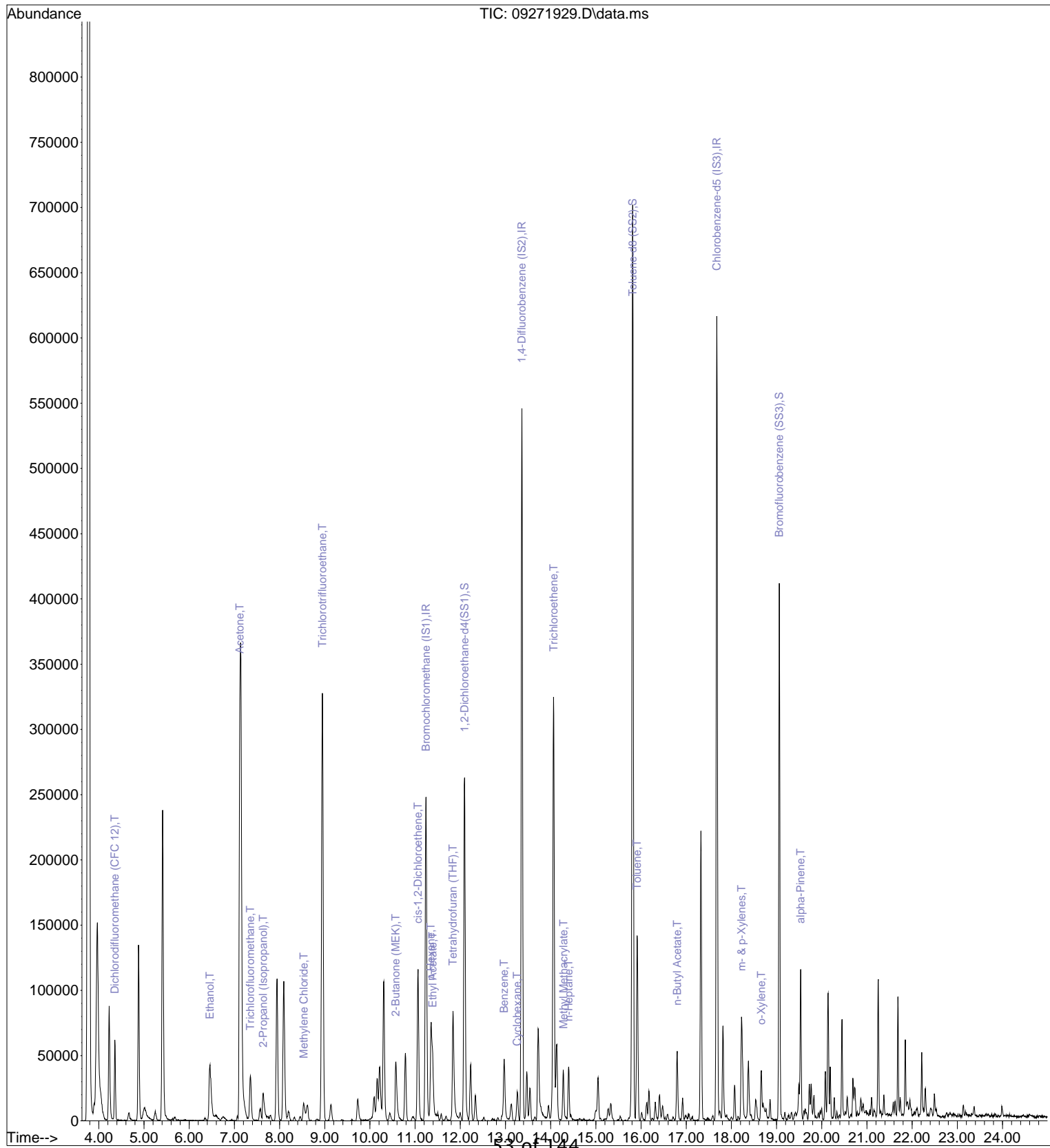
	R.T.	QIon	Response	Conc	Units	Qvalue
3) Dichlorodifluoromethan...	4.35	85	54909	2.124	ng	100
10) Ethanol	6.46	45	95131	10.034	ng	99
13) Acetone	7.12	58	124775	14.571	ng	# 52
14) Trichlorofluoromethane	7.35	101	37471	1.764	ng	96
15) 2-Propanol (Isopropanol)	7.64	45	48411	1.461	ng	89
19) Methylene Chloride	8.54	84	8500	0.831	ng	86
21) Trichlorotrifluoroethane	8.95	151	137652	14.163	ng	99
27) 2-Butanone (MEK)	10.57	72	15856	2.371	ng	# 72
28) cis-1,2-Dichloroethene	11.06	61	87166	5.427	ng	92
30) Ethyl Acetate	11.39	61	8317	2.196	ng	94
31) n-Hexane	11.35	57	36263	1.885	ng	94
34) Tetrahydrofuran (THF)	11.84	72	23633	3.410	ng	# 79
41) Benzene	12.97	78	39751	0.903	ng	97
43) Cyclohexane	13.26	84	8379	0.495	ng	94
47) Trichloroethene	14.06	130	112062	9.761	ng	97
50) Methyl Methacrylate	14.29	100	5078	1.140	ng	91
51) n-Heptane	14.40	71	8310	0.801	ng	89
58) Toluene	15.91	91	102389	2.196	ng	100
62) n-Butyl Acetate	16.80	43	47258	1.673	ng	100
67) m- & p-Xylenes	18.22	91	63226	1.478	ng	97
70) o-Xylene	18.66	91	22888	0.534	ng	93
75) alpha-Pinene	19.53	93	41096	1.561	ng	94

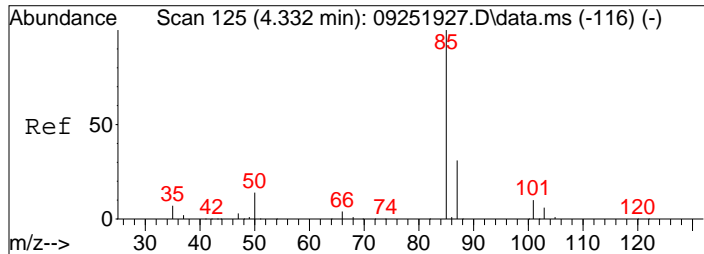
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2019_09\27\09271929.D
Acq On : 27 Sep 2019 19:16
Sample : P1905498-003 (1000mL)
Misc : S31-06261901

Vial: 1
Operator: WA
Inst : MS13

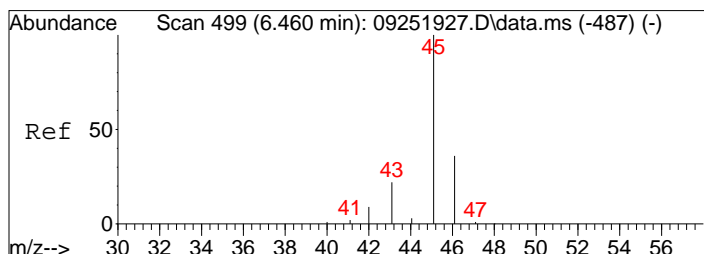
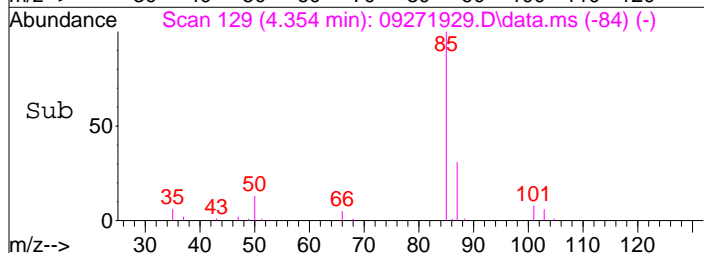
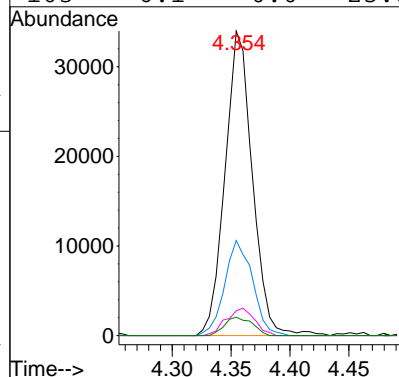
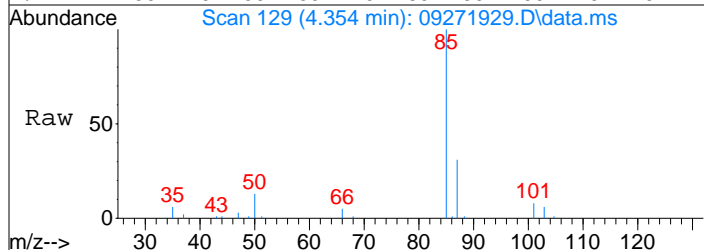
Quant Time: Sep 30 14:37:19 2019
Quant Method : I:\MS13\METHODS\R13092519A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Sep 27 06:46:45 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M





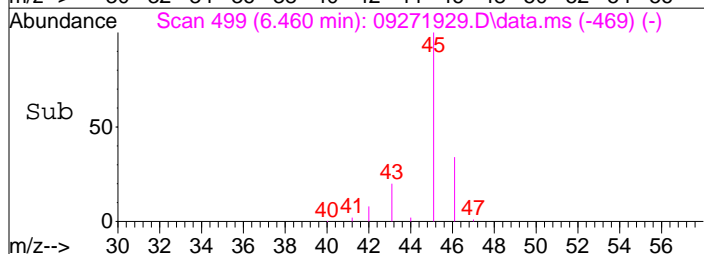
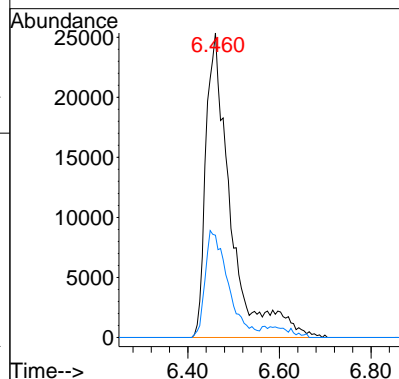
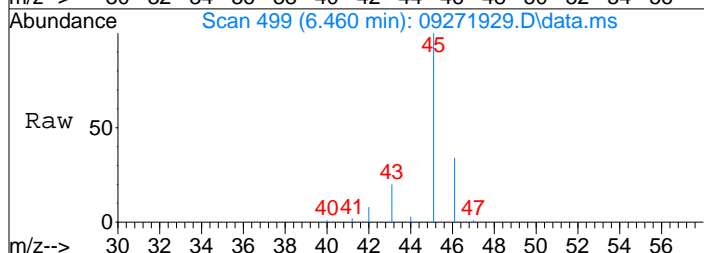
#3
 Dichlorodifluoromethane (CFC 12)
 Concen: 2.12 ng
 RT: 4.35 min Scan# 129
 Delta R.T. 0.006 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

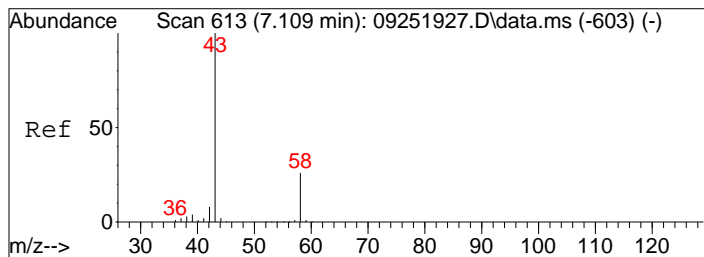
Tgt Ion	85	87	101	103	Resp	Lower	Upper
Resp	54909						
Ion Ratio	100	31.9	9.4	6.1			
Lower		12.1	0.0	0.0			
Upper		52.1	29.3	25.8			



#10
 Ethanol
 Concen: 10.03 ng
 RT: 6.46 min Scan# 499
 Delta R.T. -0.080 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

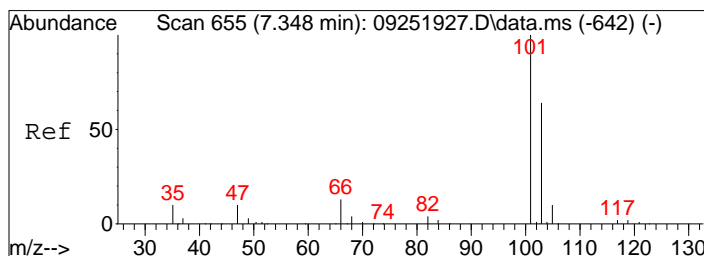
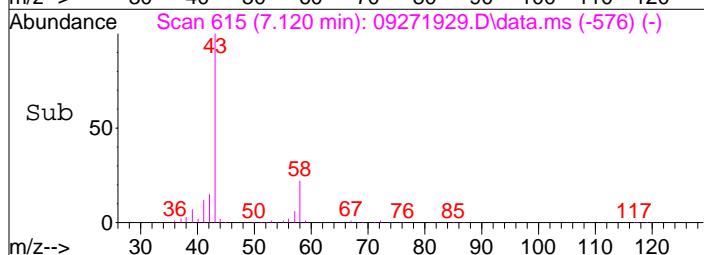
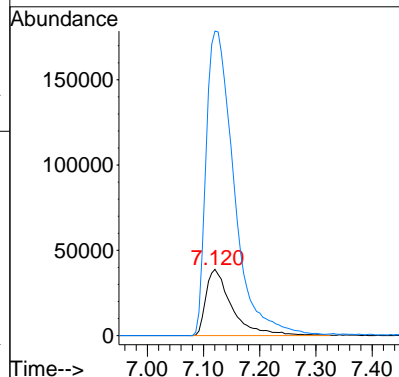
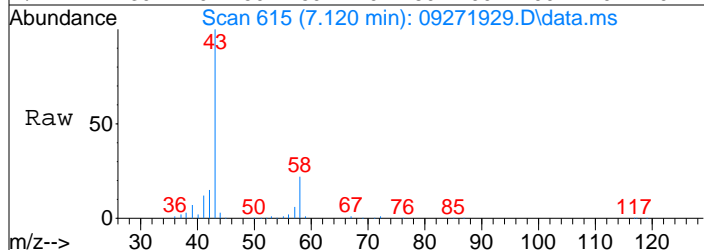
Tgt Ion	45	46	Resp	Lower	Upper
Resp	95131				
Ion Ratio	100	36.6			
Lower		16.3			
Upper		56.3			





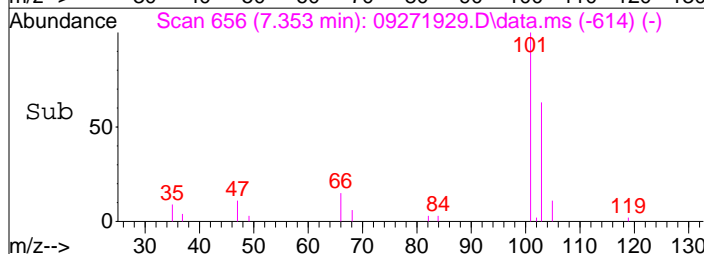
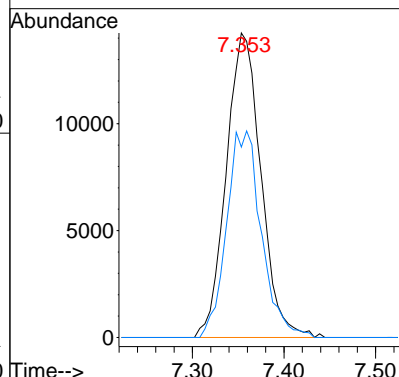
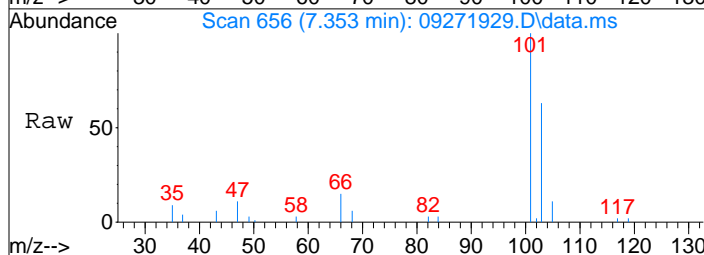
#13
 Acetone
 Concen: 14.57 ng
 RT: 7.12 min Scan# 615
 Delta R.T. -0.029 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

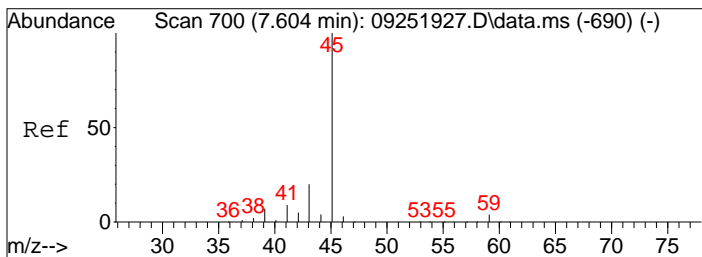
Tgt Ion	Resp	Lower	Upper
58	124775		
58	100		
43	494.7	354.6	414.6#



#14
 Trichlorofluoromethane
 Concen: 1.76 ng
 RT: 7.35 min Scan# 656
 Delta R.T. -0.011 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

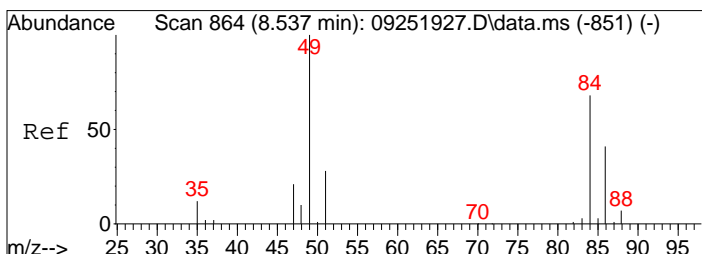
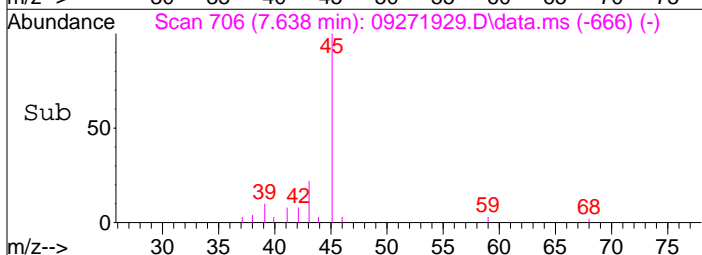
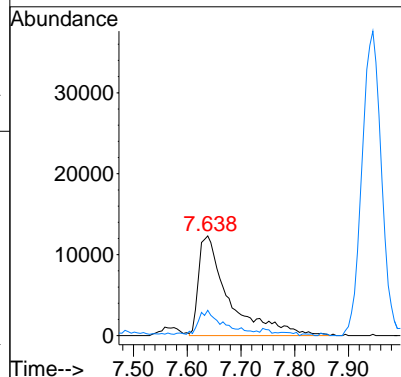
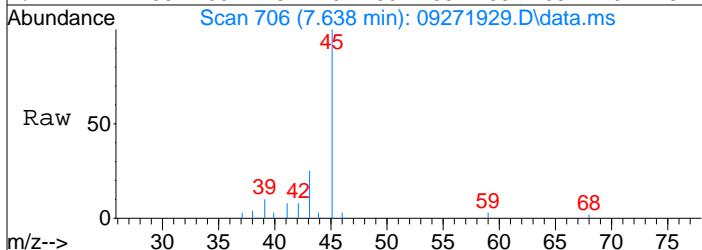
Tgt Ion	Resp	Lower	Upper
101	37471		
101	100		
103	67.8	45.0	85.0





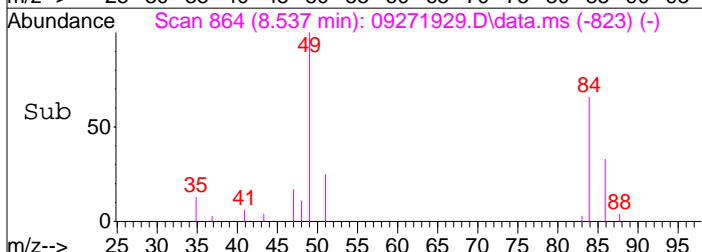
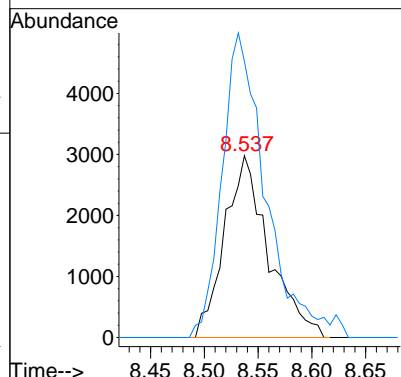
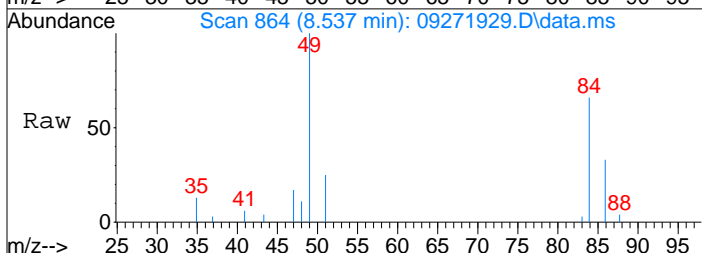
#15
 2-Propanol (Isopropanol)
 Concen: 1.46 ng
 RT: 7.64 min Scan# 706
 Delta R.T. -0.023 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

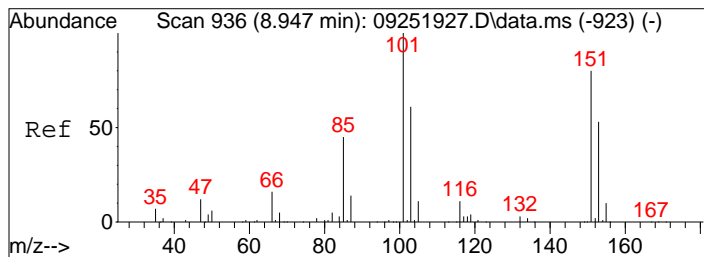
Tgt Ion	Resp	Lower	Upper
45	100		
43	25.7	0.6	40.6



#19
 Methylene Chloride
 Concen: 0.83 ng
 RT: 8.54 min Scan# 864
 Delta R.T. -0.017 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

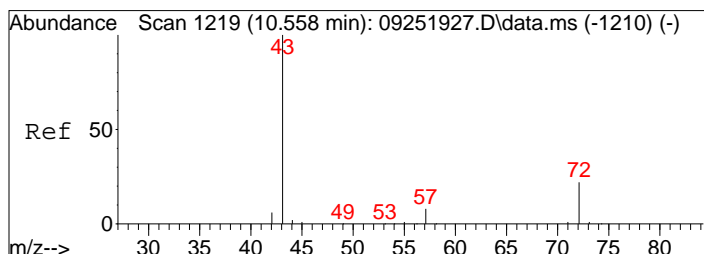
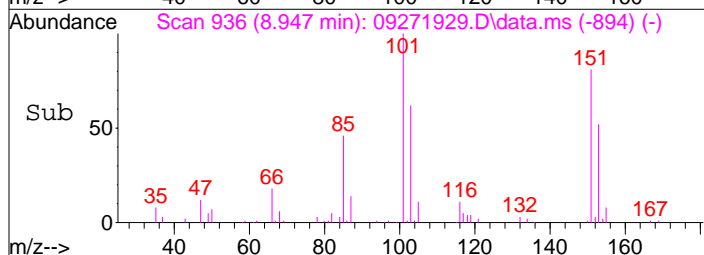
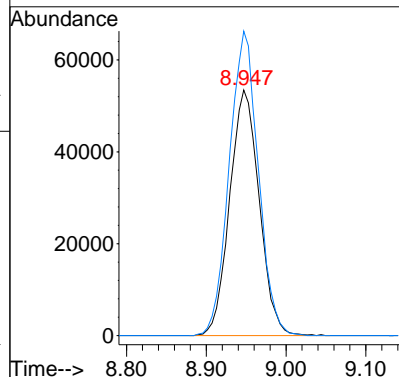
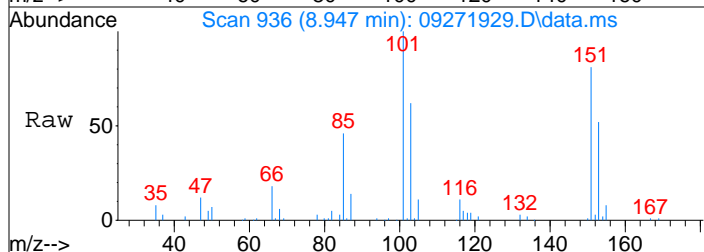
Tgt Ion	Resp	Lower	Upper
84	100		
49	166.4	123.4	173.4





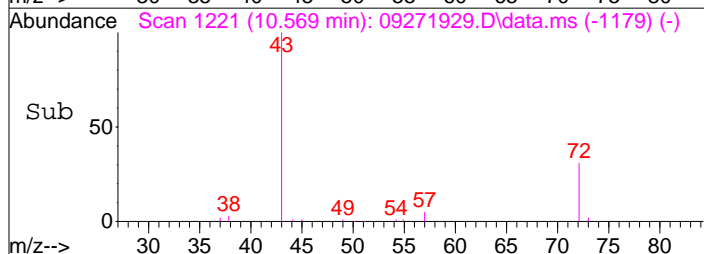
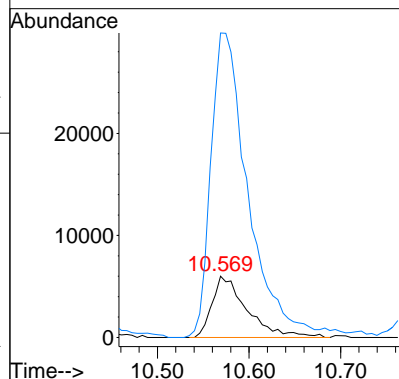
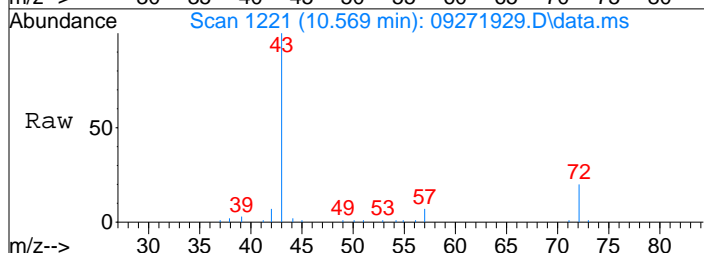
#21
 Trichlorotrifluoroethane
 Concen: 14.16 ng
 RT: 8.95 min Scan# 936
 Delta R.T. -0.011 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

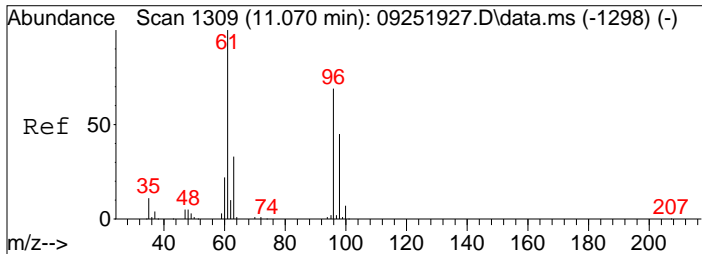
Tgt Ion: 151 Resp: 137652
 Ion Ratio Lower Upper
 151 100
 101 122.0 100.6 140.6



#27
 2-Butanone (MEK)
 Concen: 2.37 ng
 RT: 10.57 min Scan# 1221
 Delta R.T. -0.011 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

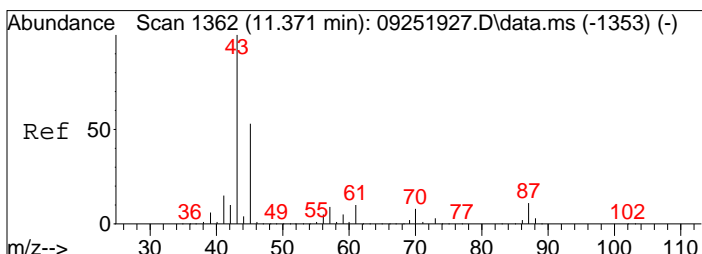
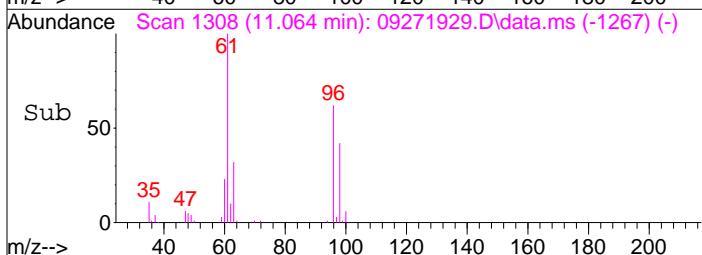
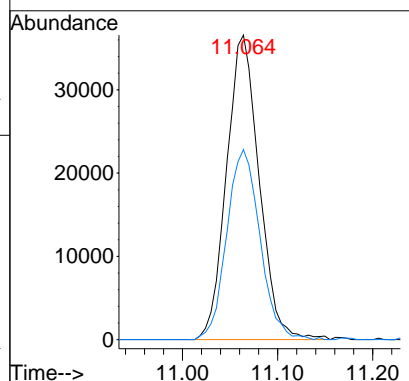
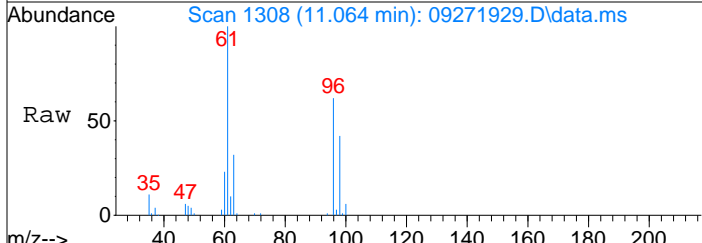
Tgt Ion: 72 Resp: 15856
 Ion Ratio Lower Upper
 72 100
 43 538.3 444.4 484.4#





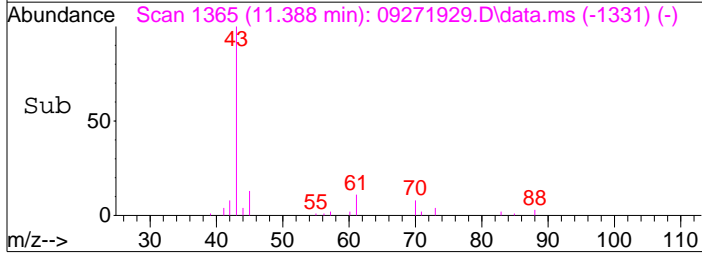
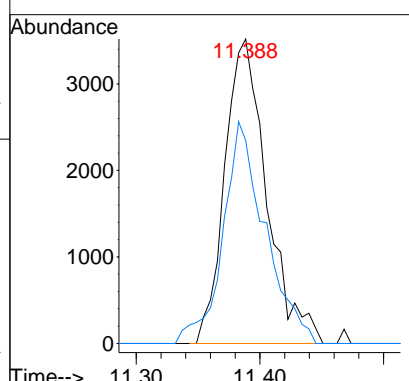
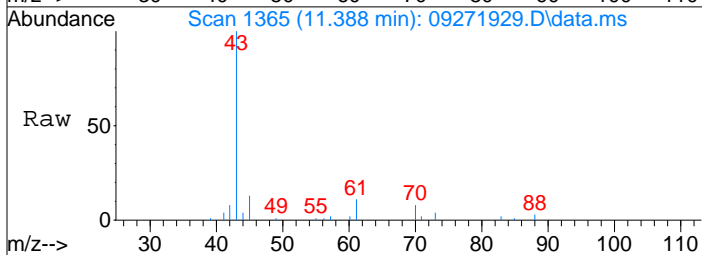
#28
 cis-1,2-Dichloroethene
 Concen: 5.43 ng
 RT: 11.06 min Scan# 1308
 Delta R.T. -0.017 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

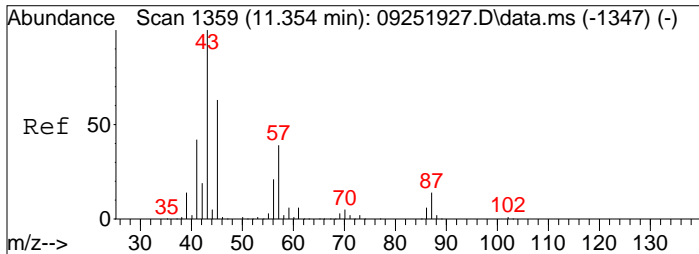
Tgt Ion	Resp	Lower	Upper
61	100		
96	63.4	49.8	89.8



#30
 Ethyl Acetate
 Concen: 2.20 ng
 RT: 11.39 min Scan# 1365
 Delta R.T. -0.006 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

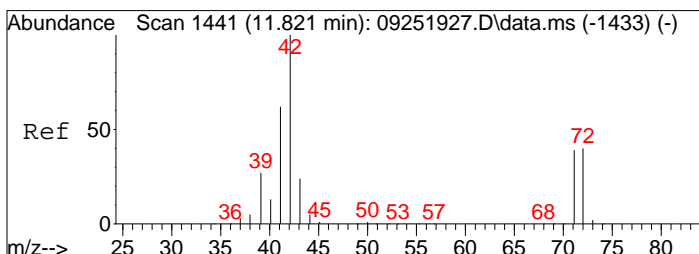
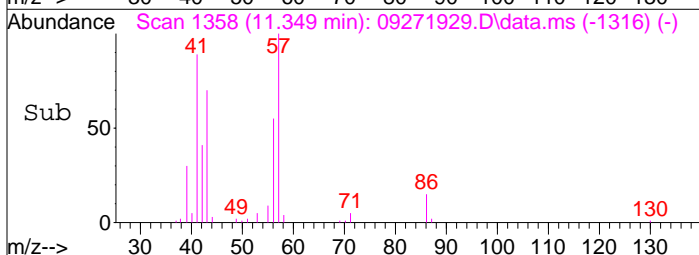
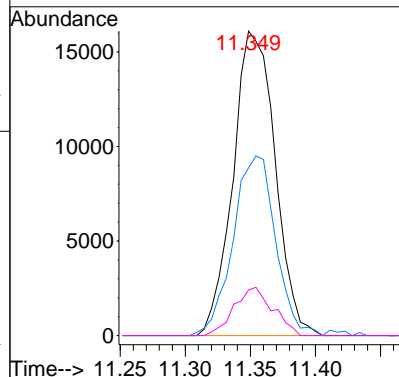
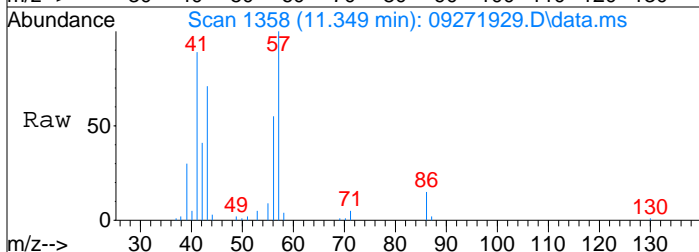
Tgt Ion	Resp	Lower	Upper
61	100		
70	73.0	58.4	98.4





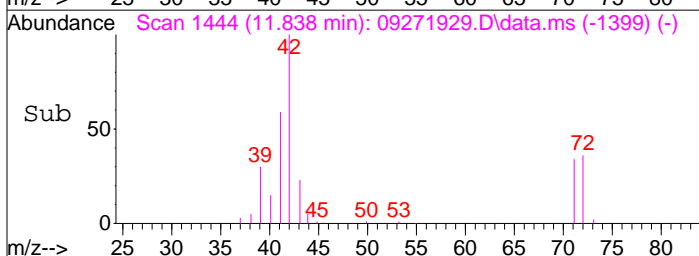
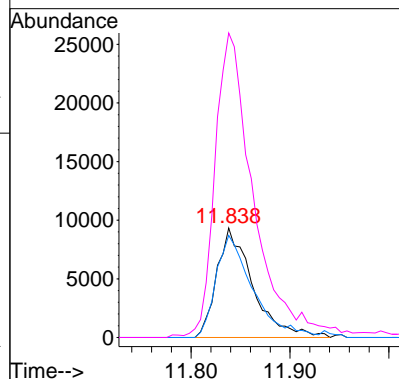
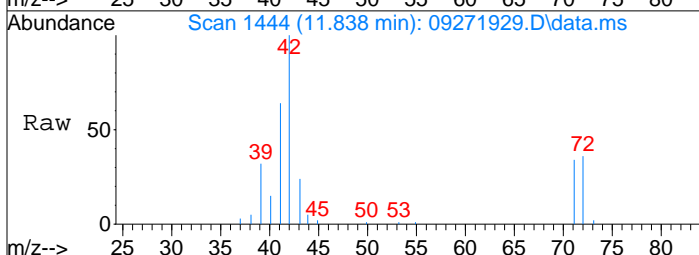
#31
 n-Hexane
 Concen: 1.89 ng
 RT: 11.35 min Scan# 1358
 Delta R.T. -0.011 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

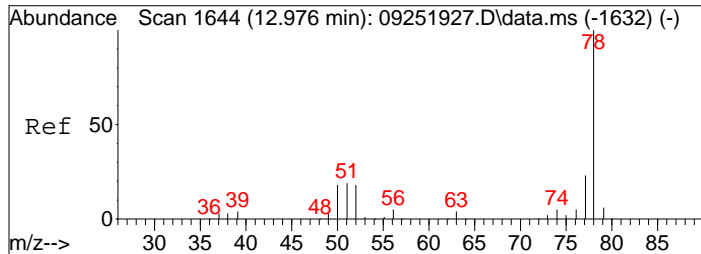
Tgt Ion	Resp	Lower	Upper
57	36263		
57	100		
56	59.5	43.8	65.6
86	14.6	12.2	18.4



#34
 Tetrahydrofuran (THF)
 Concen: 3.41 ng
 RT: 11.84 min Scan# 1444
 Delta R.T. 0.006 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

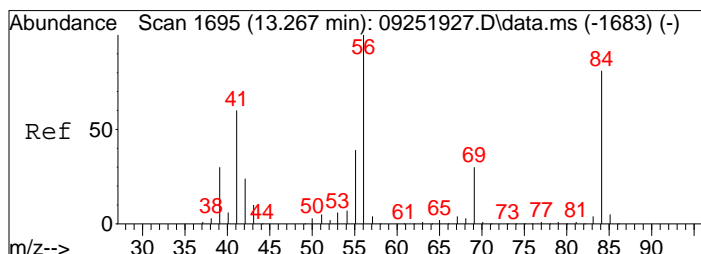
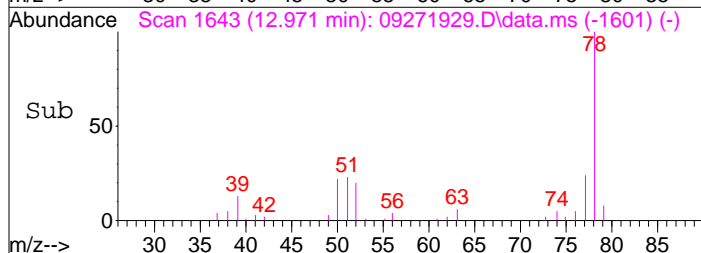
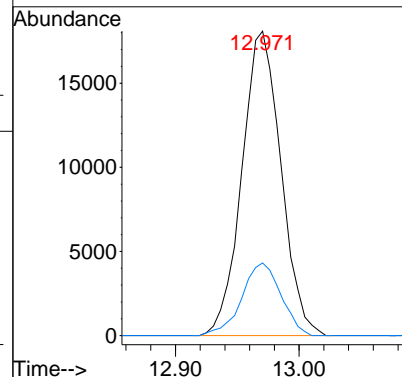
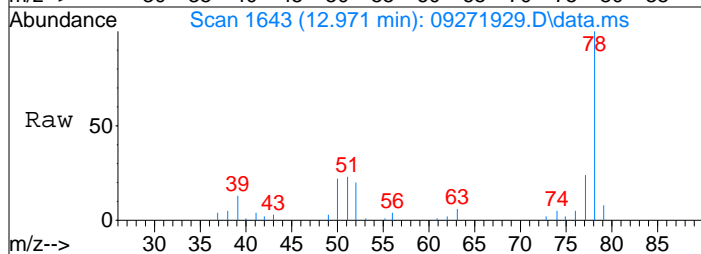
Tgt Ion	Resp	Lower	Upper
72	23633		
72	100		
71	95.5	77.6	117.6
42	304.2	235.1	275.1#





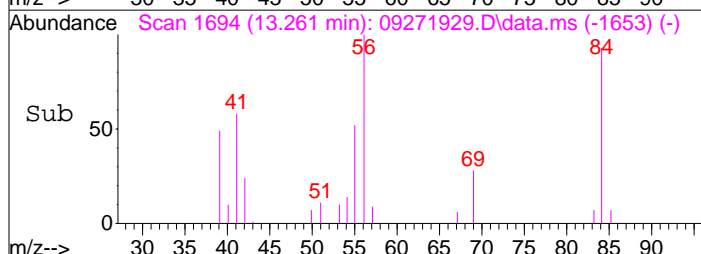
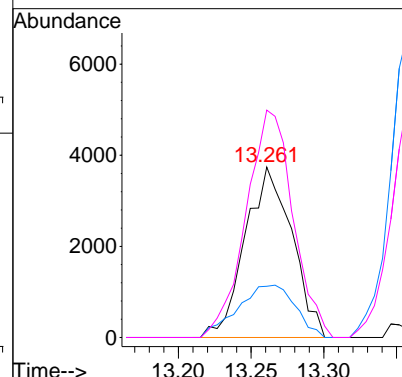
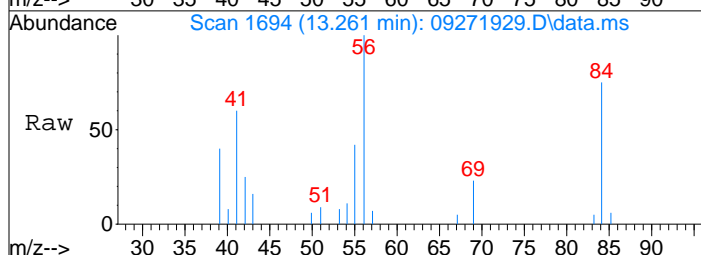
#41
Benzene
Concen: 0.90 ng
RT: 12.97 min Scan# 1643
Delta R.T. -0.011 min
Lab File: 09271929.D
Acq: 27 Sep 2019 19:16

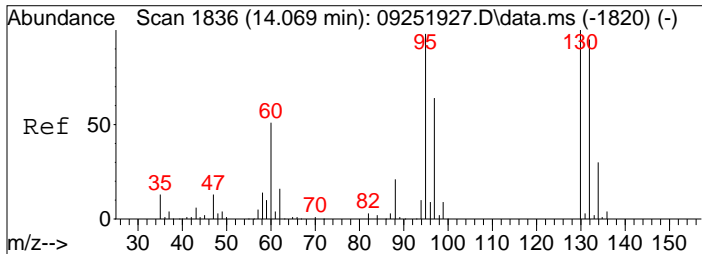
Tgt Ion	Resp	Lower	Upper
78	39751		
78	100		
77	24.0	2.7	42.7



#43
Cyclohexane
Concen: 0.50 ng
RT: 13.26 min Scan# 1694
Delta R.T. -0.017 min
Lab File: 09271929.D
Acq: 27 Sep 2019 19:16

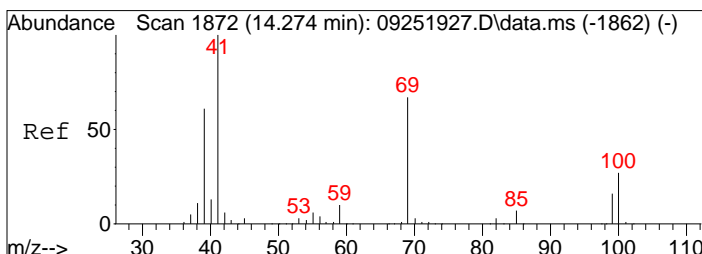
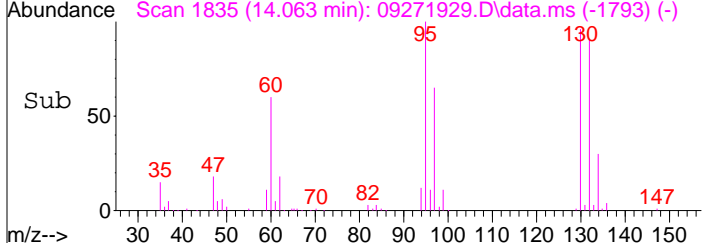
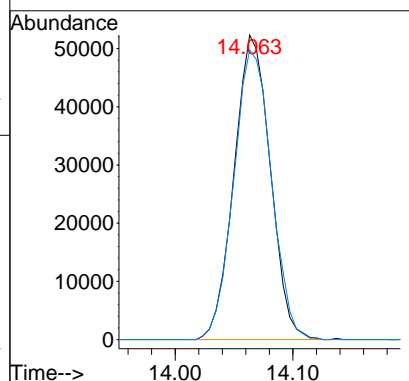
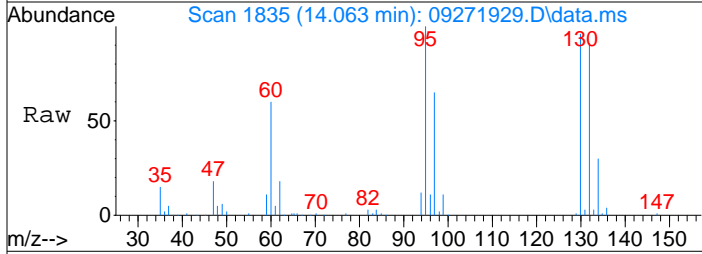
Tgt Ion	Resp	Lower	Upper
84	8379		
84	100		
69	37.7	16.3	56.3
56	133.7	105.1	145.1





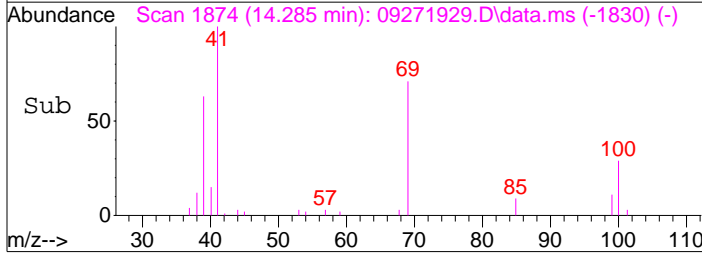
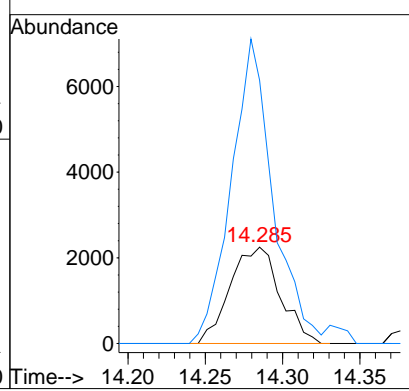
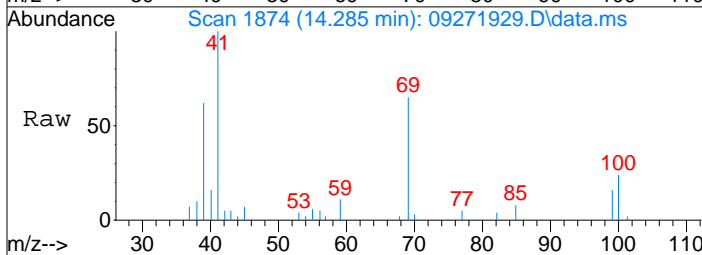
#47
 Trichloroethene
 Concen: 9.76 ng
 RT: 14.06 min Scan# 1835
 Delta R.T. -0.011 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

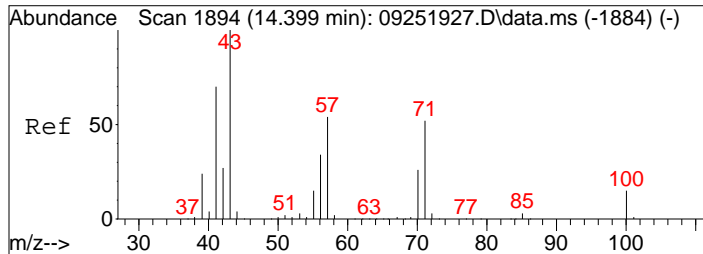
Tgt Ion	Resp	Lower	Upper
130	112062		
130	100		
132	98.8	75.8	115.8



#50
 Methyl Methacrylate
 Concen: 1.14 ng
 RT: 14.29 min Scan# 1874
 Delta R.T. -0.000 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

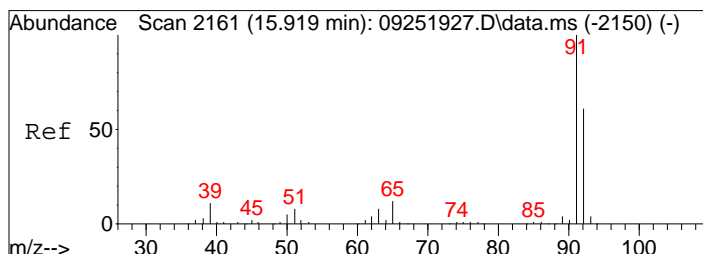
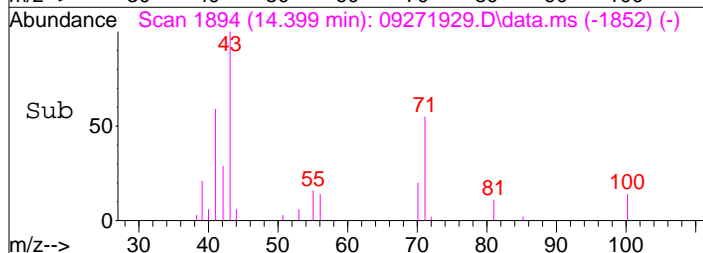
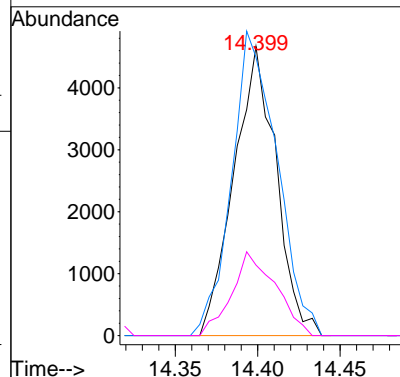
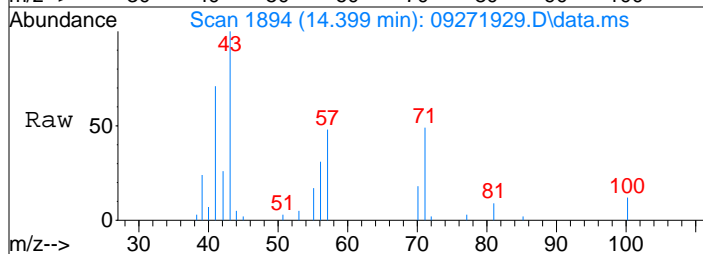
Tgt Ion	Resp	Lower	Upper
100	5078		
100	100		
69	263.2	227.5	267.5





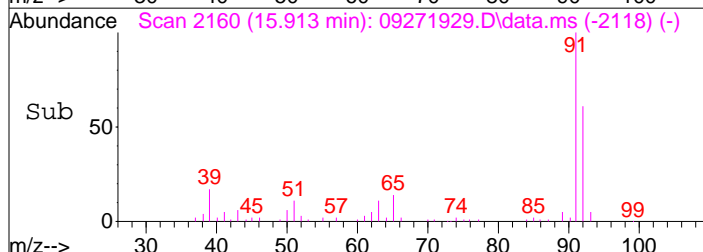
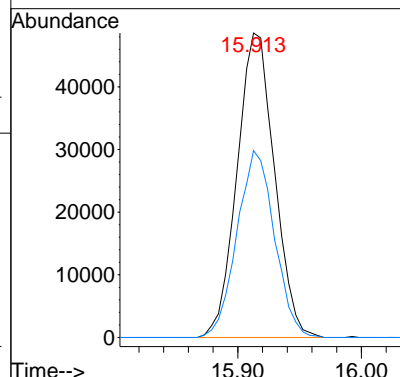
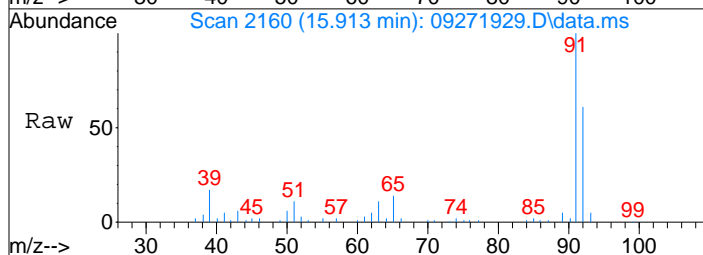
#51
 n-Heptane
 Concen: 0.80 ng
 RT: 14.40 min Scan# 1894
 Delta R.T. -0.011 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

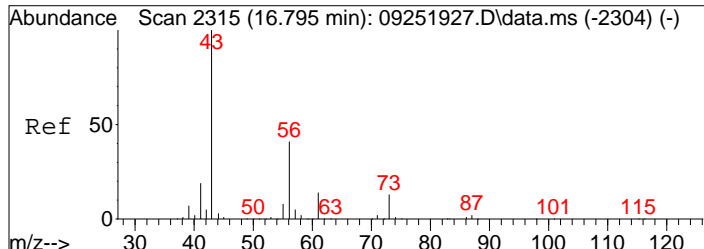
Tgt Ion	Resp	Lower	Upper
71	100		
57	113.1	80.0	120.0
100	30.1	9.1	49.1



#58
 Toluene
 Concen: 2.20 ng
 RT: 15.91 min Scan# 2160
 Delta R.T. -0.011 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

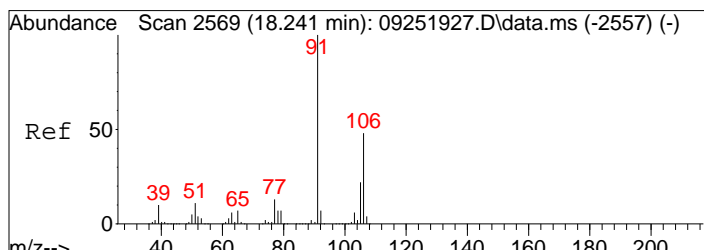
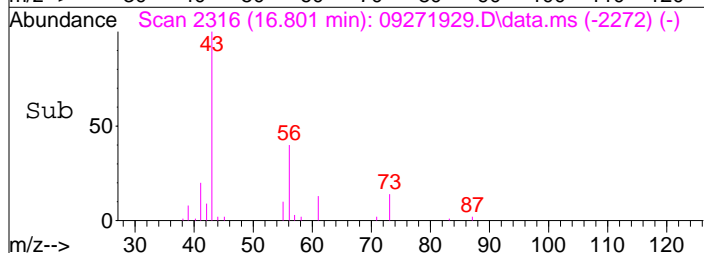
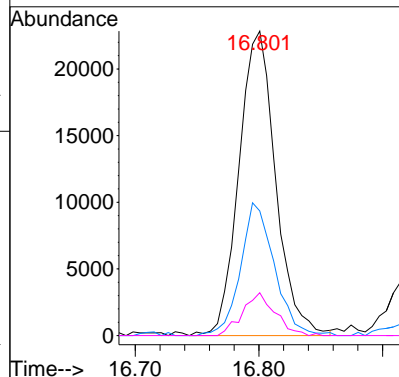
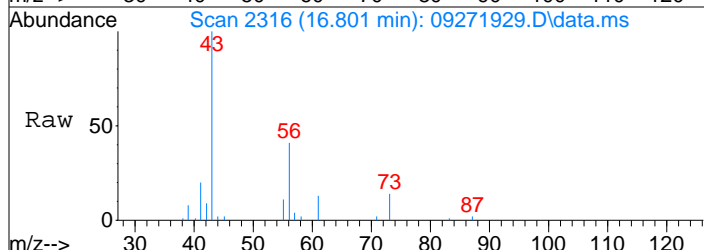
Tgt Ion	Resp	Lower	Upper
91	100		
92	61.6	41.3	81.3





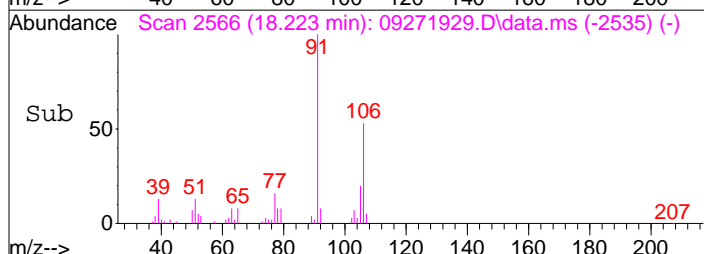
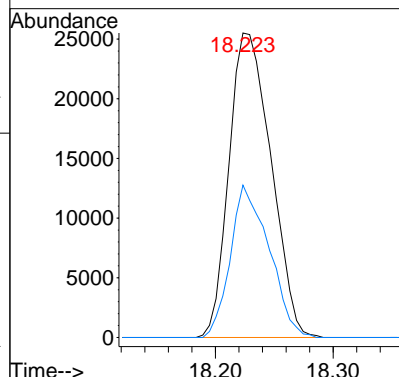
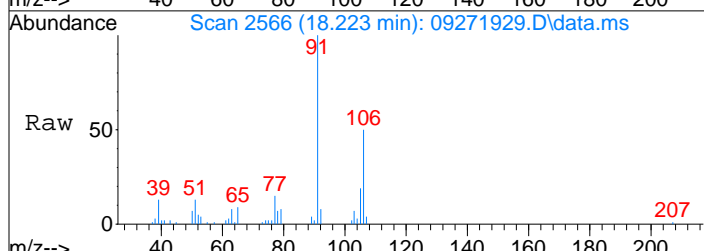
#62
 n-Butyl Acetate
 Concen: 1.67 ng
 RT: 16.80 min Scan# 2316
 Delta R.T. -0.000 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

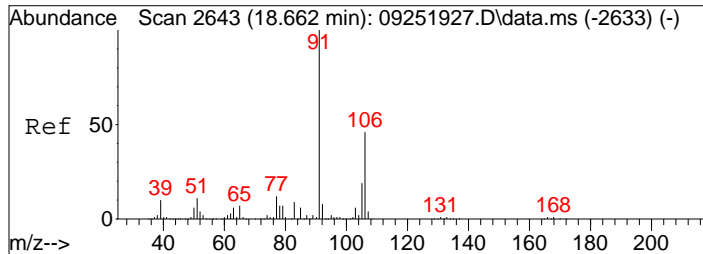
Tgt Ion:	Resp:	Lower	Upper
43	100		
56	40.3	20.5	60.5
73	12.6	0.0	33.0



#67
 m- & p-Xylenes
 Concen: 1.48 ng
 RT: 18.22 min Scan# 2566
 Delta R.T. -0.023 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

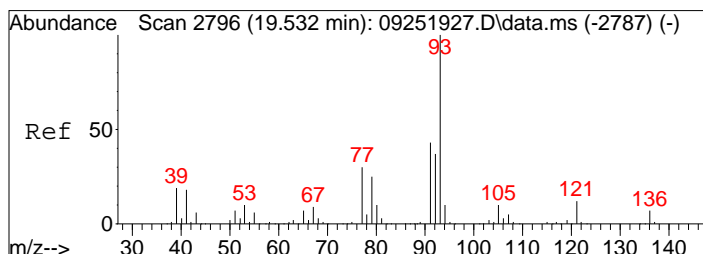
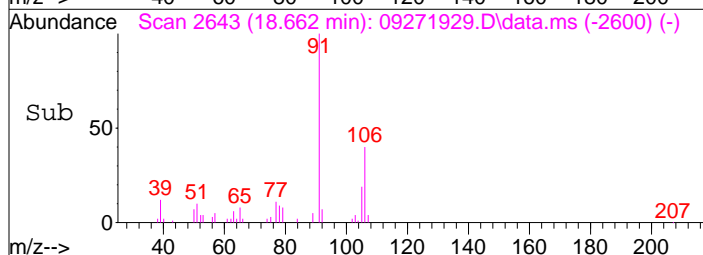
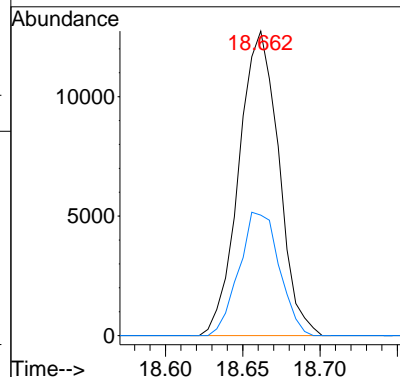
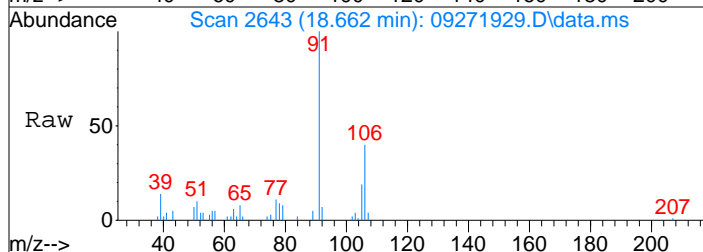
Tgt Ion:	Resp:	Lower	Upper
91	100		
106	46.0	27.8	67.8





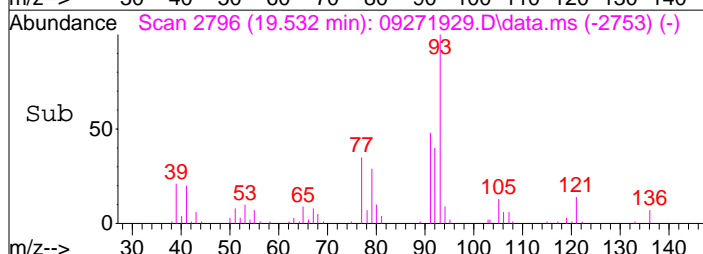
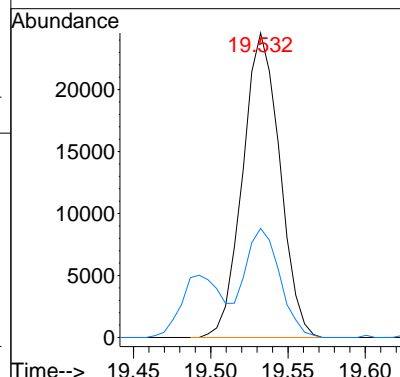
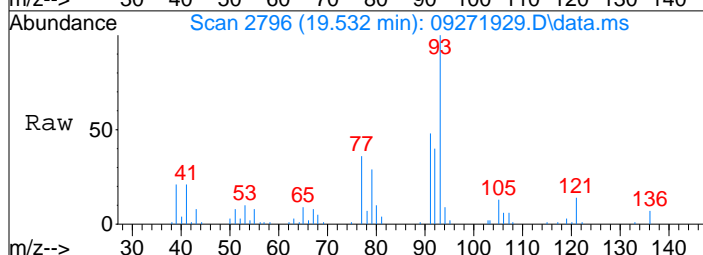
#70
 o-Xylene
 Concen: 0.53 ng
 RT: 18.66 min Scan# 2643
 Delta R.T. -0.006 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

Tgt Ion	Resp	Lower	Upper
91	100		
106	40.8	25.5	65.5



#75
 alpha-Pinene
 Concen: 1.56 ng
 RT: 19.53 min Scan# 2796
 Delta R.T. -0.006 min
 Lab File: 09271929.D
 Acq: 27 Sep 2019 19:16

Tgt Ion	Resp	Lower	Upper
93	100		
77	34.9	11.5	51.5



Data File : I:\MS13\DATA\2019_09\27\09271930.D
 Acq On : 27 Sep 2019 19:50
 Sample : P1905498-004 (1000mL)
 Misc : S31-06261901

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Sep 30 14:40:28 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

 9/30/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	96199	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.36	114	481821	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.68	82	218626	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	255576	16.153	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	129.20%	
57) Toluene-d8 (SS2)	15.82	98	543734	12.209	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.68%	
73) Bromofluorobenzene (SS3)	19.06	174	108703	11.112	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	88.88%	

Target Compounds

						Qvalue
2) Propene	0.00	42	0	N.D.	d	
3) Dichlorodifluoromethan...	4.37	85	66260	2.640	ng	100
4) Chloromethane	4.71	50	2083	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	4.92	135	1236	N.D.		
6) Vinyl Chloride	0.00	62	0	N.D.		
7) 1,3-Butadiene	5.42	54	314	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.45	45	89537	9.724	ng	97
11) Acetonitrile	6.77	41	7729	N.D.		
12) Acrolein	6.92	56	3718	0.537	ng	89
13) Acetone	7.11	58	134369	16.157	ng	# 46
14) Trichlorofluoromethane	7.35	101	36323	1.761	ng	99
15) 2-Propanol (Isopropanol)	7.63	45	65335	2.031	ng	87
16) Acrylonitrile	7.94	53	1380	N.D.		
17) 1,1-Dichloroethene	0.00	96	0	N.D.		
18) 2-Methyl-2-Propanol (t...	8.57	59	3951	N.D.		
19) Methylene Chloride	8.54	84	2656	N.D.		
20) 3-Chloro-1-propene (Al...	8.62	41	2926	N.D.		
21) Trichlorotrifluoroethane	8.95	151	35121	3.721	ng	99
22) Carbon Disulfide	8.84	76	3767	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	10.20	73	905	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	10.57	72	16192	2.493	ng	# 65
28) cis-1,2-Dichloroethene	11.07	61	9290	0.596	ng	92
29) Diisopropyl Ether	11.40	87	129	N.D.		
30) Ethyl Acetate	11.38	61	12284	3.339	ng	86
31) n-Hexane	11.35	57	28632	1.533	ng	98
32) Chloroform	11.41	83	1672	N.D.		
34) Tetrahydrofuran (THF)	11.85	72	18067	2.685	ng	# 76
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.22	62	1462	N.D.		
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.		
39) Isopropyl Acetate	12.97	61	217	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	12.97	78	34676	0.746	ng	99
42) Carbon Tetrachloride	13.13	117	7176	N.D.		
43) Cyclohexane	13.27	84	7370	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	14.03	83	630	N.D.		
47) Trichloroethene	14.07	130	10969	0.905	ng	96
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	
50) Methyl Methacrylate	14.29	100	5348	1.138	ng	# 78

65 of 144

Data File : I:\MS13\DATA\2019_09\27\09271930.D
 Acq On : 27 Sep 2019 19:50
 Sample : P1905498-004 (1000mL)
 Misc : S31-06261901

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Sep 30 14:40:28 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

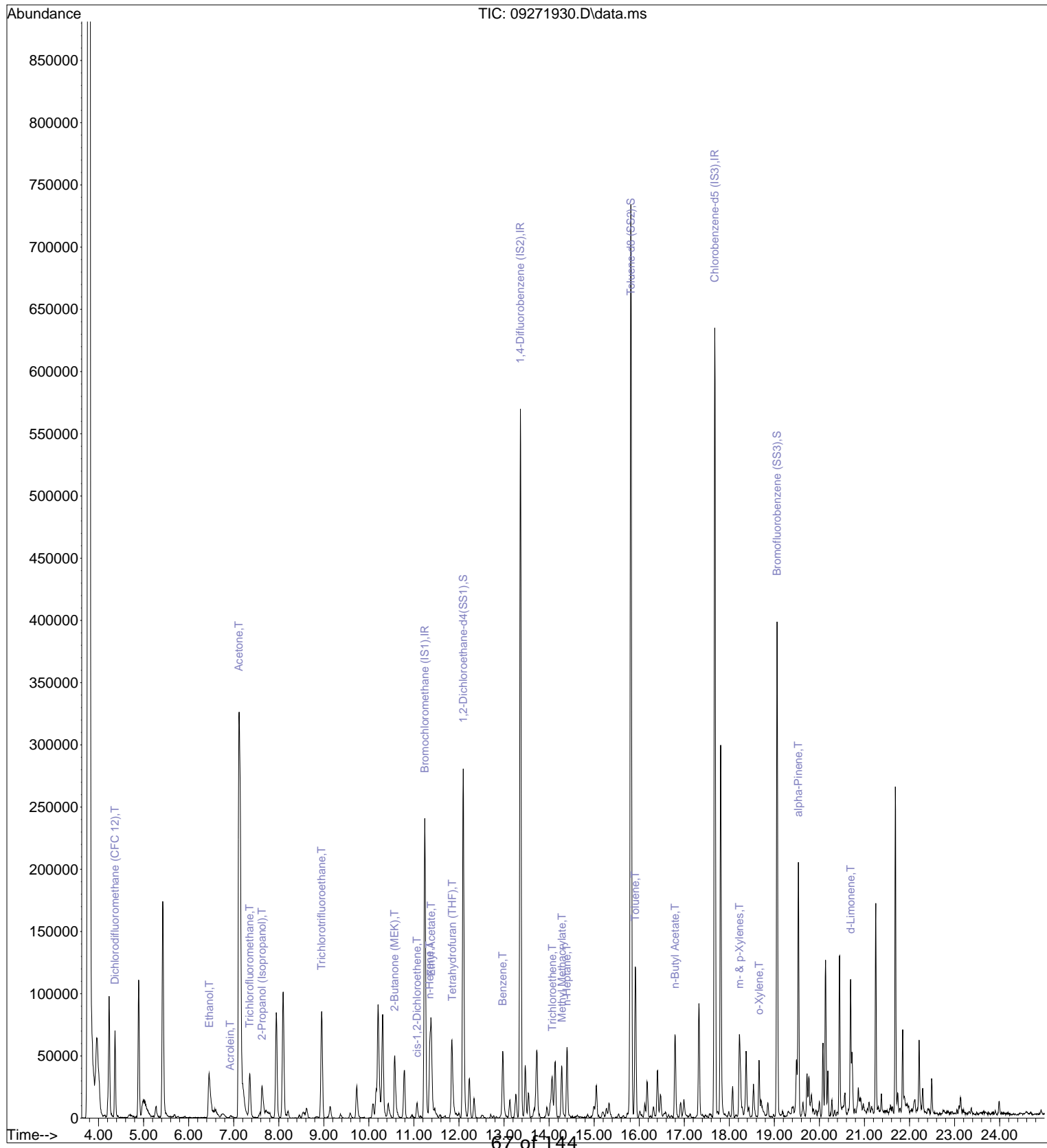
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	12022	1.097	ng	97
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	14.99	58	2007	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	15.91	91	88902	1.839	ng	99
59) 2-Hexanone	16.18	43	5653	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.79	43	62205	2.125	ng	96
63) n-Octane	16.91	57	2365	N.D.		
64) Tetrachloroethene	17.07	166	346	N.D.		
65) Chlorobenzene	17.75	112	135	N.D.		
66) Ethylbenzene	18.07	91	18677	N.D.		
67) m- & p-Xylenes	18.22	91	54754	1.235	ng	96
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.57	104	2420	N.D.		
70) o-Xylene	18.66	91	22331	0.503	ng	97
71) n-Nonane	18.85	43	4602	N.D.		
72) 1,1,2,2-Tetrachloroethane	18.70	83	109	N.D.		
74) Cumene	19.18	105	2097	N.D.		
75) alpha-Pinene	19.53	93	75055	2.751	ng	99
76) n-Propylbenzene	19.63	91	5308	N.D.		
77) 3-Ethyltoluene	19.73	105	12603	N.D.		
78) 4-Ethyltoluene	19.76	105	5353	N.D.		
79) 1,3,5-Trimethylbenzene	19.83	105	4055	N.D.		
80) alpha-Methylstyrene	19.96	118	616	N.D.		
81) 2-Ethyltoluene	19.99	105	4831	N.D.		
82) 1,2,4-Trimethylbenzene	20.19	105	17365	N.D.		
83) n-Decane	20.28	57	4233	N.D.		
84) Benzyl Chloride	20.40	91	850	N.D.		
85) 1,3-Dichlorobenzene	20.38	146	558	N.D.		
86) 1,4-Dichlorobenzene	20.38	146	558	N.D.		
87) sec-Butylbenzene	20.43	105	712	N.D.		
88) 4-Isopropyltoluene (p-...	20.57	119	3816	N.D.		
89) 1,2,3-Trimethylbenzene	20.57	105	5108	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	20.69	68	23047	1.405	ng	# 38
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	21.38	57	5123	N.D.		
94) 1,2,4-Trichlorobenzene	22.20	180	123	N.D.		
95) Naphthalene	22.30	128	4822	N.D.		
96) n-Dodecane	22.29	57	5357	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.	d	
99) tert-Butylbenzene	20.18	119	2057	N.D.		
100) n-Butylbenzene	20.93	91	3488	N.D.		

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

Data File : I:\MS13\DATA\2019_09\27\09271930.D
 Acq On : 27 Sep 2019 19:50
 Sample : P1905498-004 (1000mL)
 Misc : S31-06261901

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Sep 30 14:40:28 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019_09\27\09271930.D
 Acq On : 27 Sep 2019 19:50
 Sample : P1905498-004 (1000mL)
 Misc : S31-06261901

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Sep 30 14:40:28 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

WA 9/30/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	96199	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.36	114	481821	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.68	82	218626	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	255576	16.153	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	129.20%	
57) Toluene-d8 (SS2)	15.82	98	543734	12.209	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.68%	
73) Bromofluorobenzene (SS3)	19.06	174	108703	11.112	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	88.88%	

Target Compounds

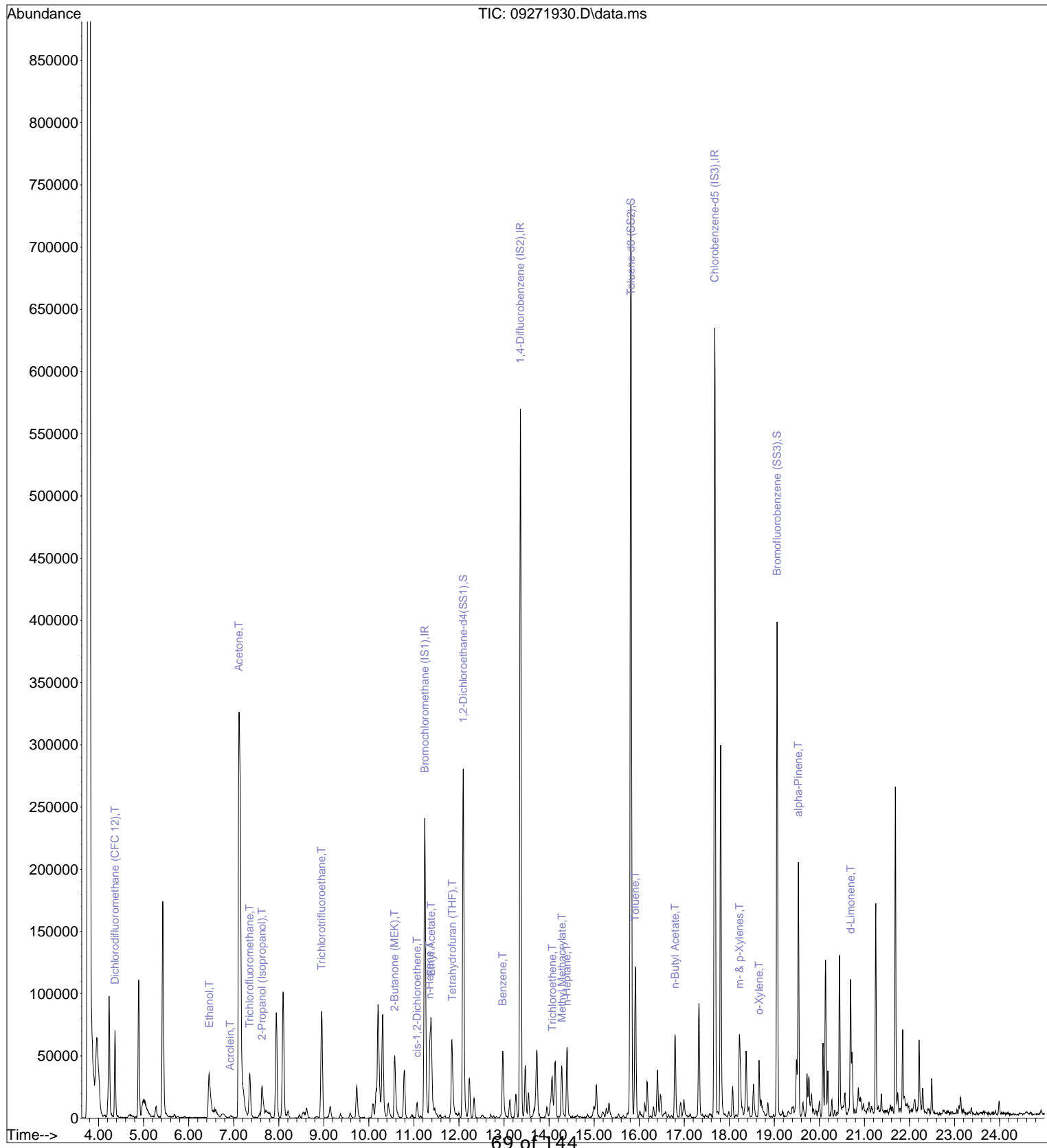
	R.T.	QIon	Response	Conc	Units	Qvalue
3) Dichlorodifluoromethan...	4.37	85	66260	2.640	ng	100
10) Ethanol	6.45	45	89537	9.724	ng	97
12) Acrolein	6.92	56	3718	0.537	ng	89
13) Acetone	7.11	58	134369	16.157	ng	# 46
14) Trichlorofluoromethane	7.35	101	36323	1.761	ng	99
15) 2-Propanol (Isopropanol)	7.63	45	65335	2.031	ng	87
21) Trichlorotrifluoroethane	8.95	151	35121	3.721	ng	99
27) 2-Butanone (MEK)	10.57	72	16192	2.493	ng	# 65
28) cis-1,2-Dichloroethene	11.07	61	9290	0.596	ng	92
30) Ethyl Acetate	11.38	61	12284	3.339	ng	86
31) n-Hexane	11.35	57	28632	1.533	ng	98
34) Tetrahydrofuran (THF)	11.85	72	18067	2.685	ng	# 76
41) Benzene	12.97	78	34676	0.746	ng	99
47) Trichloroethene	14.07	130	10969	0.905	ng	96
50) Methyl Methacrylate	14.29	100	5348	1.138	ng	# 78
51) n-Heptane	14.39	71	12022	1.097	ng	97
58) Toluene	15.91	91	88902	1.839	ng	99
62) n-Butyl Acetate	16.79	43	62205	2.125	ng	96
67) m- & p-Xylenes	18.22	91	54754	1.235	ng	96
70) o-Xylene	18.66	91	22331	0.503	ng	97
75) alpha-Pinene	19.53	93	75055	2.751	ng	99
91) d-Limonene	20.69	68	23047	1.405	ng	# 38

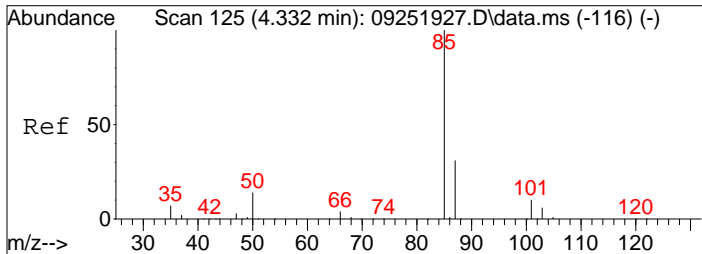
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2019_09\27\09271930.D
 Acq On : 27 Sep 2019 19:50
 Sample : P1905498-004 (1000mL)
 Misc : S31-06261901

Vial: 4
 Operator: WA
 Inst : MS13

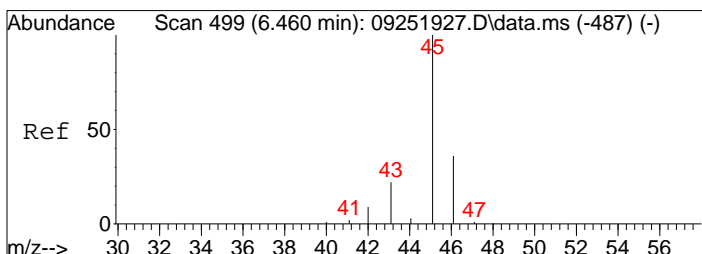
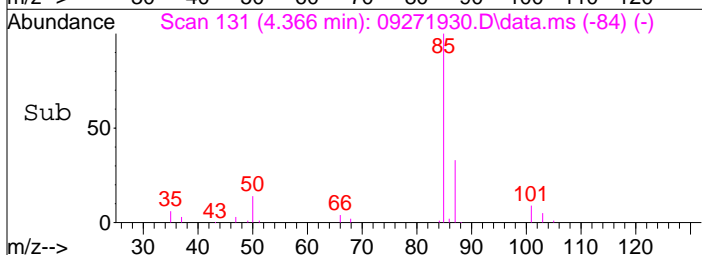
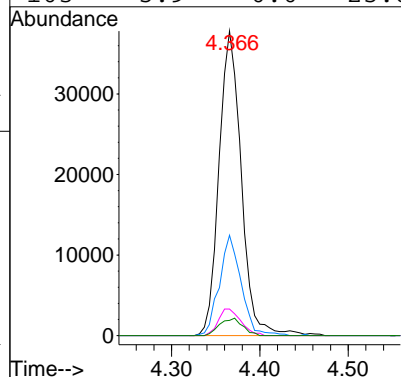
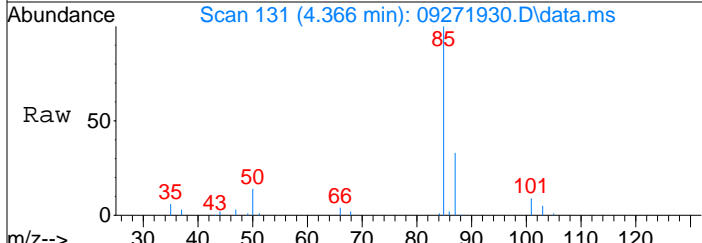
Quant Time: Sep 30 14:40:28 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M





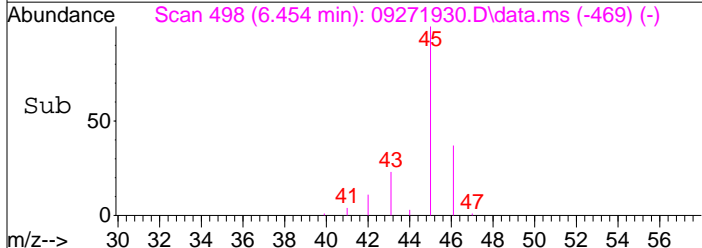
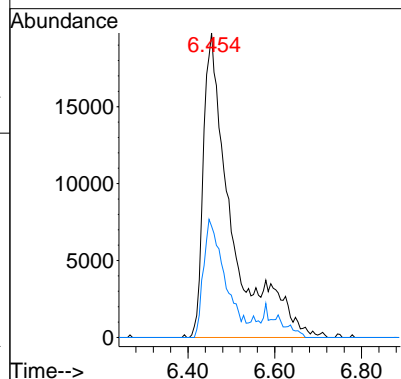
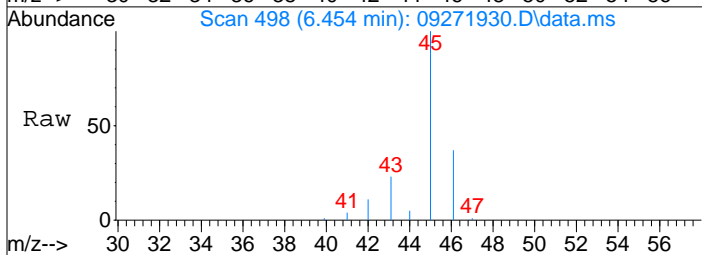
#3
 Dichlorodifluoromethane (CFC 12)
 Concen: 2.64 ng
 RT: 4.37 min Scan# 131
 Delta R.T. 0.017 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

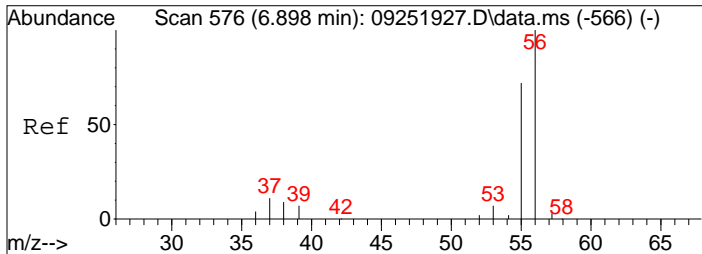
Tgt Ion	Resp	Lower	Upper
85	100		
87	32.1	12.1	52.1
101	8.9	0.0	29.3
103	5.9	0.0	25.8



#10
 Ethanol
 Concen: 9.72 ng
 RT: 6.45 min Scan# 498
 Delta R.T. -0.085 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

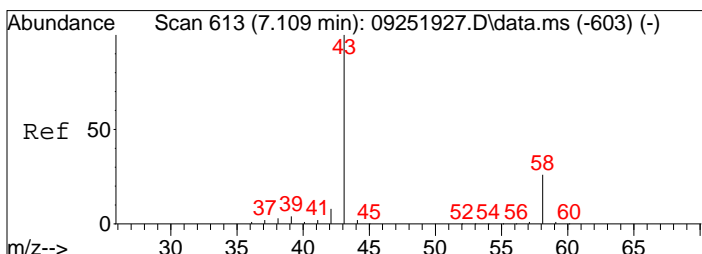
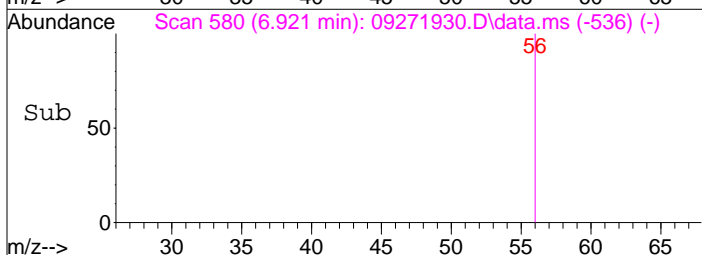
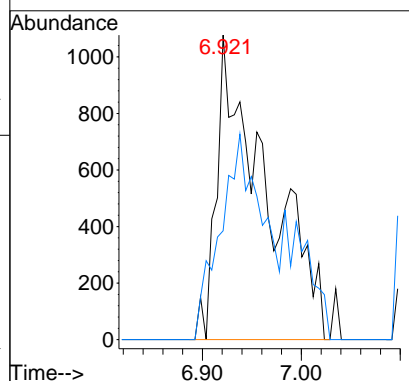
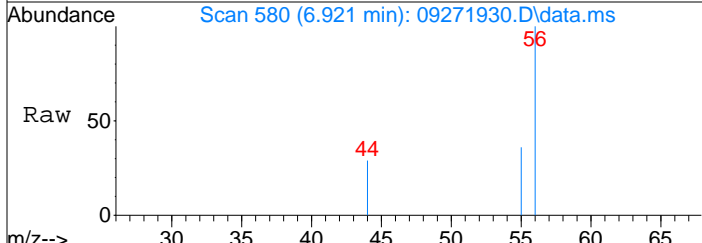
Tgt Ion	Resp	Lower	Upper
45	100		
46	37.8	16.3	56.3





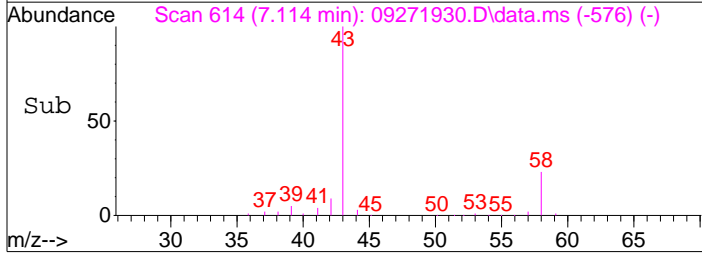
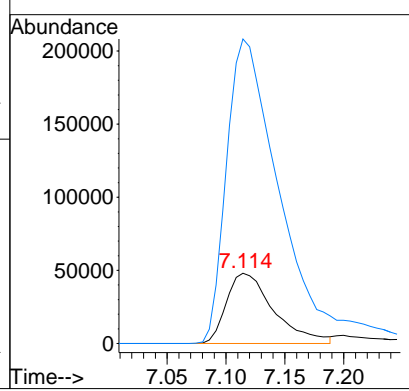
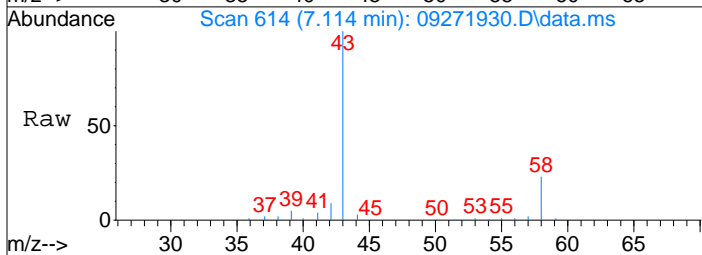
#12
 Acrolein
 Concen: 0.54 ng
 RT: 6.92 min Scan# 580
 Delta R.T. -0.000 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

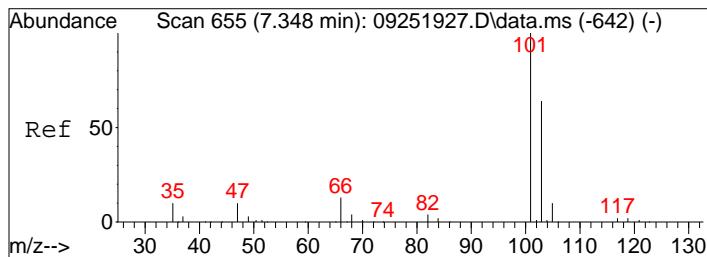
Tgt Ion	Resp	Lower	Upper
56	100		
55	79.6	50.7	90.7



#13
 Acetone
 Concen: 16.16 ng
 RT: 7.11 min Scan# 614
 Delta R.T. -0.034 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

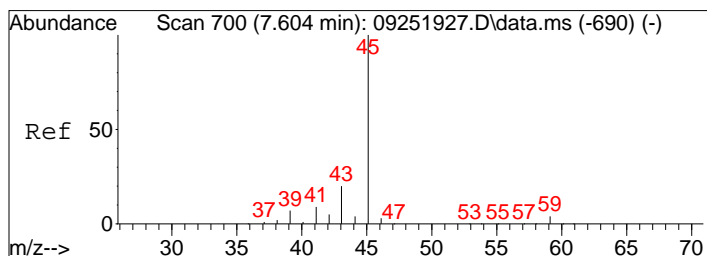
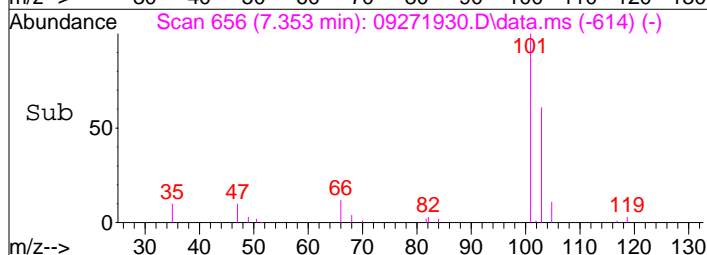
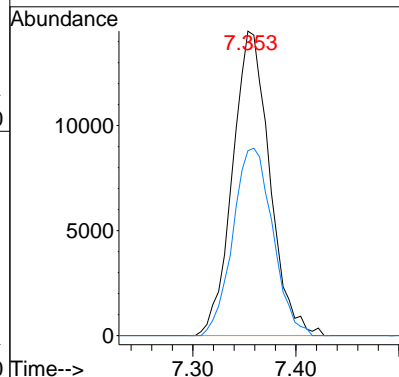
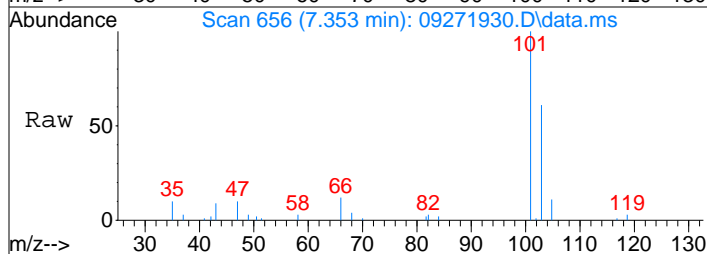
Tgt Ion	Resp	Lower	Upper
58	100		
43	509.5	354.6	414.6#





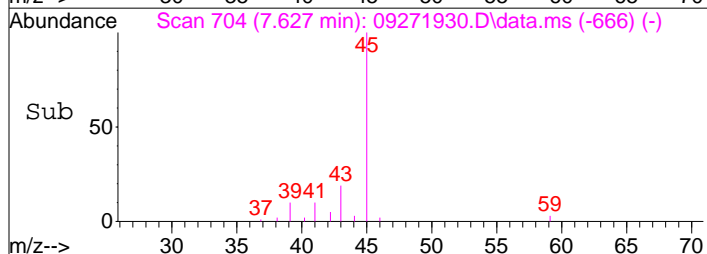
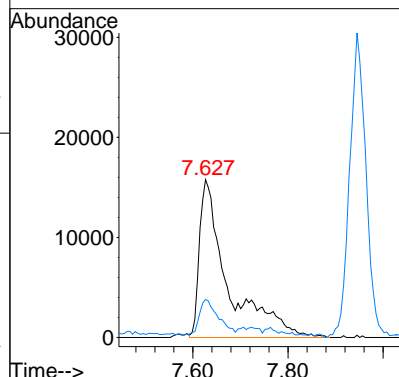
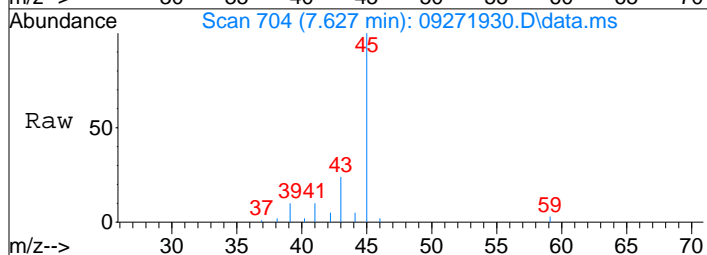
#14
 Trichlorofluoromethane
 Concen: 1.76 ng
 RT: 7.35 min Scan# 656
 Delta R.T. -0.012 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

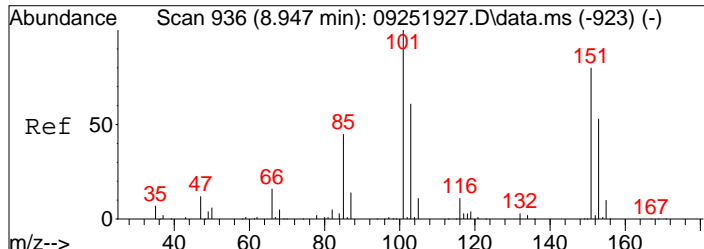
Tgt Ion	Resp	Lower	Upper
101	100		
103	65.9	45.0	85.0



#15
 2-Propanol (Isopropanol)
 Concen: 2.03 ng
 RT: 7.63 min Scan# 704
 Delta R.T. -0.034 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

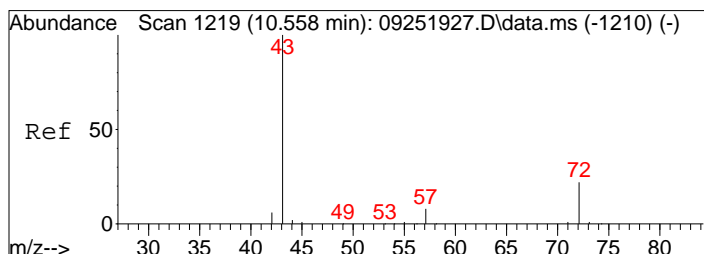
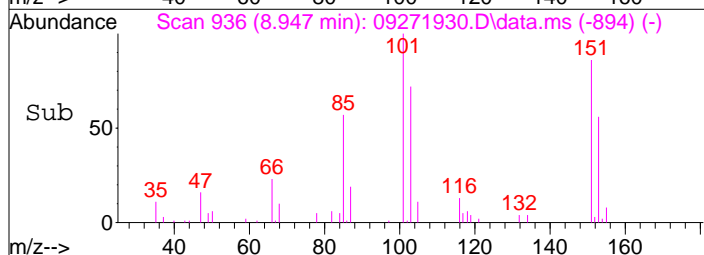
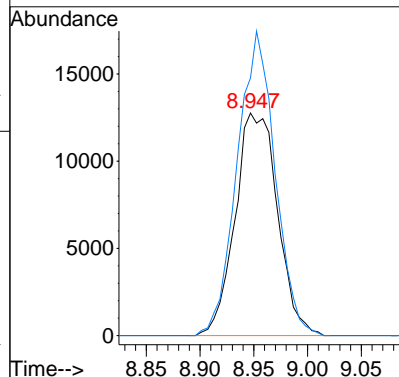
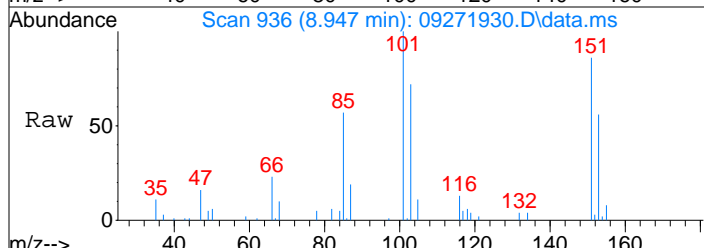
Tgt Ion	Resp	Lower	Upper
45	100		
43	26.6	0.6	40.6





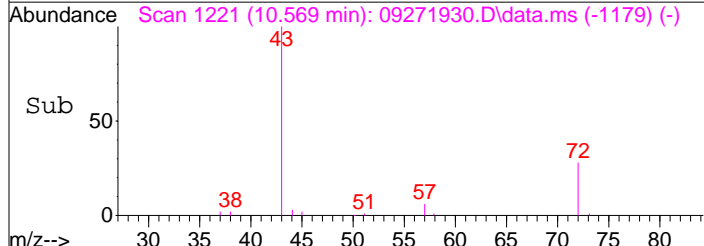
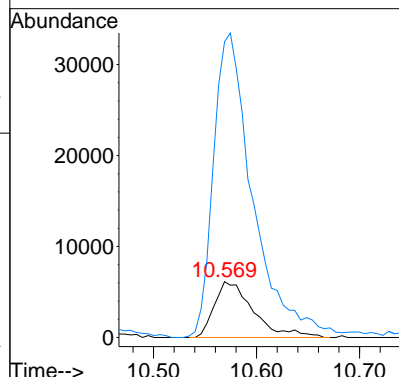
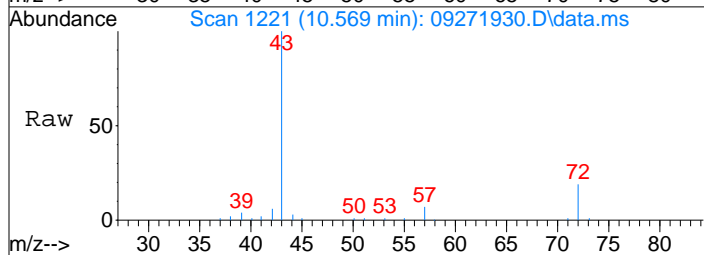
#21
 Trichlorotrifluoroethane
 Concen: 3.72 ng
 RT: 8.95 min Scan# 936
 Delta R.T. -0.011 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

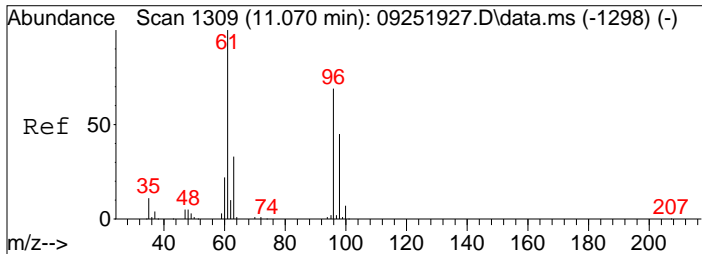
Tgt Ion: 151 Resp: 35121
 Ion Ratio Lower Upper
 151 100
 101 122.0 100.6 140.6



#27
 2-Butanone (MEK)
 Concen: 2.49 ng
 RT: 10.57 min Scan# 1221
 Delta R.T. -0.011 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

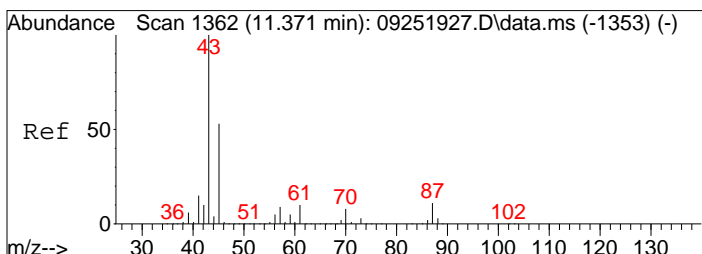
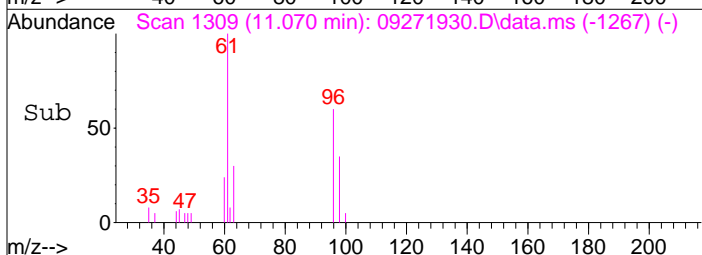
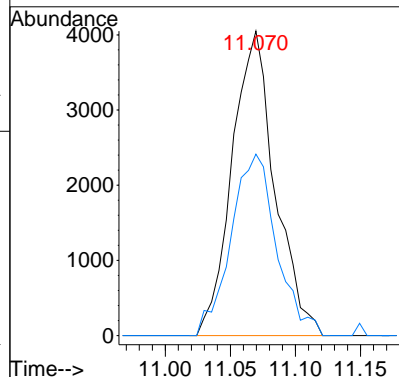
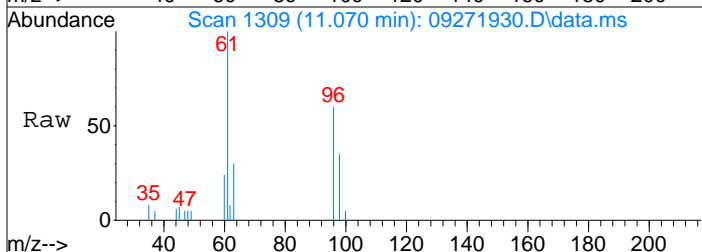
Tgt Ion: 72 Resp: 16192
 Ion Ratio Lower Upper
 72 100
 43 557.4 444.4 484.4#





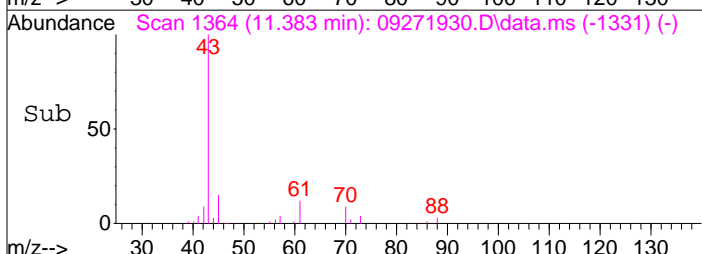
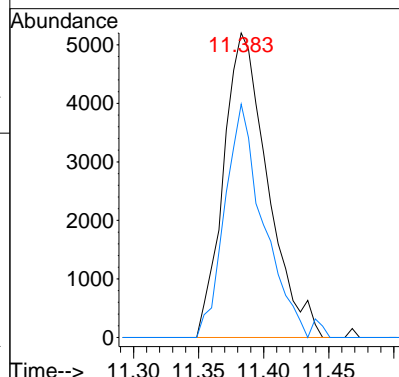
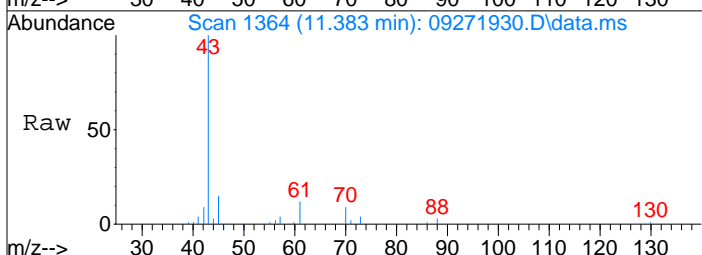
#28
 cis-1,2-Dichloroethene
 Concen: 0.60 ng
 RT: 11.07 min Scan# 1309
 Delta R.T. -0.012 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

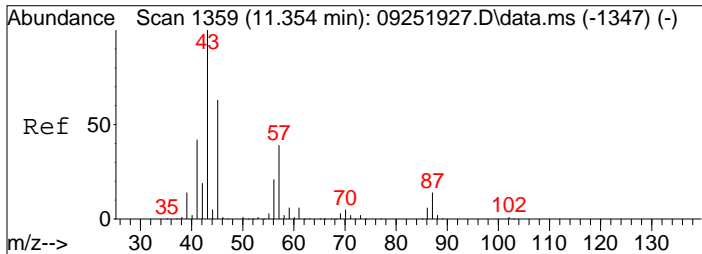
Tgt Ion	Resp	Lower	Upper
61	100		
96	63.4	49.8	89.8



#30
 Ethyl Acetate
 Concen: 3.34 ng
 RT: 11.38 min Scan# 1364
 Delta R.T. -0.011 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

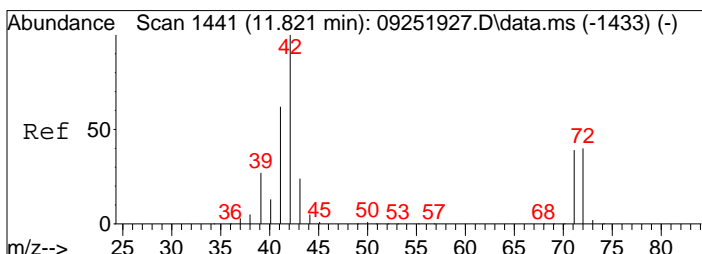
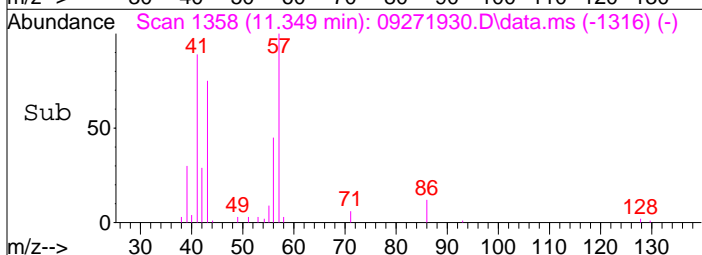
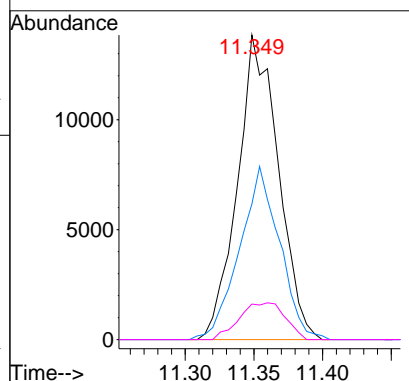
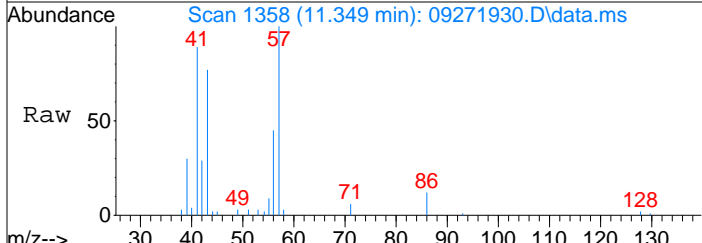
Tgt Ion	Resp	Lower	Upper
61	100		
70	66.6	58.4	98.4





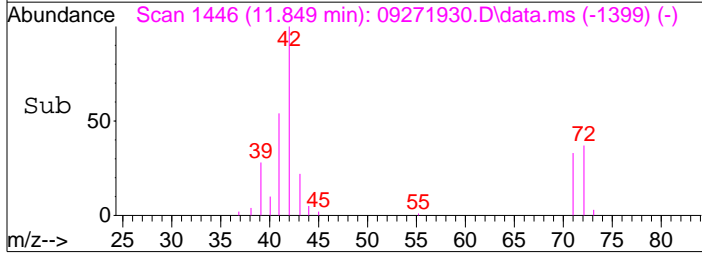
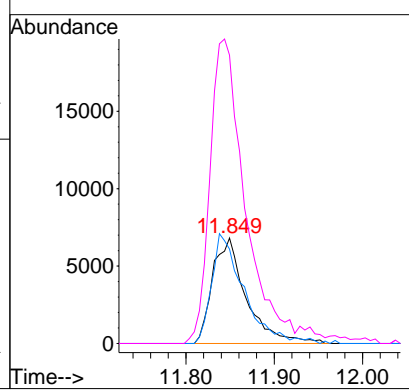
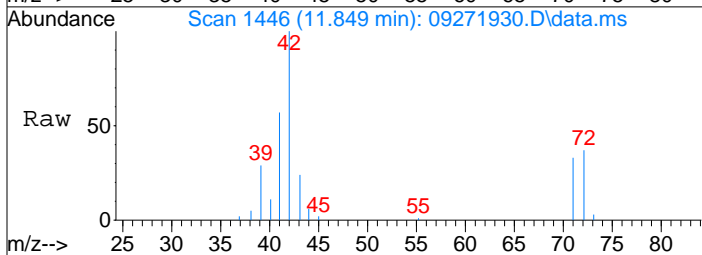
#31
 n-Hexane
 Concen: 1.53 ng
 RT: 11.35 min Scan# 1358
 Delta R.T. -0.011 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

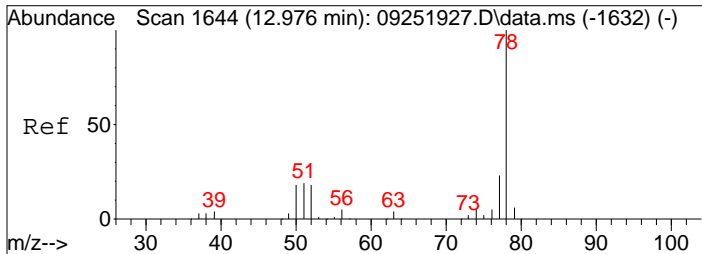
Tgt Ion:	Resp:	Lower	Upper
57	100		
56	55.7	43.8	65.6
86	13.6	12.2	18.4



#34
 Tetrahydrofuran (THF)
 Concen: 2.68 ng
 RT: 11.85 min Scan# 1446
 Delta R.T. 0.017 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

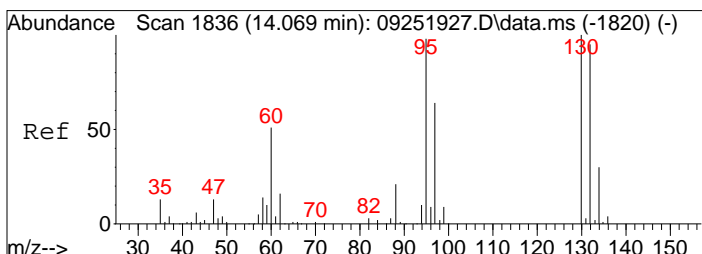
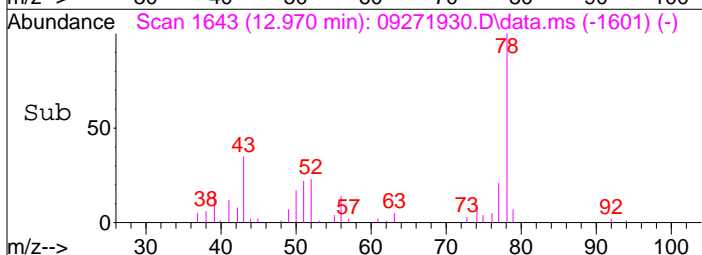
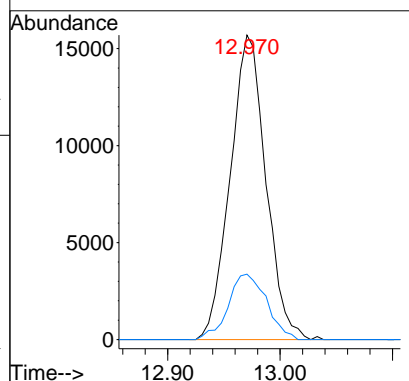
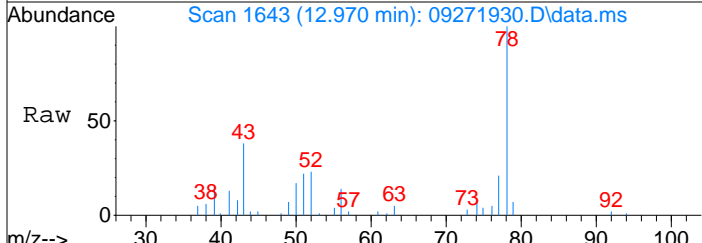
Tgt Ion:	Resp:	Lower	Upper
72	100		
71	100.0	77.6	117.6
42	313.2	235.1	275.1#





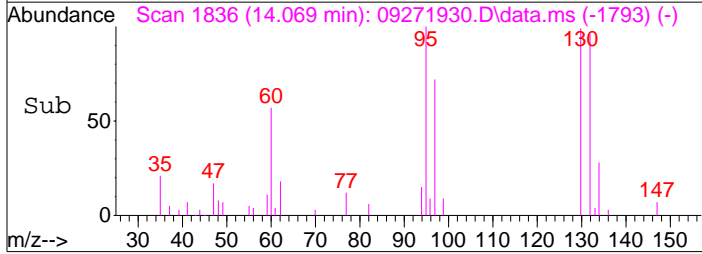
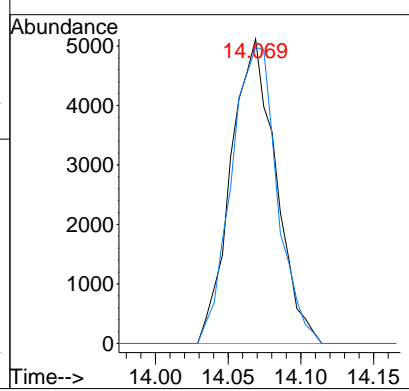
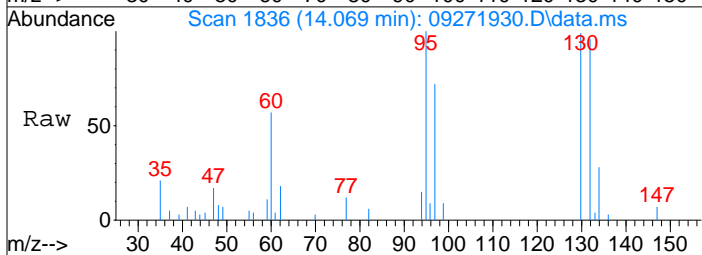
#41
Benzene
Concen: 0.75 ng
RT: 12.97 min Scan# 1643
Delta R.T. -0.011 min
Lab File: 09271930.D
Acq: 27 Sep 2019 19:50

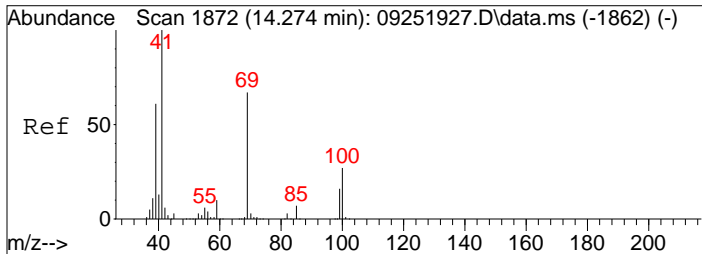
Tgt Ion	Resp	Lower	Upper
78	100		
77	23.1	2.7	42.7



#47
Trichloroethene
Concen: 0.91 ng
RT: 14.07 min Scan# 1836
Delta R.T. -0.006 min
Lab File: 09271930.D
Acq: 27 Sep 2019 19:50

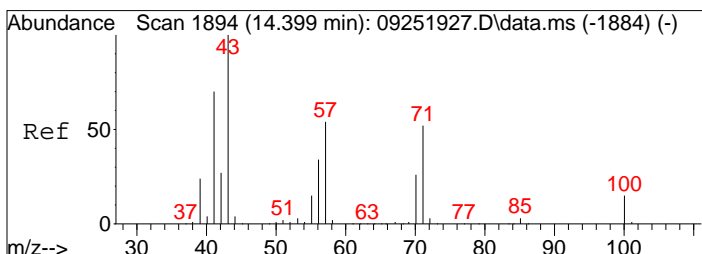
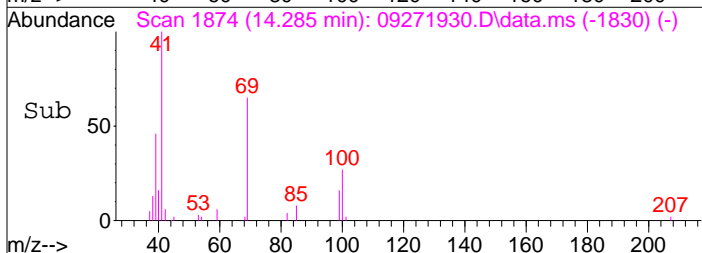
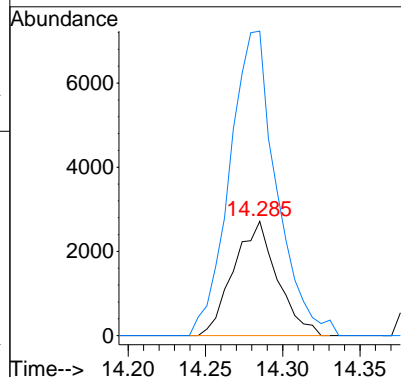
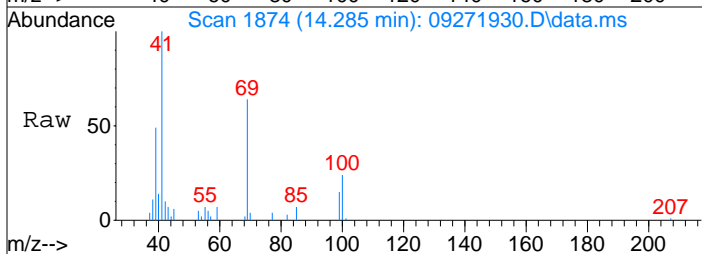
Tgt Ion	Resp	Lower	Upper
130	100		
132	99.4	75.8	115.8





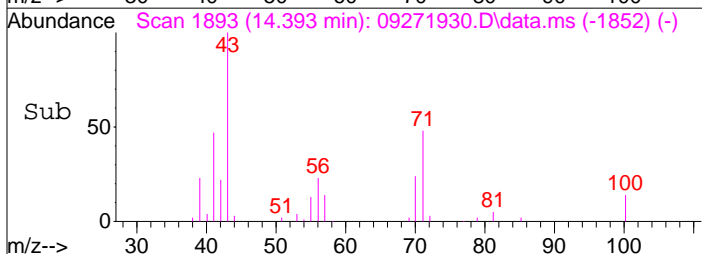
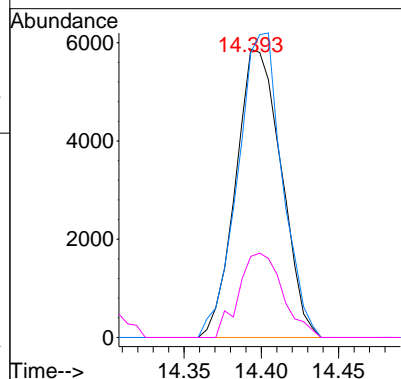
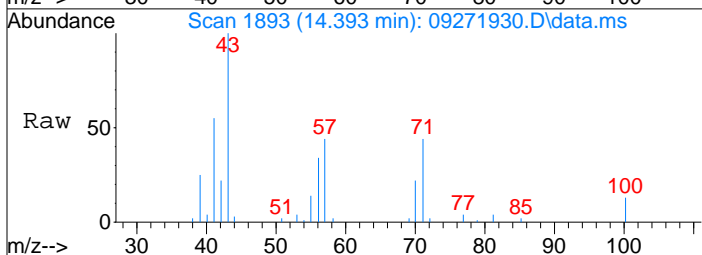
#50
 Methyl Methacrylate
 Concen: 1.14 ng
 RT: 14.29 min Scan# 1874
 Delta R.T. -0.000 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

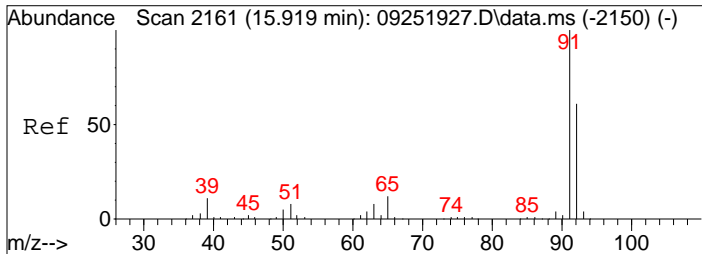
Tgt Ion	Resp	Lower	Upper
100	5348		
69	285.8	227.5	267.5#



#51
 n-Heptane
 Concen: 1.10 ng
 RT: 14.39 min Scan# 1893
 Delta R.T. -0.017 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

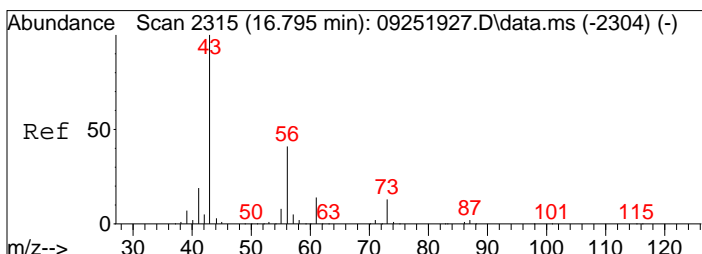
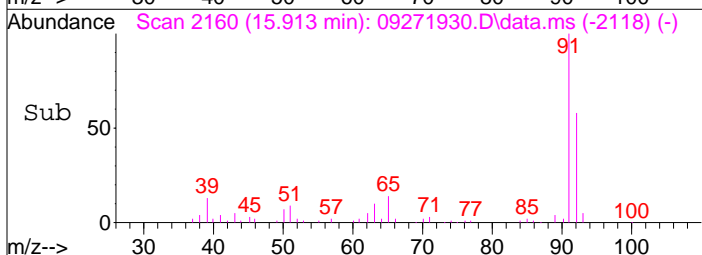
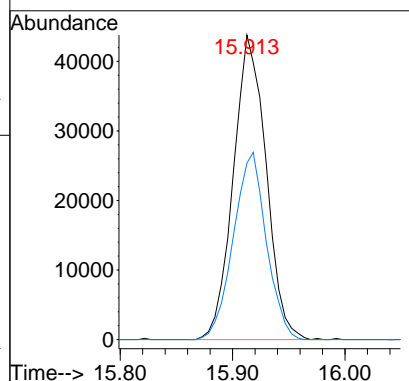
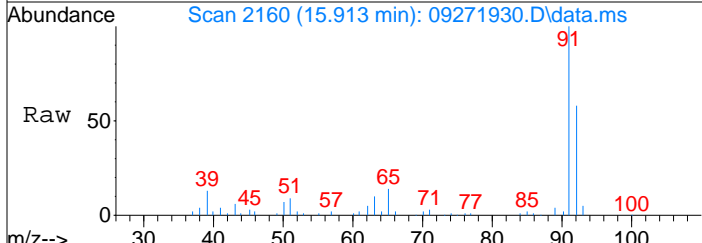
Tgt Ion	Resp	Lower	Upper
71	12022		
57	103.4	80.0	120.0
100	28.3	9.1	49.1





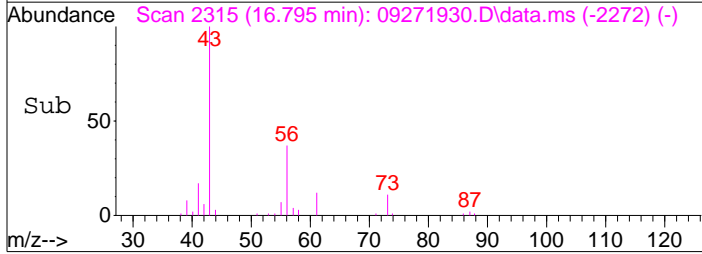
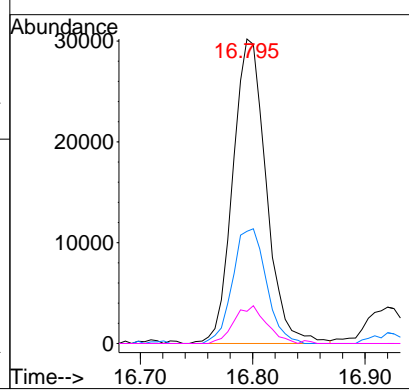
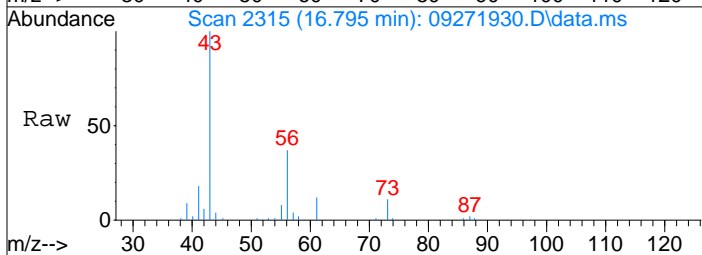
#58
 Toluene
 Concen: 1.84 ng
 RT: 15.91 min Scan# 2160
 Delta R.T. -0.011 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

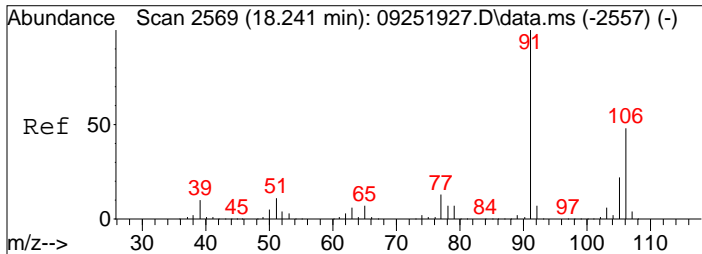
Tgt Ion	Resp	Lower	Upper
91	100		
92	61.8	41.3	81.3



#62
 n-Butyl Acetate
 Concen: 2.12 ng
 RT: 16.79 min Scan# 2315
 Delta R.T. -0.006 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

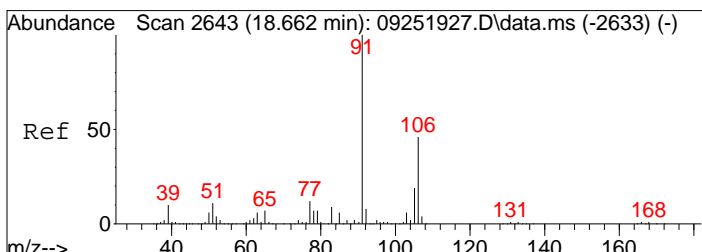
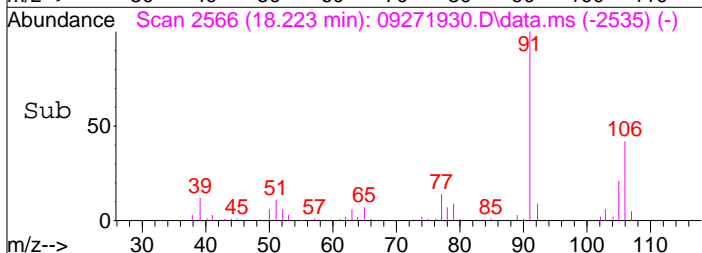
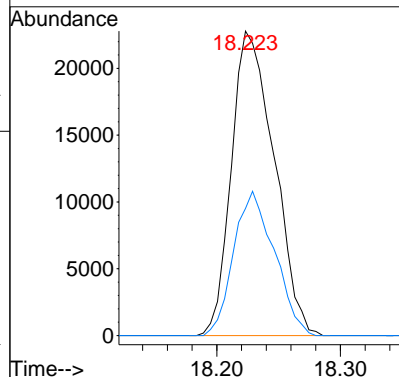
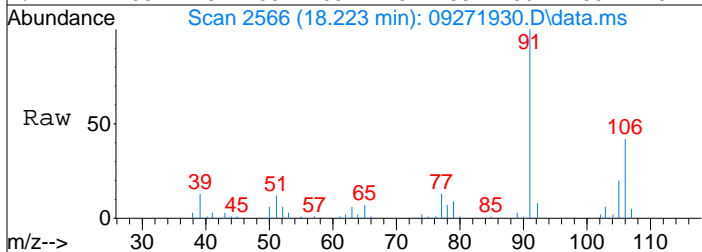
Tgt Ion	Resp	Lower	Upper
43	100		
56	38.0	20.5	60.5
73	12.1	0.0	33.0





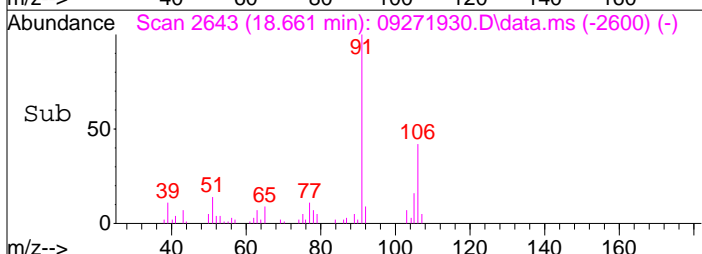
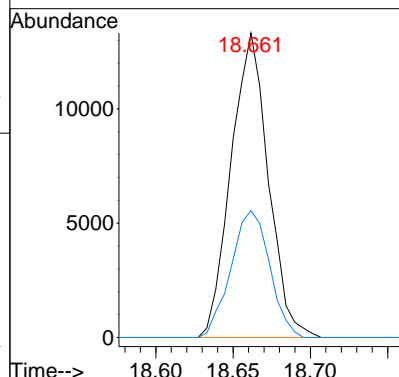
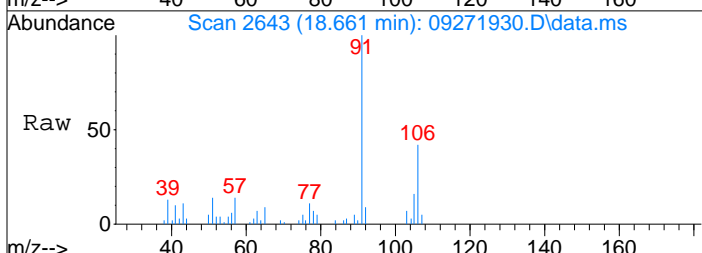
#67
 m- & p-Xylenes
 Concen: 1.24 ng
 RT: 18.22 min Scan# 2566
 Delta R.T. -0.023 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

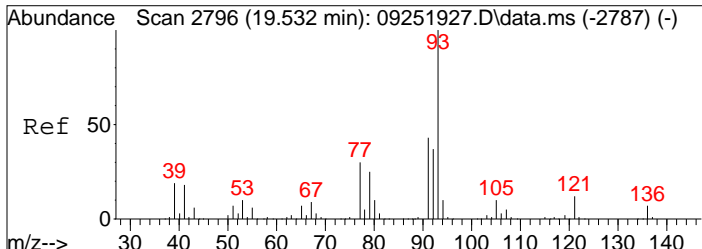
Tgt Ion	Resp	Lower	Upper
91	54754		
106	45.4	27.8	67.8



#70
 o-Xylene
 Concen: 0.50 ng
 RT: 18.66 min Scan# 2643
 Delta R.T. -0.006 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

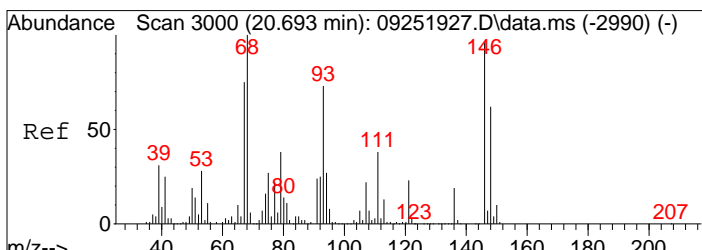
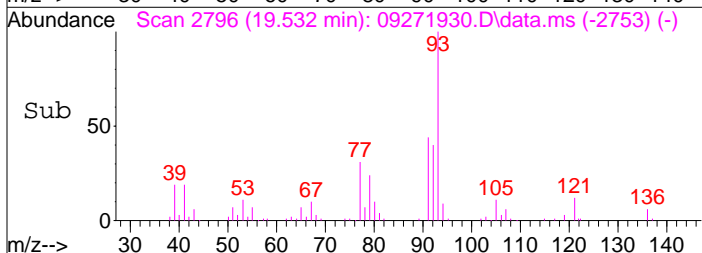
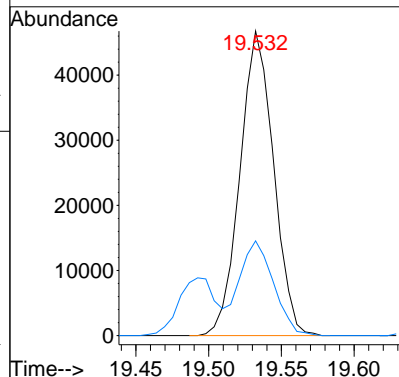
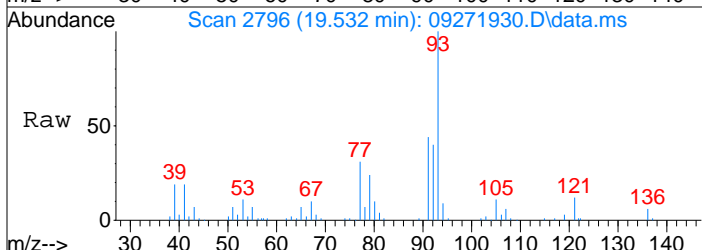
Tgt Ion	Resp	Lower	Upper
91	22331		
106	43.3	25.5	65.5





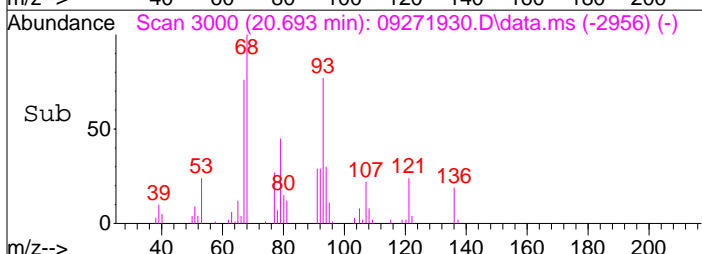
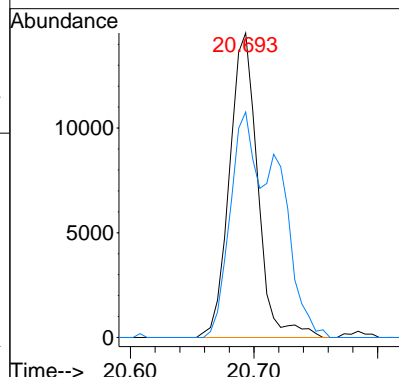
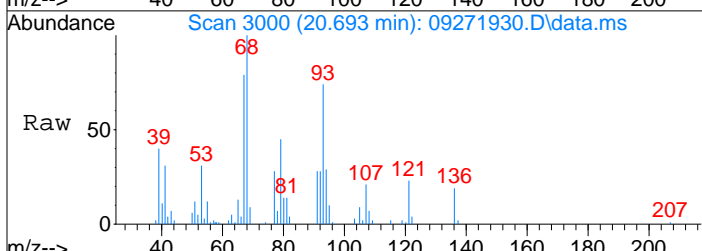
#75
 alpha-Pinene
 Concen: 2.75 ng
 RT: 19.53 min Scan# 2796
 Delta R.T. -0.006 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

Tgt Ion	Resp	Lower	Upper
93	100		
77	31.9	11.5	51.5



#91
 d-Limonene
 Concen: 1.41 ng
 RT: 20.69 min Scan# 3000
 Delta R.T. -0.000 min
 Lab File: 09271930.D
 Acq: 27 Sep 2019 19:50

Tgt Ion	Resp	Lower	Upper
68	100		
93	125.4	53.3	93.3#



Data File : I:\MS13\DATA\2019_09\27\09271904.D
 Acq On : 27 Sep 2019 4:59
 Sample : MB R13092719_1000mL
 Misc : S31-06261901/AC00880

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Sep 27 11:49:44 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

107 9/27/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	110150	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.36	114	512397	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.68	82	231473	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	243469	13.439	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	107.52%	
57) Toluene-d8 (SS2)	15.82	98	577367	12.245	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.92%	
73) Bromofluorobenzene (SS3)	19.07	174	124145	11.986	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	95.92%	

Target Compounds

						Qvalue
2) Propene	4.29	42	436	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	6.51	45	1365	0.129	ng	# 49
11) Acetonitrile	6.80	41	189	N.D.		
12) Acrolein	6.96	56	137	N.D.		
13) Acetone	7.19	58	7668	0.805	ng	# 74
14) Trichlorofluoromethane	0.00	101	0	N.D.		
15) 2-Propanol (Isopropanol)	7.73	45	88	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	0.00	76	0	N.D.	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)	0.00	72	0	N.D.	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)	11.94	72	280	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	13.06	56	316	N.D.		
41) Benzene	12.98	78	1981	N.D.		
42) Carbon Tetrachloride	0.00	117	0	N.D.		
43) Cyclohexane	13.36	84	447	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...	0.00	57	0	N.D.		
50) Methyl Methacrylate	0.00	100	0	N.D.		

81 of 144

Data File : I:\MS13\DATA\2019_09\27\09271904.D
 Acq On : 27 Sep 2019 4:59
 Sample : MB R13092719_1000mL
 Misc : S31-06261901/AC00880

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Sep 27 11:49:44 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

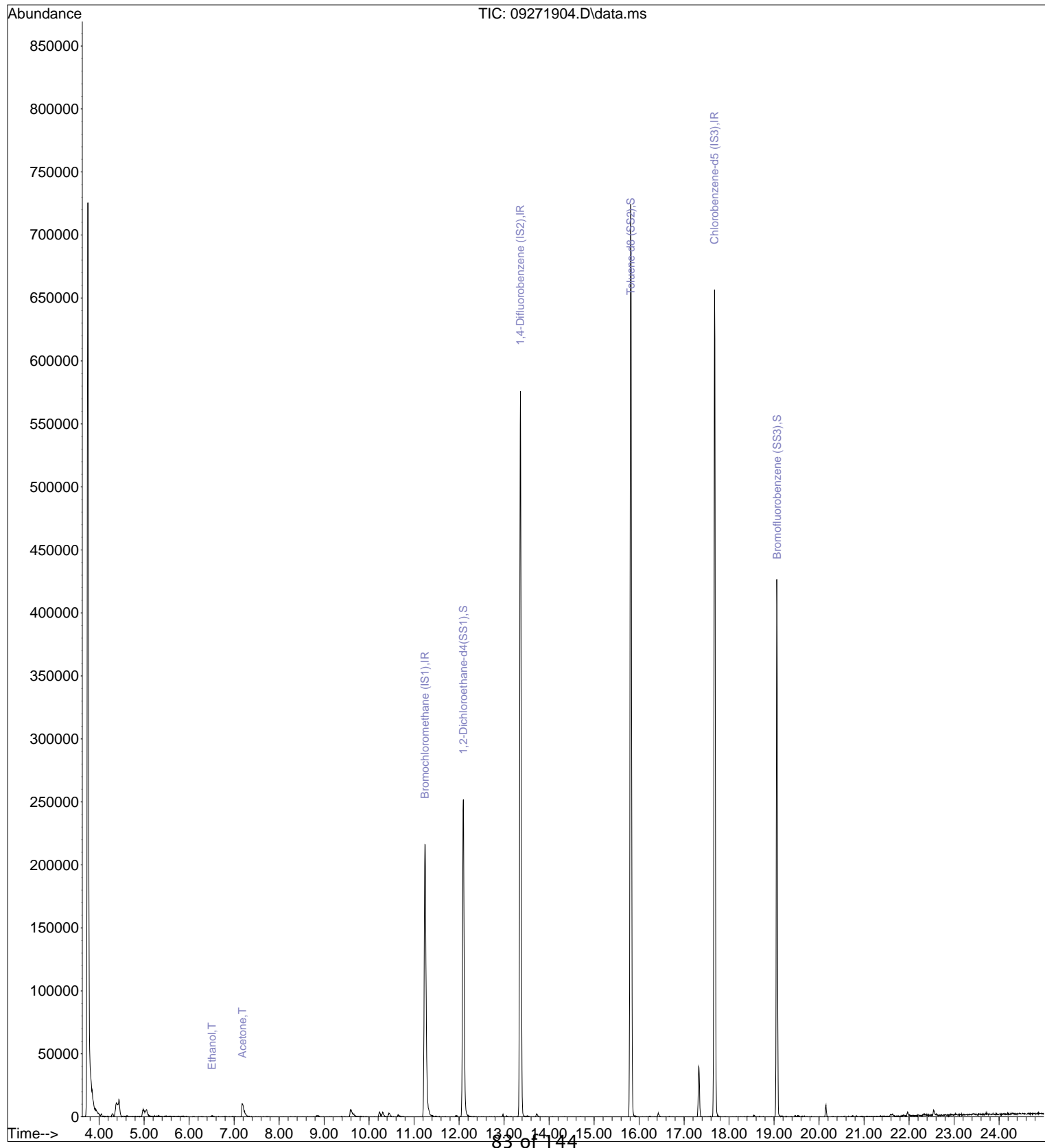
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	15.92	91	175	N.D.		
59) 2-Hexanone	16.21	43	134	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	18.21	91	120	N.D.		
67) m- & p-Xylenes	18.21	91	120	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	0.00	104	0	N.D.		
70) o-Xylene	0.00	91	0	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	19.06	105	203	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	19.61	91	306	N.D.		
77) 3-Ethyltoluene	19.73	105	243	N.D.		
78) 4-Ethyltoluene	19.73	105	243	N.D.		
79) 1,3,5-Trimethylbenzene	19.83	105	184	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	20.00	105	143	N.D.		
82) 1,2,4-Trimethylbenzene	20.19	105	110	N.D.		
83) n-Decane	0.00	57	0	N.D.		
84) Benzyl Chloride	0.00	91	0	N.D.		
85) 1,3-Dichlorobenzene	20.40	146	126	N.D.		
86) 1,4-Dichlorobenzene	20.40	146	126	N.D.		
87) sec-Butylbenzene	20.57	105	217	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.		
89) 1,2,3-Trimethylbenzene	20.57	105	217	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	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	0.00	57	0	N.D.		
94) 1,2,4-Trichlorobenzene	22.20	180	302	N.D.		
95) Naphthalene	22.33	128	759	N.D.		
96) n-Dodecane	0.00	57	0	N.D.		
97) Hexachlorobutadiene	22.62	225	463	N.D.		
98) Cyclohexanone	18.41	55	355	N.D.		
99) tert-Butylbenzene	20.20	119	306	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\2019_09\27\09271904.D
Acq On : 27 Sep 2019 4:59
Sample : MB R13092719_1000mL
Misc : S31-06261901/AC00880

Vial: 2
Operator: WA
Inst : MS13

Quant Time: Sep 27 11:49:44 2019
Quant Method : I:\MS13\METHODS\R13092519A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Sep 27 06:46:45 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019_09\27\09271905.D
 Acq On : 27 Sep 2019 5:32
 Sample : LCS R13092719_25ng
 Misc : S31-06261901/S31-09031907

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Sep 27 06:58:34 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

DA 9/27/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	120313	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.37	114	543235	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.68	82	224369	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.10	65	266138	13.450	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	107.60%	
57) Toluene-d8 (SS2)	15.82	98	603366	13.201	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	105.60%	
73) Bromofluorobenzene (SS3)	19.06	174	125196	12.470	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	99.76%	

Target Compounds

						Qvalue
2) Propene	4.18	42	456635	26.671	ng	100
3) Dichlorodifluoromethan...	4.33	85	802932	25.575	ng	100
4) Chloromethane	4.62	50	491160	22.592	ng	98
5) 1,2-Dichloro-1,1,2,2-t...	4.89	135	378318	25.359	ng	98
6) Vinyl Chloride	5.04	62	612216	30.776	ng	98
7) 1,3-Butadiene	5.31	54	452119	31.723	ng	96
8) Bromomethane	5.75	94	310431	27.454	ng	100
9) Chloroethane	6.08	64	260564	27.213	ng	98
10) Ethanol	6.46	45	1484037	128.871	ng	99
11) Acetonitrile	6.72	41	728400	26.580	ng	100
12) Acrolein	6.90	56	221932	25.639	ng	100
13) Acetone	7.11	58	1382024	132.870	ng	97
14) Trichlorofluoromethane	7.35	101	693480	26.878	ng	100
15) 2-Propanol (Isopropanol)	7.60	45	2134367	53.046	ng	98
16) Acrylonitrile	7.87	53	529545	28.124	ng	100
17) 1,1-Dichloroethene	8.31	96	321210	26.018	ng	95
18) 2-Methyl-2-Propanol (t...	8.47	59	1897984	50.479	ng	100
19) Methylene Chloride	8.54	84	318832	25.662	ng	94
20) 3-Chloro-1-propene (Al...	8.69	41	610661	29.690	ng	96
21) Trichlorotrifluoroethane	8.95	151	288476	24.437	ng	98
22) Carbon Disulfide	8.80	76	1140294	24.654	ng	99
23) trans-1,2-Dichloroethene	9.81	61	535825	26.717	ng	97
24) 1,1-Dichloroethane	10.06	63	636851	26.290	ng	100
25) Methyl tert-Butyl Ether	10.15	73	1123615	27.694	ng	99
26) Vinyl Acetate	10.31	86	383107	125.471	ng	# 88
27) 2-Butanone (MEK)	10.56	72	218140	26.855	ng	# 87
28) cis-1,2-Dichloroethene	11.07	61	512329	26.260	ng	95
29) Diisopropyl Ether	11.37	87	301511	23.802	ng	# 90
30) Ethyl Acetate	11.37	61	253528	55.103	ng	98
31) n-Hexane	11.35	57	616590	26.393	ng	98
32) Chloroform	11.42	83	635281	26.773	ng	100
34) Tetrahydrofuran (THF)	11.82	72	207641	24.669	ng	# 91
35) Ethyl tert-Butyl Ether	11.96	87	439838	26.609	ng	97
36) 1,2-Dichloroethane	12.22	62	596988	27.148	ng	99
38) 1,1,1-Trichloroethane	12.50	97	616305	26.580	ng	99
39) Isopropyl Acetate	12.92	61	436084	51.629	ng	97
40) 1-Butanol	12.94	56	711238	50.792	ng	94
41) Benzene	12.98	78	1295893	24.737	ng	100
42) Carbon Tetrachloride	13.14	117	531050	26.784	ng	99
43) Cyclohexane	13.27	84	1012603	50.260	ng	96
44) tert-Amyl Methyl Ether	13.61	73	1014263	27.379	ng	99
45) 1,2-Dichloropropane	13.82	63	318166	25.742	ng	98
46) Bromodichloromethane	14.02	83	508076	27.244	ng	100
47) Trichloroethene	14.07	130	346927	25.388	ng	100
48) 1,4-Dioxane	14.05	88	271080	25.532	ng	96
49) 2,2,4-Trimethylpentane...	14.14	57	1484220	26.306	ng	100
50) Methyl Methacrylate	14.27	100	282273	53.257	ng	100

84 of 144

Data File : I:\MS13\DATA\2019_09\27\09271905.D
 Acq On : 27 Sep 2019 5:32
 Sample : LCS R13092719_25ng
 Misc : S31-06261901/S31-09031907

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Sep 27 06:58:34 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

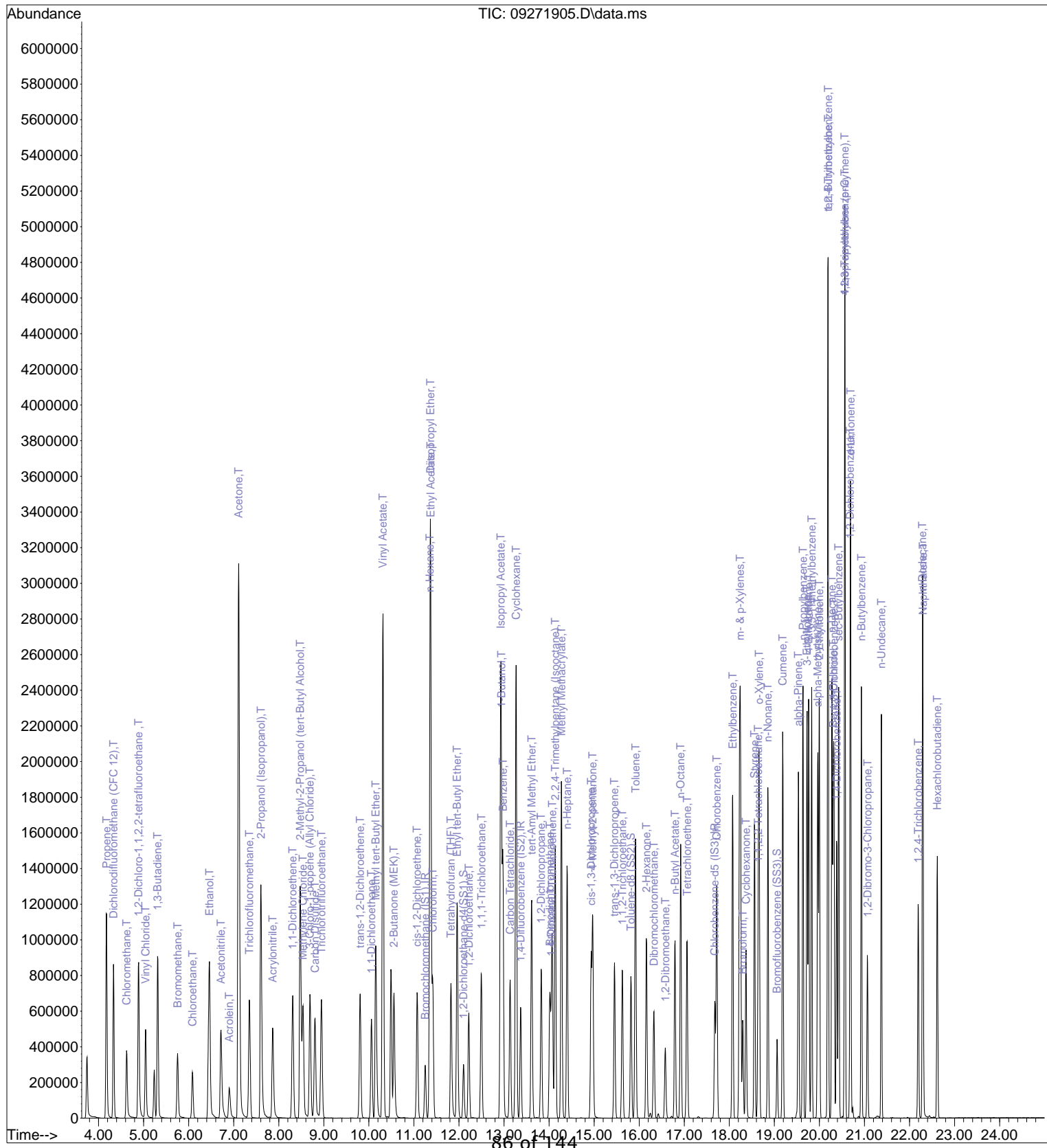
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.40	71	322219	26.084	ng	98
52) cis-1,3-Dichloropropene	14.93	75	547559	26.680	ng	99
53) 4-Methyl-2-pentanone	14.97	58	328966	27.028	ng	97
54) trans-1,3-Dichloropropene	15.45	75	540857	27.990	ng	100
55) 1,1,2-Trichloroethane	15.63	97	305607	25.861	ng	98
58) Toluene	15.92	91	1285430	25.911	ng	100
59) 2-Hexanone	16.16	43	828922	28.921	ng	99
60) Dibromochloromethane	16.33	129	395479	28.718	ng	99
61) 1,2-Dibromoethane	16.58	107	331522	26.523	ng	99
62) n-Butyl Acetate	16.79	43	859834	28.615	ng	99
63) n-Octane	16.92	57	293523	27.022	ng	96
64) Tetrachloroethene	17.06	166	335594	24.910	ng	99
65) Chlorobenzene	17.72	112	785389	24.792	ng	100
66) Ethylbenzene	18.08	91	1426674	24.758	ng	100
67) m- & p-Xylenes	18.24	91	2286364	50.259	ng	100
68) Bromoform	18.30	173	294573	26.920	ng	100
69) Styrene	18.56	104	828177	25.998	ng	99
70) o-Xylene	18.66	91	1145478	25.134	ng	99
71) n-Nonane	18.86	43	672814	27.097	ng	98
72) 1,1,2,2-Tetrachloroethane	18.64	83	472032	25.718	ng	100
74) Cumene	19.19	105	1407595	24.755	ng	100
75) alpha-Pinene	19.53	93	762300	27.226	ng	99
76) n-Propylbenzene	19.63	91	1866185	28.563	ng	99
77) 3-Ethyltoluene	19.73	105	1443486	25.808	ng	100
78) 4-Ethyltoluene	19.76	105	1393517	27.341	ng	100
79) 1,3,5-Trimethylbenzene	19.83	105	1222477	25.790	ng	100
80) alpha-Methylstyrene	19.96	118	626165	27.691	ng	99
81) 2-Ethyltoluene	20.00	105	1430295	26.587	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	1324863	28.871	ng	100
83) n-Decane	20.28	57	747421	30.622	ng	97
84) Benzyl Chloride	20.31	91	1083792	28.606	ng	99
85) 1,3-Dichlorobenzene	20.32	146	682194	28.036	ng	99
86) 1,4-Dichlorobenzene	20.39	146	636283	26.436	ng	100
87) sec-Butylbenzene	20.43	105	1572793	25.903	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	1585943	27.442	ng	100
89) 1,2,3-Trimethylbenzene	20.56	105	1280492	27.988	ng	100
90) 1,2-Dichlorobenzene	20.68	146	631695	27.371	ng	100
91) d-Limonene	20.69	68	495052	29.416	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.07	157	240711	27.547	ng	95
93) n-Undecane	21.38	57	673735	26.167	ng	98
94) 1,2,4-Trichlorobenzene	22.20	180	385342	23.435	ng	99
95) Naphthalene	22.30	128	1119798	21.334	ng	100
96) n-Dodecane	22.29	57	588851	23.611	ng	97
97) Hexachlorobutadiene	22.62	225	289104	23.625	ng	100
98) Cyclohexanone	18.37	55	426428	23.295	ng	98
99) tert-Butylbenzene	20.19	119	1313732	28.319	ng	100
100) n-Butylbenzene	20.93	91	1254551	26.934	ng	100

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

Data File : I:\MS13\DATA\2019_09\27\09271905.D
Acq On : 27 Sep 2019 5:32
Sample : LCS R13092719_25ng
Misc : S31-06261901/S31-09031907

Vial: 2
Operator: WA
Inst : MS13

Quant Time: Sep 27 06:58:34 2019
Quant Method : I:\MS13\METHODS\R13092519A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Sep 27 06:46:45 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019_09\27\09271912.D
 Acq On : 27 Sep 2019 9:41
 Sample : P1905498-002dup (3.5mL)
 Misc : S31-06261901

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Sep 30 13:55:58 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

407 9/30/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	123786	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.36	114	534088	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.68	82	234486	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	277418	13.626	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	109.04%	
57) Toluene-d8 (SS2)	15.82	98	594816	12.453	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	99.60%	
73) Bromofluorobenzene (SS3)	19.06	174	114054	10.870	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	86.96%	

Target Compounds

						Qvalue
2) Propene	4.24	42	580	N.D.		
3) Dichlorodifluoromethan...	4.37	85	744	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	5.11	62	20191	0.987	ng	96
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	6.52	45	1856	N.D.		
11) Acetonitrile	6.81	41	68	N.D.		
12) Acrolein	0.00	56	0	N.D.		
13) Acetone	7.14	58	154	N.D.		
14) Trichlorofluoromethane	7.36	101	144	N.D.		
15) 2-Propanol (Isopropanol)	7.76	45	339	N.D.		
16) Acrylonitrile	8.10	53	648	N.D.		
17) 1,1-Dichloroethene	8.32	96	13132	1.034	ng	# 85
18) 2-Methyl-2-Propanol (t...	8.32	59	689	N.D.		
19) Methylene Chloride	8.53	84	106461	8.328	ng	89
20) 3-Chloro-1-propene (Al...	8.61	41	179	N.D.		
21) Trichlorotrifluoroethane	8.95	151	1119994	92.214	ng	99
22) Carbon Disulfide	8.82	76	9448	N.D.		
23) trans-1,2-Dichloroethene	9.81	61	3074	N.D.		
24) 1,1-Dichloroethane	10.05	63	3839	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)	10.66	72	246	N.D.		
28) cis-1,2-Dichloroethene	11.06	61	1257245	62.634	ng	93
29) Diisopropyl Ether	11.41	87	584	N.D.		
30) Ethyl Acetate	11.37	61	203	N.D.		
31) n-Hexane	11.35	57	368	N.D.		
32) Chloroform	11.41	83	5542	N.D.		
34) Tetrahydrofuran (THF)	11.92	72	573	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.21	62	19106	0.844	ng	95
38) 1,1,1-Trichloroethane	12.49	97	729	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	3996	N.D.		
42) Carbon Tetrachloride	13.13	117	1928	N.D.		
43) Cyclohexane	13.27	84	1391	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	14.07	130	1369136	101.910	ng	99
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	14.14	57	1367	N.D.		
50) Methyl Methacrylate	0.00	100	0	N.D.	d	

87 of 144

Data File : I:\MS13\DATA\2019_09\27\09271912.D
 Acq On : 27 Sep 2019 9:41
 Sample : P1905498-002dup (3.5mL)
 Misc : S31-06261901

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Sep 30 13:55:58 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

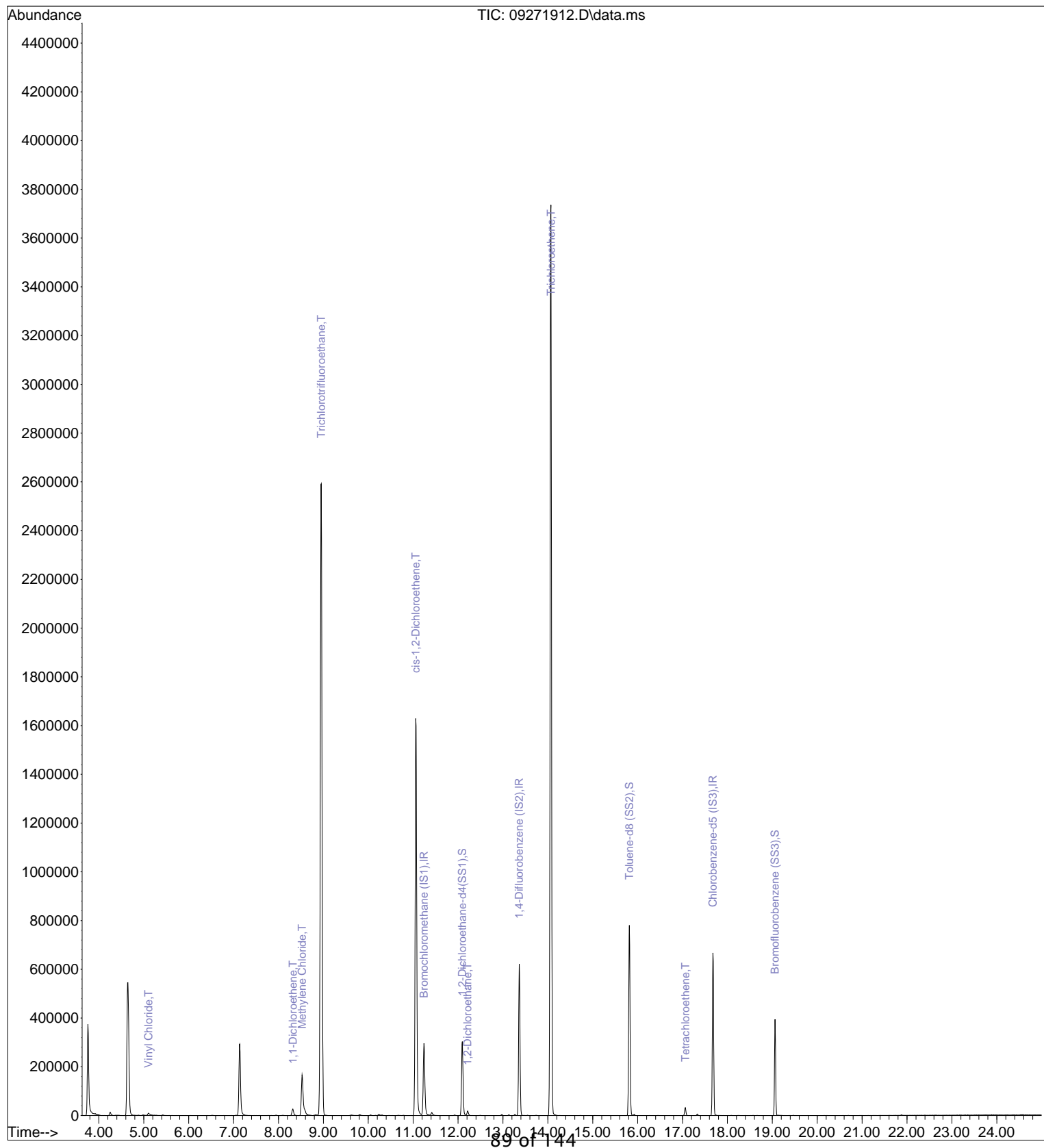
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	15.65	97	267	N.D.		
58) Toluene	15.92	91	3308	N.D.		
59) 2-Hexanone	16.26	43	308	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	17.06	166	11525	0.819	ng	97
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	18.08	91	954	N.D.		
67) m- & p-Xylenes	18.23	91	1222	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.58	104	396	N.D.		
70) o-Xylene	18.67	91	442	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	0.00	105	0	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	0.00	91	0	N.D.		
77) 3-Ethyltoluene	0.00	105	0	N.D.		
78) 4-Ethyltoluene	0.00	105	0	N.D.		
79) 1,3,5-Trimethylbenzene	0.00	105	0	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D.		
82) 1,2,4-Trimethylbenzene	0.00	105	0	N.D.		
83) n-Decane	20.22	57	128	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	0.00	105	0	N.D.		
88) 4-Isopropyltoluene (p-...	20.58	119	294	N.D.		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	20.69	68	270	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	21.42	57	126	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	22.45	128	112	N.D.		
96) n-Dodecane	0.00	57	0	N.D.		
97) Hexachlorobutadiene	22.63	225	125	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.		
99) tert-Butylbenzene	0.00	119	0	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\2019_09\27\09271912.D
 Acq On : 27 Sep 2019 9:41
 Sample : P1905498-002dup (3.5mL)
 Misc : S31-06261901

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Sep 30 13:55:58 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019_09\27\09271912.D
 Acq On : 27 Sep 2019 9:41
 Sample : P1905498-002dup (3.5mL)
 Misc : S31-06261901

Vial: 3
 Operator: WA
 Inst : MS13

Quant Time: Sep 30 13:55:58 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

WA 9/30/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	123786	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.36	114	534088	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.68	82	234486	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	277418	13.626	ng	-0.02
Spiked Amount	12.500	Range 70 - 130	Recovery	=	109.04%	
57) Toluene-d8 (SS2)	15.82	98	594816	12.453	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	99.60%	
73) Bromofluorobenzene (SS3)	19.06	174	114054	10.870	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	86.96%	

Target Compounds

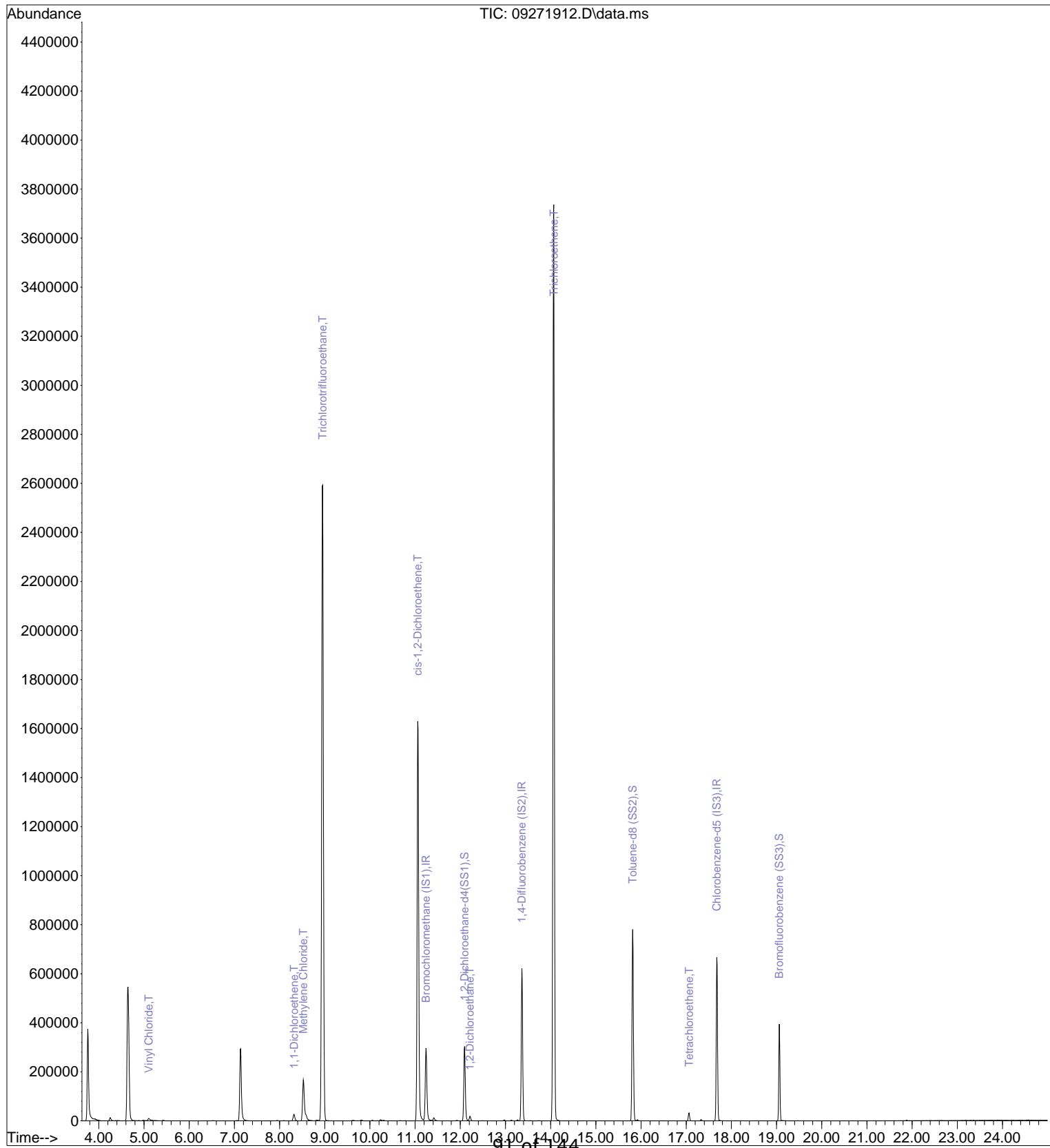
						Qvalue
6) Vinyl Chloride	5.11	62	20191	0.987	ng	96
17) 1,1-Dichloroethene	8.32	96	13132	1.034	ng	# 85
19) Methylene Chloride	8.53	84	106461	8.328	ng	89
21) Trichlorotrifluoroethane	8.95	151	1119994	92.214	ng	99
28) cis-1,2-Dichloroethene	11.06	61	1257245	62.634	ng	93
36) 1,2-Dichloroethane	12.21	62	19106	0.844	ng	95
47) Trichloroethene	14.07	130	1369136	101.910	ng	99
64) Tetrachloroethene	17.06	166	11525	0.819	ng	97

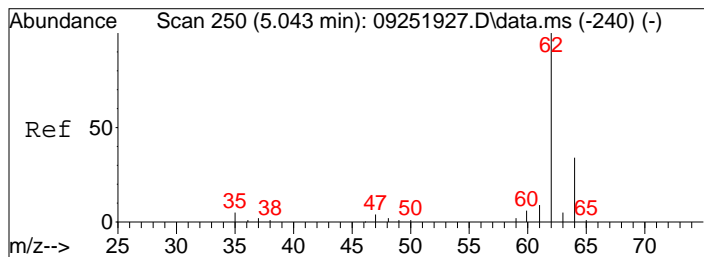
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS13\DATA\2019_09\27\09271912.D
 Acq On : 27 Sep 2019 9:41
 Sample : P1905498-002dup (3.5mL)
 Misc : S31-06261901

Vial: 3
 Operator: WA
 Inst : MS13

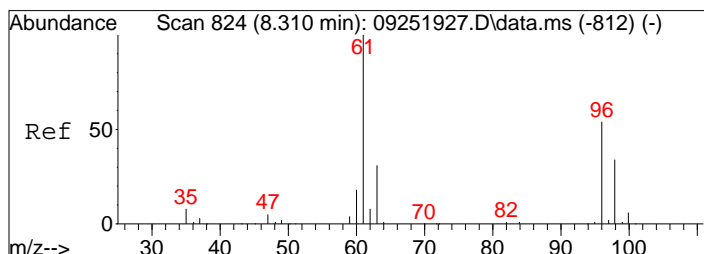
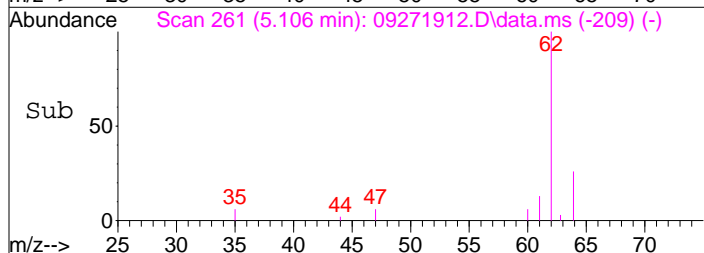
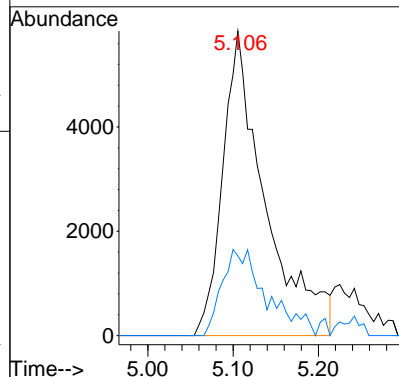
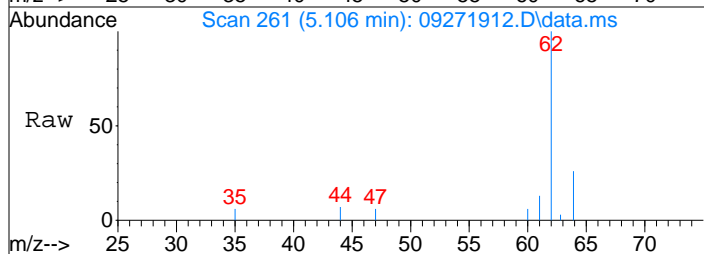
Quant Time: Sep 30 13:55:58 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M





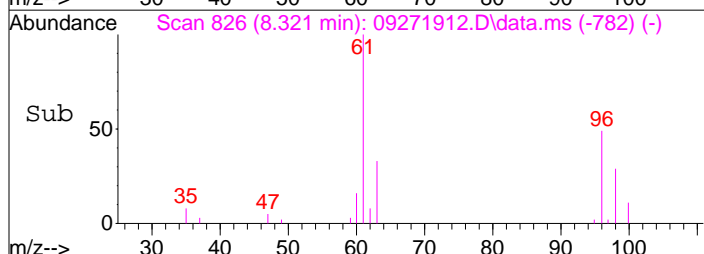
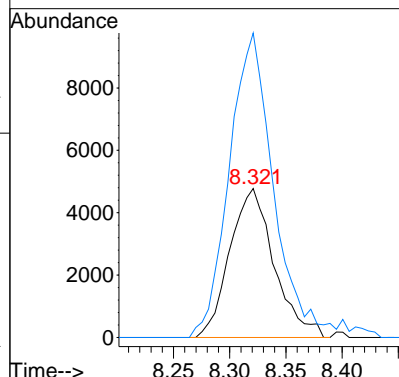
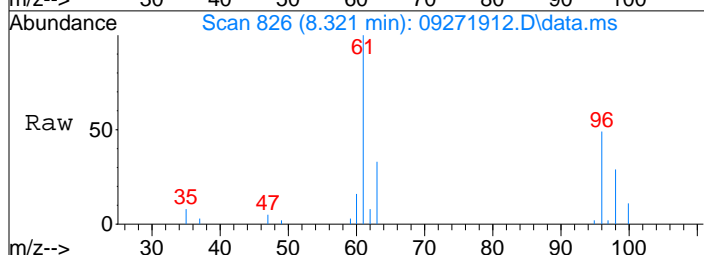
#6
 Vinyl Chloride
 Concen: 0.99 ng
 RT: 5.11 min Scan# 261
 Delta R.T. 0.045 min
 Lab File: 09271912.D
 Acq: 27 Sep 2019 9:41

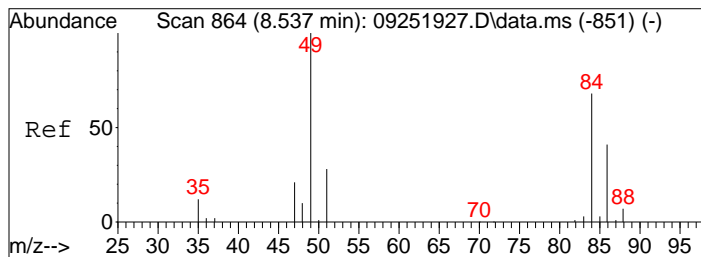
Tgt Ion: 62 Resp: 20191
 Ion Ratio Lower Upper
 62 100
 64 29.6 11.8 51.8



#17
 1,1-Dichloroethene
 Concen: 1.03 ng
 RT: 8.32 min Scan# 826
 Delta R.T. -0.000 min
 Lab File: 09271912.D
 Acq: 27 Sep 2019 9:41

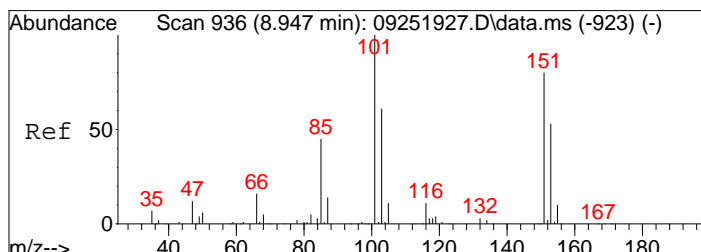
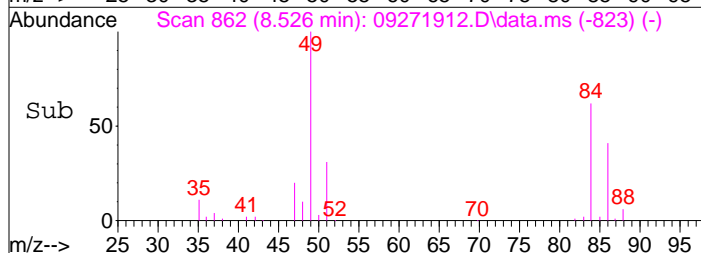
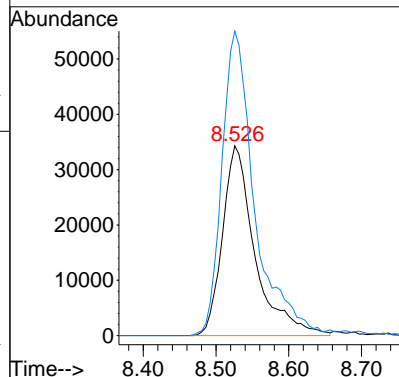
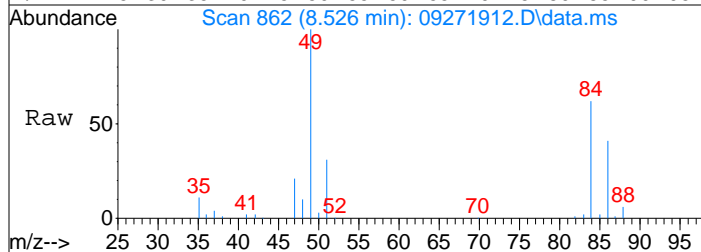
Tgt Ion: 96 Resp: 13132
 Ion Ratio Lower Upper
 96 100
 61 208.5 166.5 206.5#





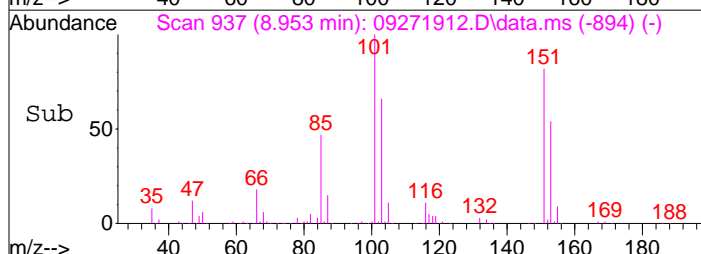
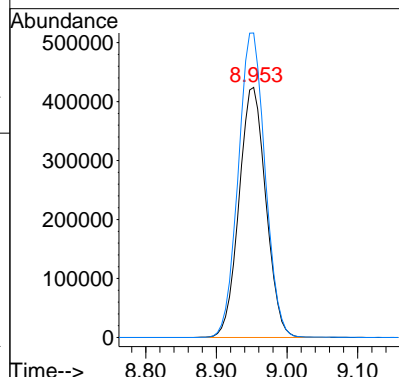
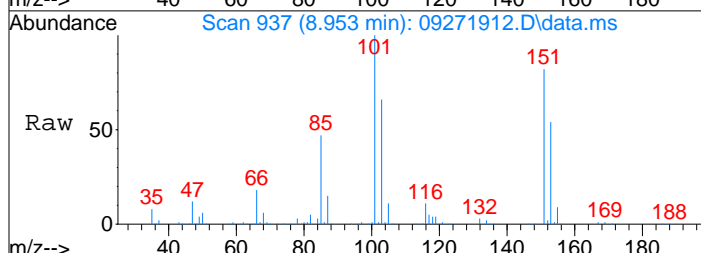
#19
 Methylene Chloride
 Concen: 8.33 ng
 RT: 8.53 min Scan# 862
 Delta R.T. -0.029 min
 Lab File: 09271912.D
 Acq: 27 Sep 2019 9:41

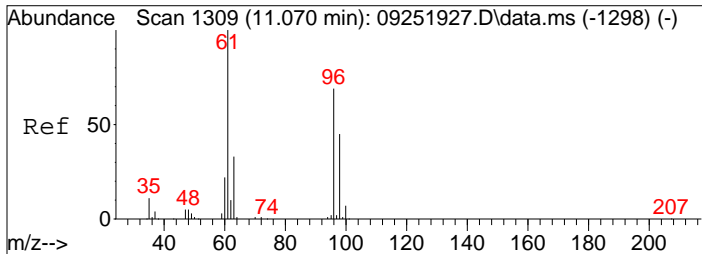
Tgt Ion: 84 Resp: 106461
 Ion Ratio Lower Upper
 84 100
 49 162.5 123.4 173.4



#21
 Trichlorotrifluoroethane
 Concen: 92.21 ng
 RT: 8.95 min Scan# 937
 Delta R.T. -0.006 min
 Lab File: 09271912.D
 Acq: 27 Sep 2019 9:41

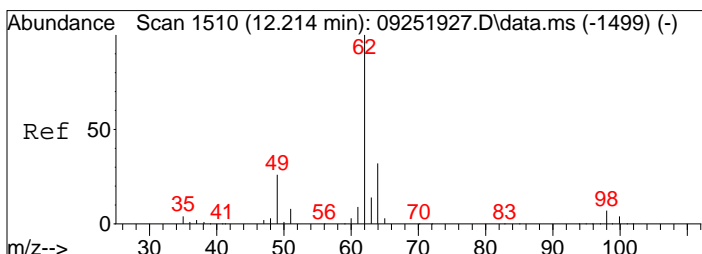
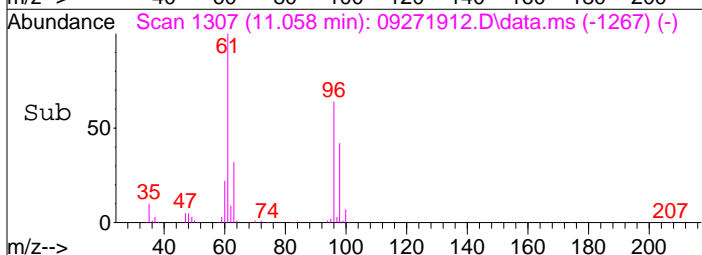
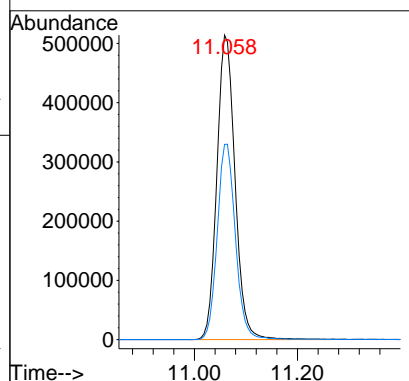
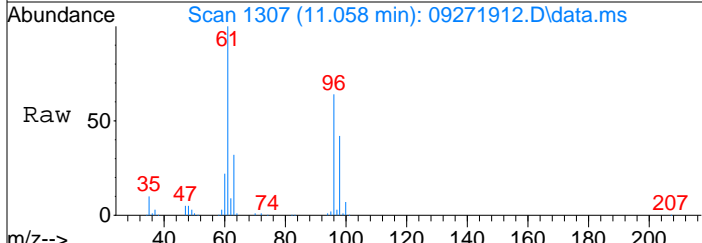
Tgt Ion: 151 Resp: 1119994
 Ion Ratio Lower Upper
 151 100
 101 122.1 100.6 140.6





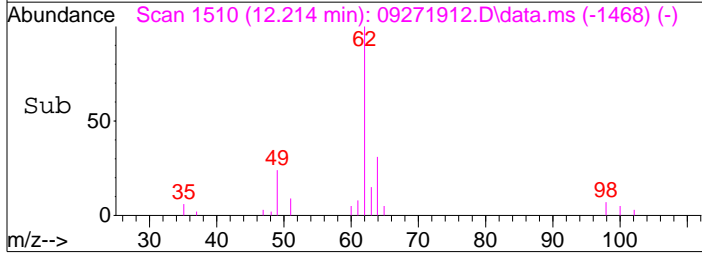
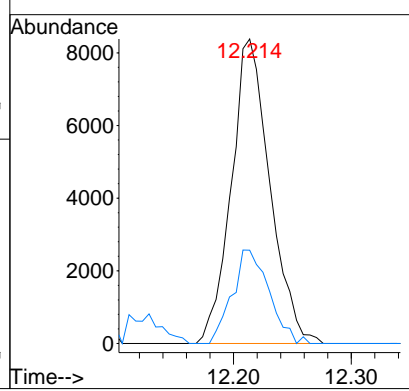
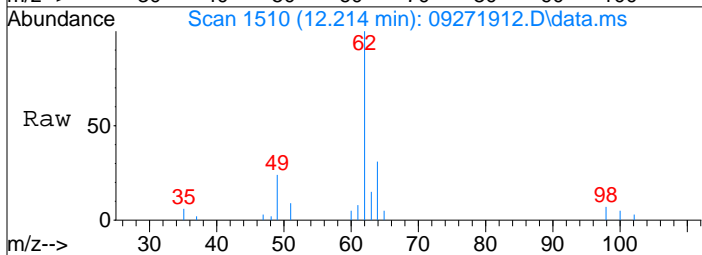
#28
 cis-1,2-Dichloroethene
 Concen: 62.63 ng
 RT: 11.06 min Scan# 1307
 Delta R.T. -0.023 min
 Lab File: 09271912.D
 Acq: 27 Sep 2019 9:41

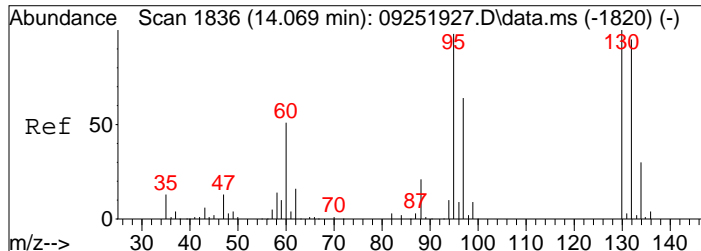
Tgt Ion	Resp	Lower	Upper
61	100		
96	64.3	49.8	89.8



#36
 1,2-Dichloroethane
 Concen: 0.84 ng
 RT: 12.21 min Scan# 1510
 Delta R.T. -0.011 min
 Lab File: 09271912.D
 Acq: 27 Sep 2019 9:41

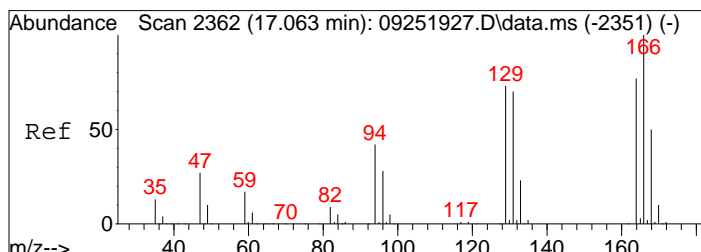
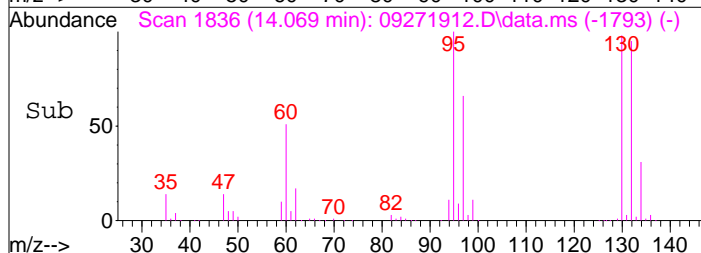
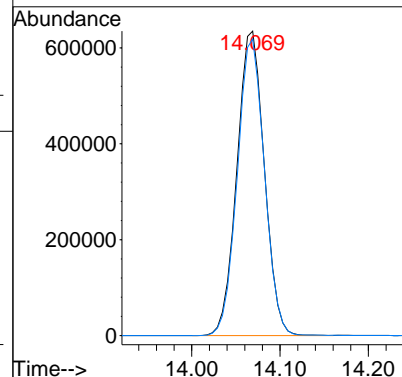
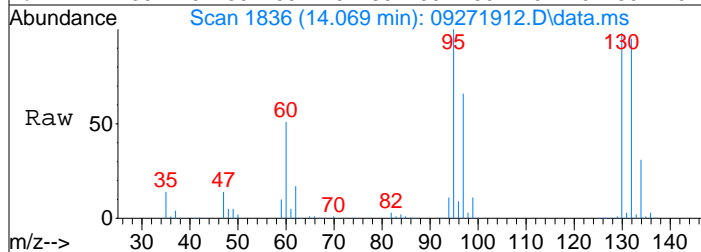
Tgt Ion	Resp	Lower	Upper
62	100		
64	29.3	12.2	52.2





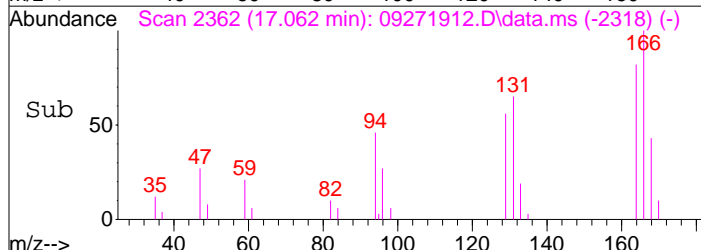
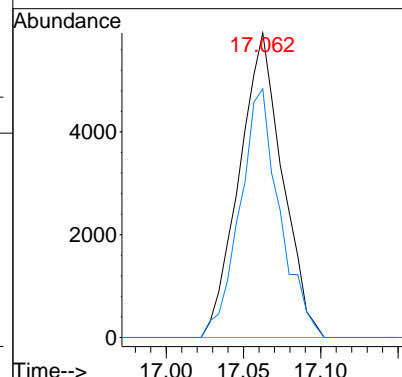
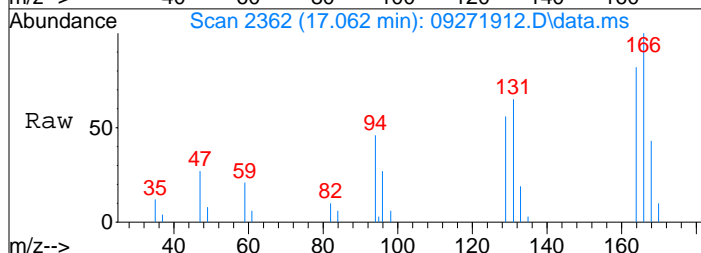
#47
 Trichloroethene
 Concen: 101.91 ng
 RT: 14.07 min Scan# 1836
 Delta R.T. -0.006 min
 Lab File: 09271912.D
 Acq: 27 Sep 2019 9:41

Tgt Ion:130 Resp: 1369136
 Ion Ratio Lower Upper
 130 100
 132 96.4 75.8 115.8



#64
 Tetrachloroethene
 Concen: 0.82 ng
 RT: 17.06 min Scan# 2362
 Delta R.T. -0.000 min
 Lab File: 09271912.D
 Acq: 27 Sep 2019 9:41

Tgt Ion:166 Resp: 11525
 Ion Ratio Lower Upper
 166 100
 164 75.3 58.0 98.0



Method Path : I:\MS13\METHODS\
 Method File : R13092519A.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Thu Sep 26 06:41:47 2019
 Response Via : Initial Calibration

Calibration Files

0.1 =09101914.D 0.2 =09251923.D 0.5 =09251924.D 1.0 =09251925.D 5.0 =09251931.D 25 =09251927.D 50 =09251928.D
 100 =09251929.D

IDA 9/26/19

Compound	0.1	0.2	0.5	1.0	5.0	25	50	100	AVG	%RSD
1) IR Bromochloromethane...				ISTD						
2) T Propene	1.847	1.841	1.598	1.634	1.744	1.744	1.744	2.044	1.779	8.43
3) T Dichlorodifluo...	3.291	3.587	3.378	3.198	3.292	3.151	2.936	3.262	3.262	6.18
4) T Chloromethane	2.425	2.467	2.418	2.218	2.105	1.919		2.259	2.259	9.65
5) T 1,2-Dichloro-1...	1.493	1.782	1.648	1.509	1.488	1.505	1.426	1.550	1.550	7.87
6) T Vinyl Chloride	1.679	1.865	1.951	2.270	2.236	2.300	2.166	2.067	2.067	11.49
7) T 1,3-Butadiene	0.809	1.462	1.419	1.568	1.689	1.744	1.674	1.481	1.481	21.59
8) T Bromomethane	0.960	1.187	1.153	1.206	1.275	1.236	1.206	1.175	1.175	8.69
9) T Chloroethane	0.848	0.972	1.043	1.003	1.058	1.040	1.000	0.995	0.995	7.18
10) T Ethanol	1.260	1.294	1.195	1.169	1.187	1.160	1.109	1.196	1.196	5.21
11) T Acetonitrile	3.066	2.823	2.764	2.809	2.905	2.831	2.732	2.847	2.847	3.89
12) T Acrolein	1.061	1.159	1.129	1.065	1.094	1.055	0.859	0.899	0.899	3.63
13) T Acetone	2.615	2.852	2.810	2.642	2.737	2.648	2.458	2.681	2.681	4.82
14) T Trichlorofluor...	4.172	4.583	4.366	4.307	4.435	4.173	3.227	4.180	4.180	10.64
15) T 2-Propanol (Is...	1.647	2.054	1.895	1.970	2.114	2.054	1.961	1.956	1.956	7.91
16) T Acrylonitrile	1.261	1.321	1.267	1.286	1.320	1.286	1.238	1.283	1.283	2.37
17) T 1,1-Dichloroet...	3.881	4.227	4.266	4.388	4.236	3.813	2.534	3.906	3.906	16.41
18) T 2-Methyl-2-Pro...	1.183	1.448	1.331	1.245	1.290	1.294	1.245	1.291	1.291	6.47
19) T Methylene Chlo...	2.088	1.759	2.270	2.164	2.313	2.247	2.116	2.137	2.137	8.69
20) T 3-Chloro-1-pro...	1.344	1.374	1.248	1.184	1.186	1.153	1.097	1.226	1.226	8.27
21) T Trichlorotrifl...	5.590	5.399	4.845	4.358	4.601	4.530	4.314	4.805	4.805	10.51
22) T Carbon Disulfide	2.060	2.050	2.096	2.069	2.168	2.118	2.025	2.084	2.084	2.30
23) T trans-1,2-Dich...	2.461	2.712	2.575	2.492	2.545	2.489	2.344	2.517	2.517	4.50
24) T 1,1-Dichloroet...	4.117	4.551	4.245	4.420	4.545	4.369	3.259	4.215	4.215	10.66
25) T Methyl tert-Bu...	0.234	0.326	0.286	0.327	0.354	0.354	0.341	0.317	0.317	13.59
26) T Vinyl Acetate	0.671	0.828	0.798	0.865	0.931	0.921	0.893	0.844	0.844	10.65
27) T 2-Butanone (MEK)	2.030	2.185	1.974	1.996	2.080	2.012	1.912	2.027	2.027	4.26
28) T cis-1,2-Dichlo...	1.397	1.500	1.400	1.351	1.217	1.198	1.149	1.316	1.316	9.84
29) T Diisopropyl Ether	0.395	0.506	0.439	0.502	0.505	0.505	0.495	0.478	0.478	9.15
30) T Ethyl Acetate	2.661	2.611	2.378	2.358	2.399	2.334	2.250	2.427	2.427	6.22
31) T n-Hexane	2.480	2.638	2.495	2.380	2.516	2.440	2.308	2.465	2.465	4.26
32) T Chloroform	2.097	2.080	2.032	2.051	2.044	2.076	2.011	2.056	2.056	1.47
33) S 1,2-Dichloroet...	0.935	0.941	0.855	0.869	0.864	0.842	0.815	0.874	0.874	5.36
34) T Tetrahydrofura...	1.631	1.767	1.665	1.751	1.786	1.752	1.670	1.717	1.717	3.53
35) T Ethyl tert-But...	2.158	2.480	2.332	2.282	2.355	2.278	2.107	2.285	2.285	5.45
36) T 1,2-Dichloroet...				ISTD						
37) IR 1,4-Difluorobenzen...				ISTD						
38) T 1,1,1-Trichlor...	0.560	0.576	0.542	0.513	0.549	0.517	0.478	0.534	0.534	6.16
39) T Isopropyl Acetate	0.169	0.208	0.195	0.197	0.206	0.198	0.189	0.194	0.194	6.75
40) T 1-Butanol	0.282	0.270	0.283	0.336	0.373	0.363	0.348	0.322	0.322	13.29
41) T Benzene	1.228	1.306	1.232	1.152	1.212	1.181	1.127	1.205	1.205	4.89
42) T Carbon Tetrach...	0.411	0.478	0.454	0.463	0.487	0.467	0.434	0.456	0.456	5.72

Method Path : I:\MS13\METHODS\
Method File : R13092519A.M

Title	: EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)	ISTD	
43) T Cyclohexane	0.422 0.498 0.480 0.461 0.478 0.464 0.442 0.464	2.597 2.540 2.582 2.517 2.544 2.512 2.532 2.546	5.46
44) T tert-Amyl Meth...	0.781 0.856 0.865 0.855 0.912 0.872 0.826 0.852	2.792 2.992 2.818 2.675 2.796 2.693 2.580 2.764	4.77
45) T 1,2-Dichloropr...	0.288 0.317 0.283 0.272 0.289 0.277 0.264 0.284	1.243 1.685 1.559 1.638 1.762 1.691 1.600 1.597	6.01
46) T Bromodichlorom...	0.409 0.444 0.439 0.425 0.453 0.433 0.401 0.429	0.703 0.771 0.763 0.743 0.834 0.799 0.758 0.767	4.39
47) T Trichloroethene	0.286 0.334 0.319 0.313 0.326 0.319 0.303 0.314	0.627 0.745 0.715 0.679 0.729 0.705 0.675 0.696	5.02
48) T 1,4-Dioxane	0.221 0.260 0.235 0.240 0.262 0.251 0.242 0.244	1.163 1.689 1.663 1.756 1.897 1.822 1.729 1.674	5.95
49) T 2,2,4-Trimethy...	1.217 1.459 1.340 1.265 1.322 1.272 1.212 1.298	0.579 0.657 0.628 0.581 0.624 0.597 0.570 0.605	6.59
50) T Methyl Methacr...	0.100 0.117 0.123 0.127 0.133 0.129 0.125 0.122	0.751 0.816 0.776 0.704 0.761 0.741 0.705 0.751	8.80
51) T n-Heptane	0.242 0.324 0.291 0.281 0.293 0.283 0.275 0.284	1.574 1.890 1.846 1.737 1.841 1.776 1.691 1.765	8.53
52) T cis-1,3-Dichlo...	0.354 0.519 0.469 0.476 0.517 0.498 0.472 0.472	2.911 3.420 3.314 3.159 3.371 3.237 3.062 3.210	11.87
53) T 4-Methyl-2-pen...	0.219 0.289 0.278 0.292 0.307 0.294 0.282 0.280	2.394 2.823 2.538 2.444 2.625 2.528 2.389 2.534	10.19
54) T trans-1,3-Dich...	0.316 0.416 0.431 0.474 0.515 0.495 0.465 0.445	0.507 0.594 0.590 0.605 0.678 0.662 0.632 0.610	14.87
55) T 1,1,2-Trichlor...	0.212 0.308 0.289 0.271 0.286 0.275 0.261 0.272	1.205 1.845 1.690 1.857 2.003 1.948 1.875 1.775	11.20
56) IR Chlorobenzene-d5 (...)	ISTD		
57) S Toluene-d8 (SS2)	2.597 2.540 2.582 2.517 2.544 2.512 2.532 2.546	2.404 2.665 2.621 2.475 2.650 2.544 2.415 2.539	1.25
58) T Toluene	2.792 2.992 2.818 2.675 2.796 2.693 2.580 2.764	1.133 1.515 1.460 1.373 1.473 1.403 1.325 1.383	4.75
59) T 2-Hexanone	1.243 1.685 1.559 1.638 1.762 1.691 1.600 1.597	0.820 1.017 1.042 1.026 1.106 1.093 1.054 1.023	10.61
60) T Dibromochlorom...	0.703 0.771 0.763 0.743 0.834 0.799 0.758 0.767	0.540 0.548 0.537 0.573 0.563 0.580 0.573 0.559	5.40
61) T 1,2-Dibromoethane	0.627 0.745 0.715 0.679 0.729 0.705 0.675 0.696	3.053 3.475 3.236 3.067 3.257 3.132 2.955 3.168	5.67
62) T n-Butyl Acetate	1.163 1.689 1.663 1.756 1.897 1.822 1.729 1.674	1.363 1.443 1.514 1.568 1.729 1.689 1.612 1.560	14.28
63) T n-Octane	0.579 0.657 0.628 0.581 0.624 0.597 0.570 0.605	2.397 2.947 2.818 2.773 3.067 3.063 2.813 2.839	5.29
64) T Tetrachloroethene	0.751 0.816 0.776 0.704 0.761 0.741 0.705 0.751	2.350 2.894 2.677 2.566 2.784 2.675 2.541 2.641	5.28
65) T Chlorobenzene	1.574 1.890 1.846 1.737 1.841 1.776 1.691 1.765	1.045 1.033 1.309 1.434 1.390 1.348 1.260	6.15
66) T Ethylbenzene	2.911 3.420 3.314 3.159 3.371 3.237 3.062 3.210	2.670 3.194 3.041 2.951 3.168 3.050 2.905 2.997	15.18
67) T m- & p-Xylenes	2.394 2.823 2.538 2.444 2.625 2.528 2.389 2.534	1.980 2.613 2.617 2.620 2.812 2.695 2.558 2.557	9.32
68) T Bromoform	0.507 0.594 0.590 0.605 0.678 0.662 0.632 0.610	0.997 1.448 1.385 1.398 1.485 1.435 1.370 1.360	3.13
69) T Styrene	1.205 1.845 1.690 1.857 2.003 1.948 1.875 1.775	0.844 1.377 1.339 1.412 1.542 1.508 1.469 1.356	5.43
70) T o-Xylene	2.404 2.665 2.621 2.475 2.650 2.544 2.415 2.539	1.253 1.470 2.222 2.610 2.604 2.506 2.111	8.37
71) T n-Nonane	1.133 1.515 1.460 1.373 1.473 1.403 1.325 1.383	0.856 1.339 1.235 1.442 1.561 1.507 1.447 1.341	8.08
72) T 1,1,2,2-Tetrac...	0.820 1.017 1.042 1.026 1.106 1.093 1.054 1.023	2.962 3.544 3.461 3.360 3.603 3.467 3.283 3.383	8.71
73) S Bromofluoroben...	0.540 0.548 0.537 0.573 0.563 0.580 0.573 0.559	2.392 3.395 3.333 3.279 3.536 3.404 3.198 3.220	8.07
74) T Cumene	3.053 3.475 3.236 3.067 3.257 3.132 2.955 3.168	1.863 2.727 2.578 2.595 2.803 2.719 2.558 2.549	6.68
75) T alpha-Pinene	1.363 1.443 1.514 1.568 1.729 1.689 1.612 1.560	0.889 1.262 1.272 1.352 1.448 1.416 1.361 1.286	13.99
76) T n-Propylbenzene	3.039 3.875 3.832 3.646 3.854 3.715 3.519 3.640	0.733 0.858 0.838 0.975 1.084 1.059 1.016 0.938	5.94
77) T 3-Ethyltoluene	2.582 3.411 3.247 3.165 3.314 3.068 3.023 3.116	1.252 1.304 1.479 1.587 1.530 1.454 1.434	10.44
78) T 4-Ethyltoluene	2.397 2.947 2.818 2.773 3.067 3.063 2.813 2.839	0.638 0.645 1.003 1.093 1.080 1.038 0.916	12.13
79) T 1,3,5-Trimethy...	2.350 2.894 2.677 2.566 2.784 2.675 2.541 2.641		28.49
80) T alpha-Methylst...	1.045 1.033 1.309 1.434 1.390 1.348 1.260		17.46
81) T 1,2,4-Trimethy...	2.670 3.194 3.041 2.951 3.168 3.050 2.905 2.997		17.85
82) T 1,2,4-Trimethy...	1.980 2.613 2.617 2.620 2.812 2.695 2.558 2.557		6.33
83) T n-Decane	0.997 1.448 1.385 1.398 1.485 1.435 1.370 1.360		11.81
84) T Benzyl Chloride	1.253 1.470 2.222 2.610 2.604 2.506 2.111		12.40
85) T 1,3-Dichlorobe...	0.844 1.377 1.339 1.412 1.542 1.508 1.469 1.356		14.59
86) T 1,4-Dichlorobe...	0.856 1.339 1.235 1.442 1.561 1.507 1.447 1.341		13.90
87) T sec-Butylbenzene	2.962 3.544 3.461 3.360 3.603 3.467 3.283 3.383		14.82
88) T 4-Isopropyltol...	2.392 3.395 3.333 3.279 3.536 3.404 3.198 3.220		9.08
89) T 1,2,3-Trimethy...	1.863 2.727 2.578 2.595 2.803 2.719 2.558 2.549		23.48
90) T 1,2-Dichlorobe...	0.889 1.262 1.272 1.352 1.448 1.416 1.361 1.286		
91) T d-Limonene	0.733 0.858 0.838 0.975 1.084 1.059 1.016 0.938		
92) T 1,2-Dibromo-3-...	0.388 0.415 0.481 0.562 0.547 0.528 0.487		
93) T n-Undecane	1.252 1.304 1.479 1.587 1.530 1.454 1.434		
94) T 1,2,4-Trichlor...	0.638 0.645 1.003 1.093 1.080 1.038 0.916		

Method Path : I:\MS13\METHODS\
 Method File : R13092519A.M

Title	EPA TO-15 per SOP	VOA-TO15	(CASS TO-15/GC-MS)	2.554	1.645	1.553	3.344	3.812	3.858	3.705	2.924	34.48
95) T Naphthalene												
96) T n-Dodecane												
97) T Hexachlorobuta...	0.813	0.675	0.649	0.639	0.695	0.667	0.634	0.682				26.83
98) T Cyclohexanone	0.755	0.957	0.948	1.063	1.177	1.148	1.092	1.020				9.02
99) T tert-Butylbenzene	2.525	2.623	2.565	2.533	2.731	2.627	2.488	2.584				14.30
100) T n-Butylbenzene	1.491	2.738	2.666	2.789	2.956	2.846	2.679	2.595				3.18

(#) = Out of Range



9/26/19

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID: S31-08291902
 4ng/L Std. ID: S31-09111903
 20ng/L Std. ID: S31-09111903
 200ng/L Std. ID: S31-09041910

Compounds	Source Std. mg/m ³	Dilution Factors:					Working STD Conc.(ng/L): Injection (L): ICAL Points:	20					200									
		Primary Working Standards						0.050					0.025					0.0125				
		200ng/L	20ng/L	4ng/L	1ng/L	0.5ng/L		0.050	0.025	0.0125	0.00625	0.003125	0.0015625	0.00078125	0.000390625	0.0001953125	0.00009765625					
Propene	1.031	206.2	20.62	4.124	1.031	NA	0.050	0.025	0.0125	0.00625	0.003125	0.0015625	0.00078125	0.000390625	0.0001953125	0.00009765625	0.000048828125	0.0000244140625				
Dichlorodifluoromethane	1.045	209.0	20.90	4.180	1.045	NA	0.2062	0.5155	1.031	2.062	4.124	8.248	16.496	32.992	65.984	131.968	263.936	527.872	1055.744			
Chloromethane	1.008	201.6	20.16	4.032	1.008	NA	0.2090	0.5225	1.045	2.090	4.180	8.360	16.720	33.440	66.880	133.760	267.520	535.040	1070.080			
Freon-114	1.028	205.6	20.56	4.112	1.028	NA	0.2016	0.5040	1.008	2.016	4.032	8.064	16.128	32.256	64.512	129.024	258.048	516.096	1032.192			
Vinyl Chloride	1.051	210.2	21.02	4.204	1.051	NA	0.2056	0.5140	1.028	2.056	4.112	8.224	16.448	32.896	65.792	131.584	263.168	526.336	1052.672			
1,3-Butadiene	1.049	209.8	20.98	4.196	1.049	NA	0.2102	0.5255	1.051	2.102	4.204	8.408	16.816	33.632	67.264	134.528	269.056	538.112	1076.224			
Chloromethane	1.009	201.8	20.18	4.036	1.009	NA	0.2098	0.5245	1.049	2.098	4.196	8.392	16.784	33.568	67.136	134.272	268.544	537.088	1074.176			
Bromomethane	1.022	204.4	20.44	4.088	1.022	NA	0.2018	0.5045	1.009	2.018	4.036	8.072	16.144	32.288	64.576	129.152	258.304	516.608	1033.216			
Ethanol	5.140	1028.0	102.80	20.560	5.140	NA	1.0280	2.5700	5.140	10.280	20.560	41.120	82.240	164.480	328.960	657.920	1315.840	2631.680	5263.360			
Acetonitrile	1.033	206.6	20.66	4.132	1.033	NA	0.2066	0.5165	1.033	2.066	4.132	8.264	16.528	33.056	66.112	132.224	264.448	528.896	1057.792			
Acrolein	1.028	205.6	20.56	4.112	1.028	NA	0.2056	0.5140	1.028	2.056	4.112	8.224	16.448	32.896	65.792	131.584	263.168	526.336	1052.672			
Acetone	5.370	1074.0	107.40	21.480	5.370	NA	1.0740	2.6850	5.370	10.740	21.480	42.960	85.920	171.840	343.680	687.360	1374.720	2749.440	5498.880			
Trichlorofluoromethane	1.060	212.0	21.20	4.240	1.060	NA	0.2120	0.5300	1.060	2.120	4.240	8.480	16.960	33.920	67.840	135.680	271.360	542.720	1085.440			
Isopropanol	2.063	412.6	41.26	8.252	2.063	NA	0.4126	1.0315	2.063	4.126	8.252	16.504	33.008	66.016	132.032	264.064	528.128	1056.256	2112.512			
Acrylonitrile	1.034	206.8	20.68	4.136	1.034	NA	0.2068	0.5170	1.034	2.068	4.136	8.272	16.544	33.088	66.176	132.352	264.704	529.408	1058.816			
1,1-Dichloroethene	1.074	214.8	21.48	4.296	1.074	NA	0.2148	0.5370	1.074	2.148	4.296	8.592	17.184	34.368	68.736	137.472	274.944	549.888	1099.776			
tert-Butanol	2.144	428.8	42.88	8.576	2.144	NA	0.4288	1.0720	2.144	4.288	8.576	17.152	34.304	68.608	137.216	274.432	548.864	1097.728	2195.456			
Methylene Chloride	1.070	214.0	21.40	4.280	1.070	NA	0.2140	0.5350	1.070	2.140	4.280	8.560	17.120	34.240	68.480	136.960	273.920	547.840	1095.680			
Allyl Chloride	1.067	213.4	21.34	4.268	1.067	NA	0.2134	0.5335	1.067	2.134	4.268	8.536	17.072	34.144	68.288	136.576	273.152	546.304	1092.608			
Trichlorotrifluoroethane	1.065	213.0	21.30	4.260	1.065	NA	0.2130	0.5325	1.065	2.130	4.260	8.520	17.040	34.080	68.160	136.320	272.640	545.280	1090.560			
Carbon Disulfide	1.075	215.0	21.50	4.300	1.075	NA	0.2150	0.5375	1.075	2.150	4.300	8.600	17.200	34.400	68.800	137.600	275.200	550.400	1100.800			
trans-1,2-Dichloroethene	1.062	212.4	21.24	4.248	1.062	NA	0.2124	0.5310	1.062	2.124	4.248	8.496	16.992	33.984	67.968	135.936	271.872	543.744	1087.488			
1,1-Dichloroethane	1.030	206.0	20.60	4.120	1.030	NA	0.2060	0.5150	1.030	2.060	4.120	8.240	16.480	32.960	65.920	131.840	263.680	527.360	1054.720			
Methyl tert-Butyl Ether	1.089	217.8	21.78	4.356	1.089	NA	0.2178	0.5445	1.089	2.178	4.356	8.712	17.424	34.848	69.696	139.392	278.784	557.568	1115.136			
Vinyl Acetate	5.252	1050.4	105.04	21.008	5.252	NA	1.0504	2.6260	5.252	10.504	21.008	42.016	84.032	168.064	336.128	672.256	1344.512	2689.024	5378.048			
2-Butanone	1.027	205.4	20.54	4.108	1.027	NA	0.2054	0.5135	1.027	2.054	4.108	8.216	16.432	32.864	65.728	131.456	262.912	525.824	1051.648			
cis-1,2-Dichloroethene	1.054	210.8	21.08	4.216	1.054	NA	0.2108	0.5270	1.054	2.108	4.216	8.432	16.864	33.728	67.456	134.912	269.824	539.648	1079.296			
Diisopropyl Ether	1.081	216.2	21.62	4.324	1.081	NA	0.2162	0.5405	1.081	2.162	4.324	8.648	17.296	34.592	69.184	138.368	276.736	553.472	1106.944			
Ethyl Acetate	2.166	433.2	43.32	8.664	2.166	NA	0.4332	1.0830	2.166	4.332	8.664	17.328	34.656	69.312	138.624	277.248	554.496	1108.992	2217.984			
n-Hexane	1.082	216.4	21.64	4.328	1.082	NA	0.2164	0.5410	1.082	2.164	4.328	8.656	17.312	34.624	69.248	138.496	276.992	553.984	1107.968			
Chloroform	1.077	215.4	21.54	4.308	1.077	NA	0.2154	0.5385	1.077	2.154	4.308	8.616	17.232	34.464	68.928	137.856	275.712	551.424	1102.848			
Tetrahydrofuran	1.068	213.6	21.36	4.272	1.068	NA	0.2136	0.5340	1.068	2.136	4.272	8.544	17.088	34.176	68.352	136.704	273.408	546.816	1093.632			
Ethyl tert-Butyl Ether	1.060	212.0	21.20	4.240	1.060	NA	0.2120	0.5300	1.060	2.120	4.240	8.480	16.960	33.920	67.840	135.680	271.360	542.720	1085.440			
1,2-Dichloroethane	1.061	212.2	21.22	4.244	1.061	NA	0.2122	0.5305	1.061	2.122	4.244	8.488	16.976	33.952	67.904	135.808	271.616	543.232	1086.464			
1,1,1-Trichloroethane	1.081	216.2	21.62	4.324	1.081	NA	0.2162	0.5405	1.081	2.162	4.324	8.648	17.296	34.592	69.184	138.368	276.736	553.472	1106.944			
Isopropyl Acetate	2.066	413.2	41.32	8.264	2.066	NA	0.4132	1.0330	2.066	4.132	8.264	16.528	33.056	66.112	132.224	264.448	528.896	1057.792				
1-Butanol	2.067	413.4	41.34	8.268	2.067	NA	0.4134	1.0335	2.067	4.134	8.268	16.536	33.072	66.144	132.288	264.576	529.152	1058.304				
Benzene	1.033	206.6	20.66	4.132	1.033	NA	0.2066	0.5165	1.033	2.066	4.132	8.264	16.528	33.056	66.112	132.224	264.448	528.896	1057.792			
Carbon Tetrachloride	1.036	207.2	20.72	4.144	1.036	NA	0.2072	0.5180	1.036	2.072	4.144	8.288	16.576	33.152	66.304	132.608	265.216	530.432	1060.864			
Cyclohexane	2.087	417.4	41.74	8.348	2.087	NA	0.4174	1.0435	2.087	4.174	8.348	16.696	33.392	66.784	133.568	267.136	534.272	1068.544				
tert-Amyl Methyl Ether	1.074	214.8	21.48	4.296	1.074	NA	0.2148	0.5370	1.074	2.148	4.296	8.592	17.184	34.368	68.736	137.472	274.944	549.888	1099.776			
1,2-Dichloropropane	1.073	214.6	21.46	4.292	1.073	NA	0.2146	0.5365	1.073	2.146	4.292	8.584	17.168	34.336	68.672	137.344	274.688	549.376	1099.752			
Bromodichloromethane	1.068	213.6	21.36	4.272	1.068	NA	0.2136	0.5340	1.068	2.136	4.272	8.544	17.088	34.176	68.352	136.704	273.408	546.816	1093.632			
Trichloroethene	1.062	212.4	21.24	4.248	1.062	NA	0.2124	0.5310	1.062	2.124	4.248	8.496	16.992	33.984	67.968	135.936	271.872	543.744	1087.488			
1,4-Dioxane	1.064	212.8	21.28	4.256	1.064	NA	0.2128	0.5320	1.064	2.128	4.256	8.512	17.024	34.048	68.096	136.192	272.384	544.768	1089.536			
Isooctane	1.061	212.2	21.22	4.244	1.061	NA	0.2122	0.5305	1.061	2.122	4.244	8.488	16.976	33.952	67.904	135.808	271.616	543.232	1086.464			
Methyl Methacrylate	2.135	427.0	42.70	8.540	2.135	NA	0.4270	1.0675	2.135	4.270	8.540	17.080	34.160	68.320	136.640	273.280	546.560	1093.120				
n-Heptane	1.076	215.2	21.52	4.304	1.076	NA	0.2152	0.5380	1.076	2.152	4.304	8.608	17.216	34.432	68.864	137.728	275.456	550.912	1101.824			

Date Updated: 08/22/18
Version: 0

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID: [Redacted]
 4ng/L Std. ID: S31-08291902
 20ng/L Std. ID: S31-09111903
 200ng/L Std. ID: S31-09041910

Compounds	Source Std. mg/m ³	Dilution Factors:						Working STD Conc. (ng/L):								
		5	50	250	1000	Primary Working Standards										
		200ng/L	20ng/L	4ng/L	1ng/L			NA	4	20	200	200	200	200	200	
		0.1ng	0.050	0.2ng	0.025	0.5ng	0.025	0.1ng	0.050	1ng	5ng	25ng	0.125	50ng	100ng	
Injection (L):																
ICAL Points:																
cis-1,3-Dichloropropene	1.120	224.0	22.40	4.480	1.120			NA	0.2240	0.5600	5.600	28.000	0.125	56.00	112.0	
4-Methyl-2-pentanone	1.060	212.0	21.20	4.240	1.060			NA	0.2120	0.5300	5.300	26.500	0.125	53.00	106.0	
trans-1,3-Dichloropropene	1.055	211.0	21.10	4.220	1.055			NA	0.2110	0.5275	5.275	26.375	0.125	52.75	105.5	
1,1,2-Trichloroethane	1.076	215.2	21.52	4.304	1.076			NA	0.2152	0.5380	5.380	26.900	0.125	53.80	107.6	
Toluene	1.052	210.4	21.04	4.208	1.052			NA	0.2104	0.5260	5.260	26.300	0.125	52.60	105.2	
2-Hexanone	1.074	214.8	21.48	4.296	1.074			NA	0.2148	0.5370	5.370	26.850	0.125	53.70	107.4	
Dibromochloromethane	1.075	215.0	21.50	4.300	1.075			NA	0.2150	0.5375	5.375	26.875	0.125	53.75	107.5	
1,2-Dibromoethane	1.076	215.2	21.52	4.304	1.076			NA	0.2152	0.5380	5.380	26.900	0.125	53.80	107.6	
n-Butyl Acetate	1.085	217.0	21.70	4.340	1.085			NA	0.2170	0.5425	5.425	27.125	0.125	54.25	108.5	
n-Octane	1.076	215.2	21.52	4.304	1.076			NA	0.2152	0.5380	5.380	26.900	0.125	53.80	107.6	
Tetrachloroethene	1.058	211.6	21.16	4.232	1.058			NA	0.2116	0.5290	5.290	26.450	0.125	52.90	105.8	
Chlorobenzene	1.066	213.2	21.32	4.264	1.066			NA	0.2132	0.5330	5.330	26.650	0.125	53.30	106.6	
Ethylbenzene	1.033	206.6	20.66	4.132	1.033			NA	0.2066	0.5165	5.165	25.825	0.125	51.65	103.3	
m- <i>p</i> -Xylene	2.123	424.6	42.46	8.492	2.123			NA	0.4246	1.0615	10.615	53.075	0.125	106.15	212.3	
Bromoform	1.063	212.6	21.26	4.252	1.063			NA	0.2126	0.5315	5.315	26.575	0.125	53.15	106.3	
Styrene	1.060	212.0	21.20	4.240	1.060			NA	0.2120	0.5300	5.300	26.500	0.125	53.00	106.0	
o-Xylene	1.062	212.4	21.24	4.248	1.062			NA	0.2124	0.5310	5.310	26.550	0.125	53.10	106.2	
n-Nonane	1.071	214.2	21.42	4.284	1.071			NA	0.2142	0.5355	5.355	26.775	0.125	53.55	107.1	
1,1,2,2-Tetrachloroethane	1.064	212.8	21.28	4.256	1.064			NA	0.2128	0.5320	5.320	26.600	0.125	53.20	106.4	
Cumene	1.057	211.4	21.14	4.228	1.057			NA	0.2114	0.5285	5.285	26.425	0.125	52.85	105.7	
alpha- <i>P</i> -Pinene	1.035	207.0	20.70	4.140	1.035			NA	0.2070	0.5175	5.175	25.875	0.125	51.75	103.5	
n-Propylbenzene	1.076	215.2	21.52	4.304	1.076			NA	0.2152	0.5380	5.380	26.900	0.125	53.80	107.6	
3-Ethyltoluene	1.062	212.4	21.24	4.248	1.062			NA	0.2124	0.5310	5.310	26.550	0.125	53.10	106.2	
4-Ethyltoluene	1.061	212.2	21.22	4.244	1.061			NA	0.2122	0.5305	5.305	26.525	0.125	53.05	106.1	
1,3,5-Trimethylbenzene	1.057	211.4	21.14	4.228	1.057			NA	0.2114	0.5285	5.285	26.425	0.125	52.85	105.7	
alpha-Methylstyrene	1.058	211.6	21.16	4.232	1.058			NA	0.2116	0.5290	5.290	26.450	0.125	52.90	105.8	
2-Ethyltoluene	1.072	214.4	21.44	4.288	1.072			NA	0.2144	0.5360	5.360	26.800	0.125	53.60	107.2	
1,2,4-Trimethylbenzene	1.068	213.6	21.36	4.272	1.068			NA	0.2136	0.5340	5.340	26.700	0.125	53.40	106.8	
n-Decane	1.076	215.2	21.52	4.304	1.076			NA	0.2152	0.5380	5.380	26.900	0.125	53.80	107.6	
Benzyl Chloride	1.051	210.2	21.02	4.204	1.051			NA	0.2102	0.5255	5.255	26.275	0.125	52.55	105.1	
1,3-Dichlorobenzene	1.080	216.0	21.60	4.320	1.080			NA	0.2160	0.5400	5.400	27.000	0.125	54.00	108.0	
1,4-Dichlorobenzene	1.081	216.2	21.62	4.324	1.081			NA	0.2162	0.5405	5.405	27.025	0.125	54.05	108.1	
sec-Butylbenzene	1.063	212.6	21.26	4.252	1.063			NA	0.2126	0.5315	5.315	26.575	0.125	53.15	106.3	
p-Isopropyltoluene	1.042	208.4	20.84	4.168	1.042			NA	0.2084	0.5210	5.210	26.050	0.125	52.10	104.2	
1,2,3-Trimethylbenzene	1.042	208.4	20.84	4.168	1.042			NA	0.2084	0.5210	5.210	26.050	0.125	52.10	104.2	
1,2-Dichlorobenzene	1.089	217.8	21.78	4.356	1.089			NA	0.2178	0.5445	5.445	27.225	0.125	54.45	108.9	
d-Limonene	1.010	202.0	20.20	4.040	1.010			NA	0.2020	0.5050	5.050	25.250	0.125	50.50	101.0	
1,2-Dibromo-3-chloropropane	1.042	208.4	20.84	4.168	1.042			NA	0.2084	0.5210	5.210	26.050	0.125	52.10	104.2	
n-Undecane	1.057	211.4	21.14	4.228	1.057			NA	0.2114	0.5285	5.285	26.425	0.125	52.85	105.7	
1,2,4-Trichlorobenzene	1.064	212.8	21.28	4.256	1.064			NA	0.2128	0.5320	5.320	26.600	0.125	53.20	106.4	
Naphthalene	1.025	205.0	20.50	4.100	1.025			NA	0.2050	0.5125	5.125	25.625	0.125	51.25	102.5	
n-Dodecane	1.031	206.2	20.62	4.124	1.031			NA	0.2062	0.5155	5.155	25.775	0.125	51.55	103.1	
Hexachloro-1,3-butadiene	1.053	210.6	21.06	4.212	1.053			NA	0.2106	0.5265	5.265	26.325	0.125	52.65	105.3	
Methacrylonitrile	1.041	208.2	20.82	4.164	1.041			NA	0.2082	0.5205	5.205	26.025	0.125	52.05	104.1	
Cyclohexanone	0.982	196.4	19.64	3.928	0.982			NA	0.1964	0.4910	4.910	24.550	0.125	49.10	98.2	
tert-Butylbenzene	1.067	213.4	21.34	4.268	1.067			NA	0.2134	0.5335	5.335	26.675	0.125	53.35	106.7	
n-Butylbenzene	1.064	212.8	21.28	4.256	1.064			NA	0.2128	0.5320	5.320	26.600	0.125	53.20	106.4	

Method : I:\MS13\METHODS\R13092519A.M (RTE Integrator)
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Thu Sep 26 06:41:47 2019
 Response via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	0.2	0	13	I:\MS13\DATA\2019_09\25\09251923.D
2	0.5	1	13	I:\MS13\DATA\2019_09\25\09251924.D
3	1.0	1	13	I:\MS13\DATA\2019_09\25\09251925.D
4	5.0	5	13	I:\MS13\DATA\2019_09\25\09251931.D
5	25	26	13	I:\MS13\DATA\2019_09\25\09251927.D
6	50	52	13	I:\MS13\DATA\2019_09\25\09251928.D
7	100	103	13	I:\MS13\DATA\2019_09\25\09251929.D

USA 9/26/19

#	ID	Update Time	Quant Time	Acquisition Time
1	0.2	Sep 26 06:40 2019	Sep 26 06:33 2019	25 Sep 2019 17:43
2	0.5	Sep 26 06:40 2019	Sep 26 06:27 2019	25 Sep 2019 18:16
3	1.0	Sep 26 06:40 2019	Sep 26 06:27 2019	25 Sep 2019 18:50
4	5.0	Sep 26 06:41 2019	Sep 26 06:28 2019	25 Sep 2019 22:13
5	25	Sep 26 06:41 2019	Sep 26 06:27 2019	25 Sep 2019 19:58
6	50	Sep 26 06:41 2019	Sep 26 06:27 2019	25 Sep 2019 20:31
7	100	Sep 26 06:41 2019	Sep 26 06:27 2019	25 Sep 2019 21:05

R13092519A.M

Thu Sep 26 06:57:35 2019

Data File : I:\MS13\DATA\2019_09\25\09251923.D
 Acq On : 25 Sep 2019 17:43
 Sample : 0.2ng R13092519 ICAL Std
 Misc : S31-06261901/S31-08291902

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:33:27 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

WA 9/26/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	102512	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.36	114	472857	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.68	82	204303	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	215005	17.315	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	138.56%#	
57) Toluene-d8 (SS2)	15.82	98	530548	12.118	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	96.96%	
73) Bromofluorobenzene (SS3)	19.06	174	110364	10.235	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	81.84%	

Target Compounds

						Qvalue
2) Propene	4.26	42	3123	0.208	ng	85
3) Dichlorodifluoromethan...	4.42	85	5641	0.257	ng	# 96
4) Chloromethane	4.74	50	4010m	0.214	ng	
5) 1,2-Dichloro-1,1,2,2-t...	4.95	135	2517	0.207	ng	98
6) Vinyl Chloride	5.14	62	2895	0.170	ng	81
7) 1,3-Butadiene	5.41	54	1392	0.123	ng	# 76
8) Bromomethane	5.84	94	1589	0.168	ng	# 70
9) Chloroethane	6.15	64	1421	0.174	ng	# 43
10) Ethanol	6.49	45	10625	1.063	ng	96
11) Acetonitrile	6.79	41	5194	0.199	ng	99
12) Acrolein	0.00	56	0	N.D.	d	
13) Acetone	7.16	58	9344	1.040	ng	# 79
14) Trichlorofluoromethane	7.39	101	4547	0.244	ng	95
15) 2-Propanol (Isopropanol)	7.68	45	14118	0.454	ng	95
16) Acrylonitrile	7.93	53	2793	0.176	ng	93
17) 1,1-Dichloroethene	8.33	96	2221	0.224	ng	95
18) 2-Methyl-2-Propanol (t...	8.55	59	13647	0.513	ng	95
19) Methylene Chloride	8.54	84	2077m	0.191	ng	
20) 3-Chloro-1-propene (Al...	8.70	41	3655	0.201	ng	# 48
21) Trichlorotrifluoroethane	8.97	151	2348	0.233	ng	93
22) Carbon Disulfide	8.84	76	9857	0.225	ng	82
23) trans-1,2-Dichloroethene	9.84	61	3588	0.232	ng	100
24) 1,1-Dichloroethane	10.06	63	4157	0.211	ng	88
25) Methyl tert-Butyl Ether	10.22	73	7353	0.230	ng	86
26) Vinyl Acetate	10.33	86	2019	0.751	ng	# 63
27) 2-Butanone (MEK)	10.63	72	1131	0.146	ng	# 66
28) cis-1,2-Dichloroethene	11.08	61	3509	0.232	ng	95
29) Diisopropyl Ether	11.41	87	2477	0.241	ng	# 48
30) Ethyl Acetate	11.41	61	1403	0.353	ng	93
31) n-Hexane	11.37	57	4722	0.245	ng	# 91
32) Chloroform	11.41	83	4381	0.242	ng	99
34) Tetrahydrofuran (THF)	11.90	72	1638	0.210	ng	# 43
35) Ethyl tert-Butyl Ether	12.00	87	2835	0.223	ng	90
36) 1,2-Dichloroethane	12.22	62	3756	0.266	ng	98
38) 1,1,1-Trichloroethane	12.49	97	4577	0.266	ng	90
39) Isopropyl Acetate	12.95	61	2634	0.344	ng	96
40) 1-Butanol	13.02	56	4412m	0.348	ng	
41) Benzene	12.98	78	9595	0.188	ng	96
42) Carbon Tetrachloride	13.13	117	3225	0.211	ng	88
43) Cyclohexane	13.27	84	6670	0.364	ng	89
44) tert-Amyl Methyl Ether	13.64	73	6345	0.197	ng	98
45) 1,2-Dichloropropane	13.82	63	2341	0.198	ng	98
46) Bromodichloromethane	14.02	83	3302	0.223	ng	91
47) Trichloroethene	14.07	130	2300	0.179	ng	97
48) 1,4-Dioxane	14.10	88	1778m	0.192	ng	
49) 2,2,4-Trimethylpentane...	14.13	57	9772	0.187	ng	99
50) Methyl Methacrylate	14.29	100	1623	0.332	ng	99

Data File : I:\MS13\DATA\2019_09\25\09251923.D
 Acq On : 25 Sep 2019 17:43
 Sample : 0.2ng R13092519 ICAL Std
 Misc : S31-06261901/S31-08291902

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:33:27 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

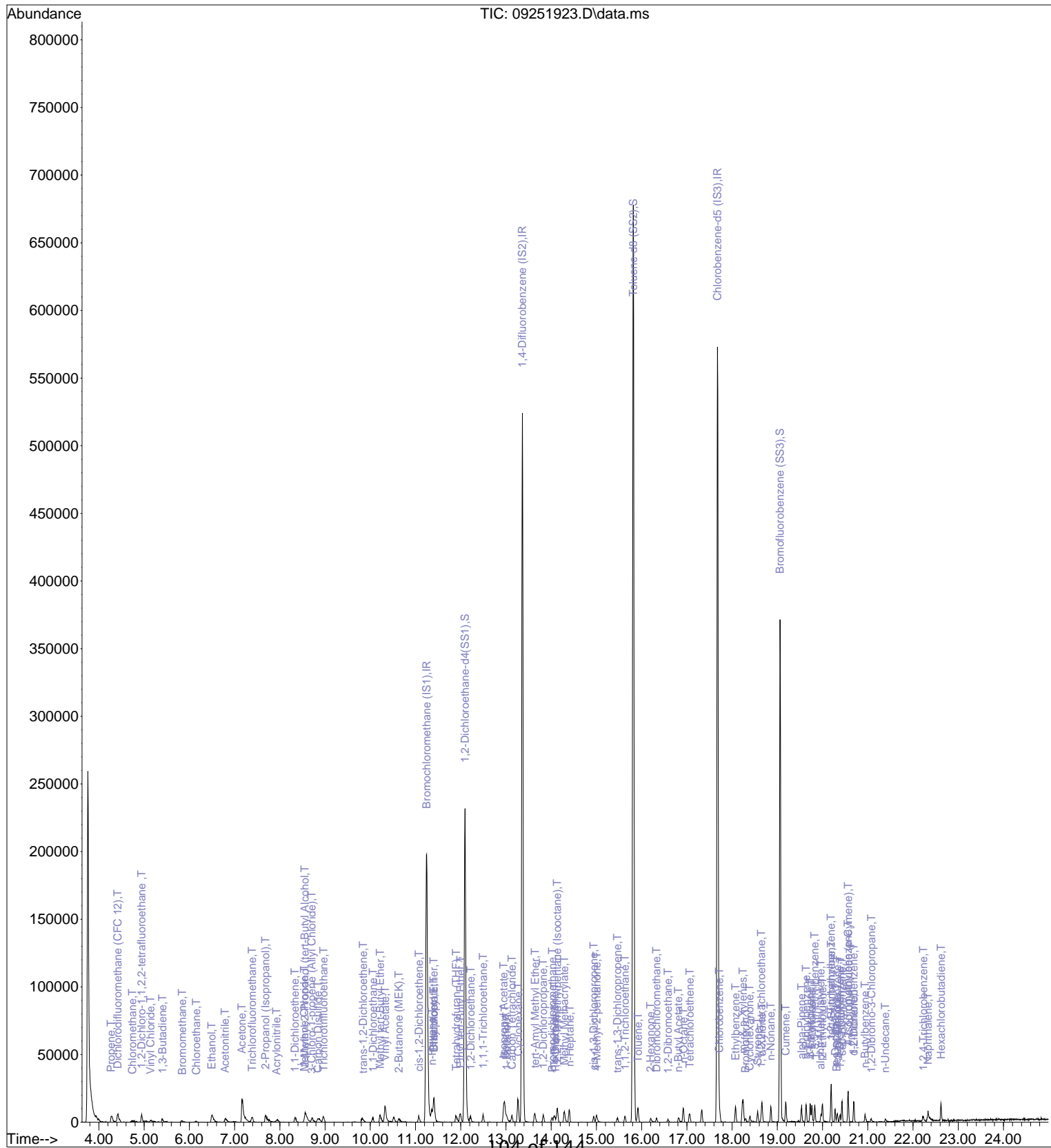
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.41	71	1973	0.167	ng	85
52) cis-1,3-Dichloropropene	14.94	75	3000	0.163	ng	92
53) 4-Methyl-2-pentanone	15.01	58	1755	0.153	ng #	73
54) trans-1,3-Dichloropropene	15.46	75	2524	0.149	ng	82
55) 1,1,2-Trichloroethane	15.63	97	1724	0.161	ng #	71
58) Toluene	15.92	91	9601	0.189	ng	100
59) 2-Hexanone	16.20	43	4364	0.156	ng	81
60) Dibromochloromethane	16.33	129	2469	0.185	ng	100
61) 1,2-Dibromoethane	16.58	107	2207	0.179	ng	81
62) n-Butyl Acetate	16.81	43	4124	0.124	ng	93
63) n-Octane	16.93	57	2036	0.186	ng	93
64) Tetrachloroethene	17.06	166	2598	0.172	ng	94
65) Chlorobenzene	17.72	112	5485	0.167	ng	86
66) Ethylbenzene	18.08	91	9829	0.174	ng	99
67) m- & p-Xylenes	18.24	91	16615	0.387	ng	98
68) Bromoform	18.30	173	1760	0.151	ng	93
69) Styrene	18.56	104	4175	0.118	ng	100
70) o-Xylene	18.66	91	8346	0.190	ng	96
71) n-Nonane	18.86	43	3968	0.148	ng	92
72) 1,1,2,2-Tetrachloroethane	18.64	83	2851	0.140	ng	89
74) Cumene	19.19	105	10548	0.187	ng	95
75) alpha-Pinene	19.54	93	4613	0.161	ng	100
76) n-Propylbenzene	19.63	91	10688	0.165	ng	99
77) 3-Ethyltoluene	19.73	105	8965	0.163	ng	94
78) 4-Ethyltoluene	19.77	105	8312	0.166	ng	99
79) 1,3,5-Trimethylbenzene	19.83	105	8121	0.177	ng	94
80) alpha-Methylstyrene	19.96	118	2053	0.081	ng	84
81) 2-Ethyltoluene	20.00	105	9356	0.172	ng	96
82) 1,2,4-Trimethylbenzene	20.19	105	6914	0.155	ng	99
83) n-Decane	20.28	57	3505	0.130	ng	93
84) Benzyl Chloride	20.31	91	2470	0.066	ng	69
85) 1,3-Dichlorobenzene	20.33	146	2979	0.103	ng	99
86) 1,4-Dichlorobenzene	20.39	146	3025	0.105	ng	94
87) sec-Butylbenzene	20.43	105	10293	0.167	ng	92
88) 4-Isopropyltoluene (p-...	20.57	119	8146	0.141	ng	92
89) 1,2,3-Trimethylbenzene	20.56	105	6344	0.139	ng	99
90) 1,2-Dichlorobenzene	20.69	146	3166	0.115	ng	97
91) d-Limonene	20.69	68	2421	0.121	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.08	157	973	0.100	ng #	67
93) n-Undecane	21.39	57	924	0.033	ng	95
94) 1,2,4-Trichlorobenzene	22.23	180	1954	0.098	ng #	90
95) Naphthalene	22.33	128	8556	0.144	ng	83
96) n-Dodecane	0.00	57	0	N.D.	d	
97) Hexachlorobutadiene	22.62	225	2797	0.189	ng	88
98) Cyclohexanone	18.39	55	2423	0.127	ng	93
99) tert-Butylbenzene	20.19	119	8806	0.189	ng	97
100) n-Butylbenzene	20.94	91	5185	0.102	ng #	83

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

Data File : I:\MS13\DATA\2019_09\25\09251923.D
Acq On : 25 Sep 2019 17:43
Sample : 0.2ng R13092519 ICAL Std
Misc : S31-06261901/S31-08291902

Vial: 4
Operator: WA
Inst : MS13

Quant Time: Sep 26 06:33:27 2019
Quant Method : I:\MS13\METHODS\R13092519A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Sep 26 06:27:04 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

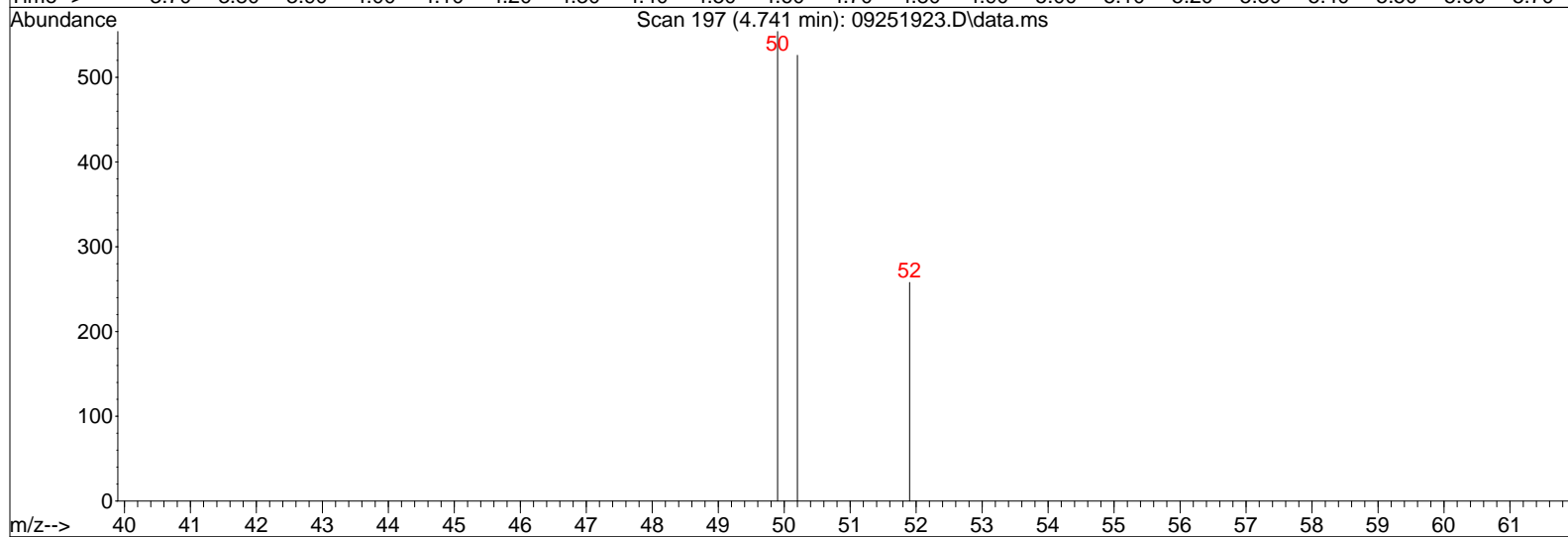
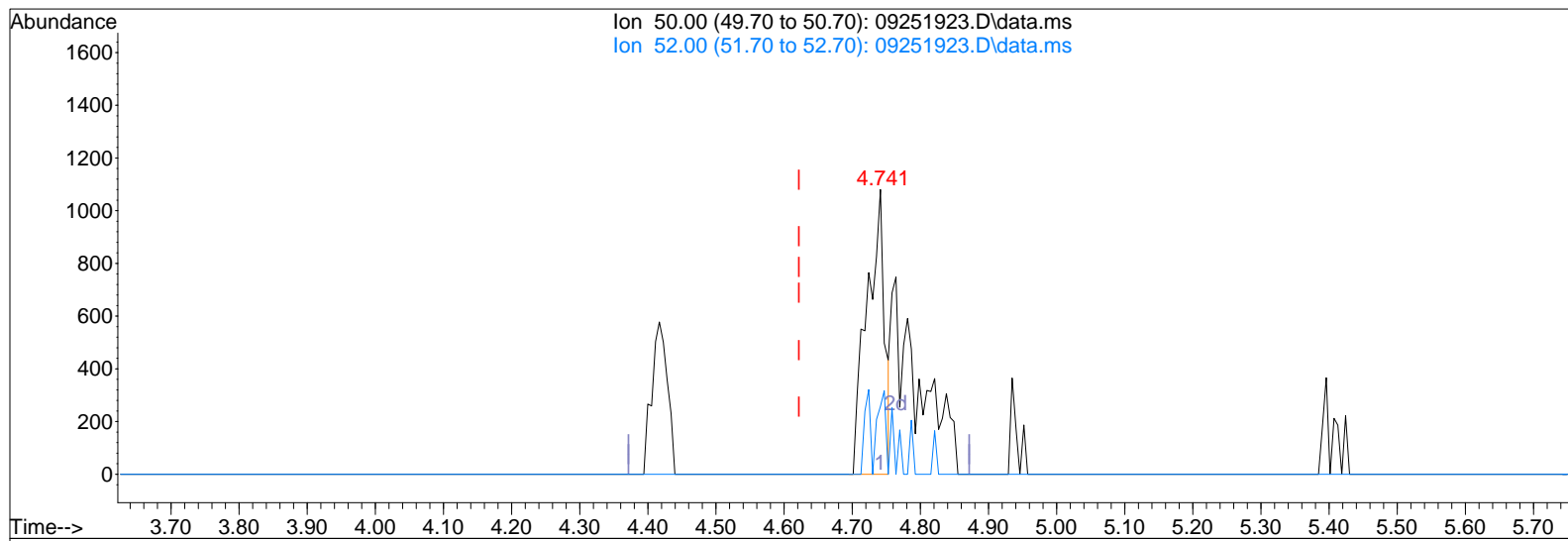


TIC: 09251923.D\data.ms

Data File : I:\MS13\DATA\2019_09\25\09251923.D
 Acq On : 25 Sep 2019 17:43
 Sample : 0.2ng R13092519 ICAL Std
 Misc : S31-06261901/S31-08291902

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:27:45 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



TIC: 09251923.D\data.ms

(4) Chloromethane (T)

4.741min (+0.119) 0.10ng

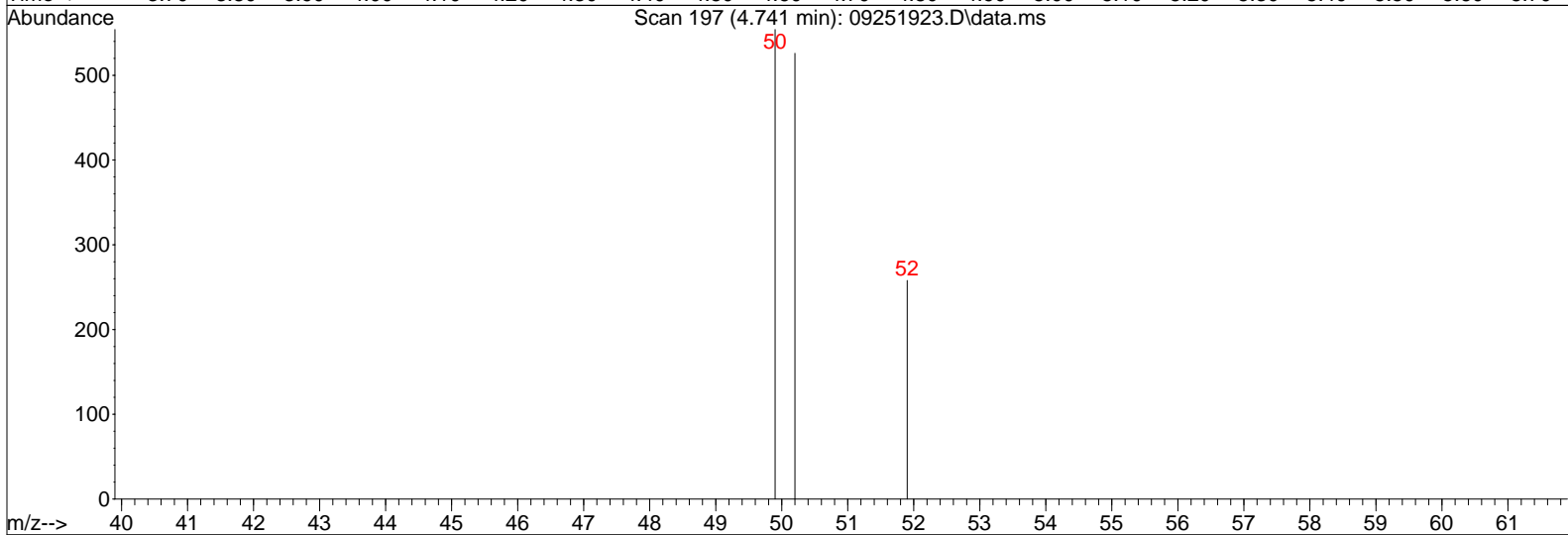
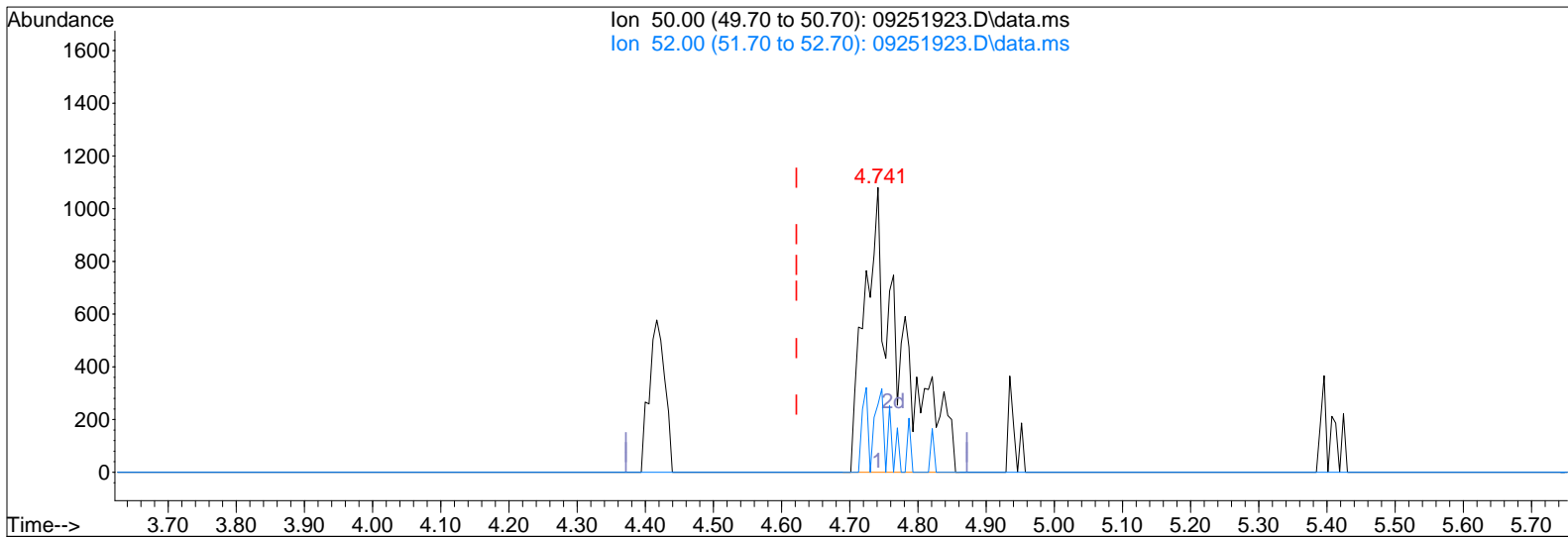
response 1933

Ion	Exp%	Act%
50.00	100	100
52.00	31.90	13.81
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2019_09\25\09251923.D
 Acq On : 25 Sep 2019 17:43
 Sample : 0.2ng R13092519 ICAL Std
 Misc : S31-06261901/S31-08291902

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:27:45 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



TIC: 09251923.D\data.ms

(4) Chloromethane (T)
 4.741min (+0.119) 0.21ng m

SP

response 4010

WA 9/26/19

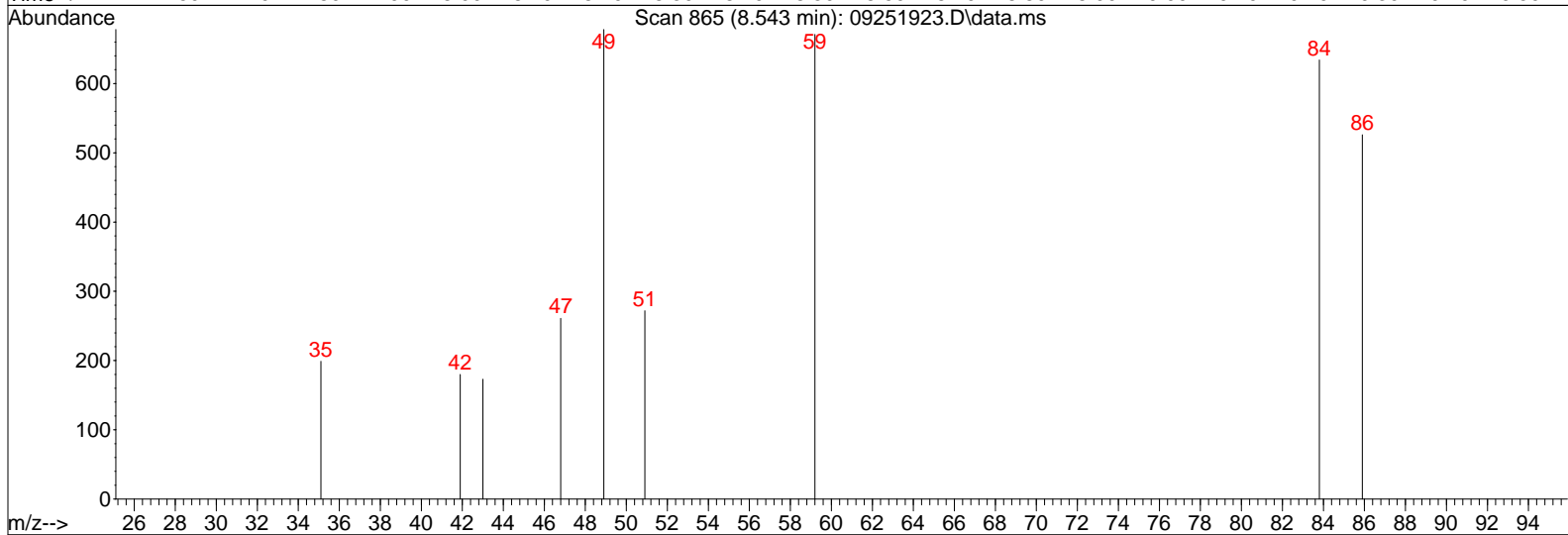
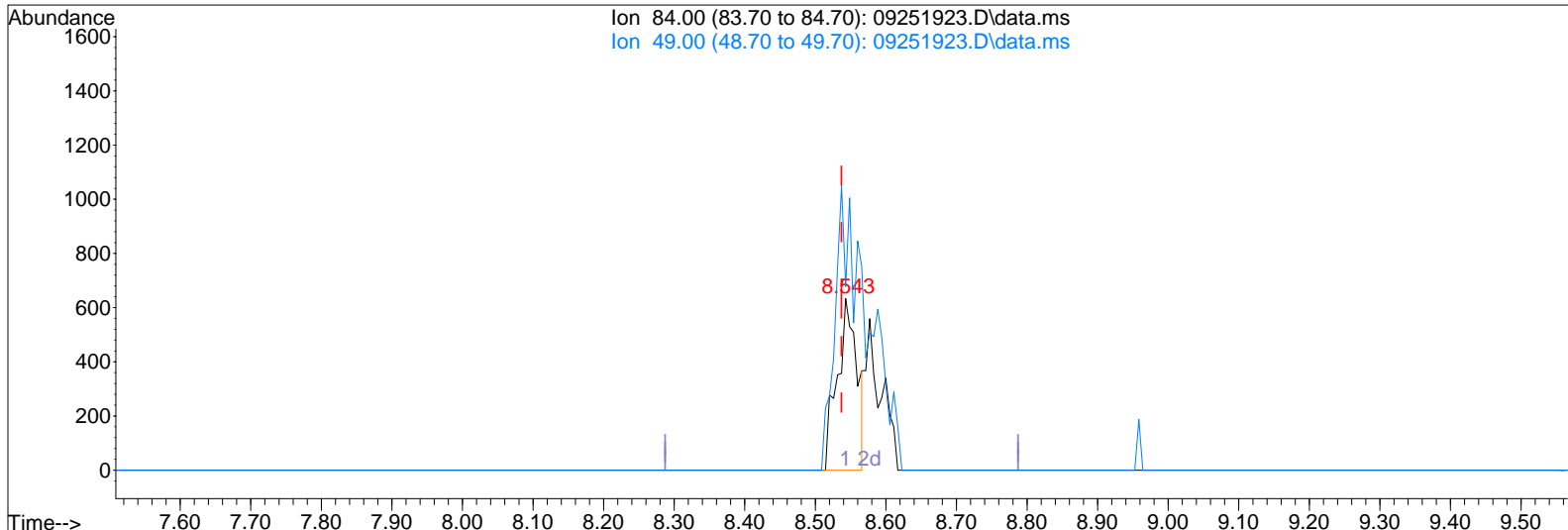
WA 10/2/19

Ion	Exp%	Act%
50.00	100	100
52.00	31.90	6.66#
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2019_09\25\09251923.D
 Acq On : 25 Sep 2019 17:43
 Sample : 0.2ng R13092519 ICAL Std
 Misc : S31-06261901/S31-08291902

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:27:45 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



TIC: 09251923.D\data.ms

(19) Methylene Chloride (T)

8.543min (+0.006) 0.11ng

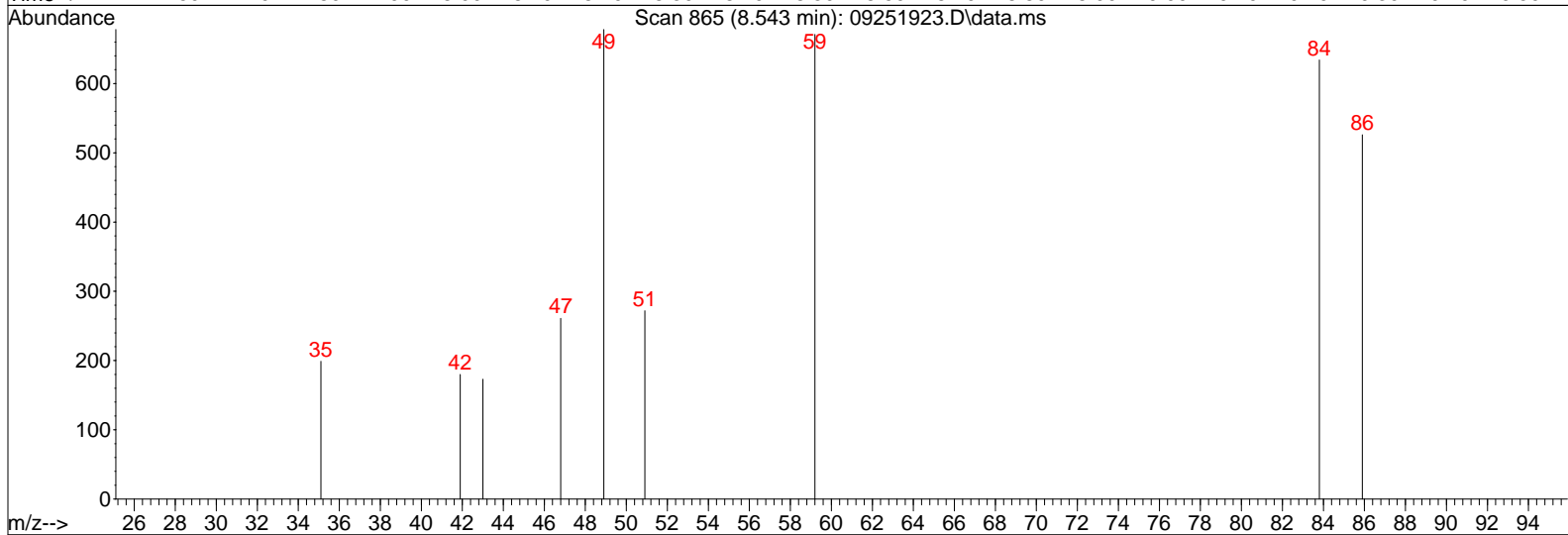
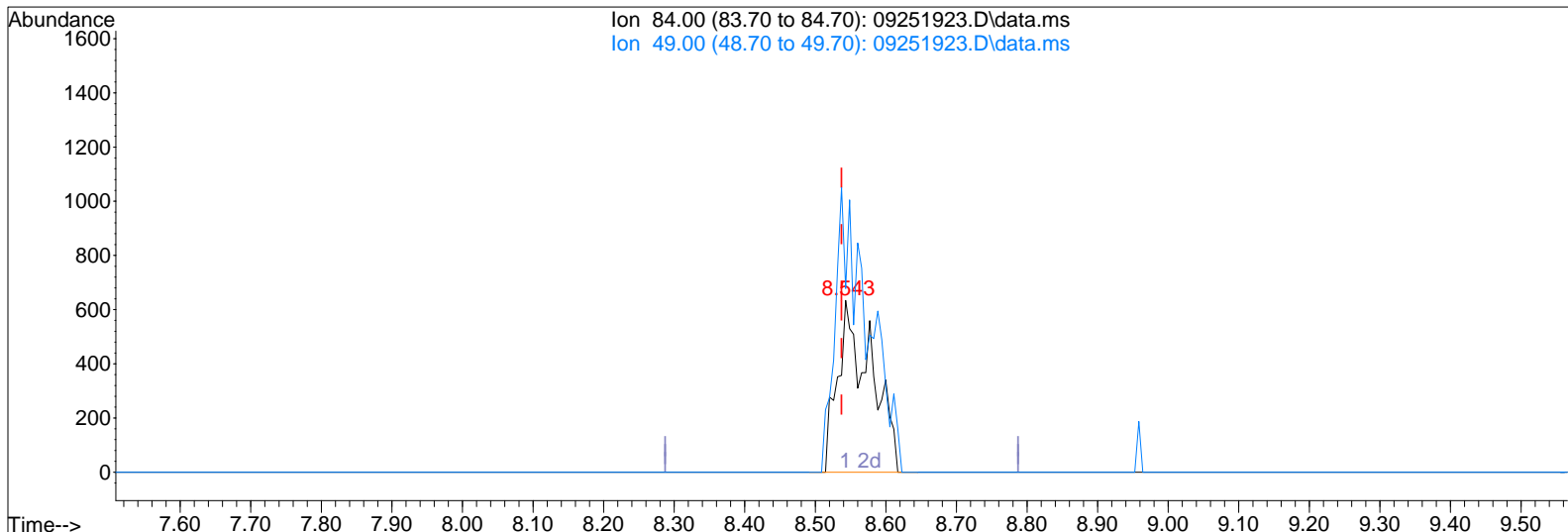
response 1229

Ion	Exp%	Act%
84.00	100	100
49.00	148.40	277.22#
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2019_09\25\09251923.D
 Acq On : 25 Sep 2019 17:43
 Sample : 0.2ng R13092519 ICAL Std
 Misc : S31-06261901/S31-08291902

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:27:45 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



TIC: 09251923.D\data.ms

(19) Methylene Chloride (T)

8.543min (+0.006) 0.19ng m

response 2077

SP

Ion	Exp%	Act%
84.00	100	100
49.00	148.40	164.03
0.00	0.00	0.00
0.00	0.00	0.00

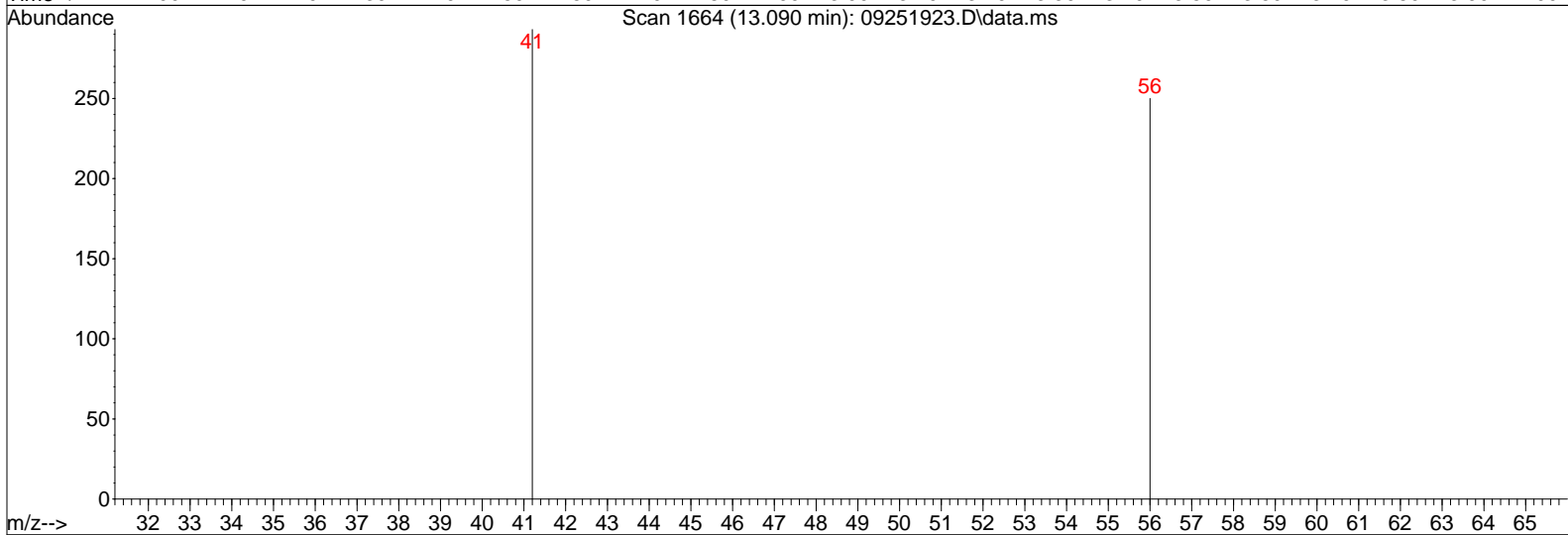
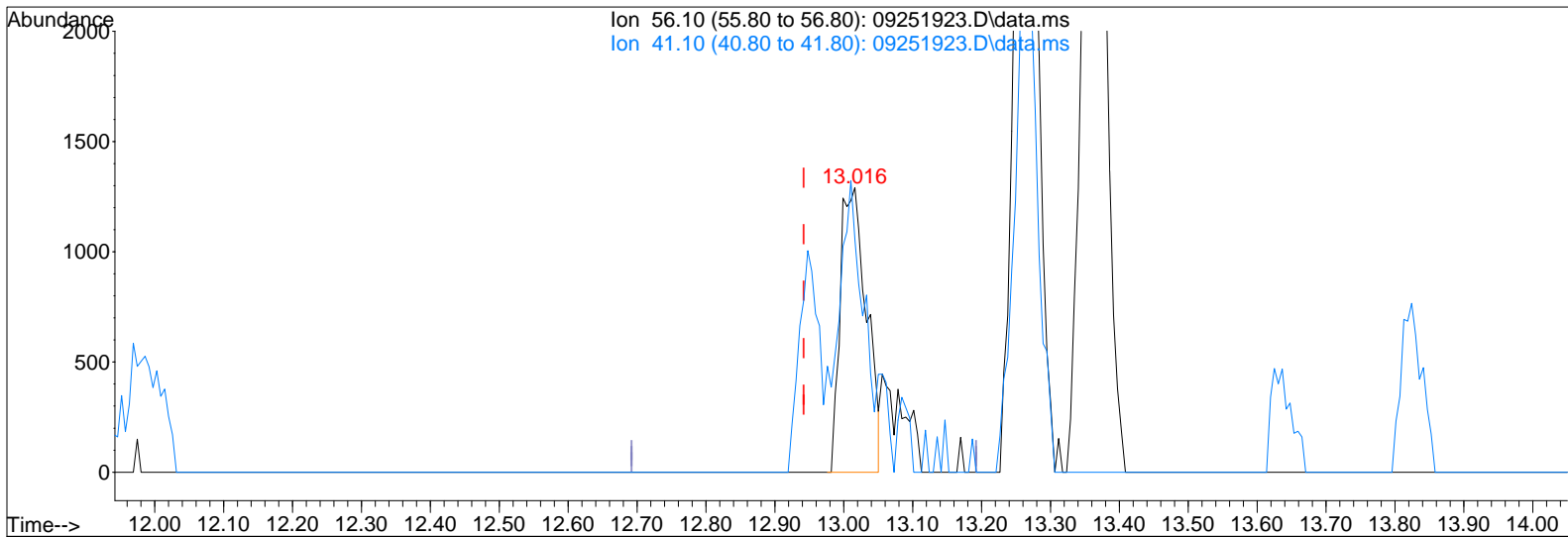
WA 9/26/19

WA 10/2/19

Data File : I:\MS13\DATA\2019_09\25\09251923.D
 Acq On : 25 Sep 2019 17:43
 Sample : 0.2ng R13092519 ICAL Std
 Misc : S31-06261901/S31-08291902

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:27:45 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



TIC: 09251923.D\data.ms

(40) 1-Butanol (T)

13.016min (+0.074) 0.27ng

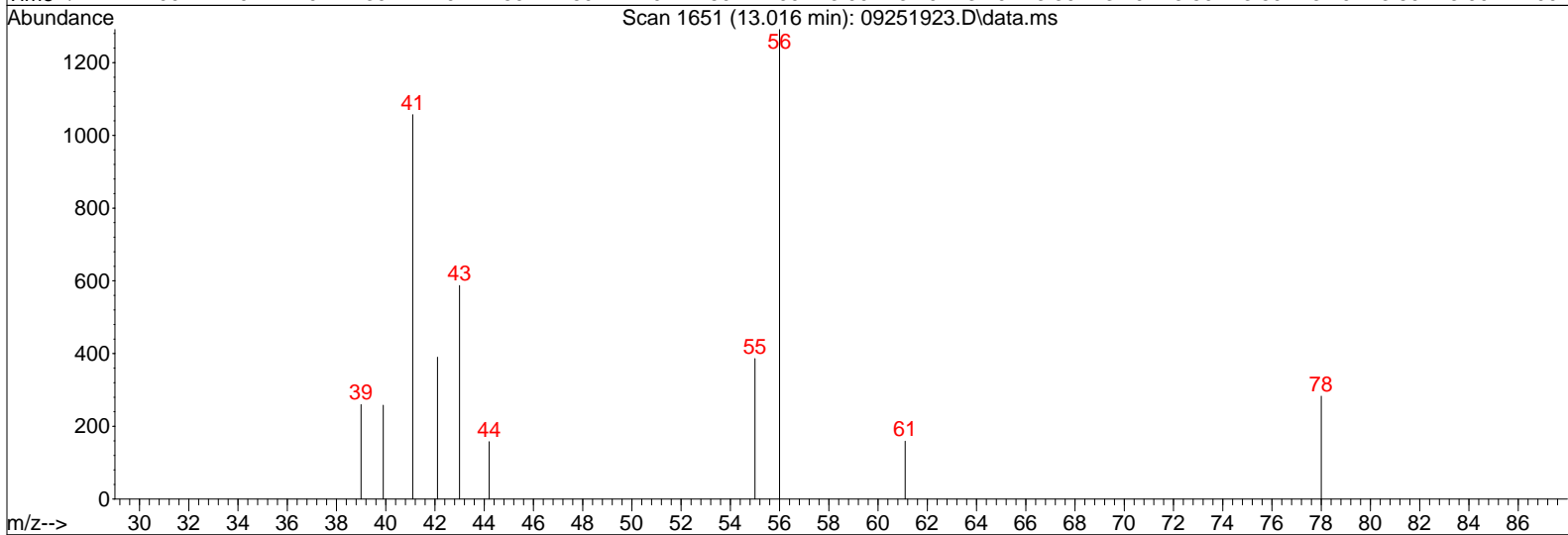
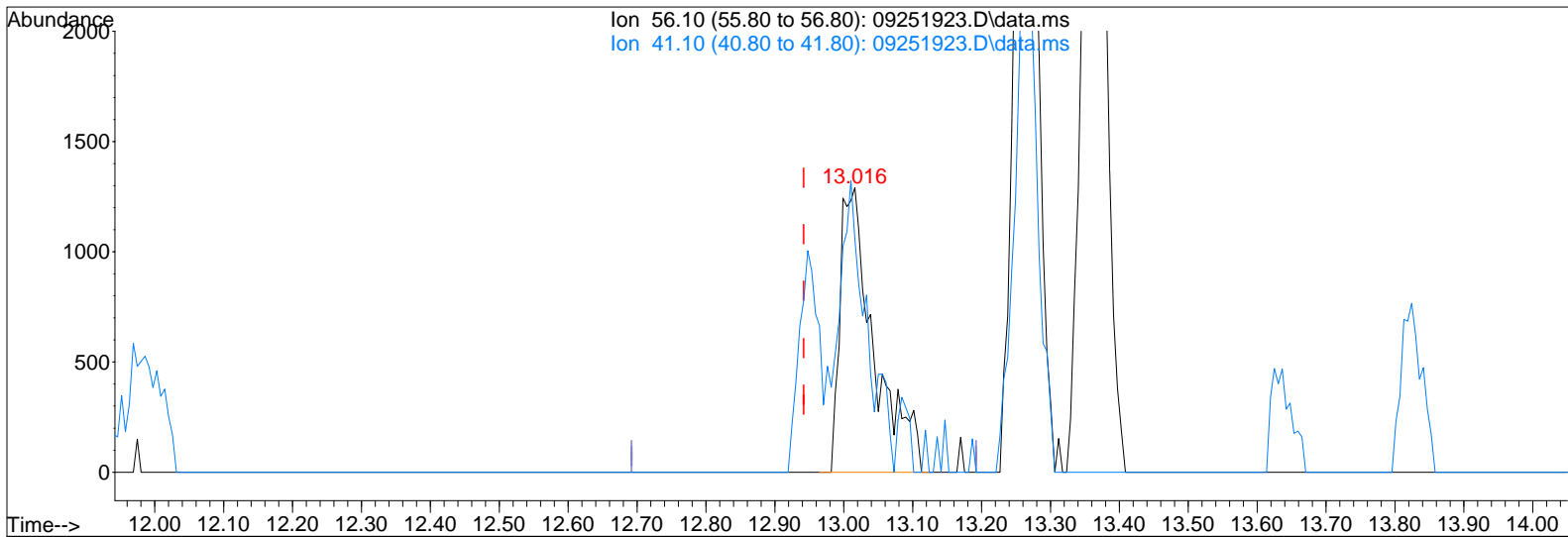
response 3412

Ion	Exp%	Act%
56.10	100	100
41.10	114.90	88.25#
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2019_09\25\09251923.D
 Acq On : 25 Sep 2019 17:43
 Sample : 0.2ng R13092519 ICAL Std
 Misc : S31-06261901/S31-08291902

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:27:45 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



TIC: 09251923.D\data.ms

(40) 1-Butanol (T)

SP

13.016min (+0.074) 0.35ng m

response 4412

Ion	Exp%	Act%
56.10	100	100
41.10	114.90	68.25#
0.00	0.00	0.00
0.00	0.00	0.00

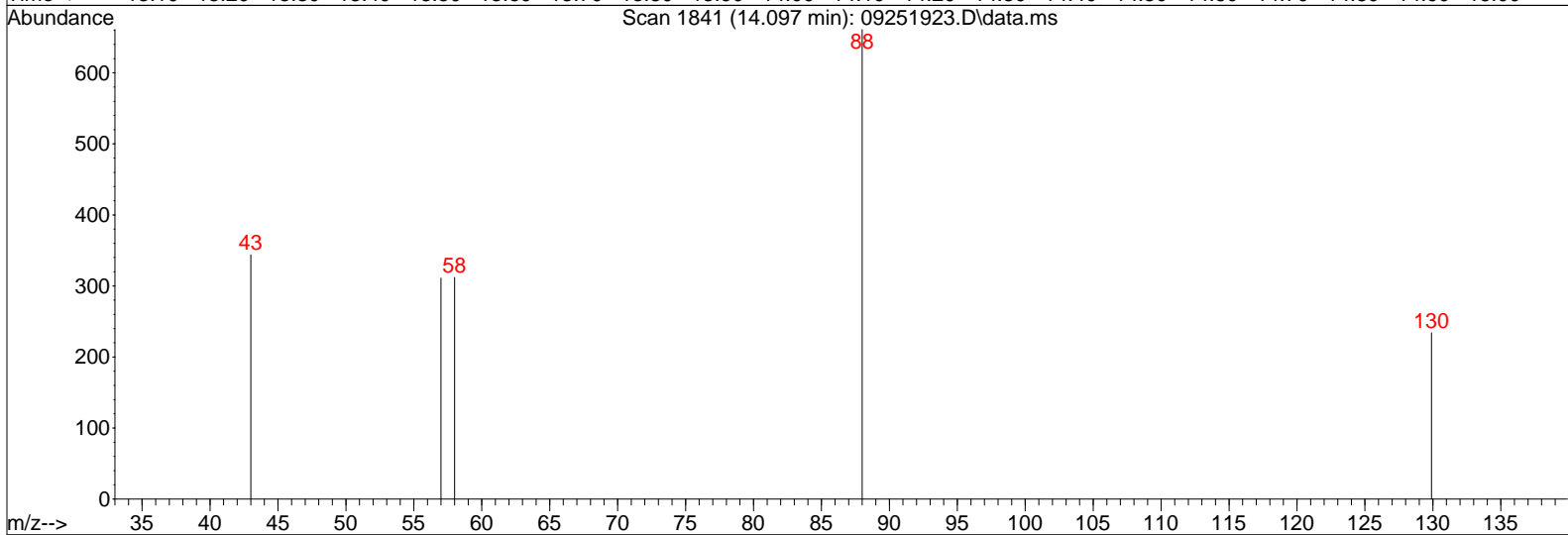
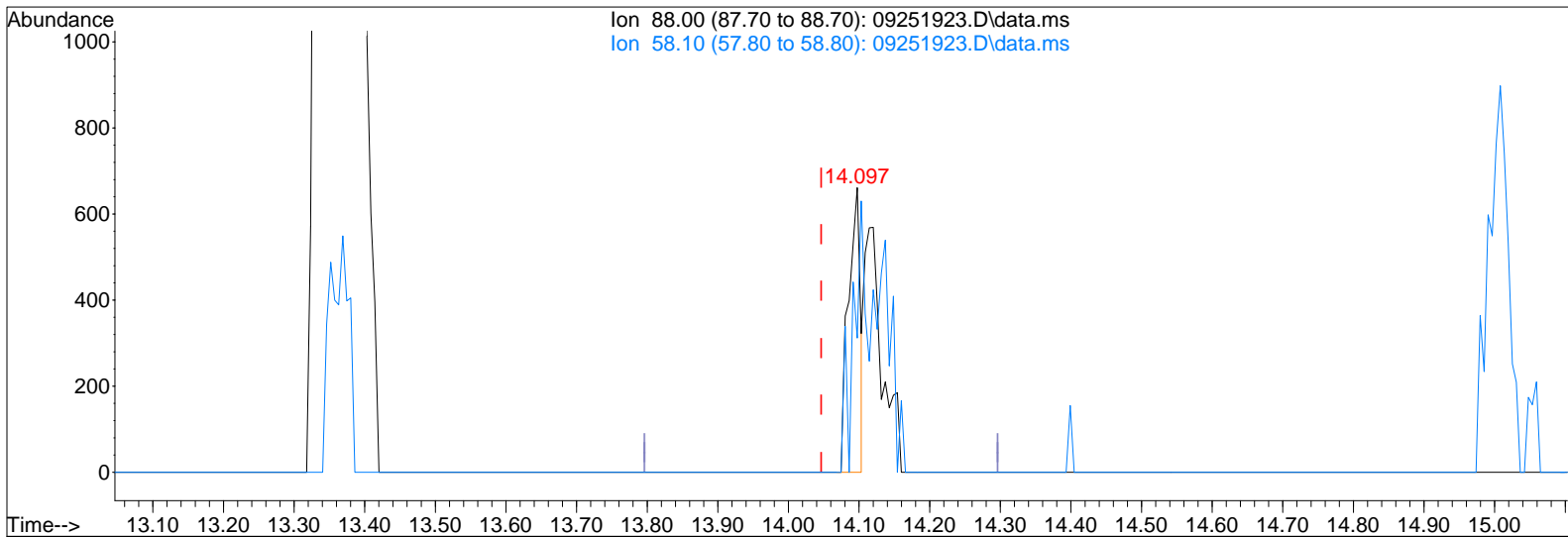
~~10/1~~ 9/26/19

10/2/19

Data File : I:\MS13\DATA\2019_09\25\09251923.D
 Acq On : 25 Sep 2019 17:43
 Sample : 0.2ng R13092519 ICAL Std
 Misc : S31-06261901/S31-08291902

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:27:45 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



TIC: 09251923.D\data.ms

(48) 1,4-Dioxane (T)

14.097min (+0.051) 0.08ng

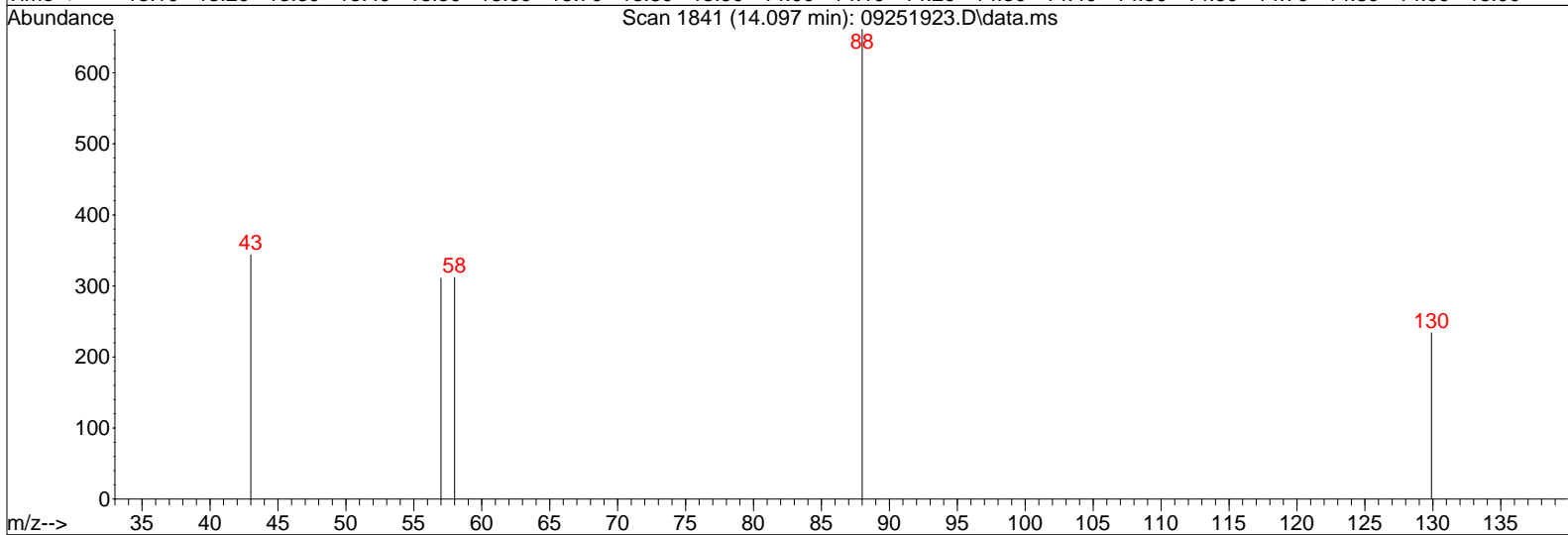
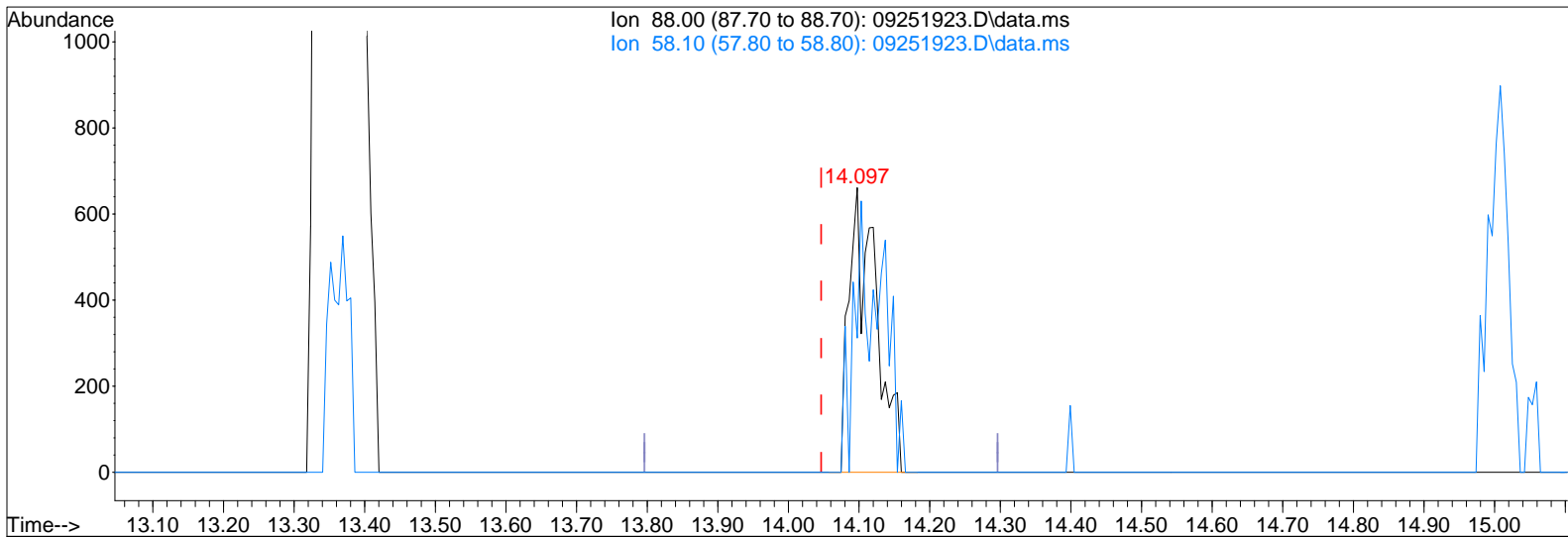
response 777

Ion	Exp%	Act%
88.00	100	100
58.10	66.50	103.22#
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS13\DATA\2019_09\25\09251923.D
 Acq On : 25 Sep 2019 17:43
 Sample : 0.2ng R13092519 ICAL Std
 Misc : S31-06261901/S31-08291902

Vial: 4
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:27:45 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M



TIC: 09251923.D\data.ms

(48) 1,4-Dioxane (T)

14.097min (+0.051) 0.19ng m

SP

response 1778

Ion	Exp%	Act%
88.00	100	100
58.10	66.50	45.11#
0.00	0.00	0.00
0.00	0.00	0.00

WA 9/26/19

10/2/19

Data File : I:\MS13\DATA\2019_09\25\09251924.D
 Acq On : 25 Sep 2019 18:16
 Sample : 0.5ng R13092519 ICAL Std
 Misc : S31-06261901/S31-09111903

Vial: 1
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:27:49 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

 9/26/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	105655	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.36	114	478469	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.68	82	210291	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	219782	17.173	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	137.36%#	
57) Toluene-d8 (SS2)	15.82	98	534162	11.853	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	94.80%	
73) Bromofluorobenzene (SS3)	19.06	174	115213	10.380	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	83.04%	

Target Compounds

	R.T.	QIon	Response	Conc	Units	Qvalue
2) Propene	4.24	42	8023	0.518	ng	98
3) Dichlorodifluoromethan...	4.39	85	15843	0.699	ng	100
4) Chloromethane	4.70	50	10510	0.544	ng	74
5) 1,2-Dichloro-1,1,2,2-t...	4.92	135	7740	0.617	ng	98
6) Vinyl Chloride	5.10	62	8283	0.473	ng	99
7) 1,3-Butadiene	5.37	54	6483	0.556	ng	97
8) Bromomethane	5.80	94	5061	0.520	ng	97
9) Chloroethane	6.12	64	4199	0.499	ng	99
10) Ethanol	6.47	45	28106	2.729	ng	99
11) Acetonitrile	6.78	41	12324	0.458	ng	94
12) Acrolein	6.94	56	3976	0.523	ng	# 14
13) Acetone	7.13	58	26313	2.842	ng	93
14) Trichlorofluoromethane	7.37	101	12777	0.664	ng	99
15) 2-Propanol (Isopropanol)	7.63	45	39954	1.246	ng	97
16) Acrylonitrile	7.94	53	8975	0.550	ng	94
17) 1,1-Dichloroethene	8.34	96	5994	0.585	ng	95
18) 2-Methyl-2-Propanol (t...	8.52	59	38298	1.397	ng	96
19) Methylene Chloride	8.53	84	6546	0.583	ng	99
20) 3-Chloro-1-propene (Al...	8.70	41	7934	0.424	ng	92
21) Trichlorotrifluoroethane	8.96	151	6183	0.596	ng	92
22) Carbon Disulfide	8.85	76	24530	0.543	ng	96
23) trans-1,2-Dichloroethene	9.81	61	9202	0.576	ng	93
24) 1,1-Dichloroethane	10.05	63	11805	0.581	ng	99
25) Methyl tert-Butyl Ether	10.19	73	20946	0.636	ng	96
26) Vinyl Acetate	10.31	86	7230	2.611	ng	99
27) 2-Butanone (MEK)	10.59	72	3593	0.451	ng	# 90
28) cis-1,2-Dichloroethene	11.07	61	9732	0.625	ng	98
29) Diisopropyl Ether	11.39	87	6855	0.648	ng	# 69
30) Ethyl Acetate	11.39	61	4629	1.129	ng	95
31) n-Hexane	11.35	57	11940	0.601	ng	97
32) Chloroform	11.41	83	12006	0.644	ng	97
34) Tetrahydrofuran (THF)	11.88	72	4246	0.529	ng	99
35) Ethyl tert-Butyl Ether	11.97	87	7917	0.604	ng	98
36) 1,2-Dichloroethane	12.21	62	11120	0.765	ng	100
38) 1,1,1-Trichloroethane	12.49	97	11911	0.683	ng	95
39) Isopropyl Acetate	12.94	61	8224	1.061	ng	# 91
40) 1-Butanol	12.98	56	10687	0.833	ng	# 71
41) Benzene	12.97	78	25812	0.498	ng	97
42) Carbon Tetrachloride	13.13	117	9483	0.614	ng	98
43) Cyclohexane	13.26	84	19897	1.072	ng	99
44) tert-Amyl Methyl Ether	13.63	73	17593	0.540	ng	97
45) 1,2-Dichloropropane	13.82	63	6513	0.543	ng	98
46) Bromodichloromethane	14.01	83	9077	0.607	ng	96
47) Trichloroethene	14.06	130	6797	0.524	ng	91
48) 1,4-Dioxane	14.08	88	5295	0.565	ng	81
49) 2,2,4-Trimethylpentane...	14.14	57	29628	0.562	ng	98
50) Methyl Methacrylate	14.27	100	4768	0.963	ng	96

Data File : I:\MS13\DATA\2019_09\25\09251924.D
 Acq On : 25 Sep 2019 18:16
 Sample : 0.5ng R13092519 ICAL Std
 Misc : S31-06261901/S31-09111903

Vial: 1
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:27:49 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

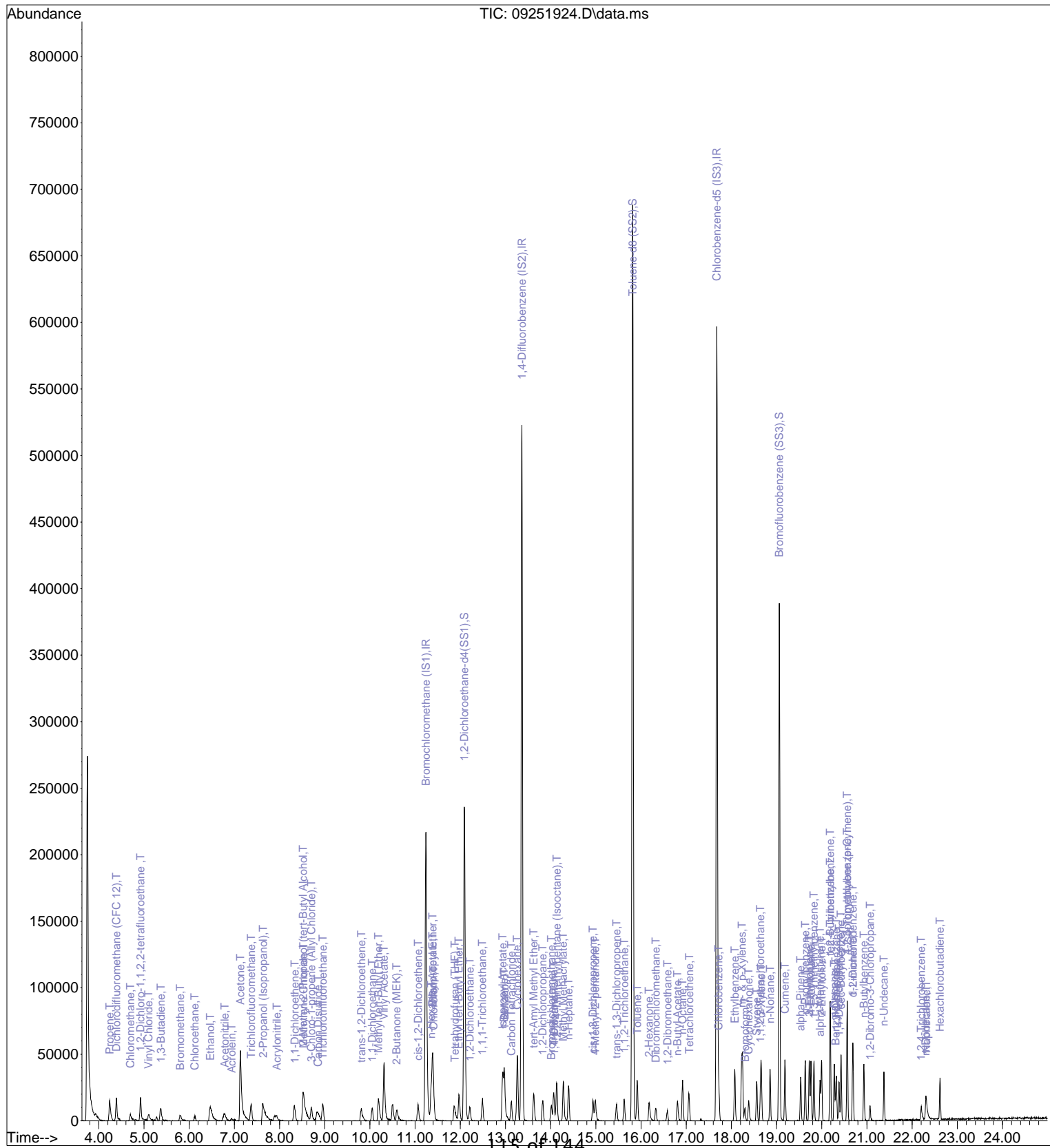
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.39	71	6665	0.557	ng	94
52) cis-1,3-Dichloropropene	14.93	75	11133	0.598	ng	89
53) 4-Methyl-2-pentanone	14.99	58	5856	0.505	ng	98
54) trans-1,3-Dichloropropene	15.46	75	8401	0.489	ng	95
55) 1,1,2-Trichloroethane	15.63	97	6344	0.585	ng	98
58) Toluene	15.91	91	26479	0.506	ng	100
59) 2-Hexanone	16.17	43	15226	0.530	ng	89
60) Dibromochloromethane	16.33	129	6970	0.507	ng	94
61) 1,2-Dibromoethane	16.58	107	6746	0.530	ng	100
62) n-Butyl Acetate	16.81	43	15417	0.452	ng	96
63) n-Octane	16.92	57	5950	0.529	ng	97
64) Tetrachloroethene	17.07	166	7262	0.466	ng	96
65) Chlorobenzene	17.72	112	16943	0.500	ng	95
66) Ethylbenzene	18.08	91	29716	0.512	ng	97
67) m- & p-Xylenes	18.23	91	50410	1.140	ng	99
68) Bromoform	18.30	173	5308	0.441	ng	94
69) Styrene	18.56	104	16453	0.451	ng	97
70) o-Xylene	18.66	91	23806	0.526	ng	98
71) n-Nonane	18.86	43	13647	0.493	ng	96
72) 1,1,2,2-Tetrachloroethane	18.64	83	9104	0.435	ng	91
74) Cumene	19.19	105	30901	0.531	ng	98
75) alpha-Pinene	19.53	93	12566	0.425	ng	90
76) n-Propylbenzene	19.63	91	35070	0.525	ng	98
77) 3-Ethyltoluene	19.73	105	30471	0.537	ng	94
78) 4-Ethyltoluene	19.76	105	26300	0.510	ng	99
79) 1,3,5-Trimethylbenzene	19.82	105	25730	0.543	ng	92
80) alpha-Methylstyrene	19.96	118	9297	0.357	ng	93
81) 2-Ethyltoluene	20.00	105	28804	0.513	ng	98
82) 1,2,4-Trimethylbenzene	20.19	105	23473	0.510	ng	98
83) n-Decane	20.28	57	13109	0.471	ng	95
84) Benzyl Chloride	20.31	91	11077	0.286	ng	99
85) 1,3-Dichlorobenzene	20.32	146	12505	0.421	ng	95
86) 1,4-Dichlorobenzene	20.39	146	12173	0.409	ng	100
87) sec-Butylbenzene	20.43	105	31688	0.498	ng	96
88) 4-Isopropyltoluene (p-...	20.56	119	29759	0.501	ng	97
89) 1,2,3-Trimethylbenzene	20.56	105	23905	0.510	ng	97
90) 1,2-Dichlorobenzene	20.69	146	11561	0.407	ng	94
91) d-Limonene	20.69	68	7289	0.353	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.07	157	3402	0.340	ng	87
93) n-Undecane	21.38	57	11136	0.387	ng	98
94) 1,2,4-Trichlorobenzene	22.20	180	5712	0.278	ng	90
95) Naphthalene	22.32	128	14186	0.232	ng	99
96) n-Dodecane	22.30	57	5872	0.219	ng	93
97) Hexachlorobutadiene	22.62	225	5975	0.393	ng	97
98) Cyclohexanone	18.38	55	7901	0.402	ng	95
99) tert-Butylbenzene	20.19	119	23541	0.490	ng	95
100) n-Butylbenzene	20.93	91	24508	0.467	ng	94

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

Data File : I:\MS13\DATA\2019_09\25\09251924.D
Acq On : 25 Sep 2019 18:16
Sample : 0.5ng R13092519 ICAL Std
Misc : S31-06261901/S31-09111903

Vial: 1
Operator: WA
Inst : MS13

Quant Time: Sep 26 06:27:49 2019
Quant Method : I:\MS13\METHODS\R13092519A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Sep 26 06:27:04 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



TIC: 09251924.D\data.ms

Data File : I:\MS13\DATA\2019_09\25\09251925.D
 Acq On : 25 Sep 2019 18:50
 Sample : 1.0ng R13092519 ICAL Std
 Misc : S31-06261901/S31-09111903

Vial: 1
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:27:50 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

WA 9/26/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	105562	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.36	114	466718	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.68	82	204617	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	214480	16.774	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	134.16%#	
57) Toluene-d8 (SS2)	15.82	98	528357	12.049	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	96.40%	
73) Bromofluorobenzene (SS3)	19.06	174	109901	10.176	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	81.44%	

Target Compounds

						Qvalue
2) Propene	4.23	42	13912	0.898	ng	94
3) Dichlorodifluoromethan...	4.38	85	29809	1.317	ng	95
4) Chloromethane	4.67	50	20585	1.065	ng	92
5) 1,2-Dichloro-1,1,2,2-t...	4.92	135	14303	1.140	ng	99
6) Vinyl Chloride	5.09	62	17316	0.990	ng	93
7) 1,3-Butadiene	5.36	54	12569	1.079	ng	97
8) Bromomethane	5.79	94	9825	1.010	ng	100
9) Chloroethane	6.12	64	9004	1.072	ng	91
10) Ethanol	6.45	45	51862	5.040	ng	100
11) Acetonitrile	6.77	41	24109	0.897	ng	99
12) Acrolein	6.93	56	7613	1.003	ng	88
13) Acetone	7.12	58	51181	5.532	ng	96
14) Trichlorofluoromethane	7.36	101	25157	1.309	ng	100
15) 2-Propanol (Isopropanol)	7.61	45	76065	2.375	ng	94
16) Acrylonitrile	7.88	53	16543	1.014	ng	96
17) 1,1-Dichloroethene	8.33	96	11493	1.124	ng	99
18) 2-Methyl-2-Propanol (t...	8.49	59	77244	2.821	ng	100
19) Methylene Chloride	8.54	84	12026	1.072	ng	95
20) 3-Chloro-1-propene (Al...	8.70	41	20452	1.095	ng	87
21) Trichlorotrifluoroethane	8.95	151	11226	1.083	ng	98
22) Carbon Disulfide	8.83	76	43987	0.974	ng	91
23) trans-1,2-Dichloroethene	9.81	61	18798	1.178	ng	96
24) 1,1-Dichloroethane	10.05	63	22402	1.103	ng	100
25) Methyl tert-Butyl Ether	10.18	73	39044	1.187	ng	99
26) Vinyl Acetate	10.31	86	12701	4.590	ng	# 74
27) 2-Butanone (MEK)	10.57	72	6923	0.869	ng	# 81
28) cis-1,2-Dichloroethene	11.06	61	17575	1.130	ng	97
29) Diisopropyl Ether	11.38	87	12785	1.209	ng	# 71
30) Ethyl Acetate	11.39	61	8031	1.960	ng	89
31) n-Hexane	11.35	57	21728	1.094	ng	98
32) Chloroform	11.41	83	22694	1.218	ng	98
34) Tetrahydrofuran (THF)	11.85	72	7712	0.962	ng	98
35) Ethyl tert-Butyl Ether	11.97	87	14904	1.139	ng	98
36) 1,2-Dichloroethane	12.21	62	20899	1.439	ng	99
38) 1,1,1-Trichloroethane	12.49	97	21875	1.287	ng	98
39) Isopropyl Acetate	12.93	61	15012	1.986	ng	99
40) 1-Butanol	12.97	56	21831	1.745	ng	# 58
41) Benzene	12.97	78	47524	0.941	ng	99
42) Carbon Tetrachloride	13.13	117	17544	1.165	ng	92
43) Cyclohexane	13.26	84	37386	2.065	ng	99
44) tert-Amyl Methyl Ether	13.62	73	34705	1.092	ng	99
45) 1,2-Dichloropropane	13.82	63	11354	0.971	ng	100
46) Bromodichloromethane	14.01	83	17504	1.199	ng	97
47) Trichloroethene	14.07	130	12647	0.999	ng	98
48) 1,4-Dioxane	14.06	88	9323	1.019	ng	97
49) 2,2,4-Trimethylpentane...	14.13	57	53082	1.032	ng	99
50) Methyl Methacrylate	14.29	100	9782	2.026	ng	96

Data File : I:\MS13\DATA\2019_09\25\09251925.D
 Acq On : 25 Sep 2019 18:50
 Sample : 1.0ng R13092519 ICAL Std
 Misc : S31-06261901/S31-09111903

Vial: 1
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:27:50 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

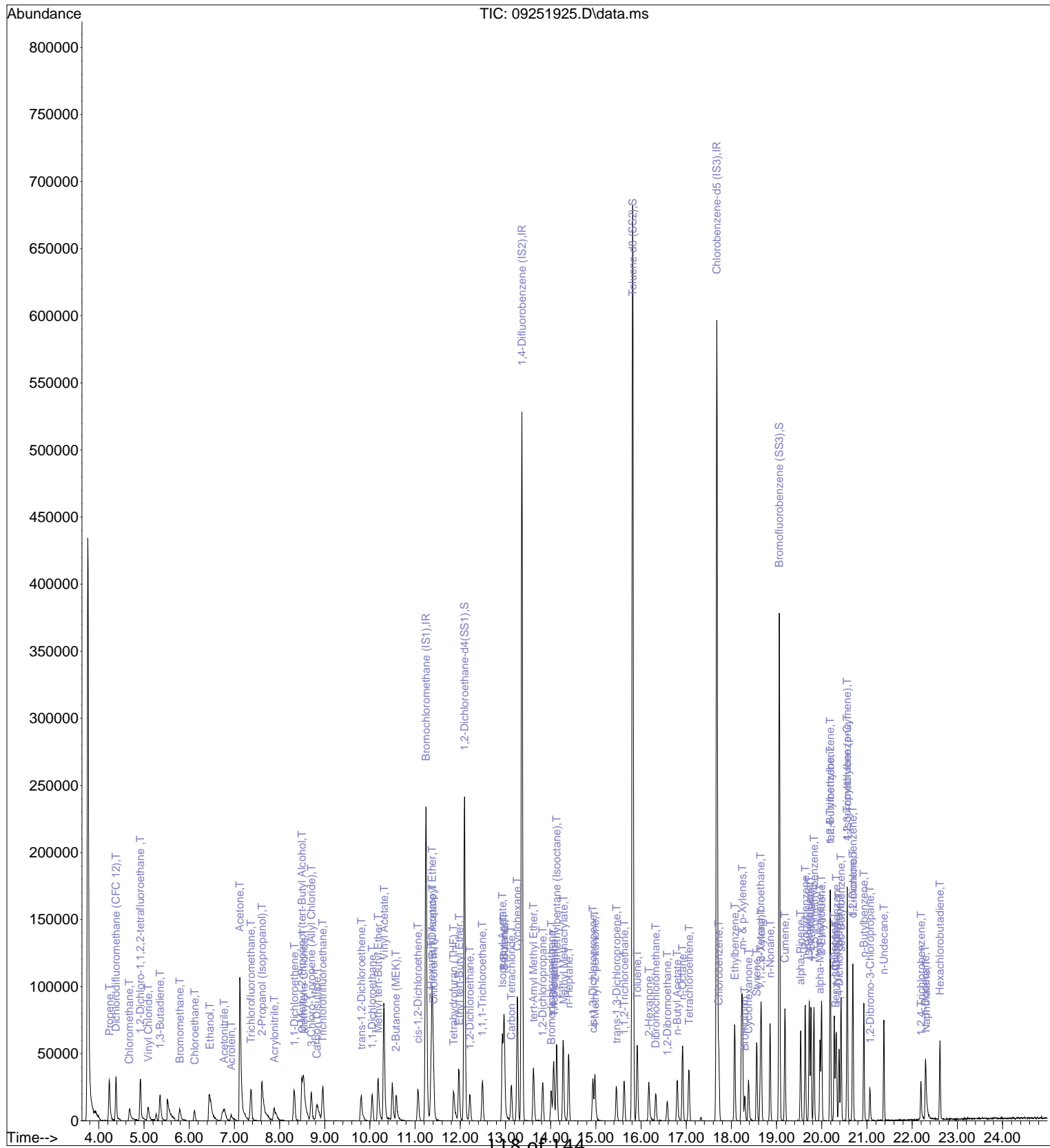
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.40	71	11683	1.000	ng	97
52) cis-1,3-Dichloropropene	14.93	75	19616	1.081	ng	99
53) 4-Methyl-2-pentanone	14.98	58	10996	0.973	ng	91
54) trans-1,3-Dichloropropene	15.46	75	16988	1.014	ng	100
55) 1,1,2-Trichloroethane	15.63	97	11621	1.099	ng	98
58) Toluene	15.91	91	48526	0.952	ng	98
59) 2-Hexanone	16.17	43	27414	0.981	ng	99
60) Dibromochloromethane	16.32	129	13420	1.003	ng	95
61) 1,2-Dibromoethane	16.58	107	12590	1.017	ng	98
62) n-Butyl Acetate	16.80	43	29528	0.890	ng	99
63) n-Octane	16.92	57	11061	1.011	ng	98
64) Tetrachloroethene	17.06	166	13443	0.887	ng	95
65) Chlorobenzene	17.72	112	32207	0.977	ng	97
66) Ethylbenzene	18.08	91	56037	0.993	ng	97
67) m- & p-Xylenes	18.24	91	88193	2.050	ng	100
68) Bromoform	18.29	173	10271	0.878	ng	99
69) Styrene	18.56	104	29328	0.827	ng	97
70) o-Xylene	18.66	91	45556	1.035	ng	98
71) n-Nonane	18.86	43	25604	0.950	ng	99
72) 1,1,2,2-Tetrachloroethane	18.64	83	18143	0.890	ng	99
74) Cumene	19.19	105	55984	0.989	ng	100
75) alpha-Pinene	19.53	93	25649	0.893	ng	95
76) n-Propylbenzene	19.63	91	67498	1.038	ng	98
77) 3-Ethyltoluene	19.72	105	56448	1.022	ng	97
78) 4-Ethyltoluene	19.76	105	48940	0.976	ng	97
79) 1,3,5-Trimethylbenzene	19.83	105	46313	1.005	ng	98
80) alpha-Methylstyrene	19.96	118	17887	0.706	ng	92
81) 2-Ethyltoluene	19.99	105	53363	0.977	ng	99
82) 1,2,4-Trimethylbenzene	20.19	105	45748	1.021	ng	99
83) n-Decane	20.28	57	24399	0.902	ng	99
84) Benzyl Chloride	20.31	91	25286	0.670	ng	95
85) 1,3-Dichlorobenzene	20.32	146	23680	0.819	ng	98
86) 1,4-Dichlorobenzene	20.39	146	21849	0.754	ng	95
87) sec-Butylbenzene	20.43	105	60218	0.973	ng	95
88) 4-Isopropyltoluene (p-...	20.56	119	56857	0.983	ng	97
89) 1,2,3-Trimethylbenzene	20.56	105	43968	0.963	ng	99
90) 1,2-Dichlorobenzene	20.69	146	22678	0.821	ng	98
91) d-Limonene	20.69	68	13847	0.690	ng	96
92) 1,2-Dibromo-3-Chloropr...	21.07	157	7071	0.727	ng	91
93) n-Undecane	21.38	57	22566	0.806	ng	99
94) 1,2,4-Trichlorobenzene	22.20	180	11229	0.561	ng	97
95) Naphthalene	22.31	128	26054	0.438	ng	100
96) n-Dodecane	22.29	57	12304	0.472	ng	94
97) Hexachlorobutadiene	22.62	225	11186	0.755	ng	96
98) Cyclohexanone	18.38	55	15239	0.798	ng	98
99) tert-Butylbenzene	20.19	119	44799	0.959	ng	99
100) n-Butylbenzene	20.93	91	46426	0.909	ng	95

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

Data File : I:\MS13\DATA\2019_09\25\09251925.D
Acq On : 25 Sep 2019 18:50
Sample : 1.0ng R13092519 ICAL Std
Misc : S31-06261901/S31-09111903

Vial: 1
Operator: WA
Inst : MS13

Quant Time: Sep 26 06:27:50 2019
Quant Method : I:\MS13\METHODS\R13092519A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Sep 26 06:27:04 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019_09\25\09251931.D
 Acq On : 25 Sep 2019 22:13
 Sample : 5.0ng R13092519 ICAL Std
 Misc : S31-06261901/S31-09041910

Vial: 1
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:28:00 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

107 9/26/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.24	130	107528	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.36	114	483157	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.68	82	216155	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	220490	16.928	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	135.44%#	
57) Toluene-d8 (SS2)	15.82	98	543991	11.744	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	93.92%	
73) Bromofluorobenzene (SS3)	19.06	174	123959	10.865	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	86.96%	

Target Compounds

						Qvalue
2) Propene	4.19	42	72443	4.592	ng	97
3) Dichlorodifluoromethan...	4.35	85	143739	6.235	ng	99
4) Chloromethane	4.63	50	96170	4.887	ng	98
5) 1,2-Dichloro-1,1,2,2-t...	4.89	135	66710	5.222	ng	99
6) Vinyl Chloride	5.05	62	102629	5.761	ng	98
7) 1,3-Butadiene	5.32	54	70737	5.963	ng	97
8) Bromomethane	5.76	94	52324	5.278	ng	99
9) Chloroethane	6.09	64	44082	5.150	ng	99
10) Ethanol	6.43	45	258531	24.664	ng	98
11) Acetonitrile	6.71	41	124784	4.557	ng	98
12) Acrolein	6.90	56	39047	5.051	ng	96
13) Acetone	7.10	58	246097	26.113	ng	99
14) Trichlorofluoromethane	7.35	101	120472	6.153	ng	100
15) 2-Propanol (Isopropanol)	7.59	45	382131	11.712	ng	99
16) Acrylonitrile	7.85	53	87597	5.271	ng	100
17) 1,1-Dichloroethene	8.32	96	59415	5.702	ng	97
18) 2-Methyl-2-Propanol (t...	8.46	59	404676	14.507	ng	100
19) Methylene Chloride	8.53	84	57289	5.014	ng	98
20) 3-Chloro-1-propene (Al...	8.69	41	99301	5.219	ng	96
21) Trichlorotrifluoroethane	8.95	151	54224	5.136	ng	99
22) Carbon Disulfide	8.80	76	201492	4.379	ng	100
23) trans-1,2-Dichloroethene	9.80	61	94518	5.817	ng	99
24) 1,1-Dichloroethane	10.05	63	110382	5.334	ng	98
25) Methyl tert-Butyl Ether	10.16	73	207044	6.181	ng	99
26) Vinyl Acetate	10.30	86	73775	26.177	ng	# 95
27) 2-Butanone (MEK)	10.56	72	38199	4.709	ng	97
28) cis-1,2-Dichloroethene	11.06	61	90493	5.710	ng	100
29) Diisopropyl Ether	11.37	87	62804	5.830	ng	# 74
30) Ethyl Acetate	11.37	61	46785	11.209	ng	99
31) n-Hexane	11.35	57	109722	5.423	ng	98
32) Chloroform	11.41	83	110259	5.808	ng	99
34) Tetrahydrofuran (THF)	11.83	72	39927	4.891	ng	93
35) Ethyl tert-Butyl Ether	11.96	87	79817	5.986	ng	98
36) 1,2-Dichloroethane	12.21	62	104153	7.038	ng	99
38) 1,1,1-Trichloroethane	12.49	97	107269	6.095	ng	99
39) Isopropyl Acetate	12.92	61	78557	10.039	ng	99
40) 1-Butanol	12.94	56	134159	10.360	ng	97
41) Benzene	12.97	78	230007	4.399	ng	100
42) Carbon Tetrachloride	13.13	117	92696	5.946	ng	98
43) Cyclohexane	13.27	84	185807	9.913	ng	98
44) tert-Amyl Methyl Ether	13.61	73	177488	5.393	ng	99
45) 1,2-Dichloropropane	13.82	63	56345	4.653	ng	98
46) Bromodichloromethane	14.01	83	87739	5.808	ng	99
47) Trichloroethene	14.06	130	64198	4.898	ng	97
48) 1,4-Dioxane	14.05	88	49371	5.215	ng	97
49) 2,2,4-Trimethylpentane...	14.14	57	259386	4.870	ng	100
50) Methyl Methacrylate	14.27	100	52493	10.503	ng	98

119 of 144

Data File : I:\MS13\DATA\2019_09\25\09251931.D
 Acq On : 25 Sep 2019 22:13
 Sample : 5.0ng R13092519 ICAL Std
 Misc : S31-06261901/S31-09041910

Vial: 1
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:28:00 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

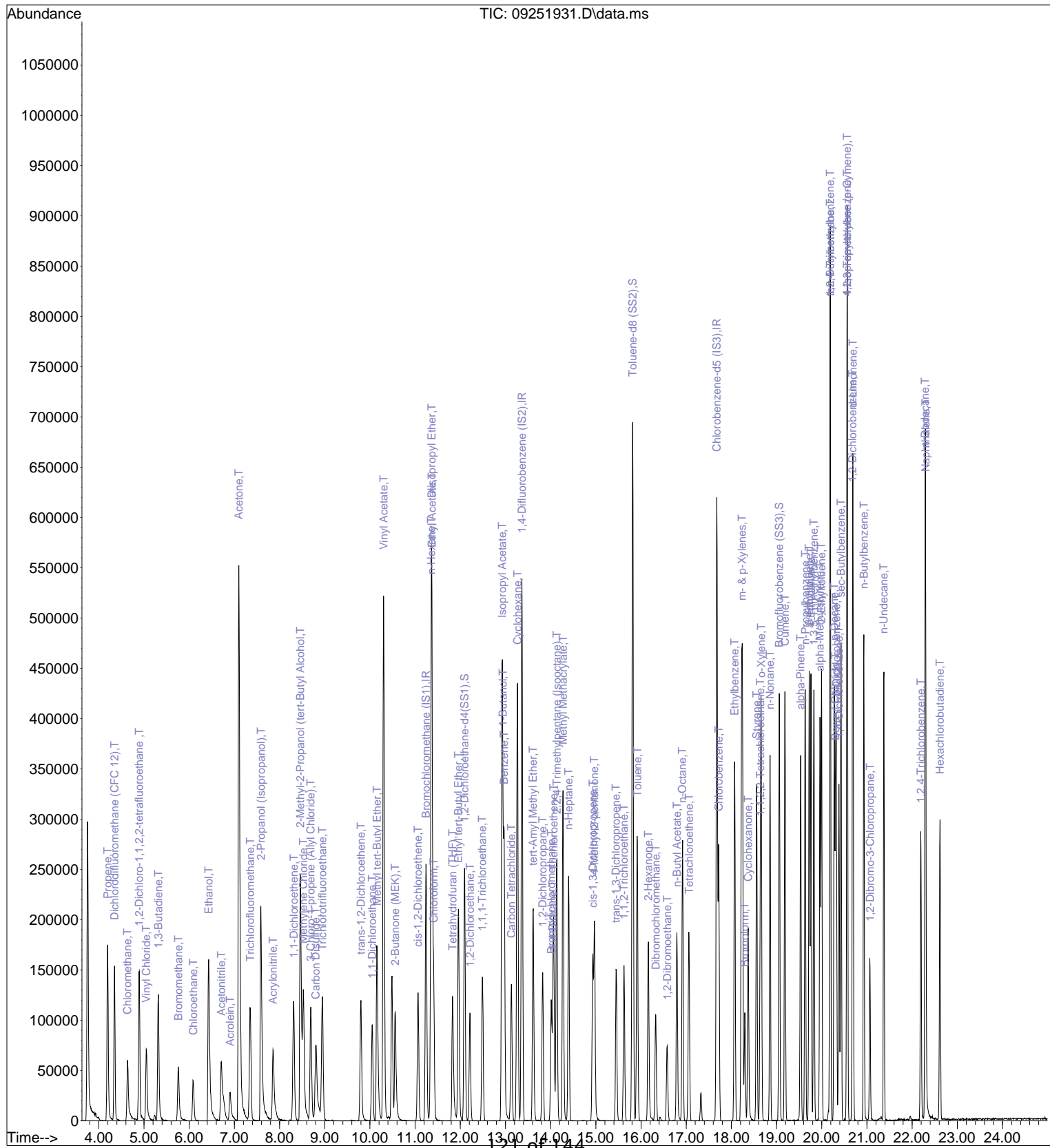
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.40	71	58471	4.836	ng	99
52) cis-1,3-Dichloropropene	14.93	75	103035	5.484	ng	99
53) 4-Methyl-2-pentanone	14.97	58	59900	5.118	ng	100
54) trans-1,3-Dichloropropene	15.45	75	96743	5.579	ng	99
55) 1,1,2-Trichloroethane	15.62	97	56458	5.159	ng	99
58) Toluene	15.92	91	243342	4.520	ng	99
59) 2-Hexanone	16.16	43	152059	5.153	ng	99
60) Dibromochloromethane	16.33	129	69097	4.886	ng	98
61) 1,2-Dibromoethane	16.58	107	63129	4.829	ng	98
62) n-Butyl Acetate	16.79	43	164759	4.699	ng	99
63) n-Octane	16.91	57	54085	4.679	ng	100
64) Tetrachloroethene	17.06	166	64355	4.017	ng	97
65) Chlorobenzene	17.72	112	160136	4.600	ng	99
66) Ethylbenzene	18.07	91	282126	4.731	ng	99
67) m- & p-Xylenes	18.23	91	448644	9.871	ng	99
68) Bromoform	18.30	173	55562	4.494	ng	96
69) Styrene	18.56	104	170200	4.541	ng	99
70) o-Xylene	18.66	91	227279	4.889	ng	100
71) n-Nonane	18.86	43	127144	4.468	ng	100
72) 1,1,2,2-Tetrachloroethane	18.64	83	94418	4.385	ng	98
74) Cumene	19.19	105	280311	4.686	ng	100
75) alpha-Pinene	19.53	93	140327	4.622	ng	99
76) n-Propylbenzene	19.63	91	339190	4.936	ng	100
77) 3-Ethyltoluene	19.72	105	290655	4.982	ng	98
78) 4-Ethyltoluene	19.76	105	254375	4.800	ng	98
79) 1,3,5-Trimethylbenzene	19.83	105	234517	4.819	ng	99
80) alpha-Methylstyrene	19.96	118	119756	4.474	ng	99
81) 2-Ethyltoluene	19.99	105	273519	4.739	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	241902	5.110	ng	98
83) n-Decane	20.28	57	130086	4.550	ng	98
84) Benzyl Chloride	20.30	91	201937	5.068	ng	99
85) 1,3-Dichlorobenzene	20.32	146	131810	4.318	ng	98
86) 1,4-Dichlorobenzene	20.38	146	134806	4.405	ng	100
87) sec-Butylbenzene	20.43	105	308807	4.724	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	295460	4.835	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	233780	4.849	ng	99
90) 1,2-Dichlorobenzene	20.68	146	127291	4.360	ng	100
91) d-Limonene	20.69	68	85148	4.015	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.07	157	43305	4.216	ng	97
93) n-Undecane	21.37	57	135165	4.569	ng	100
94) 1,2,4-Trichlorobenzene	22.20	180	92270	4.362	ng	100
95) Naphthalene	22.30	128	296326	4.713	ng	100
96) n-Dodecane	22.29	57	133365	4.838	ng	99
97) Hexachlorobutadiene	22.62	225	58183	3.720	ng	100
98) Cyclohexanone	18.37	55	90231	4.471	ng	99
99) tert-Butylbenzene	20.19	119	233703	4.736	ng	100
100) n-Butylbenzene	20.93	91	256593	4.756	ng	98

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

Data File : I:\MS13\DATA\2019_09\25\09251931.D
Acq On : 25 Sep 2019 22:13
Sample : 5.0ng R13092519 ICAL Std
Misc : S31-06261901/S31-09041910

Vial: 1
Operator: WA
Inst : MS13

Quant Time: Sep 26 06:28:00 2019
Quant Method : I:\MS13\METHODS\R13092519A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Sep 26 06:27:04 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019_09\25\09251927.D
 Acq On : 25 Sep 2019 19:58
 Sample : 25ng R13092519 ICAL Std
 Misc : S31-06261901/S31-09041910

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:27:54 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

10/26 9/26/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	101976	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.37	114	450711	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.68	82	198373	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.10	65	208467	16.877	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	135.04%#
57) Toluene-d8 (SS2)	15.82	98	504620	11.870	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	94.96%
73) Bromofluorobenzene (SS3)	19.06	174	111700	10.668	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	85.36%

Target Compounds

						Qvalue
2) Propene	4.18	42	366774	24.515	ng	100
3) Dichlorodifluoromethan...	4.33	85	701650	32.091	ng	100
4) Chloromethane	4.62	50	432717	23.185	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.89	135	311966	25.749	ng	100
6) Vinyl Chloride	5.04	62	479229	28.368	ng	100
7) 1,3-Butadiene	5.31	54	361375	32.120	ng	100
8) Bromomethane	5.75	94	262429	27.914	ng	100
9) Chloroethane	6.08	64	220436	27.158	ng	100
10) Ethanol	6.46	45	1244678	125.209	ng	100
11) Acetonitrile	6.72	41	612120	23.570	ng	100
12) Acrolein	6.90	56	198993	27.142	ng	100
13) Acetone	7.11	58	1197724	134.010	ng	100
14) Trichlorofluoromethane	7.35	101	591795	31.871	ng	100
15) 2-Propanol (Isopropanol)	7.60	45	1866061	60.305	ng	100
16) Acrylonitrile	7.87	53	445906	28.291	ng	100
17) 1,1-Dichloroethene	8.31	96	289056	29.253	ng	100
18) 2-Methyl-2-Propanol (t...	8.47	59	1852328	70.016	ng	100
19) Methylene Chloride	8.54	84	281568	25.986	ng	100
20) 3-Chloro-1-propene (Al...	8.69	41	503424	27.900	ng	100
21) Trichlorotrifluoroethane	8.95	151	257514	25.720	ng	100
22) Carbon Disulfide	8.80	76	1008687	23.117	ng	100
23) trans-1,2-Dichloroethene	9.81	61	469581	30.472	ng	100
24) 1,1-Dichloroethane	10.06	63	534660	27.241	ng	100
25) Methyl tert-Butyl Ether	10.15	73	1009533	31.778	ng	100
26) Vinyl Acetate	10.31	86	378658	141.670	ng	100
27) 2-Butanone (MEK)	10.56	72	195014	25.351	ng	100
28) cis-1,2-Dichloroethene	11.07	61	447045	29.744	ng	100
29) Diisopropyl Ether	11.37	87	268326	26.266	ng	100
30) Ethyl Acetate	11.37	61	222989	56.331	ng	100
31) n-Hexane	11.35	57	529329	27.588	ng	100
32) Chloroform	11.42	83	552661	30.700	ng	100
34) Tetrahydrofuran (THF)	11.82	72	188230	24.315	ng	100
35) Ethyl tert-Butyl Ether	11.96	87	386125	30.534	ng	100
36) 1,2-Dichloroethane	12.21	62	509652	36.316	ng	100
38) 1,1,1-Trichloroethane	12.50	97	534590	32.562	ng	100
39) Isopropyl Acetate	12.93	61	383634	52.555	ng	100
40) 1-Butanol	12.94	56	695400	57.566	ng	100
41) Benzene	12.98	78	1128566	23.137	ng	100
42) Carbon Tetrachloride	13.13	117	454497	31.252	ng	100
43) Cyclohexane	13.27	84	899739	51.455	ng	100
44) tert-Amyl Methyl Ether	13.61	73	882965	28.758	ng	100
45) 1,2-Dichloropropane	13.82	63	279919	24.779	ng	100
46) Bromodichloromethane	14.02	83	436076	30.942	ng	100
47) Trichloroethene	14.07	130	312472	25.558	ng	100
48) 1,4-Dioxane	14.05	88	251235	28.446	ng	100
49) 2,2,4-Trimethylpentane...	14.14	57	1264640	25.455	ng	100
50) Methyl Methacrylate	14.27	100	255046	54.704	ng	100

122 of 144

Data File : I:\MS13\DATA\2019_09\25\09251927.D
 Acq On : 25 Sep 2019 19:58
 Sample : 25ng R13092519 ICAL Std
 Misc : S31-06261901/S31-09041910

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:27:54 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

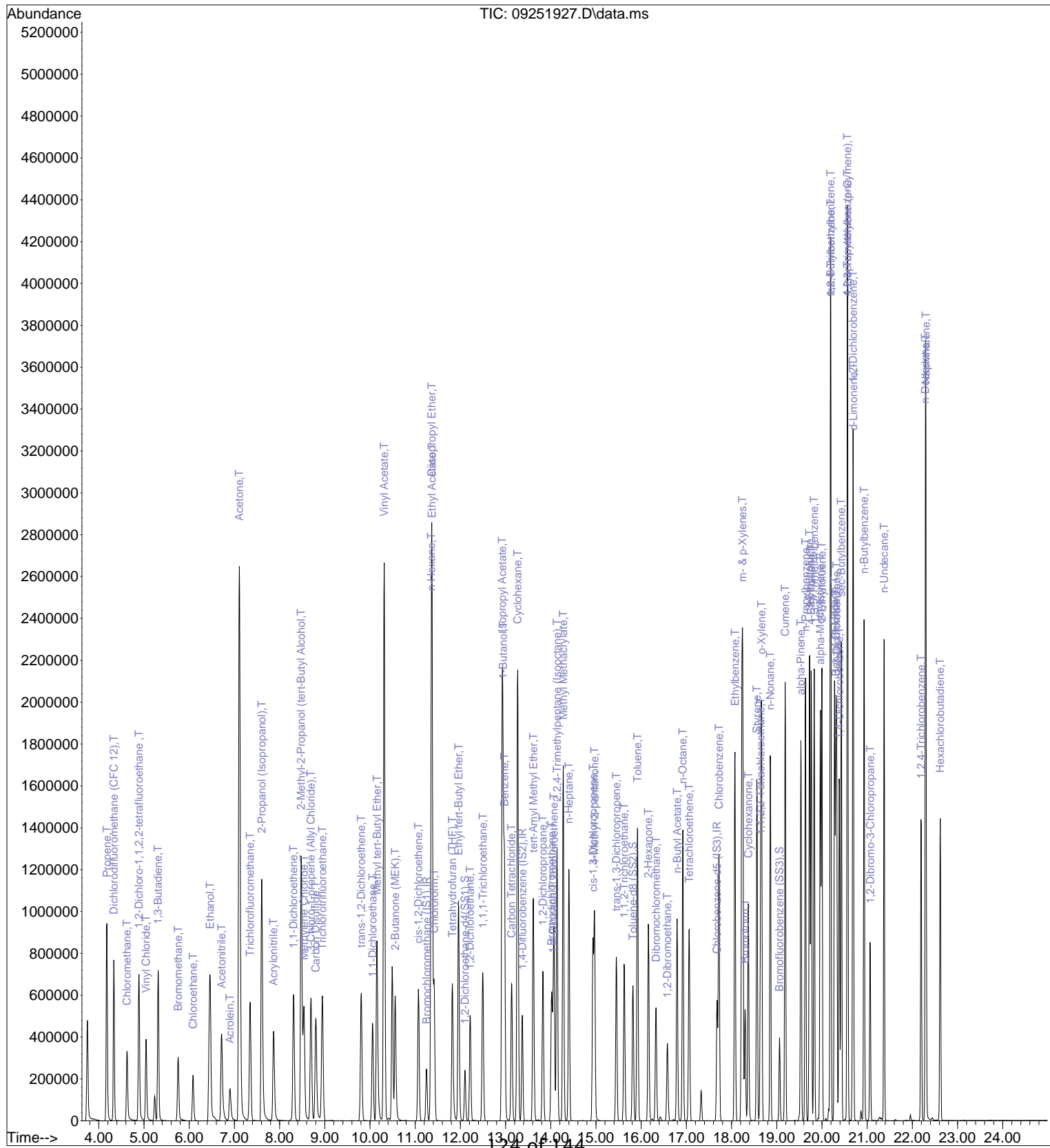
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.40	71	284588	25.233	ng	100
52) cis-1,3-Dichloropropene	14.93	75	521483	29.754	ng	100
53) 4-Methyl-2-pentanone	14.97	58	292864	26.823	ng	100
54) trans-1,3-Dichloropropene	15.45	75	489704	30.273	ng	100
55) 1,1,2-Trichloroethane	15.62	97	277855	27.215	ng	100
58) Toluene	15.92	91	1166804	23.615	ng	100
59) 2-Hexanone	16.16	43	750751	27.721	ng	100
60) Dibromochloromethane	16.33	129	355677	27.408	ng	100
61) 1,2-Dibromoethane	16.58	107	311021	25.921	ng	100
62) n-Butyl Acetate	16.80	43	816669	25.379	ng	100
63) n-Octane	16.92	57	266190	25.093	ng	100
64) Tetrachloroethene	17.06	166	319588	21.739	ng	100
65) Chlorobenzene	17.72	112	778545	24.370	ng	100
66) Ethylbenzene	18.08	91	1381369	25.240	ng	100
67) m- & p-Xylenes	18.24	91	2211317	53.012	ng	100
68) Bromoform	18.30	173	286151	25.220	ng	100
69) Styrene	18.56	104	842343	24.489	ng	100
70) o-Xylene	18.66	91	1116436	26.169	ng	100
71) n-Nonane	18.86	43	626016	23.969	ng	100
72) 1,1,2,2-Tetrachloroethane	18.64	83	466879	23.628	ng	100
74) Cumene	19.19	105	1365943	24.881	ng	100
75) alpha-Pinene	19.53	93	710139	25.489	ng	100
76) n-Propylbenzene	19.63	91	1645179	26.087	ng	100
77) 3-Ethyltoluene	19.73	105	1396498	26.083	ng	100
78) 4-Ethyltoluene	19.76	105	1291008	26.545	ng	100
79) 1,3,5-Trimethylbenzene	19.83	105	1167321	26.139	ng	100
80) alpha-Methylstyrene	19.96	118	601961	24.503	ng	100
81) 2-Ethyltoluene	20.00	105	1347236	25.437	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	1191576	27.429	ng	100
83) n-Decane	20.28	57	633862	24.159	ng	100
84) Benzyl Chloride	20.31	91	1088138	29.756	ng	100
85) 1,3-Dichlorobenzene	20.32	146	660534	23.577	ng	100
86) 1,4-Dichlorobenzene	20.39	146	669290	23.829	ng	100
87) sec-Butylbenzene	20.43	105	1519411	25.328	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	1461754	26.064	ng	100
89) 1,2,3-Trimethylbenzene	20.56	105	1158810	26.192	ng	100
90) 1,2-Dichlorobenzene	20.69	146	625816	23.358	ng	100
91) d-Limonene	20.69	68	434404	22.322	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.07	157	232372	24.651	ng	100
93) n-Undecane	21.38	57	665449	24.509	ng	100
94) 1,2,4-Trichlorobenzene	22.20	180	461237	23.757	ng	100
95) Naphthalene	22.30	128	1550026	26.865	ng	100
96) n-Dodecane	22.29	57	660801	26.120	ng	100
97) Hexachlorobutadiene	22.62	225	290507	20.237	ng	100
98) Cyclohexanone	18.37	55	458618	24.763	ng	100
99) tert-Butylbenzene	20.19	119	1156042	25.528	ng	100
100) n-Butylbenzene	20.93	91	1247708	25.200	ng	100

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

Data File : I:\MS13\DATA\2019_09\25\09251927.D
Acq On : 25 Sep 2019 19:58
Sample : 25ng R13092519 ICAL Std
Misc : S31-06261901/S31-09041910

Vial: 2
Operator: WA
Inst : MS13

Quant Time: Sep 26 06:27:54 2019
Quant Method : I:\MS13\METHODS\R13092519A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Sep 26 06:27:04 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019_09\25\09251928.D
 Acq On : 25 Sep 2019 20:31
 Sample : 50ng R13092519 ICAL Std
 Misc : S31-06261901/S31-09041910

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:27:56 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

107 9/26/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.26	130	103616	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.37	114	466221	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.68	82	205181	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.11	65	215105	17.138	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	137.12%#	
57) Toluene-d8 (SS2)	15.82	98	515484	11.723	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	93.76%	
73) Bromofluorobenzene (SS3)	19.07	174	119023	10.990	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	87.92%	

Target Compounds

						Qvalue
2) Propene	4.19	42	745361	49.031	ng	99
3) Dichlorodifluoromethan...	4.35	85	1364699	61.429	ng	100
4) Chloromethane	4.64	50	801615	42.271	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.90	135	641348	52.098	ng	98
6) Vinyl Chloride	5.06	62	1001892	58.369	ng	98
7) 1,3-Butadiene	5.33	54	758409	66.342	ng	98
8) Bromomethane	5.77	94	517093	54.131	ng	100
9) Chloroethane	6.10	64	440562	53.418	ng	100
10) Ethanol	6.50	45	2472129	244.750	ng	99
11) Acetonitrile	6.74	41	1212281	45.940	ng	100
12) Acrolein	6.92	56	388952	52.212	ng	99
13) Acetone	7.13	58	2349192	258.685	ng	97
14) Trichlorofluoromethane	7.36	101	1163433	61.664	ng	100
15) 2-Propanol (Isopropanol)	7.63	45	3568326	113.492	ng	99
16) Acrylonitrile	7.88	53	880132	54.957	ng	100
17) 1,1-Dichloroethene	8.32	96	572557	57.027	ng	100
18) 2-Methyl-2-Propanol (t...	8.50	59	3387946	126.035	ng	100
19) Methylene Chloride	8.55	84	573665	52.106	ng	97
20) 3-Chloro-1-propene (Al...	8.70	41	993869	54.208	ng	99
21) Trichlorotrifluoroethane	8.95	151	508843	50.017	ng	99
22) Carbon Disulfide	8.81	76	2018471	45.527	ng	100
23) trans-1,2-Dichloroethene	9.81	61	932111	59.530	ng	99
24) 1,1-Dichloroethane	10.06	63	1062593	53.282	ng	100
25) Methyl tert-Butyl Ether	10.16	73	1971772	61.085	ng	100
26) Vinyl Acetate	10.33	86	769505	283.344	ng	# 92
27) 2-Butanone (MEK)	10.56	72	392074	50.161	ng	98
28) cis-1,2-Dichloroethene	11.08	61	878956	57.555	ng	100
29) Diisopropyl Ether	11.37	87	536887	51.722	ng	97
30) Ethyl Acetate	11.38	61	453314	112.704	ng	100
31) n-Hexane	11.36	57	1046830	53.697	ng	99
32) Chloroform	11.43	83	1089146	59.543	ng	99
34) Tetrahydrofuran (THF)	11.83	72	372922	47.411	ng	100
35) Ethyl tert-Butyl Ether	11.96	87	769628	59.898	ng	99
36) 1,2-Dichloroethane	12.22	62	1001622	70.242	ng	99
38) 1,1,1-Trichloroethane	12.50	97	1041897	61.351	ng	99
39) Isopropyl Acetate	12.93	61	760988	100.782	ng	100
40) 1-Butanol	12.96	56	1399180	111.973	ng	99
41) Benzene	12.98	78	2275630	45.102	ng	100
42) Carbon Tetrachloride	13.14	117	901805	59.946	ng	100
43) Cyclohexane	13.27	84	1805859	99.840	ng	99
44) tert-Amyl Methyl Ether	13.61	73	1745681	54.965	ng	99
45) 1,2-Dichloropropane	13.83	63	554156	47.422	ng	100
46) Bromodichloromethane	14.02	83	862467	59.161	ng	99
47) Trichloroethene	14.07	130	631241	49.914	ng	100
48) 1,4-Dioxane	14.05	88	497729	54.481	ng	100
49) 2,2,4-Trimethylpentane...	14.14	57	2517579	48.989	ng	99
50) Methyl Methacrylate	14.28	100	514776	106.740	ng	98

125 of 144

Data File : I:\MS13\DATA\2019_09\25\09251928.D
 Acq On : 25 Sep 2019 20:31
 Sample : 50ng R13092519 ICAL Std
 Misc : S31-06261901/S31-09041910

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:27:56 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

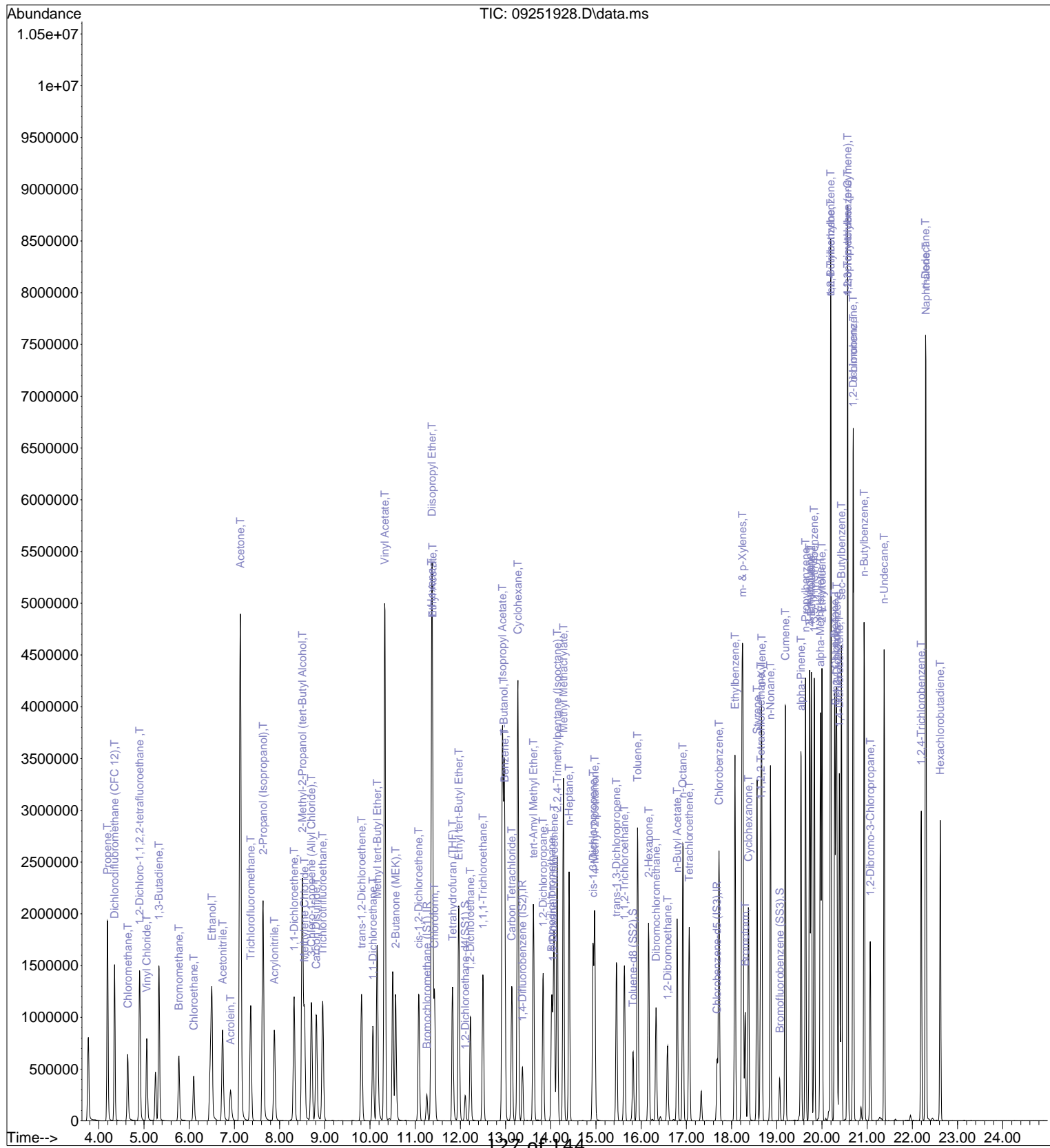
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.40	71	568454	48.725	ng	99
52) cis-1,3-Dichloropropene	14.93	75	1040626	57.399	ng	100
53) 4-Methyl-2-pentanone	14.97	58	581709	51.506	ng	100
54) trans-1,3-Dichloropropene	15.45	75	973243	58.163	ng	99
55) 1,1,2-Trichloroethane	15.63	97	552204	52.287	ng	98
58) Toluene	15.92	91	2325420	45.502	ng	100
59) 2-Hexanone	16.16	43	1490249	53.200	ng	99
60) Dibromochloromethane	16.33	129	704672	52.499	ng	99
61) 1,2-Dibromoethane	16.58	107	622276	50.142	ng	99
62) n-Butyl Acetate	16.80	43	1622215	48.740	ng	100
63) n-Octane	16.92	57	527391	48.066	ng	99
64) Tetrachloroethene	17.06	166	643090	42.293	ng	99
65) Chlorobenzene	17.72	112	1553792	47.023	ng	100
66) Ethylbenzene	18.08	91	2744013	48.475	ng	99
67) m- & p-Xylenes	18.24	91	4404528	102.086	ng	99
68) Bromoform	18.30	173	577757	49.230	ng	98
69) Styrene	18.56	104	1694648	47.633	ng	100
70) o-Xylene	18.67	91	2217039	50.242	ng	98
71) n-Nonane	18.86	43	1233032	45.644	ng	99
72) 1,1,2,2-Tetrachloroethane	18.64	83	954871	46.721	ng	99
74) Cumene	19.19	105	2716804	47.846	ng	100
75) alpha-Pinene	19.54	93	1434450	49.779	ng	99
76) n-Propylbenzene	19.63	91	3280852	50.296	ng	100
77) 3-Ethyltoluene	19.73	105	2674461	48.294	ng	95
78) 4-Ethyltoluene	19.77	105	2666975	53.017	ng	96
79) 1,3,5-Trimethylbenzene	19.83	105	2320185	50.230	ng	99
80) alpha-Methylstyrene	19.96	118	1207323	47.514	ng	100
81) 2-Ethyltoluene	20.00	105	2683603	48.988	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	2362590	52.581	ng	99
83) n-Decane	20.28	57	1267330	46.701	ng	100
84) Benzyl Chloride	20.31	91	2246532	59.396	ng	100
85) 1,3-Dichlorobenzene	20.33	146	1336583	46.125	ng	100
86) 1,4-Dichlorobenzene	20.39	146	1336735	46.013	ng	99
87) sec-Butylbenzene	20.43	105	3024430	48.743	ng	100
88) 4-Isopropyltoluene (p-...	20.57	119	2911045	50.184	ng	99
89) 1,2,3-Trimethylbenzene	20.57	105	2325125	50.809	ng	99
90) 1,2-Dichlorobenzene	20.69	146	1265200	45.656	ng	100
91) d-Limonene	20.69	68	877679	43.604	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.07	157	467806	47.980	ng	99
93) n-Undecane	21.38	57	1327157	47.258	ng	99
94) 1,2,4-Trichlorobenzene	22.20	180	942835	46.951	ng	99
95) Naphthalene	22.30	128	3245394	54.384	ng	100
96) n-Dodecane	22.29	57	1349634	51.579	ng	99
97) Hexachlorobutadiene	22.62	225	576668	38.839	ng	100
98) Cyclohexanone	18.37	55	924977	48.286	ng	99
99) tert-Butylbenzene	20.19	119	2300501	49.114	ng	99
100) n-Butylbenzene	20.93	91	2485411	48.532	ng	100

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

Data File : I:\MS13\DATA\2019_09\25\09251928.D
Acq On : 25 Sep 2019 20:31
Sample : 50ng R13092519 ICAL Std
Misc : S31-06261901/S31-09041910

Vial: 2
Operator: WA
Inst : MS13

Quant Time: Sep 26 06:27:56 2019
Quant Method : I:\MS13\METHODS\R13092519A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Sep 26 06:27:04 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019_09\25\09251929.D
 Acq On : 25 Sep 2019 21:05
 Sample : 100ng R13092519 ICAL Std
 Misc : S31-06261901/S31-09041910

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:27:58 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

9/26/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.26	130	108125	12.500	ng	0.01
37) 1,4-Difluorobenzene (IS2)	13.37	114	489025	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.68	82	214028	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.11	65	217429	16.601	ng	0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	132.80%#	
57) Toluene-d8 (SS2)	15.82	98	541938	11.816	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	94.56%	
73) Bromofluorobenzene (SS3)	19.07	174	122724	10.864	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	86.88%	

Target Compounds

						Qvalue
2) Propene	4.19	42	1822456	114.884	ng	100
3) Dichlorodifluoromethan...	4.35	85	2653599	114.466	ng	99
4) Chloromethane	4.64	50	1095292	55.348	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.91	135	1267830	98.693	ng	98
6) Vinyl Chloride	5.06	62	1969478	109.954	ng	99
7) 1,3-Butadiene	5.33	54	1518719	127.310	ng	99
8) Bromomethane	5.78	94	1052493	105.585	ng	100
9) Chloroethane	6.10	64	883973	102.712	ng	99
10) Ethanol	6.54	45	4930285	467.760	ng	99
11) Acetonitrile	6.76	41	2441586	88.666	ng	100
12) Acrolein	6.92	56	763527	98.220	ng	99
13) Acetone	7.15	58	4650122	490.702	ng	89
14) Trichlorofluoromethane	7.36	101	2254146	114.492	ng	100
15) 2-Propanol (Isopropanol)	7.66	45	5758319	175.508	ng	99
16) Acrylonitrile	7.90	53	1753805	104.944	ng	100
17) 1,1-Dichloroethene	8.32	96	1150286	109.791	ng	97
18) 2-Methyl-2-Propanol (t...	8.53	59	4699976	167.552	ng	100
19) Methylene Chloride	8.55	84	1152499	100.317	ng	95
20) 3-Chloro-1-propene (Al...	8.71	41	1953042	102.082	ng	99
21) Trichlorotrifluoroethane	8.96	151	1010715	95.206	ng	99
22) Carbon Disulfide	8.82	76	4011556	86.708	ng	100
23) trans-1,2-Dichloroethene	9.82	61	1859972	113.835	ng	99
24) 1,1-Dichloroethane	10.07	63	2088120	100.338	ng	100
25) Methyl tert-Butyl Ether	10.16	73	3070027	91.142	ng	99
26) Vinyl Acetate	10.34	86	1547023	545.883	ng	# 79
27) 2-Butanone (MEK)	10.58	72	793408	97.274	ng	94
28) cis-1,2-Dichloroethene	11.08	61	1743208	109.388	ng	99
29) Diisopropyl Ether	11.38	87	1073933	99.146	ng	# 92
30) Ethyl Acetate	11.39	61	926619	220.770	ng	100
31) n-Hexane	11.36	57	2105543	103.499	ng	99
32) Chloroform	11.43	83	2150113	112.644	ng	100
34) Tetrahydrofuran (THF)	11.83	72	752625	91.694	ng	98
35) Ethyl tert-Butyl Ether	11.97	87	1531355	114.210	ng	98
36) 1,2-Dichloroethane	12.23	62	1933307	129.926	ng	99
38) 1,1,1-Trichloroethane	12.50	97	2023477	113.594	ng	100
39) Isopropyl Acetate	12.94	61	1528731	193.018	ng	# 94
40) 1-Butanol	12.98	56	2816504	214.888	ng	# 41
41) Benzene	12.98	78	4555140	86.071	ng	99
42) Carbon Tetrachloride	13.14	117	1758682	111.454	ng	100
43) Cyclohexane	13.28	84	3607951	190.169	ng	99
44) tert-Amyl Methyl Ether	13.62	73	3471147	104.198	ng	99
45) 1,2-Dichloropropane	13.84	63	1107591	90.363	ng	100
46) Bromodichloromethane	14.02	83	1675708	109.586	ng	99
47) Trichloroethene	14.07	130	1260967	95.059	ng	100
48) 1,4-Dioxane	14.05	88	1006157	104.998	ng	100
49) 2,2,4-Trimethylpentane...	14.14	57	5031145	93.334	ng	99
50) Methyl Methacrylate	14.29	100	1042405	206.065	ng	96

128 of 144

Data File : I:\MS13\DATA\2019_09\25\09251929.D
 Acq On : 25 Sep 2019 21:05
 Sample : 100ng R13092519 ICAL Std
 Misc : S31-06261901/S31-09041910

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 06:27:58 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:27:04 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

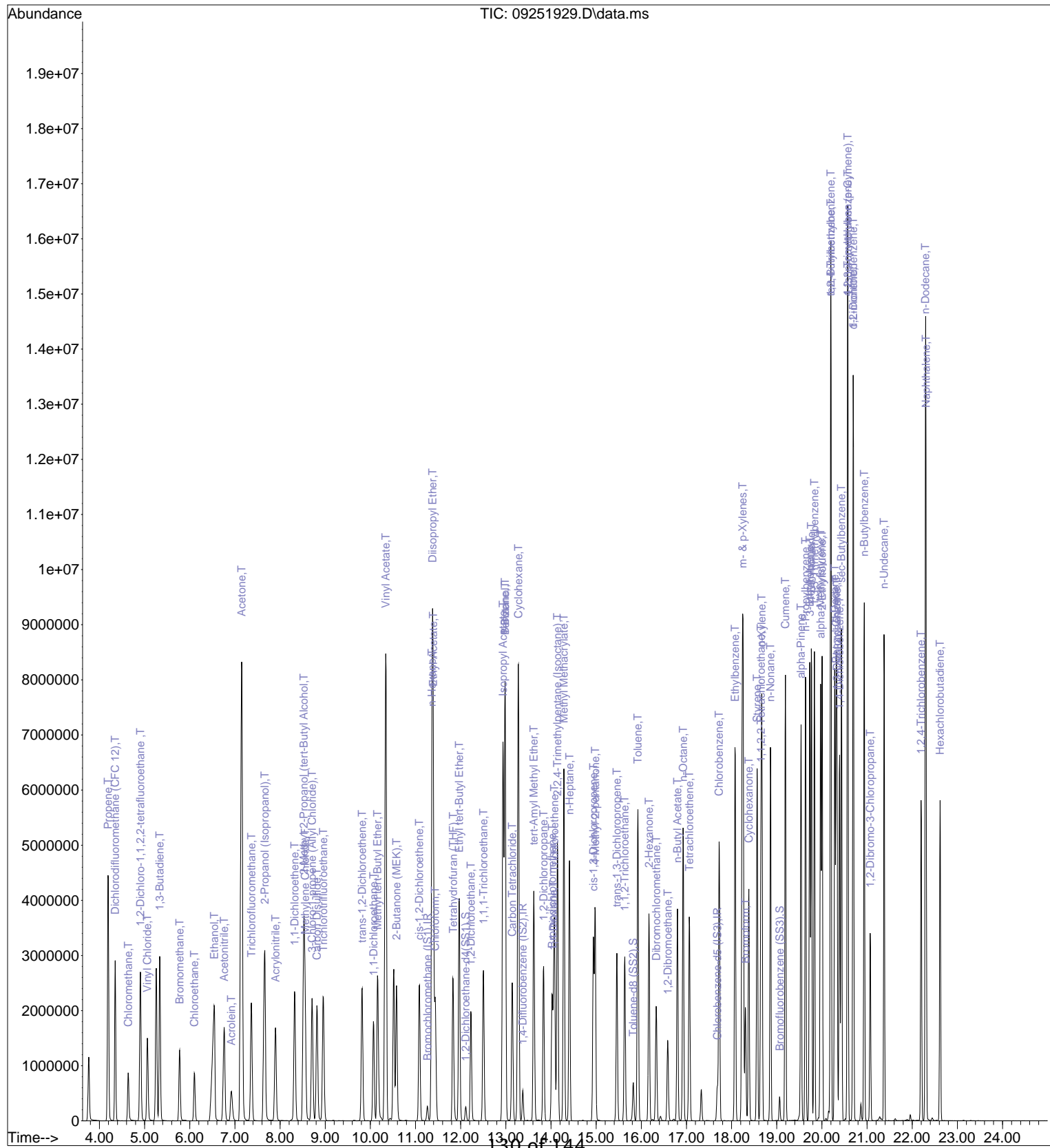
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.41	71	1157728	94.608	ng	98
52) cis-1,3-Dichloropropene	14.94	75	2070034	108.855	ng	100
53) 4-Methyl-2-pentanone	14.98	58	1169336	98.708	ng	97
54) trans-1,3-Dichloropropene	15.46	75	1918384	109.300	ng	100
55) 1,1,2-Trichloroethane	15.63	97	1099554	99.260	ng	99
58) Toluene	15.92	91	4647596	87.182	ng	100
59) 2-Hexanone	16.17	43	2941735	100.676	ng	98
60) Dibromochloromethane	16.33	129	1396045	99.709	ng	99
61) 1,2-Dibromoethane	16.58	107	1244027	96.097	ng	99
62) n-Butyl Acetate	16.80	43	3211373	92.499	ng	99
63) n-Octane	16.93	57	1049909	91.733	ng	98
64) Tetrachloroethene	17.06	166	1277324	80.531	ng	99
65) Chlorobenzene	17.72	112	3085976	89.533	ng	100
66) Ethylbenzene	18.08	91	5415506	91.714	ng	99
67) m- & p-Xylenes	18.25	91	8683590	192.945	ng	98
68) Bromoform	18.31	173	1149813	93.925	ng	98
69) Styrene	18.56	104	3402355	91.679	ng	99
70) o-Xylene	18.67	91	4391832	95.413	ng	98
71) n-Nonane	18.86	43	2430610	86.256	ng	98
72) 1,1,2,2-Tetrachloroethane	18.65	83	1919334	90.029	ng	100
74) Cumene	19.19	105	5347403	90.280	ng	99
75) alpha-Pinene	19.54	93	2857042	95.048	ng	98
76) n-Propylbenzene	19.63	91	6483200	95.281	ng	99
77) 3-Ethyltoluene	19.73	105	5497521	95.169	ng	99
78) 4-Ethyltoluene	19.77	105	5109431	97.372	ng	98
79) 1,3,5-Trimethylbenzene	19.83	105	4598188	95.433	ng	98
80) alpha-Methylstyrene	19.97	118	2441144	92.100	ng	99
81) 2-Ethyltoluene	20.00	105	5332954	93.326	ng	99
82) 1,2,4-Trimethylbenzene	20.20	105	4678486	99.818	ng	98
83) n-Decane	20.28	57	2524925	89.197	ng	100
84) Benzyl Chloride	20.31	91	4509019	114.286	ng	98
85) 1,3-Dichlorobenzene	20.33	146	2715715	89.845	ng	100
86) 1,4-Dichlorobenzene	20.39	146	2679057	88.406	ng	99
87) sec-Butylbenzene	20.43	105	5975543	92.323	ng	99
88) 4-Isopropyltoluene (p-...	20.57	119	5706139	94.303	ng	99
89) 1,2,3-Trimethylbenzene	20.57	105	4563456	95.599	ng	98
90) 1,2-Dichlorobenzene	20.69	146	2537605	87.786	ng	100
91) d-Limonene	20.69	68	1757616	83.711	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.07	157	942793	92.700	ng	96
93) n-Undecane	21.38	57	2631991	89.848	ng	99
94) 1,2,4-Trichlorobenzene	22.20	180	1891546	90.302	ng	99
95) Naphthalene	22.30	128	6502701	104.463	ng	99
96) n-Dodecane	22.29	57	2668540	97.767	ng	99
97) Hexachlorobutadiene	22.62	225	1143879	73.856	ng	99
98) Cyclohexanone	18.38	55	1836053	91.885	ng	98
99) tert-Butylbenzene	20.20	119	4544879	93.020	ng	98
100) n-Butylbenzene	20.94	91	4880787	91.366	ng	99

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

Data File : I:\MS13\DATA\2019_09\25\09251929.D
Acq On : 25 Sep 2019 21:05
Sample : 100ng R13092519 ICAL Std
Misc : S31-06261901/S31-09041910

Vial: 2
Operator: WA
Inst : MS13

Quant Time: Sep 26 06:27:58 2019
Quant Method : I:\MS13\METHODS\R13092519A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Sep 26 06:27:04 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File : I:\MS13\DATA\2019_09\25\09251932.D
 Acq On : 25 Sep 2019 22:47
 Sample : 25ng R13092519 ICV Std
 Misc : S31-06261901/S31-09031907

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 07:00:11 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:41:47 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

IDA 9/26/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	103459	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.37	114	454559	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.68	82	201078	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.10	65	207558	12.198	ng	-0.01
Spiked Amount	12.500	Range 70 - 130	Recovery	=	97.60%	
57) Toluene-d8 (SS2)	15.82	98	511855	12.496	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	100.00%	
73) Bromofluorobenzene (SS3)	19.06	174	118319	13.150	ng	0.00
Spiked Amount	12.500	Range 70 - 130	Recovery	=	105.20%	

Target Compounds

	R.T.	QIon	Response	Conc	Units	Qvalue
2) Propene	4.17	42	343546	23.334	ng	99
3) Dichlorodifluoromethan...	4.33	85	639749	23.697	ng	100
4) Chloromethane	4.62	50	382709	20.471	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.88	135	307994	24.009	ng	99
6) Vinyl Chloride	5.04	62	468796	27.405	ng	99
7) 1,3-Butadiene	5.31	54	338147	27.591	ng	98
8) Bromomethane	5.75	94	257831	26.517	ng	99
9) Chloroethane	6.08	64	214174	26.012	ng	98
10) Ethanol	6.45	45	1137760	114.896	ng	99
11) Acetonitrile	6.72	41	557522	23.659	ng	99
12) Acrolein	6.90	56	174180	23.401	ng	98
13) Acetone	7.11	58	1083864	121.180	ng	100
14) Trichlorofluoromethane	7.35	101	541848	24.422	ng	100
15) 2-Propanol (Isopropanol)	7.60	45	1656997	47.890	ng	98
16) Acrylonitrile	7.87	53	406783	25.123	ng	100
17) 1,1-Dichloroethene	8.31	96	267316	25.179	ng	99
18) 2-Methyl-2-Propanol (t...	8.47	59	1490382	46.096	ng	100
19) Methylene Chloride	8.54	84	265840	24.883	ng	97
20) 3-Chloro-1-propene (Al...	8.69	41	475766	26.900	ng	100
21) Trichlorotrifluoroethane	8.95	151	238139	23.459	ng	99
22) Carbon Disulfide	8.80	76	926027	23.283	ng	100
23) trans-1,2-Dichloroethene	9.81	61	430385	24.956	ng	98
24) 1,1-Dichloroethane	10.06	63	509055	24.438	ng	99
25) Methyl tert-Butyl Ether	10.15	73	885229	25.373	ng	99
26) Vinyl Acetate	10.31	86	317643	120.978	ng	99
27) 2-Butanone (MEK)	10.56	72	178451	25.548	ng	100
28) cis-1,2-Dichloroethene	11.07	61	404628	24.118	ng	99
29) Diisopropyl Ether	11.37	87	293632	26.956	ng	# 66
30) Ethyl Acetate	11.37	61	204977	51.809	ng	99
31) n-Hexane	11.35	57	482527	24.020	ng	99
32) Chloroform	11.42	83	501906	24.598	ng	99
34) Tetrahydrofuran (THF)	11.82	72	173808	24.014	ng	98
35) Ethyl tert-Butyl Ether	11.96	87	352567	24.804	ng	99
36) 1,2-Dichloroethane	12.21	62	461965	24.431	ng	99
38) 1,1,1-Trichloroethane	12.49	97	474454	24.454	ng	99
39) Isopropyl Acetate	12.92	61	350584	49.603	ng	97
40) 1-Butanol	12.94	56	561810	47.948	ng	95
41) Benzene	12.98	78	1051865	23.996	ng	99
42) Carbon Tetrachloride	13.13	117	409358	24.674	ng	99
43) Cyclohexane	13.27	84	826780	49.042	ng	100
44) tert-Amyl Methyl Ether	13.61	73	803931	25.934	ng	99
45) 1,2-Dichloropropane	13.82	63	256391	24.791	ng	99
46) Bromodichloromethane	14.01	83	400294	25.652	ng	99
47) Trichloroethene	14.07	130	284481	24.880	ng	98
48) 1,4-Dioxane	14.05	88	223927	25.205	ng	100
49) 2,2,4-Trimethylpentane...	14.14	57	1170672	24.796	ng	100
50) Methyl Methacrylate	14.27	100	234446	52.863	ng	99

131 of 144

Data File : I:\MS13\DATA\2019_09\25\09251932.D
 Acq On : 25 Sep 2019 22:47
 Sample : 25ng R13092519 ICV Std
 Misc : S31-06261901/S31-09031907

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Sep 26 07:00:11 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Thu Sep 26 06:41:47 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

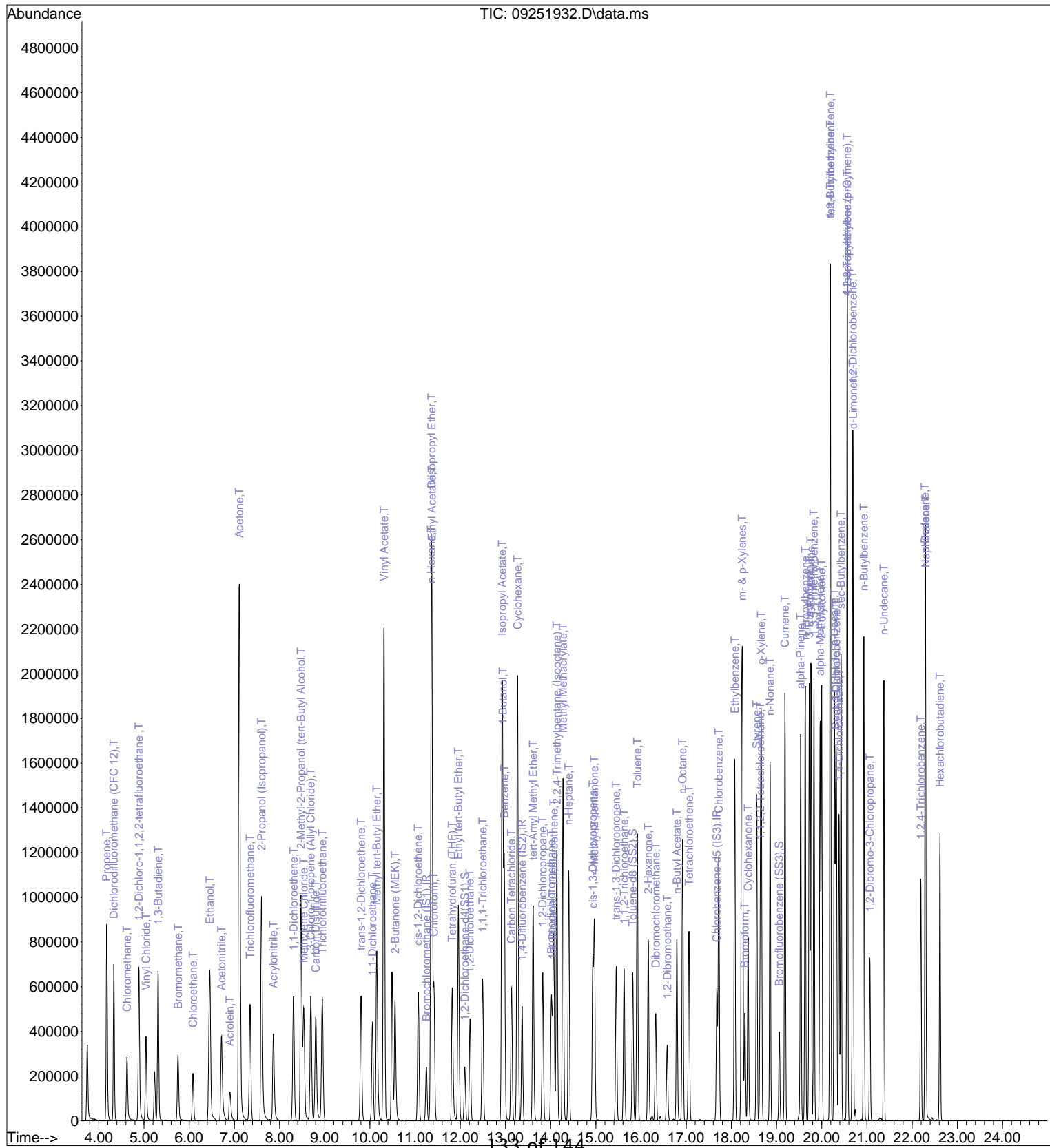
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.40	71	265124	25.649	ng	99
52) cis-1,3-Dichloropropene	14.93	75	451800	26.309	ng	98
53) 4-Methyl-2-pentanone	14.97	58	260663	25.594	ng	99
54) trans-1,3-Dichloropropene	15.45	75	433458	26.808	ng	100
55) 1,1,2-Trichloroethane	15.63	97	255933	25.882	ng	99
58) Toluene	15.92	91	1078965	24.269	ng	99
59) 2-Hexanone	16.16	43	650101	25.309	ng	99
60) Dibromochloromethane	16.33	129	319847	25.916	ng	98
61) 1,2-Dibromoethane	16.58	107	282003	25.174	ng	99
62) n-Butyl Acetate	16.79	43	700522	26.014	ng	99
63) n-Octane	16.92	57	244132	25.078	ng	100
64) Tetrachloroethene	17.06	166	296838	24.585	ng	100
65) Chlorobenzene	17.72	112	710841	25.038	ng	100
66) Ethylbenzene	18.08	91	1269352	24.580	ng	100
67) m- & p-Xylenes	18.24	91	2013540	49.389	ng	100
68) Bromoform	18.30	173	254052	25.906	ng	98
69) Styrene	18.56	104	750175	26.277	ng	99
70) o-Xylene	18.66	91	1022321	25.030	ng	100
71) n-Nonane	18.86	43	578624	26.003	ng	99
72) 1,1,2,2-Tetrachloroethane	18.64	83	425643	25.876	ng	100
74) Cumene	19.19	105	1268025	24.884	ng	100
75) alpha-Pinene	19.53	93	674150	26.867	ng	100
76) n-Propylbenzene	19.63	91	1521408	25.984	ng	99
77) 3-Ethyltoluene	19.73	105	1240501	24.748	ng	100
78) 4-Ethyltoluene	19.76	105	1217561	26.656	ng	100
79) 1,3,5-Trimethylbenzene	19.83	105	1059843	24.949	ng	100
80) alpha-Methylstyrene	19.96	118	563545	27.809	ng	99
81) 2-Ethyltoluene	20.00	105	1227870	25.468	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	1067855	25.966	ng	99
83) n-Decane	20.28	57	578404	26.442	ng	100
84) Benzyl Chloride	20.31	91	871832	25.677	ng	100
85) 1,3-Dichlorobenzene	20.32	146	569355	26.109	ng	98
86) 1,4-Dichlorobenzene	20.39	146	561977	26.053	ng	100
87) sec-Butylbenzene	20.43	105	1386038	25.471	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	1355206	26.166	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	1098091	26.782	ng	100
90) 1,2-Dichlorobenzene	20.69	146	554389	26.803	ng	100
91) d-Limonene	20.69	68	425582	28.218	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.06	157	197566	25.229	ng	99
93) n-Undecane	21.38	57	585255	25.363	ng	100
94) 1,2,4-Trichlorobenzene	22.20	180	349817	23.738	ng	99
95) Naphthalene	22.30	128	1007371	21.415	ng	100
96) n-Dodecane	22.29	57	507344	22.699	ng	99
97) Hexachlorobutadiene	22.62	225	254379	23.195	ng	100
98) Cyclohexanone	18.37	55	374351	22.819	ng	99
99) tert-Butylbenzene	20.19	119	1054646	25.368	ng	99
100) n-Butylbenzene	20.93	91	1110060	26.593	ng	100

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

Data File : I:\MS13\DATA\2019_09\25\09251932.D
Acq On : 25 Sep 2019 22:47
Sample : 25ng R13092519 ICV Std
Misc : S31-06261901/S31-09031907

Vial: 2
Operator: WA
Inst : MS13

Quant Time: Sep 26 07:00:11 2019
Quant Method : I:\MS13\METHODS\R13092519A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Sep 26 06:41:47 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



135 of 144

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 09251932.D

Acq. Method File: TO15.M

9/26/19

Data File Path: I:\MS13\DATA\2019_09\25\

Sample Name: 25ng R13092519 ICV Std

Operator: WA

Misc Info: S31-06261901/S31-09031907

Date Acquired: 9/25/2019

22:47

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	23.3	26.43	88	53	112	*	*
3)	Dichlorodifluoromethane (CFC 12)	4.33	23.7	26.30	90	62	103	*	*
4)	Chloromethane	4.62	20.5	26.38	78	51	121	*	*
5)	1,2-Dichloro-1,1,2,2-tetrafluoroethane	4.88	24.0	26.38	91	56	111	*	*
6)	Vinyl Chloride	5.04	27.4	26.73	103	57	117	*	*
7)	1,3-Butadiene	5.31	27.6	26.28	105	53	134	*	*
8)	Bromomethane	5.75	26.5	26.48	100	65	110	*	*
9)	Chloroethane	6.08	26.0	26.75	97	64	111	*	*
10)	Ethanol	6.45	115	128.10	90	57	124	*	*
11)	Acetonitrile	6.72	23.7	25.73	92	57	126	*	*
12)	Acrolein	6.90	23.4	25.63	91	62	121	*	*
13)	Acetone	7.11	121	132.33	91	60	113	*	*
14)	Trichlorofluoromethane	7.35	24.4	26.40	92	63	104	*	*
15)	2-Propanol (Isopropanol)	7.60	47.9	51.60	93	60	124	*	*
16)	Acrylonitrile	7.87	25.1	25.88	97	66	125	*	*
17)	1,1-Dichloroethene	8.31	25.2	27.23	93	68	107	*	*
18)	2-Methyl-2-Propanol (tert-Butyl Alcohol)	8.47	46.1	54.25	85	64	114	*	*
19)	Methylene Chloride	8.54	24.9	27.08	92	66	105	*	*
20)	3-Chloro-1-propene (Allyl Chloride)	8.69	26.9	27.00	100	63	127	*	*
21)	Trichlorotrifluoroethane	8.95	23.5	26.95	87	59	109	*	*
22)	Carbon Disulfide	8.80	23.3	27.20	86	67	109	*	*
23)	trans-1,2-Dichloroethene	9.81	25.0	26.73	94	70	115	*	*
24)	1,1-Dichloroethane	10.06	24.4	26.95	91	66	106	*	*
25)	Methyl tert-Butyl Ether	10.15	25.4	26.80	95	67	109	*	*
26)	Vinyl Acetate	10.31	121	133.03	91	68	136	*	*
27)	2-Butanone (MEK)	10.56	25.5	25.95	98	71	116	*	*
28)	cis-1,2-Dichloroethene	11.07	24.1	26.35	91	67	110	*	*
29)	Diisopropyl Ether	11.37	27.0	27.18	99	62	109	*	*
30)	Ethyl Acetate	11.37	51.8	54.45	95	64	127	*	*
31)	n-Hexane	11.35	24.0	26.95	89	60	115	*	*
32)	Chloroform	11.42	24.6	27.08	91	66	105	*	*
34)	Tetrahydrofuran (THF)	11.82	24.0	27.00	89	65	110	*	*
35)	Ethyl tert-Butyl Ether	11.96	24.8	26.80	93	69	109	*	*
36)	1,2-Dichloroethane	12.21	24.4	26.85	91	60	110	*	*
38)	1,1,1-Trichloroethane	12.49	24.5	26.90	91	64	108	*	*
39)	Isopropyl Acetate	12.92	49.6	51.55	96	66	119	*	*
40)	1-Butanol	12.94	47.9	51.58	93	54	143	*	*
41)	Benzene	12.98	24.0	26.38	91	67	106	*	*
42)	Carbon Tetrachloride	13.13	24.7	26.45	93	64	112	*	*
43)	Cyclohexane	13.27	49.0	52.05	94	67	110	*	*
44)	tert-Amyl Methyl Ether	13.61	25.9	27.08	96	68	112	*	*
45)	1,2-Dichloropropane	13.82	24.8	26.98	92	66	112	*	*
46)	Bromodichloromethane	14.01	25.7	26.83	96	67	113	*	*
47)	Trichloroethene	14.07	24.9	26.68	93	66	108	*	*
48)	1,4-Dioxane	14.05	25.2	26.73	94	70	116	*	*
49)	2,2,4-Trimethylpentane (Isooctane)	14.14	24.8	26.65	93	64	113	*	*

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEETData File Name: **09251932.D**

TO15.M

Data File Path: I:\MS13\DATA\2019_09\25\

Sample Name: **25ng R13092519 ICV Std**Operator: **WA**Misc Info: **S31-06261901/S31-09031907**Date Acquired: **9/25/2019****22:47**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	52.9	53.88	98	73	118	*	*
51)	n-Heptane	14.40	25.6	26.90	95	66	110	*	*
52)	cis-1,3-Dichloropropene	14.93	26.3	26.78	98	75	120	*	*
53)	4-Methyl-2-pentanone	14.97	25.6	26.15	98	65	124	*	*
54)	trans-1,3-Dichloropropene	15.45	26.8	26.60	101	77	123	*	*
55)	1,1,2-Trichloroethane	15.63	25.9	26.85	96	68	112	*	*
58)	Toluene	15.92	24.3	26.50	92	62	111	*	*
59)	2-Hexanone	16.16	25.3	26.78	94	59	128	*	*
60)	Dibromochloromethane	16.33	25.9	26.60	97	67	123	*	*
61)	1,2-Dibromoethane	16.58	25.2	27.03	93	66	122	*	*
62)	n-Butyl Acetate	16.79	26.0	27.35	95	64	128	*	*
63)	n-Octane	16.92	25.1	27.13	93	65	114	*	*
64)	Tetrachloroethene	17.06	24.6	26.60	92	55	120	*	*
65)	Chlorobenzene	17.72	25.0	26.83	93	61	114	*	*
66)	Ethylbenzene	18.08	24.6	26.53	93	64	113	*	*
67)	m- & p-Xylenes	18.24	49.4	53.28	93	64	114	*	*
68)	Bromoform	18.30	25.9	26.68	97	65	132	*	*
69)	Styrene	18.56	26.3	26.50	99	67	124	*	*
70)	o-Xylene	18.66	25.0	26.75	93	65	114	*	*
71)	n-Nonane	18.86	26.0	26.83	97	64	117	*	*
72)	1,1,2,2-Tetrachloroethane	18.64	25.9	26.80	97	66	119	*	*
74)	Cumene	19.19	24.9	26.80	93	61	116	*	*
75)	alpha-Pinene	19.53	26.9	26.40	102	65	120	*	*
76)	n-Propylbenzene	19.63	26.0	27.23	96	63	117	*	*
77)	3-Ethyltoluene	19.73	24.7	26.83	92	60	117	*	*
78)	4-Ethyltoluene	19.76	26.7	26.80	100	63	124	*	*
79)	1,3,5-Trimethylbenzene	19.83	24.9	26.73	93	60	117	*	*
80)	alpha-Methylstyrene	19.96	27.8	26.75	104	64	131	*	*
81)	2-Ethyltoluene	20.00	25.5	27.08	94	62	116	*	*
82)	1,2,4-Trimethylbenzene	20.19	26.0	26.90	97	61	122	*	*
83)	n-Decane	20.28	26.4	26.88	98	67	120	*	*
84)	Benzyl Chloride	20.31	25.7	27.08	95	77	142	*	*
85)	1,3-Dichlorobenzene	20.32	26.1	26.98	97	61	125	*	*
86)	1,4-Dichlorobenzene	20.39	26.1	27.00	97	59	123	*	*
87)	sec-Butylbenzene	20.43	25.5	26.55	96	62	117	*	*
88)	4-Isopropyltoluene (p-Cymene)	20.56	26.2	26.95	97	58	122	*	*
89)	1,2,3-Trimethylbenzene	20.56	26.8	26.95	99	62	124	*	*
90)	1,2-Dichlorobenzene	20.69	26.8	26.95	99	61	126	*	*
91)	d-Limonene	20.69	28.2	26.38	107	66	124	*	*
92)	1,2-Dibromo-3-Chloropropane	21.06	25.2	26.15	96	67	138	*	*
93)	n-Undecane	21.38	25.4	27.03	94	68	127	*	*
94)	1,2,4-Trichlorobenzene	22.20	23.7	26.78	89	62	141	*	*
95)	Naphthalene	22.30	21.4	25.38	84	62	145	*	*
96)	n-Dodecane	22.29	22.7	25.63	89	64	152	*	*
97)	Hexachlorobutadiene	22.62	23.2	26.13	89	49	131	*	*
98)	Cyclohexanone	18.37	22.8	24.45	93	61	127	*	*
99)	tert-Butylbenzene	20.19	25.4	26.88	95	58	122	*	*
100)	n-Butylbenzene	20.93	26.6	27.00	99	64	121	*	*

Bold = 75 Compound List

Data File : I:\MS13\DATA\2019_09\27\09271902.D
Acq On : 27 Sep 2019 3:52
Sample : CCV R13092719_5ng
Misc : S31-06261901/S31-09041910

Vial: 2
Operator: WA
Inst : MS13

Quant Time: Sep 27 06:58:28 2019
Quant Method : I:\MS13\METHODS\R13092519A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Sep 27 06:46:45 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

WA 9/27/19

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	116	-0.02
2 T	Propene	1.779	1.722	3.2	122	0.00
3 T	Dichlorodifluoromethane (CF	3.262	3.168	2.9	115	0.00
4 T	Chloromethane	2.259	2.407	-6.6	126	0.00
5 T	1,2-Dichloro-1,1,2,2-tetra	1.550	1.566	-1.0	120	-0.01
6 T	Vinyl Chloride	2.067	2.391	-15.7	122	0.00
7 T	1,3-Butadiene	1.481	1.757	-18.6	130	-0.02
8 T	Bromomethane	1.175	1.222	-4.0	117	-0.01
9 T	Chloroethane	0.995	1.089	-9.4	126	-0.01
10 T	Ethanol	1.196	1.281	-7.1	127	-0.11
11 T	Acetonitrile	2.847	3.191	-12.1	131	-0.05
12 T	Acrolein	0.899	1.068	-18.8	140	-0.01
13 T	Acetone	1.081	1.216	-12.5	132	-0.05
14 T	Trichlorofluoromethane	2.681	3.001	-11.9	131	-0.02
15 T	2-Propanol (Isopropanol)	4.180	4.671	-11.7	125	-0.08
16 T	Acrylonitrile	1.956	2.161	-10.5	127	-0.04
17 T	1,1-Dichloroethene	1.283	1.309	-2.0	118	0.00
18 T	2-Methyl-2-Propanol (tert-B	3.906	4.771	-22.1	126	-0.07
19 T	Methylene Chloride	1.291	1.292	-0.1	120	-0.02
20 T	3-Chloro-1-propene (Allyl C	2.137	2.338	-9.4	125	-0.01
21 T	Trichlorotrifluoroethane	1.226	1.154	5.9	113	-0.01
22 T	Carbon Disulfide	4.805	4.498	6.4	119	0.00
23 T	trans-1,2-Dichloroethene	2.084	2.259	-8.4	126	-0.02
24 T	1,1-Dichloroethane	2.517	2.542	-1.0	118	-0.02
25 T	Methyl tert-Butyl Ether	4.215	4.978	-18.1	130	0.00
26 T	Vinyl Acetate	0.317	0.343	-8.2	122	-0.04
27 T	2-Butanone (MEK)	0.844	0.975	-15.5	130	-0.02
28 T	cis-1,2-Dichloroethene	2.027	2.186	-7.8	127	-0.02
29 T	Diisopropyl Ether	1.316	1.525	-15.9	131	-0.01
30 T	Ethyl Acetate	0.478	0.572	-19.7	132	-0.02
31 T	n-Hexane	2.427	2.763	-13.8	136	-0.01
32 T	Chloroform	2.465	2.819	-14.4	137	-0.02
33 S	1,2-Dichloroethane-d4(SS1)	2.056	2.394	-16.4	135	-0.02
34 T	Tetrahydrofuran (THF)	0.874	0.974	-11.4	130	0.00
35 T	Ethyl tert-Butyl Ether	1.717	1.998	-16.4	132	-0.01
36 T	1,2-Dichloroethane	2.285	2.671	-16.9	135	-0.01
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	126	-0.01
38 T	1,1,1-Trichloroethane	0.534	0.553	-3.6	135	-0.01
39 T	Isopropyl Acetate	0.194	0.203	-4.6	129	-0.01
40 T	1-Butanol	0.322	0.364	-13.0	136	-0.05
41 T	Benzene	1.205	1.172	2.7	128	-0.01
42 T	Carbon Tetrachloride	0.456	0.485	-6.4	132	-0.01
43 T	Cyclohexane	0.464	0.460	0.9	126	-0.02
44 T	tert-Amyl Methyl Ether	0.852	0.901	-5.8	132	0.00
45 T	1,2-Dichloropropane	0.284	0.288	-1.4	133	-0.01
46 T	Bromodichloromethane	0.429	0.457	-6.5	135	-0.01
47 T	Trichloroethene	0.314	0.312	0.6	126	0.00
48 T	1,4-Dioxane	0.244	0.251	-2.9	131	0.00
49 T	2,2,4-Trimethylpentane (Iso	1.298	1.343	-3.5	133	0.00
50 T	Methyl Methacrylate	0.122	0.123	-0.8	122	-0.01
51 T	n-Heptane	0.284	0.291	-2.5	130	-0.01
52 T	cis-1,3-Dichloropropene	0.472	0.501	-6.1	132	-0.01
53 T	4-Methyl-2-pentanone	0.280	0.308	-10.0	133	-0.01
54 T	trans-1,3-Dichloropropene	0.445	0.503	-13.0	133	0.00
55 T	1,1,2-Trichloroethane	0.272	0.281	-3.3	130	-0.01

136 of 144

Data File : I:\MS13\DATA\2019_09\27\09271902.D
 Acq On : 27 Sep 2019 3:52
 Sample : CCV R13092719_5ng
 Misc : S31-06261901/S31-09041910

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Sep 27 06:58:28 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 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	131	0.00
57 S Toluene-d8 (SS2)	2.546	2.515	1.2	130	0.00
58 T Toluene	2.764	2.614	5.4	128	0.00
59 T 2-Hexanone	1.597	1.768	-10.7	141	0.00
60 T Dibromochloromethane	0.767	0.756	1.4	133	-0.01
61 T 1,2-Dibromoethane	0.696	0.679	2.4	131	0.00
62 T n-Butyl Acetate	1.674	1.892	-13.0	141	0.00
63 T n-Octane	0.605	0.611	-1.0	137	0.00
64 T Tetrachloroethene	0.751	0.711	5.3	132	0.00
65 T Chlorobenzene	1.765	1.714	2.9	129	0.00
66 T Ethylbenzene	3.210	3.155	1.7	130	0.00
67 T m- & p-Xylenes	2.534	2.484	2.0	133	-0.01
68 T Bromoform	0.610	0.609	0.2	131	-0.01
69 T Styrene	1.775	1.806	-1.7	127	0.00
70 T o-Xylene	2.539	2.494	1.8	132	0.00
71 T n-Nonane	1.383	1.523	-10.1	145	0.00
72 T 1,1,2,2-Tetrachloroethane	1.023	1.033	-1.0	131	-0.01
73 S Bromofluorobenzene (SS3)	0.559	0.547	2.1	125	0.00
74 T Cumene	3.168	3.098	2.2	132	0.00
75 T alpha-Pinene	1.560	1.624	-4.1	135	0.00
76 T n-Propylbenzene	3.640	3.667	-0.7	131	0.00
77 T 3-Ethyltoluene	3.116	3.148	-1.0	130	0.00
78 T 4-Ethyltoluene	2.839	2.787	1.8	131	0.00
79 T 1,3,5-Trimethylbenzene	2.641	2.596	1.7	132	0.00
80 T alpha-Methylstyrene	1.260	1.279	-1.5	128	-0.01
81 T 2-Ethyltoluene	2.997	2.946	1.7	130	-0.01
82 T 1,2,4-Trimethylbenzene	2.557	2.595	-1.5	129	-0.01
83 T n-Decane	1.360	1.432	-5.3	134	0.00
84 T Benzyl Chloride	2.111	2.288	-8.4	134	0.00
85 T 1,3-Dichlorobenzene	1.356	1.387	-2.3	128	-0.01
86 T 1,4-Dichlorobenzene	1.341	1.407	-4.9	127	-0.01
87 T sec-Butylbenzene	3.383	3.307	2.2	129	0.00
88 T 4-Isopropyltoluene (p-Cymen)	3.220	3.229	-0.3	129	-0.01
89 T 1,2,3-Trimethylbenzene	2.549	2.621	-2.8	132	-0.01
90 T 1,2-Dichlorobenzene	1.286	1.283	0.2	124	-0.01
91 T d-Limonene	0.938	0.994	-6.0	133	0.00
92 T 1,2-Dibromo-3-Chloropropane	0.487	0.476	2.3	129	0.00
93 T n-Undecane	1.434	1.535	-7.0	135	0.00
94 T 1,2,4-Trichlorobenzene	0.916	0.978	-6.8	127	0.00
95 T Naphthalene	2.924	3.353	-14.7	131	0.00
96 T n-Dodecane	1.389	1.554	-11.9	136	0.00
97 T Hexachlorobutadiene	0.682	0.631	7.5	129	0.00
98 T Cyclohexanone	1.020	1.132	-11.0	139	-0.01
99 T tert-Butylbenzene	2.584	2.538	1.8	131	-0.01
100 T n-Butylbenzene	2.595	2.764	-6.5	129	0.00

(#) = Out of Range

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

Data File : I:\MS13\DATA\2019_09\27\09271902.D
 Acq On : 27 Sep 2019 3:52
 Sample : CCV R13092719_5ng
 Misc : S31-06261901/S31-09041910

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Sep 27 06:58:28 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

IDA 9/27/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.25	130	124391	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.36	114	607287	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.68	82	282247	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...)	12.09	65	297732	14.553	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	116.40%
57) Toluene-d8 (SS2)	15.82	98	709804	12.346	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.80%
73) Bromofluorobenzene (SS3)	19.06	174	154471	12.231	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.84%

Target Compounds

						Qvalue
2) Propene	4.20	42	88345	4.991	ng	98
3) Dichlorodifluoromethan...	4.35	85	164703	5.074	ng	100
4) Chloromethane	4.64	50	120722	5.371	ng	96
5) 1,2-Dichloro-1,1,2,2-t...	4.90	135	80121	5.195	ng	98
6) Vinyl Chloride	5.05	62	125029	6.079	ng	97
7) 1,3-Butadiene	5.32	54	91730	6.225	ng	97
8) Bromomethane	5.77	94	61341	5.247	ng	96
9) Chloroethane	6.09	64	55401	5.596	ng	97
10) Ethanol	6.43	45	327517	27.509	ng	100
11) Acetonitrile	6.71	41	164026	5.789	ng	100
12) Acrolein	6.91	56	54622	6.104	ng	100
13) Acetone	7.10	58	324847	30.207	ng	96
14) Trichlorofluoromethane	7.35	101	158303	5.934	ng	99
15) 2-Propanol (Isopropanol)	7.58	45	479504	11.526	ng	100
16) Acrylonitrile	7.86	53	111198	5.712	ng	99
17) 1,1-Dichloroethene	8.32	96	69930	5.479	ng	90
18) 2-Methyl-2-Propanol (t...	8.46	59	508948	13.092	ng	99
19) Methylene Chloride	8.53	84	68797	5.356	ng	98
20) 3-Chloro-1-propene (Al...	8.70	41	124107	5.836	ng	96
21) Trichlorotrifluoroethane	8.95	151	61137	5.009	ng	99
22) Carbon Disulfide	8.81	76	240571	5.031	ng	100
23) trans-1,2-Dichloroethene	9.80	61	119364	5.757	ng	100
24) 1,1-Dichloroethane	10.05	63	130299	5.203	ng	100
25) Methyl tert-Butyl Ether	10.15	73	269717	6.430	ng	99
26) Vinyl Acetate	10.30	86	89735	28.426	ng	# 83
27) 2-Butanone (MEK)	10.56	72	49814	5.932	ng	# 92
28) cis-1,2-Dichloroethene	11.06	61	114665	5.685	ng	96
29) Diisopropyl Ether	11.37	87	82023	6.263	ng	# 88
30) Ethyl Acetate	11.37	61	61648	12.960	ng	94
31) n-Hexane	11.35	57	148767	6.159	ng	100
32) Chloroform	11.41	83	151060	6.157	ng	100
34) Tetrahydrofuran (THF)	11.83	72	51780	5.950	ng	93
35) Ethyl tert-Butyl Ether	11.96	87	105381	6.166	ng	98
36) 1,2-Dichloroethane	12.21	62	140992	6.202	ng	99
38) 1,1,1-Trichloroethane	12.49	97	145295	5.605	ng	99
39) Isopropyl Acetate	12.93	61	101653	10.765	ng	# 91
40) 1-Butanol	12.94	56	182651	11.668	ng	98
41) Benzene	12.97	78	294098	5.022	ng	99
42) Carbon Tetrachloride	13.13	117	122005	5.504	ng	98
43) Cyclohexane	13.26	84	233198	10.354	ng	95
44) tert-Amyl Methyl Ether	13.61	73	234937	5.673	ng	98
45) 1,2-Dichloropropane	13.82	63	75014	5.429	ng	100
46) Bromodichloromethane	14.01	83	118440	5.681	ng	100
47) Trichloroethene	14.07	130	80601	5.276	ng	100
48) 1,4-Dioxane	14.05	88	64902	5.468	ng	94
49) 2,2,4-Trimethylpentane...	14.14	57	346194	5.489	ng	98
50) Methyl Methacrylate	14.27	100	63926	10.789	ng	95

138 of 144

Data File : I:\MS13\DATA\2019_09\27\09271902.D
 Acq On : 27 Sep 2019 3:52
 Sample : CCV R13092719_5ng
 Misc : S31-06261901/S31-09041910

Vial: 2
 Operator: WA
 Inst : MS13

Quant Time: Sep 27 06:58:28 2019
 Quant Method : I:\MS13\METHODS\R13092519A.M
 Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 QLast Update : Fri Sep 27 06:46:45 2019
 Response via : Initial Calibration
 DataAcq Meth:TO15.M

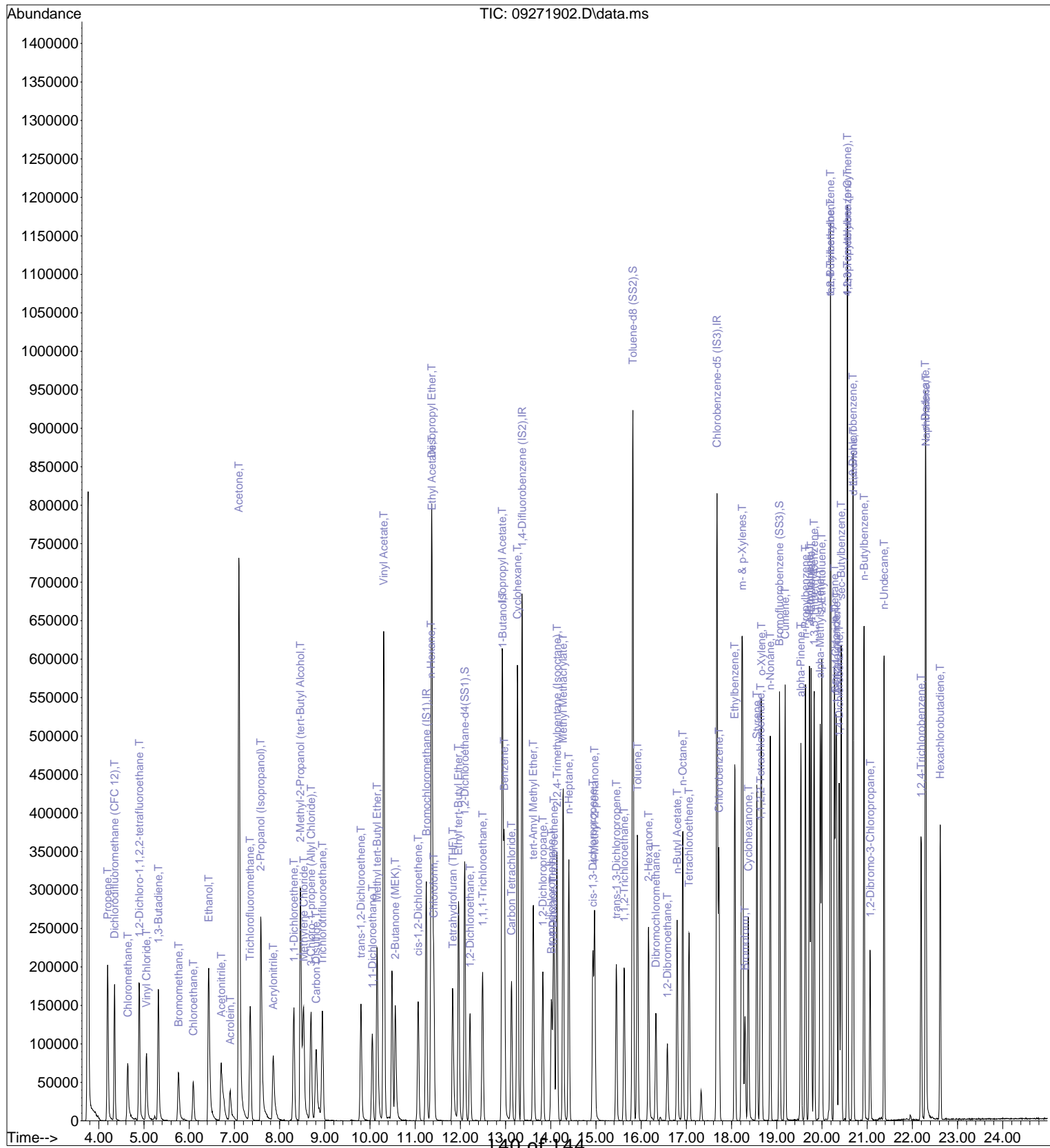
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.40	71	76050	5.507	ng	99
52) cis-1,3-Dichloropropene	14.93	75	136182	5.936	ng	98
53) 4-Methyl-2-pentanone	14.97	58	79399	5.835	ng	94
54) trans-1,3-Dichloropropene	15.45	75	128937	5.969	ng	99
55) 1,1,2-Trichloroethane	15.62	97	73348	5.552	ng	100
58) Toluene	15.92	91	310487	4.975	ng	100
59) 2-Hexanone	16.16	43	214350	5.945	ng	98
60) Dibromochloromethane	16.32	129	91743	5.296	ng	97
61) 1,2-Dibromoethane	16.58	107	82444	5.243	ng	100
62) n-Butyl Acetate	16.80	43	231798	6.132	ng	98
63) n-Octane	16.92	57	74279	5.436	ng	94
64) Tetrachloroethene	17.06	166	84979	5.014	ng	99
65) Chlorobenzene	17.72	112	206287	5.176	ng	100
66) Ethylbenzene	18.07	91	367949	5.076	ng	98
67) m- & p-Xylenes	18.23	91	595482	10.406	ng	99
68) Bromoform	18.30	173	73049	5.307	ng	95
69) Styrene	18.56	104	216179	5.395	ng	98
70) o-Xylene	18.66	91	299007	5.215	ng	97
71) n-Nonane	18.86	43	184163	5.896	ng	95
72) 1,1,2,2-Tetrachloroethane	18.64	83	124057	5.373	ng	99
74) Cumene	19.19	105	369682	5.168	ng	99
75) alpha-Pinene	19.53	93	189794	5.389	ng	99
76) n-Propylbenzene	19.63	91	445410	5.419	ng	99
77) 3-Ethyltoluene	19.73	105	377442	5.365	ng	98
78) 4-Ethyltoluene	19.76	105	333869	5.207	ng	98
79) 1,3,5-Trimethylbenzene	19.83	105	309765	5.195	ng	98
80) alpha-Methylstyrene	19.96	118	152776	5.371	ng	98
81) 2-Ethyltoluene	19.99	105	356495	5.268	ng	99
82) 1,2,4-Trimethylbenzene	20.19	105	312924	5.421	ng	100
83) n-Decane	20.28	57	173973	5.666	ng	98
84) Benzyl Chloride	20.31	91	271480	5.696	ng	98
85) 1,3-Dichlorobenzene	20.32	146	169086	5.524	ng	98
86) 1,4-Dichlorobenzene	20.38	146	171727	5.672	ng	99
87) sec-Butylbenzene	20.43	105	396924	5.197	ng	98
88) 4-Isopropyltoluene (p-...	20.56	119	379881	5.225	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	308375	5.358	ng	97
90) 1,2-Dichlorobenzene	20.68	146	157723	5.433	ng	99
91) d-Limonene	20.69	68	113396	5.356	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.07	157	56030	5.097	ng	90
93) n-Undecane	21.38	57	183123	5.654	ng	96
94) 1,2,4-Trichlorobenzene	22.20	180	117530	5.682	ng	99
95) Naphthalene	22.30	128	388024	5.877	ng	99
96) n-Dodecane	22.29	57	180845	5.764	ng	97
97) Hexachlorobutadiene	22.62	225	75003	4.872	ng	100
98) Cyclohexanone	18.37	55	125498	5.450	ng	98
99) tert-Butylbenzene	20.19	119	305710	5.239	ng	98
100) n-Butylbenzene	20.93	91	332035	5.667	ng	100

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

Data File : I:\MS13\DATA\2019_09\27\09271902.D
Acq On : 27 Sep 2019 3:52
Sample : CCV R13092719_5ng
Misc : S31-06261901/S31-09041910

Vial: 2
Operator: WA
Inst : MS13

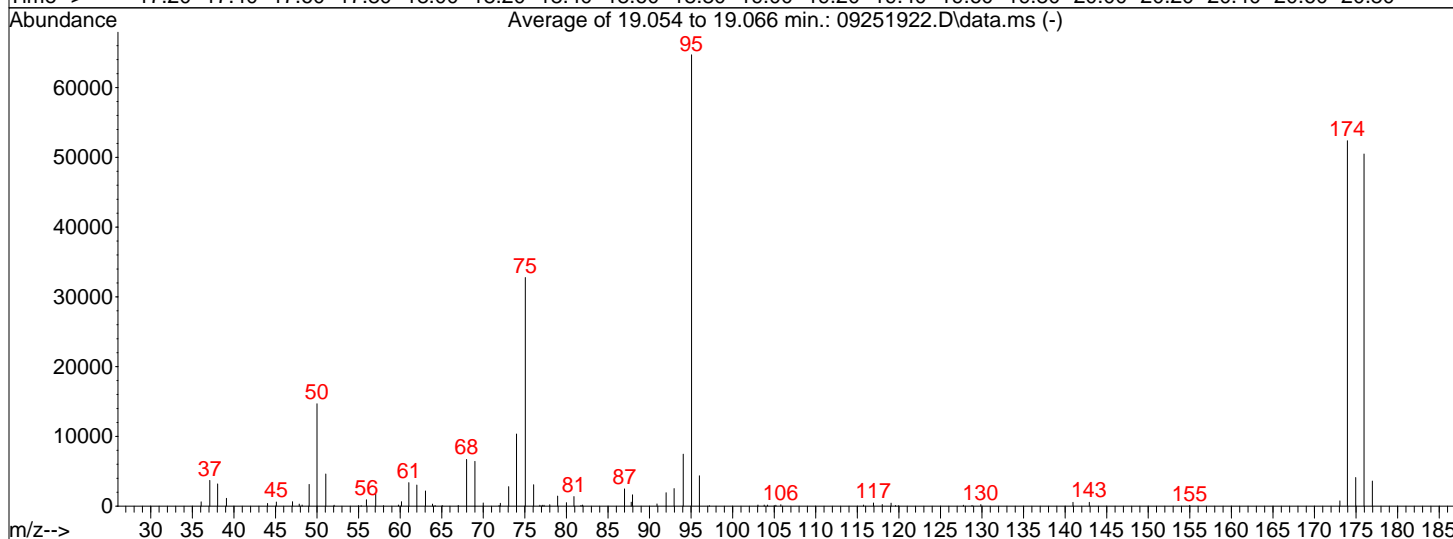
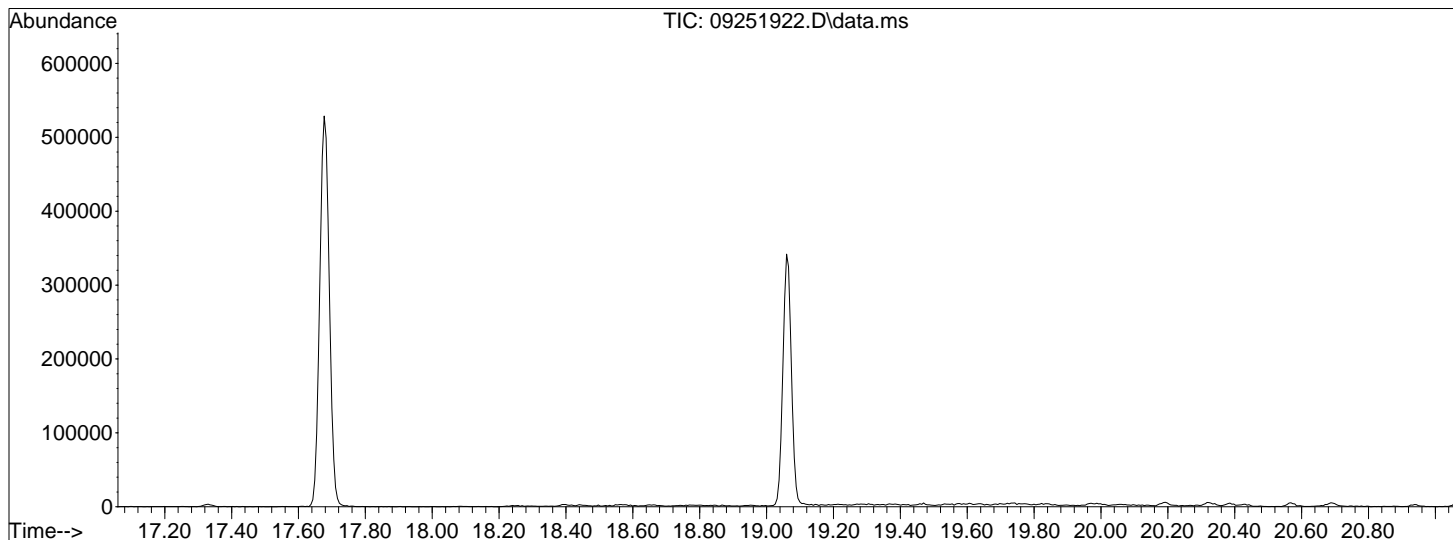
Quant Time: Sep 27 06:58:28 2019
Quant Method : I:\MS13\METHODS\R13092519A.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Sep 27 06:46:45 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data Path : I:\MS13\DATA\2019_09\25\
 Data File : 09251922.D
 Acq On : 25 Sep 2019 17:10
 Operator : WA
 Sample : BFB Std
 Misc : S31-06261901
 ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS13\METHODS\R13092519A.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Thu Sep 26 06:41:47 2019



AutoFind: Scans 2712, 2713, 2714; Background Corrected with Scan 2705

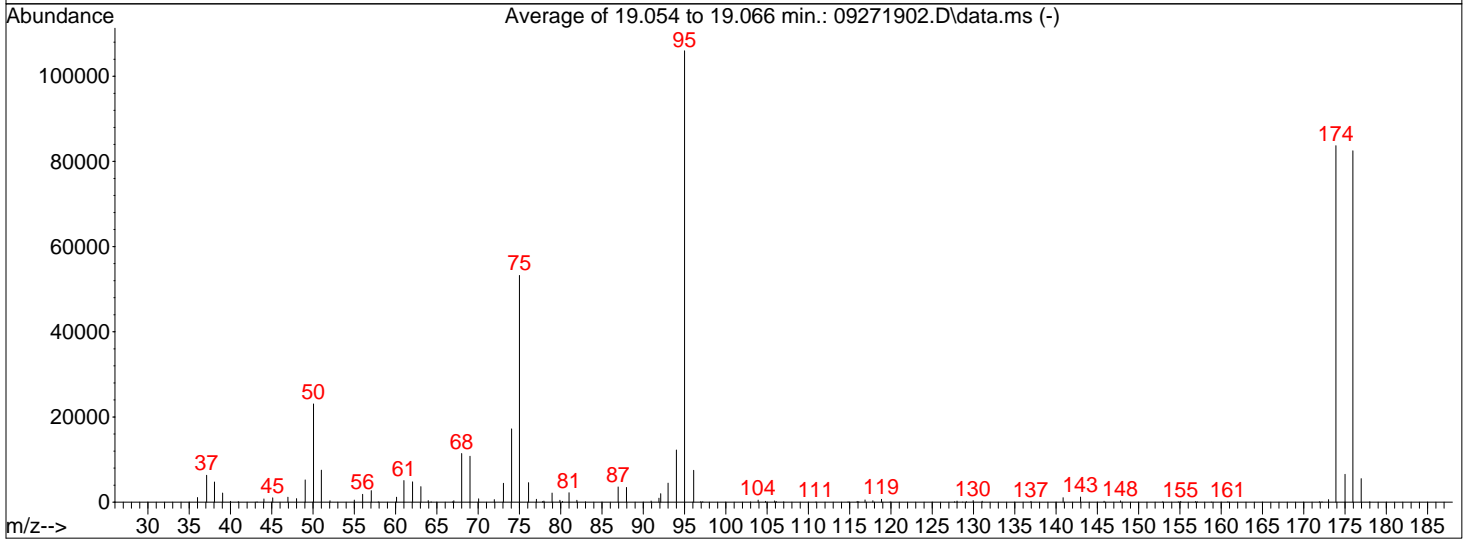
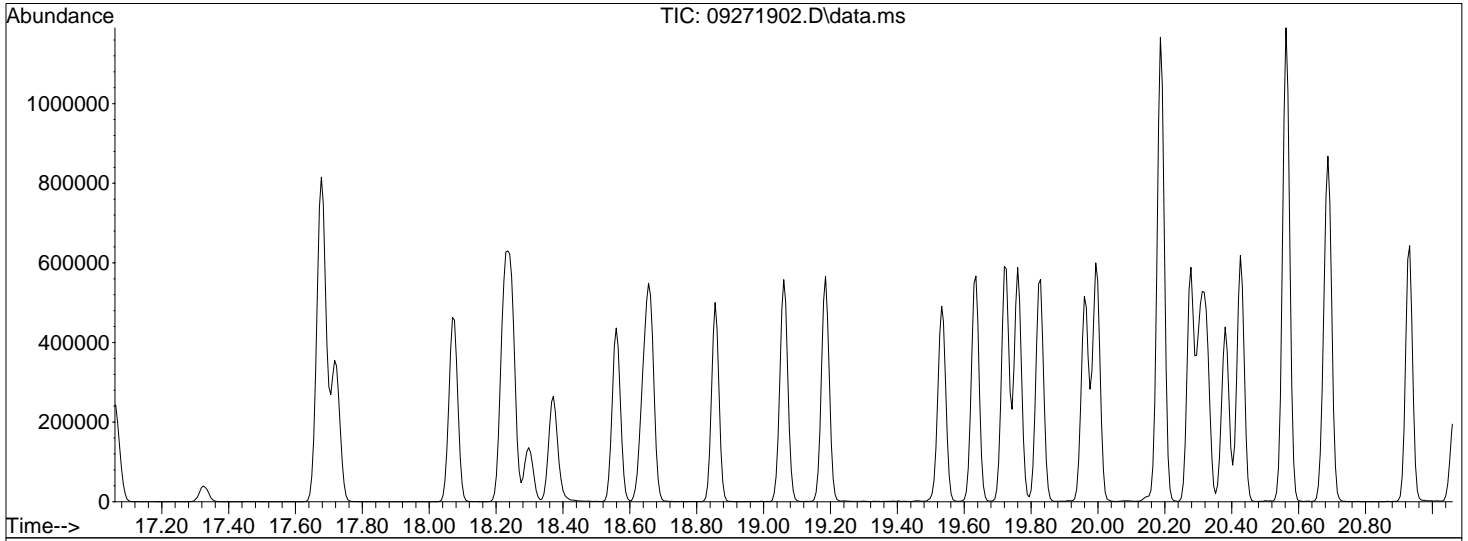
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	22.7	14685	PASS
75	95	30	66	50.7	32784	PASS
95	95	100	100	100.0	64699	PASS
96	95	5	9	6.7	4353	PASS
173	174	0.00	2	1.4	754	PASS
174	95	50	120	81.0	52392	PASS
175	174	4	9	7.9	4117	PASS
176	174	93	101	96.4	50480	PASS
177	176	5	9	7.1	3607	PASS

WA 9/26/19

Data Path : I:\MS13\DATA\2019_09\27\
 Data File : 09271902.D
 Acq On : 27 Sep 2019 3:52
 Operator : WA
 Sample : CCV R13092719_5ng
 Misc : S31-06261901/S31-09041910
 ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS13\METHODS\R13092519A.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Fri Sep 27 06:46:45 2019



AutoFind: Scans 2712, 2713, 2714; Background Corrected with Scan 2705

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	21.8	23075	PASS
75	95	30	66	50.2	53248	PASS
95	95	100	100	100.0	105973	PASS
96	95	5	9	7.1	7486	PASS
173	174	0.00	2	0.7	604	PASS
174	95	50	120	79.0	83707	PASS
175	174	4	9	7.8	6548	PASS
176	174	93	101	98.5	82480	PASS
177	176	5	9	6.7	5537	PASS

WA 9/27/19

Injection Log

Directory: J:\MS13\DATA\2019_09\25\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
22	9/25/19 17:10	09251922.D	BFB Std	S31-06261901	WA	2	Passed
23	9/25/19 17:43	09251923.D	0.2ng R13092519 ICAL Std	S31-06261901/S31-08291902	WA	4	
24	9/25/19 18:16	09251924.D	0.5ng R13092519 ICAL Std	S31-06261901/S31-09111903	WA	1	
25	9/25/19 18:50	09251925.D	1.0ng R13092519 ICAL Std	S31-06261901/S31-09111903	WA	1	
26	9/25/19 19:24	09251926.D	5.0ng R13092519 ICAL Std	S31-06261901/S31-09111903	WA	1	
27	9/25/19 19:58	09251927.D	25ng R13092519 ICAL Std	S31-06261901/S31-09041910	WA	2	
28	9/25/19 20:31	09251928.D	50ng R13092519 ICAL Std	S31-06261901/S31-09041910	WA	2	
29	9/25/19 21:05	09251929.D	100ng R13092519 ICAL Std	S31-06261901/S31-09041910	WA	2	
30	9/25/19 21:39	09251930.D	Blank	S31-06261901	WA	2	
31	9/25/19 22:13	09251931.D	5.0ng R13092519 ICAL Std	S31-06261901/S31-09041910	WA	1	
32	9/25/19 22:47	09251932.D	25ng R13092519 ICV Std	S31-06261901/S31-09031907	WA	2	Passed
33	9/25/19 23:21	09251933.D	25ng R13092519 ICV Std	S31-06261901/S31-09031907	WA	2	Passed
R13092519A.M: ranges from 0.2ng --> 100ng (ICAL is not for DoD and Navy , %RSD for naphthalene 34.5%)							
Exception for Compds ranges: chloromethane: 0.2ng --> 50ng; alpha MeStyrene, Benzyl-Cl, Undecane, 1,2,4-TCB: 0.5ng --> 100ng							
and n-Dodecane: 1.0ng --> 100ng							
						DA	9/26/19

Directory: I:\MS13\DATA\2019_09\27\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	9/27/19 3:18	09271901.D	System	S31-06261901/S31-09041910	WA	3	
2	9/27/19 3:52	09271902.D	CCV R13092719_5ng	S31-06261901/S31-09041910	WA	2	<i>passed</i>
3	9/27/19 4:25	09271903.D	CCV C13092719_5ng	S31-06261901/S31-09201903	WA	16	<i>passed</i>
4	9/27/19 4:59	09271904.D	MB R13092719_1000mL	S31-06261901/AC00880	WA	2	<i>passed</i>
5	9/27/19 5:32	09271905.D	LCS R13092719_25ng	S31-06261901/S31-09031907	WA	2	<i>passed</i>
6	9/27/19 6:06	09271906.D	LCSD R13092719_25ng	S31-06261901/S31-09031907	WA	2	<i>passed</i>
7	9/27/19 6:40	09271907.D	Blank	S31-06261901	WA	3	
8	9/27/19 7:19	09271908.D	P1905495-001dil (2.0mL)	S31-06261901	WA	3	
9	9/27/19 8:00	09271909.D	P1905635-022dil (5.0mL)	S31-06261901	WA	3	
10	9/27/19 8:34	09271910.D	P1905498-001 (4.0mL)	S31-06261901	WA	3	
11	9/27/19 9:08	09271911.D	P1905498-002 (3.5mL)	S31-06261901	WA	3	
12	9/27/19 9:41	09271912.D	P1905498-002dup (3.5mL)	S31-06261901	WA	3	<i>passed</i>
13	9/27/19 10:15	09271913.D	P1905495-001 (200mL)	S31-06261901	WA	15	
14	9/27/19 10:48	09271914.D	P1905516-002 (8.0mL)	S31-06261901	WA	3	
15	9/27/19 11:22	09271915.D	P1905516-002dil (2.0mL)	S31-06261901	WA	3	
16	9/27/19 11:55	09271916.D	P1905516-003 (2.0mL)	S31-06261901	WA	3	
17	9/27/19 12:31	09271917.D	P1905516-006 (1.25mL)	S31-06261901	WA	3	
18	9/27/19 13:04	09271918.D	P1905516-001dil (50mL)	S31-06261901	WA	5	
19	9/27/19 13:37	09271919.D	P1905516-004 (400mL)	S31-06261901	WA	6	
20	9/27/19 14:10	09271920.D	P1905516-005 (15mL)	S31-06261901	WA	7	
21	9/27/19 14:44	09271921.D	P1905516-004dil (40mL)	S31-06261901	WA	6	<i>Surr1 failed</i>
22	9/27/19 15:17	09271922.D	P1905516-005dil (5.0mL)	S31-06261901	WA	3	
23	9/27/19 15:53	09271923.D	Custom Std 2.5ng	S31-06261901	WA	15	
24	9/27/19 16:30	09271924.D	P1905515-002dil (10mL)	S31-06261901	WA	3	
25	9/27/19 17:03	09271925.D	P1905517-001dil (5.0mL)	S31-06261901	WA	3	
26	9/27/19 17:36	09271926.D	P1905516-001 (400mL)	S31-06261901	WA	1	<i>Surr1 failed</i>
27	9/27/19 18:10	09271927.D	P1905516-007 (200mL)	S31-06261901	WA	8	<i>overdiluted</i>
28	9/27/19 18:43	09271928.D	P1905516-007dil (40mL)	S31-06261901	WA	8	
29	9/27/19 19:16	09271929.D	P1905498-003 (1000mL)	S31-06261901	WA	1	
30	9/27/19 19:50	09271930.D	P1905498-004 (1000mL)	S31-06261901	WA	4	
31	9/27/19 20:23	09271931.D	P1905635-007 (1000mL)	S31-06261901	WA	15	
32	9/27/19 20:56	09271932.D	P1905635-007dil (200mL)	S31-06261901	WA	15	
33	9/27/19 21:30	09271933.D	P1905515-001 (400mL)	S31-06261901	WA	10	
34	9/27/19 22:03	09271934.D	P1905515-002 (40mL)	S31-06261901	WA	11	<i>needs dilution</i>
35	9/27/19 22:37	09271935.D	P1905515-003 (400mL)	S31-06261901	WA	12	<i>needs dilution</i>
36	9/27/19 23:10	09271936.D	P1905517-001 (30mL)	S31-06261901	WA	6	<i>needs dilution</i>
37	9/27/19 23:44	09271937.D	P1905517-002 (400mL)	S31-06261901	WA	7	
38	9/28/19 7:48	09271938.D	P1905517-002dil (40mL)	S31-06261901	WA	7	<i>cryo off/rerun</i>



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

January 7, 2020

DAIM-ODB-LO

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

Re: Surface Water Data Transmittal – 2019, Longhorn Army Ammunition Plant, Karnack,
TX

Dear Ms. Palmie,

The surface water data, collected as a requirement of the 1999 Perchlorate Dispute Resolution, will be documented in the Administrative Record via data memoranda provided by the Army. The quarterly surface water sampling results along with historical data, is presented in the attached memorandum for your file and does not require your review.

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

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

Sincerely,

A handwritten signature in cursive script that reads "Rose M. Zeiler".

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

Copies furnished:

W. Rhotenberry, USEPA Region 6, Dallas, TX

P. Bruckwicki, Caddo Lake NWR, TX

A. Williams, USACE, ARMY Environmental Section Regional Planning and Environmental Center Fort Worth District (located in Tulsa)

N. Smith, USAEC, San Antonio, TX

K. Nemmers, Bhate, Lakewood, CO (for project files)



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

January 7, 2020

DAIM-ODB-LO

Mr. William Rhotenberry
US Environmental Protection Agency
Federal Facilities Section R6
1201 Elm St Ste 500
Dallas, TX 75270

Re: Surface Water Data Transmittal – 2019, Longhorn Army Ammunition Plant, Karnack,
TX

Dear Mr. Rhotenberry,

The surface water data, collected as a requirement of the 1999 Perchlorate Dispute Resolution, will be documented in the Administrative Record via data memoranda provided by the Army. The quarterly surface water sampling results along with historical data, is presented in the attached memorandum for your file and does not require your review.

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

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

Sincerely,

A handwritten signature in black ink that reads "Rose M. Zeiler".

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

Copies furnished:

- A. Palmie, TCEQ, Austin, TX
- P. Bruckwicki, Caddo Lake NWR, TX
- A. Williams, USACE, ARMY Environmental Section Regional Planning and Environmental Center Fort Worth District (located in Tulsa)
- A. Sherman, USAEC, San Antonio, TX
- K. Nemmers, Bhate, Lakewood, CO (for project files)



LETTER OF TRANSMITTAL

DATE: December 17, 2019

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

TO: Rose Zeiler BRAC Site Manager
Aaron Williams USACE Project Engineer

FROM: Kim Nemmers Bhate Project Manager

SUBJECT: **Surface Water Data Transmittal - 2019**
Longhorn Army Ammunition Plant, Karnack, TX
Contract: W9128F-13-D-0012
Delivery Order: W912BV17F0150

REMARKS

Surface water sampling data is currently collected at the following frequencies except when locations are dry:

Surface Water	Frequency
HBW-1	Harrison Bayou, quarterly
HBW-7	Harrison Bayou, quarterly
HBW-10	Harrison Bayou, quarterly
GPW-1	Goose Prairie Creek, quarterly
GPW-3	Goose Prairie Creek, quarterly

Surface water sampling data is updated and reported to the regulatory agencies and to the public as it is available through handouts reviewed and distributed in association with the quarterly Restoration Advisory Board (RAB) meetings, and included in the Administrative Record along with other RAB meeting materials. The attached handouts will be presented at the January 2020 RAB meeting. Data associated with the 2019 surface water sampling events, including the data validation report (Quality Control Summary Report) for the samples, are attached for your file.

List of Attachments:

Table 1. LHAAP Quarterly Surface Water Sampling - 2019

- A Harrison Bayou and Goose Prairie Creek Perchlorate Data Handouts
- B Quality Control Summary Report
- C Laboratory Data Packages (Provided on CD Only)

LHAAP Quarterly Surface Water Sampling - 2019

1st Quarter 2019

Location Identification: Sample Date:	Units	PCL	HBW7_011519 1/15/19	HBW10_011519 1/15/19	HBW10_011519_a 1/15/19	HBW1_011519 1/15/19	GPW1_011519 1/15/19	GPW3_011519 1/15/19	
Perchlorate (6850)			Harrison Bayou				Goose Prairie Creek		
Perchlorate	µg/L	17	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	

2nd Quarter 2019

Location Identification: Sample Date:	Units	PCL	HBW7_040119 4/3/19	HBW7_040119_a 4/3/19	HBW10_040119 4/3/19	HBW1_040119 4/3/19	GPW1_040119 4/3/19	GPW3_040119 4/3/19	
Perchlorate (6850)			Harrison Bayou				Goose Prairie Creek		
Perchlorate	µg/L	17	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	

3rd Quarter 2019

Location Identification: Sample Date:	Units	PCL	HBW7-071119 7/11/19	HBW7-073019 7/30/19*	HBW10_071119 7/11/19	HBW1_071119 7/11/19	GPW1_071119 7/11/19	GPW1_071119_a 7/11/19	GPW3_071119 7/11/19	
Perchlorate (6850)			Harrison Bayou				Goose Prairie Creek			
Perchlorate	µg/L	17	27	1.2 J	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	

4th Quarter 2019

Location Identification: Sample Date:	Units	PCL	HBW7-103119 10/31/19	HBW10_103119 10/31/19	HBW1_103119 10/31/19	HBW1_103119_a 10/31/19	GPW1_103119 10/31/19	GPW3_103119 10/31/19	
Perchlorate (6850)			Harrison Bayou				Goose Prairie Creek		
Perchlorate	µg/L	17	1.6 J	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	

Notes:

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

µg/L - micrograms per liter

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

*resample

_a - field duplicate

Blue shading indicates the results are in exceedance of the PCL of 17 µg/L

Attachment A

**Harrison Bayou and Goose Prairie Creek Perchlorate Data
Handouts**

Harrison Bayou and Goose Prairie Creek – Perchlorate Data

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

Surface Water Sample Data (in micrograms per liter)

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

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

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

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

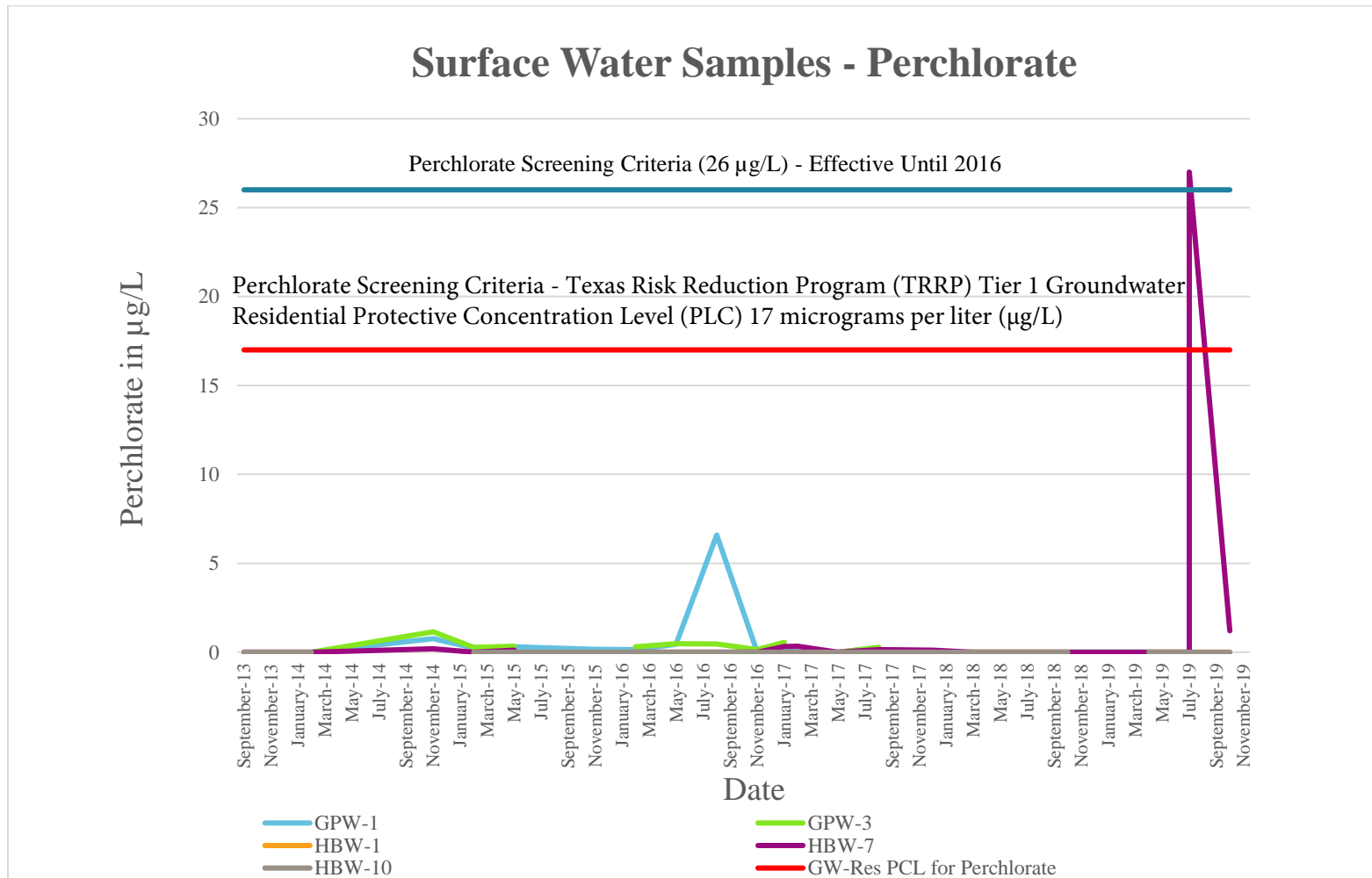
Quarter	2 nd	3 rd	4 th	1 st	2 nd	3 rd	4 th	1 st	2 nd	3 rd	4 th
Creek Sample ID	Jun 2013	Sept 2013	Dec 2013	Feb 2014	May 2014	Aug 2014	Nov 2014	Feb 2015	May 2015	Aug 2015	Nov 2015
GPW-1	Dry	<0.2 U	Dry	0.766	Dry	Dry	0.244 J	0.311 J	0.156 J	Dry	0.142 J
GPW-3	Dry	<0.2 U	Dry	1.15	Dry	Dry	0.276 J	0.344 J	Dry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

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

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

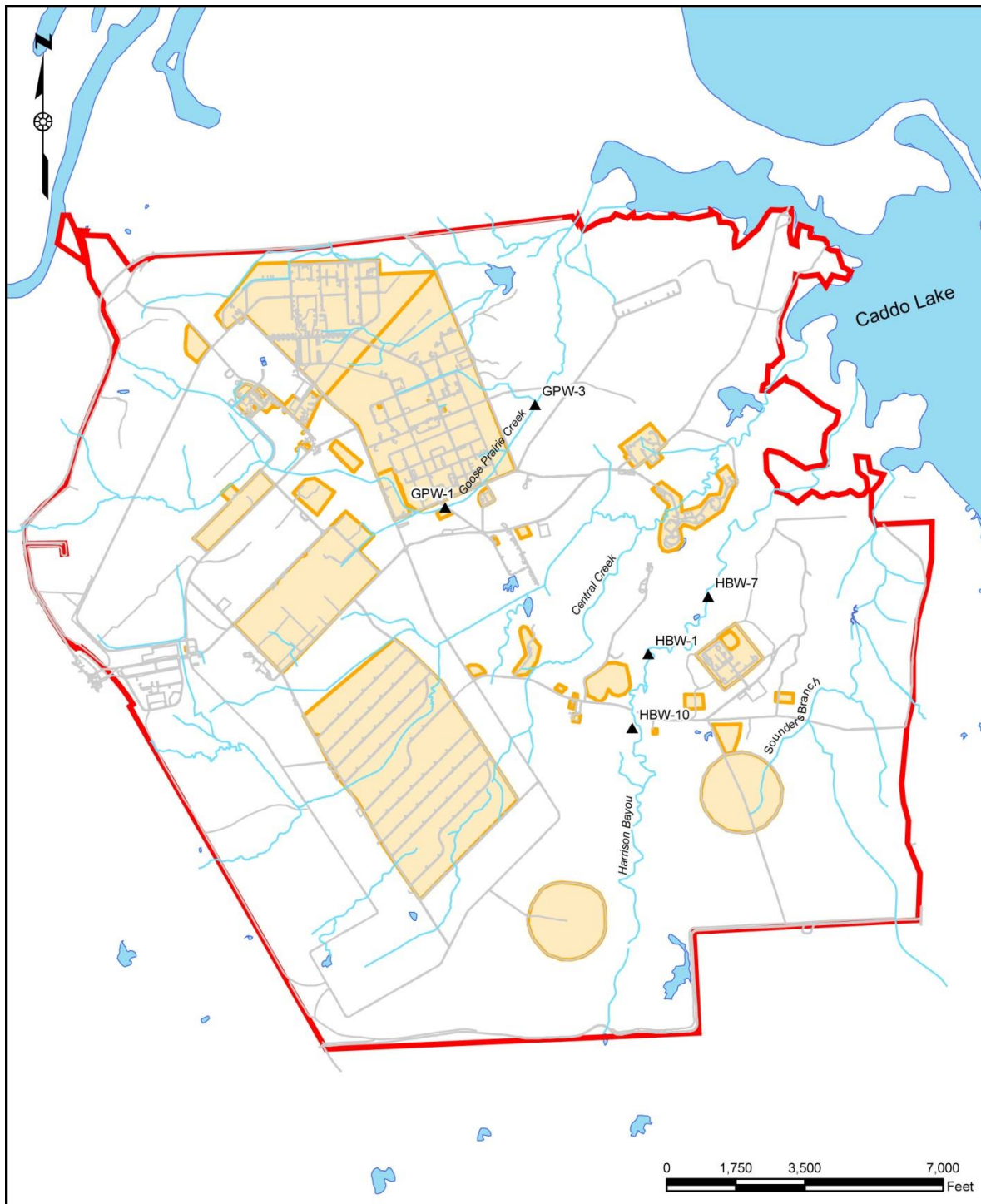
Quarter	4 th	1 st	2 nd	3 rd	4 th
Creek Sample ID	Oct 2018	Jan 2019	Apr 2019	July 2019	Oct 2019
GPW-1	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U
GPW-3	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U
HBW-1	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U
HBW-7	<2.0 U	<2.0 U	<2.0 U	27 (initial)/ 1.2 J (resample)	1.6 J
HBW-10	<2.0 U	<2.0 U	<2.0 U	<2.0 U	<2.0 U

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



Note: Surface water at HBW-7 had a detection of 27 µg/L from a sample collected on 11 July 2019. Surface water at HBW-7 was resampled 19 days later (30 July 2019) with a detection of 1.2 µg/L.

Longhorn Army Ammunition Plant Creek Sampling Locations



<p>Legend</p> <ul style="list-style-type: none"> ▲ Surface Water Sampling Location — Stream — Road ■ Site ■ Lake 	<p>U.S. ARMY CORPS OF ENGINEERS TULSA DISTRICT TULSA, OKLAHOMA</p>
<p>SURFACE WATER SAMPLING LOCATION</p> <p>LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS</p>	

Attachment B

Quality Control Summary Report

**QUALITY CONTROL SUMMARY REPORT
2019 SURFACE WATER
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS**

Prepared For:



U.S. Army Corps of Engineers

Prepared By:

≡ bhate

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

December 2019

Table of Contents

1	INTRODUCTION	1
1.1	Intended Use of Data	1
1.2	Preservation and Holding Times	1
1.3	Calibrations	1
1.3.1	Continuing Calibration Verifications (CCV).....	1
1.4	Blanks.....	1
1.5	Laboratory Control Sample(LCS)/Laboratory Control Sample Duplicate(LCSD).....	2
1.6	Matrix Spike (MS)/Matrix Spike Duplicate Sample (MSD)	2
1.7	Internal Standards	2
1.8	Field Precision.....	2
2	DATA USABILITY SUMMARY.....	2

List of Tables

Table 1: Field Sample Identification and Laboratory Identification

Table 2: Qualified Analytical Data

Table 3: Completeness by Method

1 INTRODUCTION

Bhate reviewed five data packages from ALS Environmental, Houston, Texas (perchlorate data subcontracted thru ALS Environmental in Salt Lake City, Utah). Quarterly surface water samples were collected on January 15th, April 3rd, July 11th and 30th (resample), and October 31th, 2019 at Goose Prairie Creek and Harrison Bayou at the Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas. Data were reviewed for conformance to the requirements of the following guidance documents: *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

Analyses requested included:

- SW6850 – Perchlorate

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

Table 2 lists qualified results with the associated quality control parameter that was exceeded.

1.2 Preservation and Holding Times

Sample ID 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 with the required signatures.

1.3 Calibrations

Initial calibration acceptance criteria are specified in Worksheet 24 of the project-specific QAPP. For perchlorate, the methods criteria are a relative standard deviation (RSD) less than or equal to 20 percent (%) or a correlation coefficient (r^2) ≥ 0.99 .

All calibrations met the method criteria.

1.3.1 Continuing Calibration Verifications (CCV)

The continuing calibration verification (CCV) acceptance criteria are specified in Worksheet 24 of the project-specific QAPP. For perchlorate, the methods criteria are if the CCV is outside $\pm 15\%$ difference (%D) the lab will reanalyze all samples since last acceptable CCV. If reanalysis cannot be performed, all results for perchlorate in all samples since last acceptable CCV are qualified J or UJ.

All CCVs were within the acceptance criteria.

1.4 Blanks

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

Perchlorate was not detected in the blanks.

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

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

All LCS/LCSD recoveries were within the control limits.

1.6 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.

The project MS/MSD recoveries were within the control limits.

1.7 Internal Standards

When the percent recovery for an internal standard in a sample is outside the laboratory limits, the associated sample is qualified for the analytes associated with the internal standard(s) outside of the acceptance criteria.

Internal standard recoveries were within the acceptance criteria.

1.8 Field Precision

Precision is the measure of variability of individual sample measurements. Evaluation of 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 matrices. Both field duplicate sample sets were non-detect. Therefore, the RPD calculation was not performed.

2 DATA USABILITY SUMMARY

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

Table 1: Field Sample Identification and Laboratory Identification

Client Sample ID	Laboratory Sample ID	SW6850
HBW7_011519	HS19010717-01	X
HBW10_011519	HS19010717-02	X
HBW10_011519_a	HS19010717-03	X
HBW1_011519	HS19010717-04	X
GPW1_011519	HS19010717-05	X
GPW3_011519	HS19010717-06	X
HBW7_040119	HS19040315-01	X
HBW7_040119_a	HS19040315-02	X
HBW10_040119	HS19040315-03	X
HBW1_040119	HS19040315-04	X
GPW1_040119	HS19040315-05	X
GPW3_040119	HS19040315-06	X
HBW7_071119	HS19070619-01	X
HBW7_073019*	HS19071525-01	X
HBW10_071119	HS19070619-02	X
HBW1_071119	HS19070619-03	X
GPW1_071119	HS19070619-04	X
GPW1_071119_a	HS19070619-05	X
GPW3_071119	HS19070619-06	X
HBW7_103119	HS19110036-01	X
HBW10_103119	HS19110036-02	X
HBW1_103119	HS19110036-03	X
HBW1_103119_a	HS19110036-04	X
GPW3_103119	HS19110036-05	X
GPW1_103119	HS19110036-06	X

Notes:

Laboratory – ALS Environmental Houston, TX (sub'd through ALS Salt Lake City, UT)

SW-846 - Test Methods for Evaluating Solid Waste, Physical/Chemical Methods

X – Sample analyzed for indicated parameter

*-resample

Table 2: Qualified Analytical Data

Client Sample ID	Laboratory Sample ID	Analyte Name	Data Validation Qualifier	Reason for Qualification
N/A	N/A	N/A	N/A	N/A

N/A – Not applicable

Table 3: Completeness by Method

Method	No. of Rejected Results	% Completeness
SW6850	0	100

Attachment C

Laboratory Data Packages



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

WorkOrder: HS19010717

LHAAP / Surface Water

Bhate Environmental Associates, Inc.

Marcia Olive
445 Union Blvd Ste 129
Lakewood CO 80228

30-Jan-2019





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

January 30, 2019

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

Work Order: **HS19010717**

Laboratory Results for: **LHAAP / Surface Water**

Dear Marcia,

ALS Environmental received 6 sample(s) on Jan 16, 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 simple oval scribble.

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager



ALS Houston, US

Date: 30-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Surface Water
Work Order: HS19010717

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19010717-01	HBW7_011519	Surface Water		15-Jan-2019 09:20	16-Jan-2019 09:10	<input type="checkbox"/>
HS19010717-02	HBW10_011519	Surface Water		15-Jan-2019 09:33	16-Jan-2019 09:10	<input type="checkbox"/>
HS19010717-03	HBW10_011519_a	Surface Water		15-Jan-2019 09:33	16-Jan-2019 09:10	<input type="checkbox"/>
HS19010717-04	HBW1_011519	Surface Water		15-Jan-2019 09:42	16-Jan-2019 09:10	<input type="checkbox"/>
HS19010717-05	GPW1_011519	Surface Water		15-Jan-2019 09:50	16-Jan-2019 09:10	<input type="checkbox"/>
HS19010717-06	GPW3_011519	Surface Water		15-Jan-2019 09:57	16-Jan-2019 09:10	<input type="checkbox"/>



ALS Houston, US

Date: 30-Jan-19

Client: Bhate Environmental Associates, Inc.

CASE NARRATIVE

Project: LHAAP / Surface Water

Work Order:

Work Order Comments

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



ALS Houston, US

Date: 30-Jan-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP / Surface Water
 Sample ID: HBW7_011519
 Collection Date: 15-Jan-2019 09:20

ANALYTICAL REPORT

WorkOrder:HS19010717
 Lab ID:HS19010717-01
 Matrix:Surface 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-Jan-2019 14:38

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



ALS Houston, US

Date: 30-Jan-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP / Surface Water
 Sample ID: HBW10_011519
 Collection Date: 15-Jan-2019 09:33

ANALYTICAL REPORT

WorkOrder:HS19010717
 Lab ID:HS19010717-02
 Matrix:Surface 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-Jan-2019 14:38

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



ALS Houston, US

Date: 30-Jan-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP / Surface Water
 Sample ID: HBW10_011519_a
 Collection Date: 15-Jan-2019 09:33

ANALYTICAL REPORT

WorkOrder:HS19010717
 Lab ID:HS19010717-03
 Matrix:Surface 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-Jan-2019 14:38

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



ALS Houston, US

Date: 30-Jan-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP / Surface Water
 Sample ID: HBW1_011519
 Collection Date: 15-Jan-2019 09:42

ANALYTICAL REPORT

WorkOrder:HS19010717
 Lab ID:HS19010717-04
 Matrix:Surface 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-Jan-2019 14:38

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



ALS Houston, US

Date: 30-Jan-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP / Surface Water
 Sample ID: GPW1_011519
 Collection Date: 15-Jan-2019 09:50

ANALYTICAL REPORT

WorkOrder:HS19010717
 Lab ID:HS19010717-05
 Matrix:Surface 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-Jan-2019 14:38

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



ALS Houston, US

Date: 30-Jan-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP / Surface Water
 Sample ID: GPW3_011519
 Collection Date: 15-Jan-2019 09:57

ANALYTICAL REPORT

WorkOrder:HS19010717
 Lab ID:HS19010717-06
 Matrix:Surface 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-Jan-2019 14:38

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



ALS Houston, US

Date: 30-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Surface Water
WorkOrder: HS19010717

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R331950	Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) Matrix: Surface Water					
HS19010717-01	HBW7_011519	15 Jan 2019 09:20			30 Jan 2019 14:38	1
HS19010717-02	HBW10_011519	15 Jan 2019 09:33			30 Jan 2019 14:38	1
HS19010717-03	HBW10_011519_a	15 Jan 2019 09:33			30 Jan 2019 14:38	1
HS19010717-04	HBW1_011519	15 Jan 2019 09:42			30 Jan 2019 14:38	1
HS19010717-05	GPW1_011519	15 Jan 2019 09:50			30 Jan 2019 14:38	1
HS19010717-06	GPW3_011519	15 Jan 2019 09:57			30 Jan 2019 14:38	1



ALS Houston, US

Date: 30-Jan-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Surface Water
WorkOrder: HS19010717

**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	88-0356	27-Mar-2019
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019



Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19010717

Date/Time Received: **16-Jan-2019 09:10**
 Received by: **JRM**

Checklist completed by:	<u>Jared R. Makan</u>	<u>16-Jan-2019</u>	Reviewed by:	<u>RJ Modashia</u>	<u>17-Jan-2019</u>
	eSignature	Date		eSignature	Date

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

- | | | | |
|---|---|-----------------------------|---|
| Shipping container/cooler in good condition? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | Not Present <input type="checkbox"/> |
| Custody seals intact on shipping container/cooler? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | Not Present <input type="checkbox"/> |
| Custody seals intact on sample bottles? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | Not Present <input checked="" type="checkbox"/> |
| Chain of custody present? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Chain of custody signed when relinquished and received? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Chain of custody agrees with sample labels? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Samples in proper container/bottle? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Sample containers intact? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| TX1005 solids received in hermetically sealed vials? | Yes <input type="checkbox"/> | No <input type="checkbox"/> | N/A <input checked="" type="checkbox"/> |
| Sufficient sample volume for indicated test? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| All samples received within holding time? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |
| Container/Temp Blank temperature in compliance? | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/> | |

Temperature(s)/Thermometer(s):	1.1c/1.5c UC/C	IR11
Cooler(s)/Kit(s):	Red	
Date/Time sample(s) sent to storage:	01/16/2019 18:00	
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/> No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
pH adjusted by:		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:





1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____

Project/Phase No: NW01312.0150

COC Number(1): _____

LIMS Number: _____

Facility/Base I.D.: LHAAP		Sample Analysis Requested ⁽³⁾										Quality Assurance Samples ⁽⁴⁾		
Project/Site Name: LHAAP / SURFACE WATER		Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (2)	Sample Matrix (2)	Number of containers	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
Client Name:														
Collected by: Scott Beesinger														
		HBW7-011519		15 JAN 2019	0920	-	N		WS	1	X			
		HBW10-011519		15 JAN 2019	0933	-	N		WS	1	X			
		HBW10-011519-a		15 JAN 2019	0933	-	FD		WS	1	X			
		HBW1-011519		15 JAN 2019	0942	-	N		WS	1	X			
		GPW1-011519		15 JAN 2019	0950	-	N		WS	1	X			
		GPW3-011519		15 JAN 2019	0957	-	N		WS	1	X			

HS19010717
 Bhate Environmental Associates, Inc.
 LHAAP / Surface Water



COMMENTS: _____

Custody Transfers Prior to Receipt by Laboratory				Sample Delivery Details / Laboratory Receipt			
Relinquished By (signed)	Date	Time	Received by (signed)	Date	Time	Delivered Directly to Lab:	Shipped
<u>Scott Beesinger</u>	<u>1/15/19</u>	<u>1400</u>	<u>S. West</u>	<u>1/16/19</u>	<u>09:10</u>	_____	_____
2. _____			2. _____			Method of Shipment: _____	No.:
3. _____			3. _____			Fed _____ Ex _____ Airbill _____	Number:
						Analytical Lab: <u>ALS 10450 Stinnell Rd, Suite 210 Houston, TX 77099 (817) 530-5656</u>	
						Lab Recipient: _____	Delivery Date/Time: _____

- 1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)
- 2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-s) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)
- 3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)
- 4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks
- 5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.
- 6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

Cooler - Red Temp 1.0
1/211
CFO-4



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

CUSTOMER
 Date: 1/15/19
 Name: GREGG B
 Company: BHA

BODY SEAL

Time: 1:00
 GREGG B
 BHA

Seal Broken By: ALS
 Date: 01/15/19


TRK# 4380 9530 9397
 0221

FedEx
 TRK# 4380 9530 9397
 0221

AB SGRA

77000
 WED - 16 JAN 10:30A
 PRIORITY OVERNIGHT

77099
 TX-US
 IAH



FID 162785 15JAN19 GGGA 553C2/D74C/8CBA





Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1901759

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2210 (231635)

General Set Information: There were six field samples in this Work Order. The samples were analyzed for perchlorate.

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

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 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: NA

Method QC data: The method blank (LMB 637286) was less than 1/2 the CRDL. The recovery for the LCS (637287) was within acceptable parameters.





MS/MSD Analysis: MS/MSD was performed on sample 1901759001 (Client ID's: HBW7_011519). 5.0 μ l of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 5. 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 – 637284) is reported from the analysis of the Laboratory Control Sample (LCS – 637287) at a level of 4.0 μ g/L.

Thomas Bosch January 30, 2019
Analyst Date





ANALYTICAL REPORT

Report Date: January 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: **34-1901759**

Project ID: HS19010717

Purchase Order: HS19010717

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
HBW7_011519	1901759001	01/15/19	01/17/19	
HBW10_011519	1901759002	01/15/19	01/17/19	
HBW10_011519_a	1901759003	01/15/19	01/17/19	
HBW1_011519	1901759004	01/15/19	01/17/19	
GPW1_011519	1901759005	01/15/19	01/17/19	
GPW3_011519	1901759006	01/15/19	01/17/19	

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

19 of 98





ANALYTICAL REPORT

Workorder: **34-1901759**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: HBW7_011519	Sampling Site: NA	Collected: 01/15/2019				
Lab ID: 1901759001	Media: 125 mL Nalgene	Received: 01/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2210 (HBN: 231635) Analyzed: 01/24/2019 11:31	Instrument ID: LCMS04 Percent Solid: 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

Sample ID: HBW10_011519	Sampling Site: NA	Collected: 01/15/2019				
Lab ID: 1901759002	Media: 125 mL Nalgene	Received: 01/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2210 (HBN: 231635) Analyzed: 01/24/2019 12:13	Instrument ID: LCMS04 Percent Solid: 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

Sample ID: HBW10_011519_a	Sampling Site: NA	Collected: 01/15/2019				
Lab ID: 1901759003	Media: 125 mL Nalgene	Received: 01/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2210 (HBN: 231635) Analyzed: 01/24/2019 12:26	Instrument ID: LCMS04 Percent Solid: 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

Sample ID: HBW1_011519	Sampling Site: NA	Collected: 01/15/2019				
Lab ID: 1901759004	Media: 125 mL Nalgene	Received: 01/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2210 (HBN: 231635) Analyzed: 01/24/2019 12:40	Instrument ID: LCMS04 Percent Solid: 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



ANALYTICAL REPORT

Workorder: 34-1901759

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: GPW1_011519	Sampling Site: NA	Collected: 01/15/2019				
Lab ID: 1901759005	Media: 125 mL Nalgene	Received: 01/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2210 (HBN: 231635) Analyzed: 01/24/2019 12:54	Instrument ID: LCMS04 Percent Solid: 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

Sample ID: GPW3_011519	Sampling Site: NA	Collected: 01/15/2019				
Lab ID: 1901759006	Media: 125 mL Nalgene	Received: 01/17/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2210 (HBN: 231635) Analyzed: 01/24/2019 13:08	Instrument ID: LCMS04 Percent Solid: 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 01/29/2019 15:20	/S/ Stephen Brose 01/30/2019 12:04

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123Phone: (801) 266-7700
Email: alsst.lab@ALSGlobal.com
Web: www.alsslc.com



ANALYTICAL REPORT

Workorder: 34-1901759

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

General Lab Comments

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

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

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

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

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

Result Symbol Definitions

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

Qualifier Symbol Definitions

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





Quality Control Sample Batch Report

00953426

Analysis Information

Workorder: 1901759

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2210 (HBN: 231635)
Analyzed By: Thomas Bosch

Blank

LMB: 637286 Analyzed: 01/24/2019 11:18 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 637287 Analyzed: 01/24/2019 10:50 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	4.22	4.00	105	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1901759001 Analyzed: 01/24/2019 11:31 Dilution: 1 Units: ug/L			MS: 637288 Analyzed: 01/24/2019 11:45 Dilution: 1 Units: ug/L			MSD: 637289 Analyzed: 01/24/2019 11:59 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	5.38	5	108	78.8 123.8	5.6	112	4.03	0.0 20.0

Continuing Calibration Verification

CCV: 637283 Analyzed: 01/24/2019 10:10 Units: ug/L Criteria: ± 15%				CCV: 637290 Analyzed: 01/24/2019 13:27 Units: ug/L Criteria: ± 15%		
Analyte	Result	Target	% Rec.	Result	Target	% Rec.
Perchlorate	26.1	25.0	104	26.5	25.0	106

Interference Check Sample

ICSA: 637285 Analyzed: 01/24/2019 11:04 Units: ug/L Criteria: ± 30%			
Analyte	Result	Target	% Rec.
Perchlorate	3.90	4.00	97.6





Quality Control Sample Batch Report

00953427

Analysis Information

Workorder: 1901759

Limits: Client SOW/Contract Specified

Preparation: NA

Analysis: EPA 6850, DoD QSM

Basis: DoD QSM

Batch: NA

Batch: ELMS/2210 (HBN: 231635)

Prepared By: NA

Analyzed By: Thomas Bosch

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

Analyst	Peer Review
/S/ Thomas Bosch 01/30/2019 10:16	/S/ Stephen Brose 01/30/2019 12:04

Symbols and Definitions

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

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





W



1901759

18698/#2

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

Subcontract Chain of Custody

COC ID: 10615

SUBCONTRACT TO:

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

Phone: +1 801 266 7700

1901759

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: HS19010717
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS19010717-01	HBW7_011519	Surface Water	15 Jan 2019 09:20
	SUB_Perch-6850			30 Jan 2019
2.	HS19010717-02	HBW10_011519	Surface Water	15 Jan 2019 09:33
	SUB_Perch-6850			30 Jan 2019
3.	HS19010717-03	HBW10_011519_a	Surface Water	15 Jan 2019 09:33
	SUB_Perch-6850			30 Jan 2019
4.	HS19010717-04	HBW1_011519	Surface Water	15 Jan 2019 09:42
	SUB_Perch-6850			30 Jan 2019
5.	HS19010717-05	GPW1_011519	Surface Water	15 Jan 2019 09:50
	SUB_Perch-6850			30 Jan 2019
6.	HS19010717-06	GPW3_011519	Surface Water	15 Jan 2019 09:57
	SUB_Perch-6850			30 Jan 2019

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

QC Level: DOD IV (DoD Data Package)





Subcontract Chain of Custody

COC ID: 10615

Relinquished By: J. Mankov

Date/Time: 01/16/19 18:00

Received By: Jamila Jassal

Date/Time: 01-17-19 9:50

Cooler ID(s): _____

Temperature(s): _____

ALS is a registered trademark of ALS Environmental Services, Inc. © 2019 ALS Environmental Services, Inc. All rights reserved. This document is the property of ALS Environmental Services, Inc. and is not to be distributed, copied, or reproduced without the written permission of ALS Environmental Services, Inc.



ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston Project/Task/Site: 1901759
 Date/Time of Receipt: 01-17-19 9:50 Number of Coolers Received: _____

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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 <u>9095</u>	<u>2</u> °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Jenni Vantassel Signature Printed Name Jenni Vantassel Date 01-17-19

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





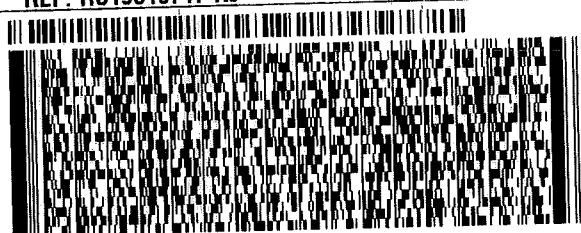
ORIGIN ID:SGRA (281) 530-5656
SHIPPING DEPT
ALS LABORATORY GROUP
10450 STANCLIFF RD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 16JAN19
ACTWGT: 11.25 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: HS19010717 RJ



FedEx
Express



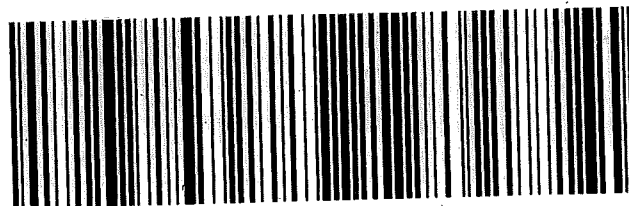
J181118080501 IN

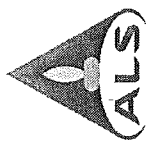
THU - 17 JAN 3:00P
STANDARD OVERNIGHT

TRK# 4809 7830 1005
0201

AX BTFA

84123
UT-US SLC





Batch Worklist

HBN: 231635

Created: 1/24/2019 09:59

Batch: ELMs/ 2210

Instrument:



Status: WP

Analyst: T. Bosch

Rule: EPA 6850, DoD QSM Water

Workorder: 1901759 [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	637283	CCV for HBN 231635 [ELMS/2210]				CCV	3		E685041C3Q	5311		1/30/2019	
2	637284	RLYS for HBN 231635 [ELMS/2210]				RLYS	3		E685041C3Q	5311		1/30/2019	
3	637285	ICS for HBN 231635 [ELMS/2210]				ICS	3		E6850.D3Q	5311		1/30/2019	
4	637286	LMB for HBN 231635 [ELMS/2210]				LMB	3		E6850Q413Q	5311		1/30/2019	
5	637287	LCS for HBN 231635 [ELMS/2210]				LCS	3		E6850Q413Q	5311		1/30/2019	
6	1901759001	HBW7_011519				SAMPLE	3	1901759001-A	E6850Q41.3	5480	2/12/2019	1/30/2019	
7	637288	HBW7_011519(1901759001MS)				MS	3		E6850Q413Q	5311		1/30/2019	
8	637289	HBW7_011519(1901759001MSD)				MSD	3		E6850Q413Q	5311		1/30/2019	
9	1901759002	HBW10_011519				SAMPLE	3	1901759002-A	E6850Q41.3	5480	2/12/2019	1/30/2019	
10	1901759003	HBW10_011519_a				SAMPLE	3	1901759003-A	E6850Q41.3	5480	2/12/2019	1/30/2019	
11	1901759004	HBW1_011519				SAMPLE	3	1901759004-A	E6850Q41.3	5480	2/12/2019	1/30/2019	
12	1901759005	GPW1_011519				SAMPLE	3	1901759005-A	E6850Q41.3	5480	2/12/2019	1/30/2019	
13	1901759006	GPW3_011519				SAMPLE	3	1901759006-A	E6850Q41.3	5480	2/12/2019	1/30/2019	
14	637290	CCV for HBN 231635 [ELMS/2210]				CCV	3		E685041C3Q	5311		1/30/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation



ALS Work Order #'s & Sample #()'s: 1901759 (001-06)
 ELMS Batch/HBN ID: 2210 (231635)
 Prep Date: 01/24/2019 Analysis Date: 01/24/2019 Analyst: T. Bosch
 Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
 Sequence: \\HPCHEM1\SEQUENCE\CLO4\2019\JAN\24JAN19D.s
 Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

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

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

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

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

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.

Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 3 Injection Volume: 30µL
 Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.50
5.0	0.50
5.3	0.25
10.0	0.25
10.5	0.50
12.0	0.50

QC DATA: 4.0µL of QC Solution Horizon ID 41830 was used for LCS 637287; Target = 4.0µg/L. ASTM type II water was used for LMB 637286.

MS/MSD: MS/MSD were performed on sample 1901759001 (Client ID's: HBW7_011519). 5.0µL of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L.

COMMENTS:

- 1) Results reported in µg/L.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JAN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\231635-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 637284) is reported from the analysis of the Laboratory Control Sample (LCS – 637287) at a level 4.0µg/L.



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.

<u>Chromatography (GC, HPLC, LC/MS) Technical Review Criteria</u>	<u>Analyst Initials</u>	<u>Reviewer Initials</u>
<u>Batch(es)/SDG: ELMS: 2210 HBN: 231635</u>		
<u>Sample Set IDs if Applicable: 1901759</u>		
<u>Calibration standards analyzed and meets criteria</u>	TB	SB
<u>Standards traceability checked and meets criteria</u>	TB	SB
<u>Standard curve coefficients evaluated and meet criteria</u>	TB	SB
<u>ICVs analyzed and meet acceptance criteria</u>	TB	SB
<u>CCVs analyzed and meet acceptance criteria</u>	TB	SB
<u>Method Blanks analyzed and meet acceptance criteria</u>	TB	SB
<u>Retention Time Windows checked</u>	TB	SB
<u>For method 8081A, Endrin/DDT Breakdown is checked for compliance</u>	—	—
<u>Surrogate recoveries checked and appropriately addressed</u>	—	—
<u>Method Preparation Blanks analyzed and meet acceptance criteria</u>	TB	SB
<u>MSS, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed</u>	TB	SB
<u>RLVS analyzed</u>	TB	SB
<u>Preparation and analysis hold times met</u>	TB	SB
<u>Preparation deviations and re-preparations noted when performed</u>	TB	SB
<u>Analysis deviations and re-analyses noted when performed</u>	TB	SB
<u>Sample dilution factors noted on reports</u>	TB	SB
<u>Electronic records in HBN transcription accuracy and completeness checked</u>	TB	SB
<u>Preparation and analysis calculations checked</u>	TB	SB
<u>NCRs are completed as necessary NC/CAR#</u>	—	—
<u>Report forms are complete and accurate</u>	TB	SB
<u>Manual integrations checked</u>	TB	SB





STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK			Description - 6850.WKG Std 100.ug/L		
Standard: 43702		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/18/2018 02:09PM		Expires: 09/18/2019	
MFG Lot: TNB: 09/18/2018				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 WRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019





STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK			Description - 6850: Stock AccStd: 1,000ug/mL
Standard: 43659		Created By: Thomas Bosch	Amount: 100 mL
MFG: AccuStandard		Create Date: 09/17/2018 09:09AM	Expires: 07/25/2020
MFG Lot: 218065075			Usable: No
Part ID: IC-PER-10X-1			Lab Lot: CLO4 STOCK
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL





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: 43701		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/18/2018 02:09PM		Expires: 09/18/2019	
MFG Lot: TNB: 09/18/2018				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 INT	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020





STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK			Description - 6850 QC WKG STD 100ug/L		
Standard: 41831		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/09/2018 10:05AM		Expires: 05/09/2019	
MFG Lot: TNB: 05/09/2018				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
41830	CLO4 QC INT	6850 QC Intmtd Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	05/09/2019





STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT		Description - 6850 QC Intrmdt Std-QC 10ug/mL			
Standard: 41830 MFG: ALS/SLC MFG Lot: TNB: 05/09/2018 Pipette ID: Not Provided		Created By: Thomas Bosch Create Date: 05/09/2018 10:05AM		Amount: 10 mL Expires: 05/09/2019 Usable: Yes Lab Lot: CLO4 QC INT 10.ug/mL	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020





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

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK			Description - Perchlorate ISTD Wrk 1,000ug/L		
Standard: 43730		Created By: Thomas Bosch		Amount: 25 mL	
MFG: ALS/SLC		Create Date: 09/20/2018 09:09AM		Expires: 09/20/2019	
MFG Lot: TNB: 05/09/2018		Verified By: Thomas Bosch		Usable: Yes	
Pipette ID: Not Provided		Verify Date:		Lab Lot: CLO4ISTDWRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026





STANDARD REPORT

Constituent

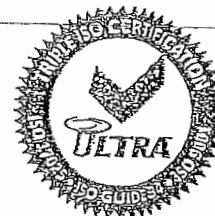
Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK			Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL	
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026	
MFG Lot: SDFE-012A	Verified By: Thomas Bosch	Usable: Yes	
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK	
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL





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.





Certificate of Analysis



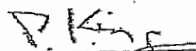
ISO Guide 34 Reference Material

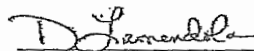
Product Number: ICC-013
Lot Number: CP-0860

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

Maintenance of Certification:

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


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


Daniel J. Lamendola
Director of QA/RA



125 Market Street
New Haven, CT 06513
USA



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

CERTIFICATE OF ANALYSIS



S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (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

OR-ORG/INC-001
Rev. 5/18



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:

ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP



23118

Product Name: PERCHLORIC ACID, SODIUM SALT
(Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDDG-013

Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

Labeled CAS Number: NA

Unlabeled CAS Number: 7601-89-0

MW*: 130.4

Chemical Formula: NaCl⁺O₄

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

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

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

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

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

Approved by: T. J. Eckerley

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

Quality Control Tests and Results

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



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data



Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DPR.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	
*	637283	C	Vial 71	1	Control	1	3.83014e6	8.929	26.06227
*	637287	Q	Vial 72	1	Control	2	6.96799e5	8.939	4.21662
*	637285	I	Vial 73	1	Control	3	3.97185e5	8.714	3.90319
*	637286	L	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1901759001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	637288	1	Vial 76	1	Sample	6	7.52202e5	8.800	5.37816
*	637289	1	Vial 77	1	Sample	7	8.22680e5	8.790	5.59947
*	1901759002		Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1901759003		Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1901759004		Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1901759005		Vial 81	1	Sample	11	7.21226e4	8.861	6.38573e-1
*	1901759006		Vial 82	1	Sample	12	6.64954e4	8.901	6.41248e-1
*	637290	C	Vial 71	1	Control	13	4.21294e6	8.998	26.50956

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount	
*	637283	C	Vial 71	1	Control	1	1.11691e6	8.946	25.21011
*	637287	Q	Vial 72	1	Control	2	2.16636e5	8.953	4.29136
*	637285	I	Vial 73	1	Control	3	1.50408e5	8.729	4.79909
*	637286	L	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1901759001		Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	637288	1	Vial 76	1	Sample	6	2.27314e5	8.813	5.35525
*	637289	1	Vial 77	1	Sample	7	2.45002e5	8.812	5.50119
*	1901759002		Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1901759003		Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1901759004		Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1901759005		Vial 81	1	Sample	11	2.75148e4	8.886	6.40858e-1
*	1901759006		Vial 82	1	Sample	12	2.51513e4	8.933	6.39541e-1
*	637290	C	Vial 71	1	Control	13	1.20176e6	9.013	25.11277

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-ISTD RT	CLO4-89-ISTD Amount	
*	637283	C	Vial 71	1	Control	1	4.37697e5	8.949	5.00000
*	637287	Q	Vial 72	1	Control	2	5.33669e5	8.963	5.00000
*	637285	I	Vial 73	1	Control	3	3.30189e5	8.734	5.00000
*	637286	L	Vial 74	1	Control	4	4.39746e5	8.977	5.00000
*	1901759001		Vial 75	1	Sample	5	4.77515e5	8.774	5.00000
*	637288	1	Vial 76	1	Sample	6	4.45737e5	8.825	5.00000
*	637289	1	Vial 77	1	Sample	7	4.67304e5	8.817	5.00000
*	1901759002		Vial 78	1	Sample	8	4.25063e5	8.846	5.00000
*	1901759003		Vial 79	1	Sample	9	4.36499e5	8.886	5.00000
*	1901759004		Vial 80	1	Sample	10	4.22938e5	8.915	5.00000
*	1901759005		Vial 81	1	Sample	11	5.18079e5	8.890	5.00000
*	1901759006		Vial 82	1	Sample	12	4.74702e5	8.917	5.00000
*	637290	C	Vial 71	1	Control	13	4.72890e5	9.019	5.00000

*** End of Report ***



Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	637283	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	637287	QC@4.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	637285	ICS@4.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	637286	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1901759001		CLO4-AQN	1	Sample	
6	Vial 76	637288	17591MS	CLO4-AQN	1	Sample	
7	Vial 77	637289	17591SD	CLO4-AQN	1	Sample	
8	Vial 78	1901759002		CLO4-AQN	1	Sample	
9	Vial 79	1901759003		CLO4-AQN	1	Sample	
10	Vial 80	1901759004		CLO4-AQN	1	Sample	
11	Vial 81	1901759005		CLO4-AQN	1	Sample	
12	Vial 82	1901759006		CLO4-AQN	1	Sample	
13	Vial 71	637290	CCV@25	CLO4-AQN	1	Ctrl Samp	

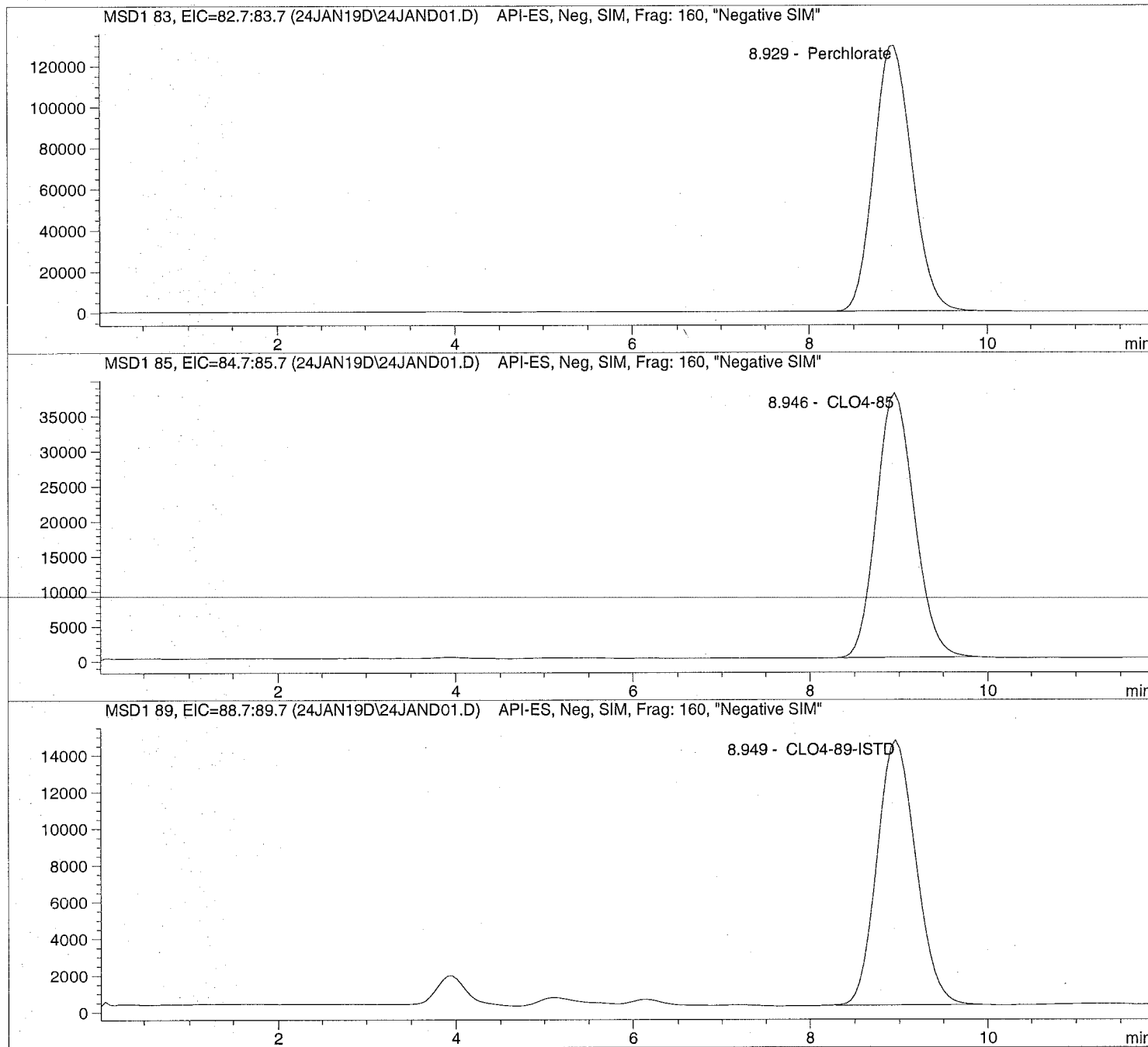


Injection Date: 1/24/2019 10:10:47
Sample Name: 637283 CCV@25
Acq Operator: TNB

Seq Line: 1
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2018 12:46:06

Perchlorate analysis



Injection Date: 1/24/2019 10:10:47 Seq Line: 1
Sample Name: 637283 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-DPR.M
Last Changed: 12/3/2018 12:46:06

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Mon, 3. Dec. 2018, 00:29:27 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
8.929	PBA	3830143.8	26.0623	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.946	PBA	1116908.0	25.2101	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.949	BBA	437696.8	5.0000	CLO4-89-ISTD

*** End of Report ***

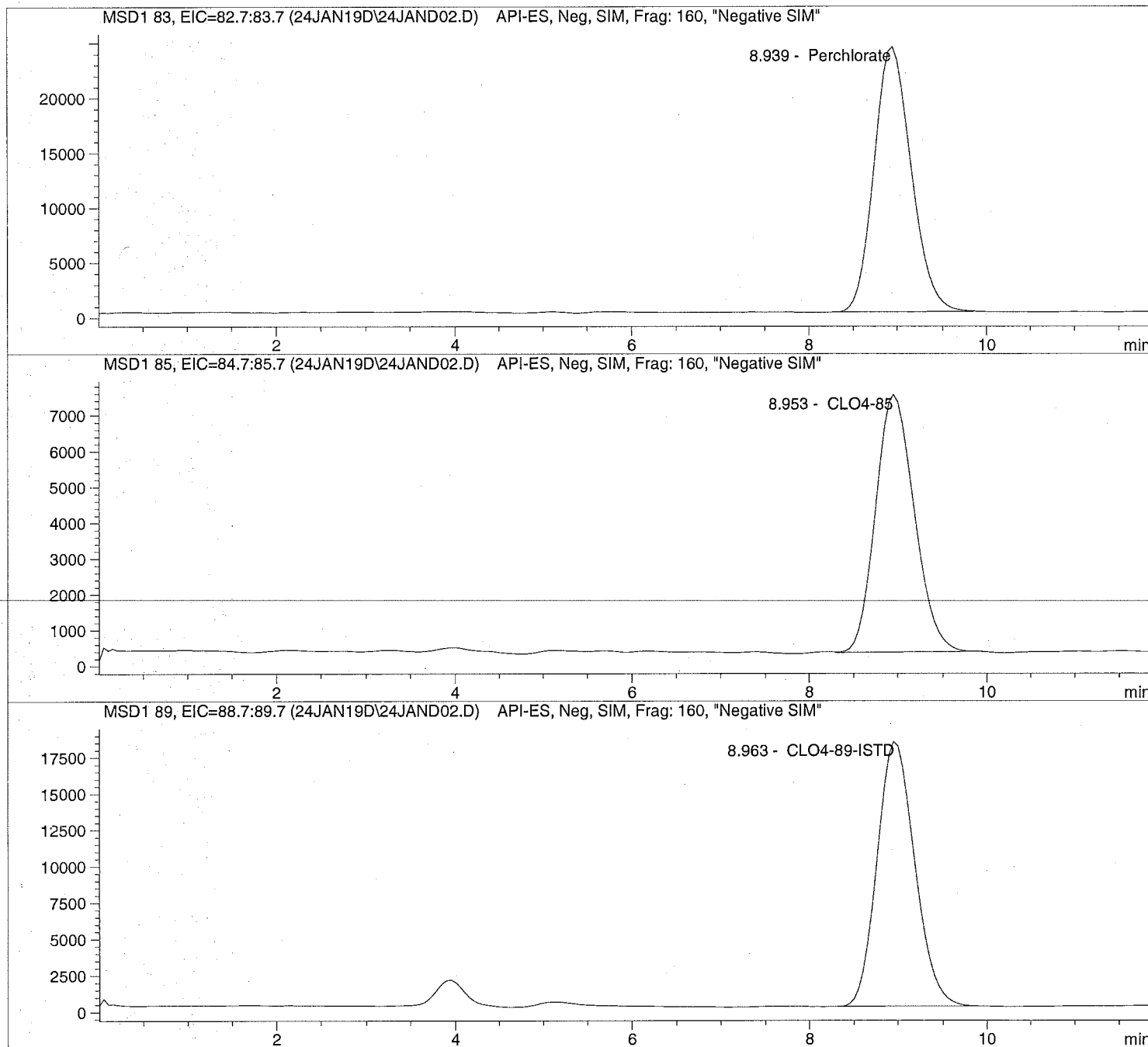


Injection Date: 1/24/2019 10:50:25
Sample Name: 637287 QC@4.0
Acq Operator: TNB

Seq Line: 2
Location: Vial 72
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2018 12:46:06

Perchlorate analysis



```

=====
Injection Date: 1/24/2019 10:50:25   Seq Line: 2
Sample Name: 637287 QC@4.0           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-DPR.M
Last Changed: 12/3/2018 12:46:06
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 3. Dec. 2018, 00:29:27 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 4.000
=====

```

```

=====
LCMS Results
=====

```

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.939	PBA	696799.1	4.2166	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.953	BBA	216636.3	4.2914	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.963	PBA	533669.1	5.0000	CLO4-89-ISTD

```

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

```

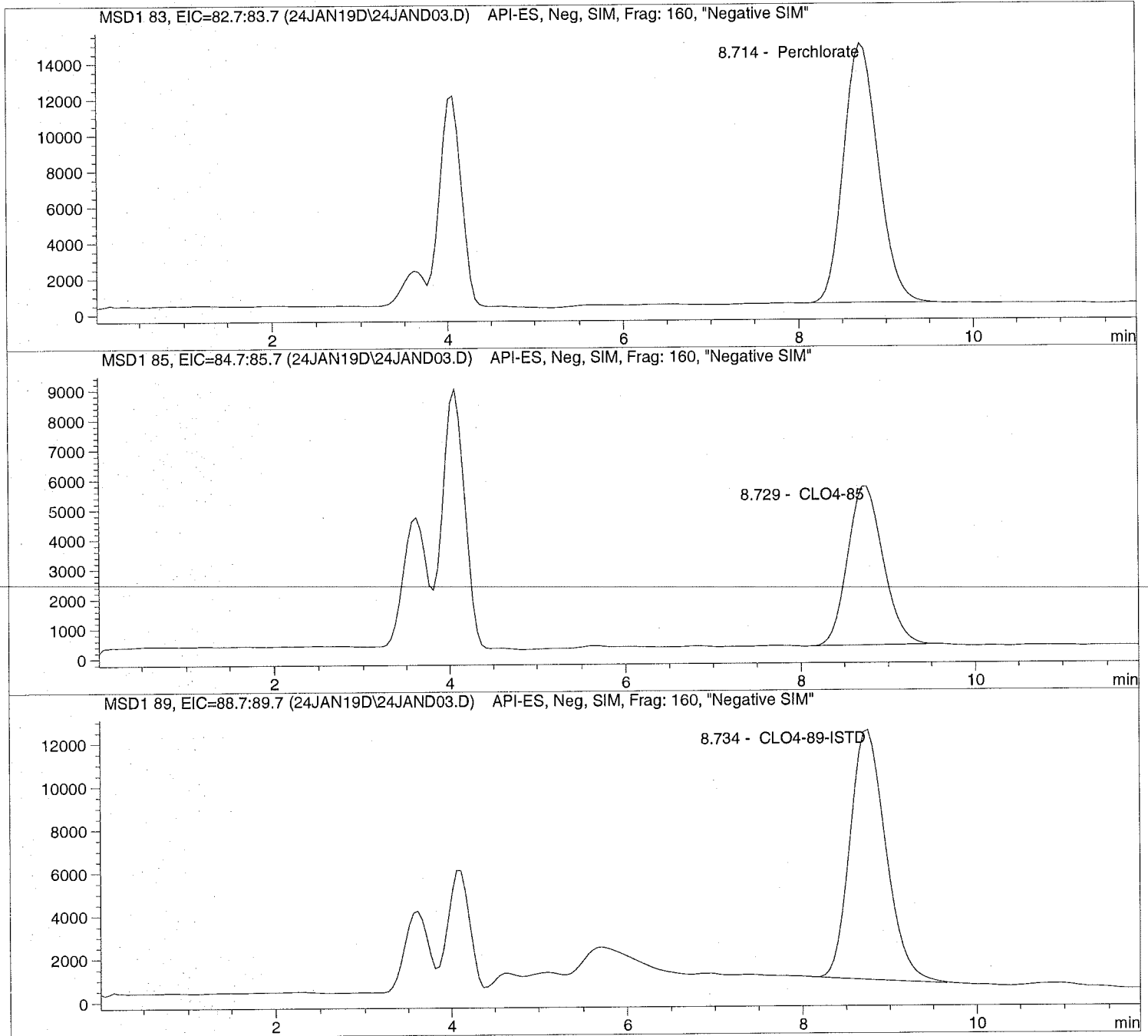


Injection Date: 1/24/2019 11:04:15
Sample Name: 637285 ICS@4.0
Acq Operator: TNB

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-DPR.M
Last Changed: 12/3/2018 12:46:06

Perchlorate analysis



```
=====
Injection Date: 1/24/2019 11:04:15      Seq Line: 3
Sample Name: 637285 ICS@4.0             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-DPR.M
Last Changed: 12/3/2018 12:46:06
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By: Signal
Calib. Data Modified: Mon, 3. Dec. 2018, 00:29:27 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 4.000
```

===== LCMS Results =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.714	PBA	397184.7	3.9032	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.729	PBA	150407.6	4.7991	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.734	BBA	330189.2	5.0000	CLO4-89-ISTD

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

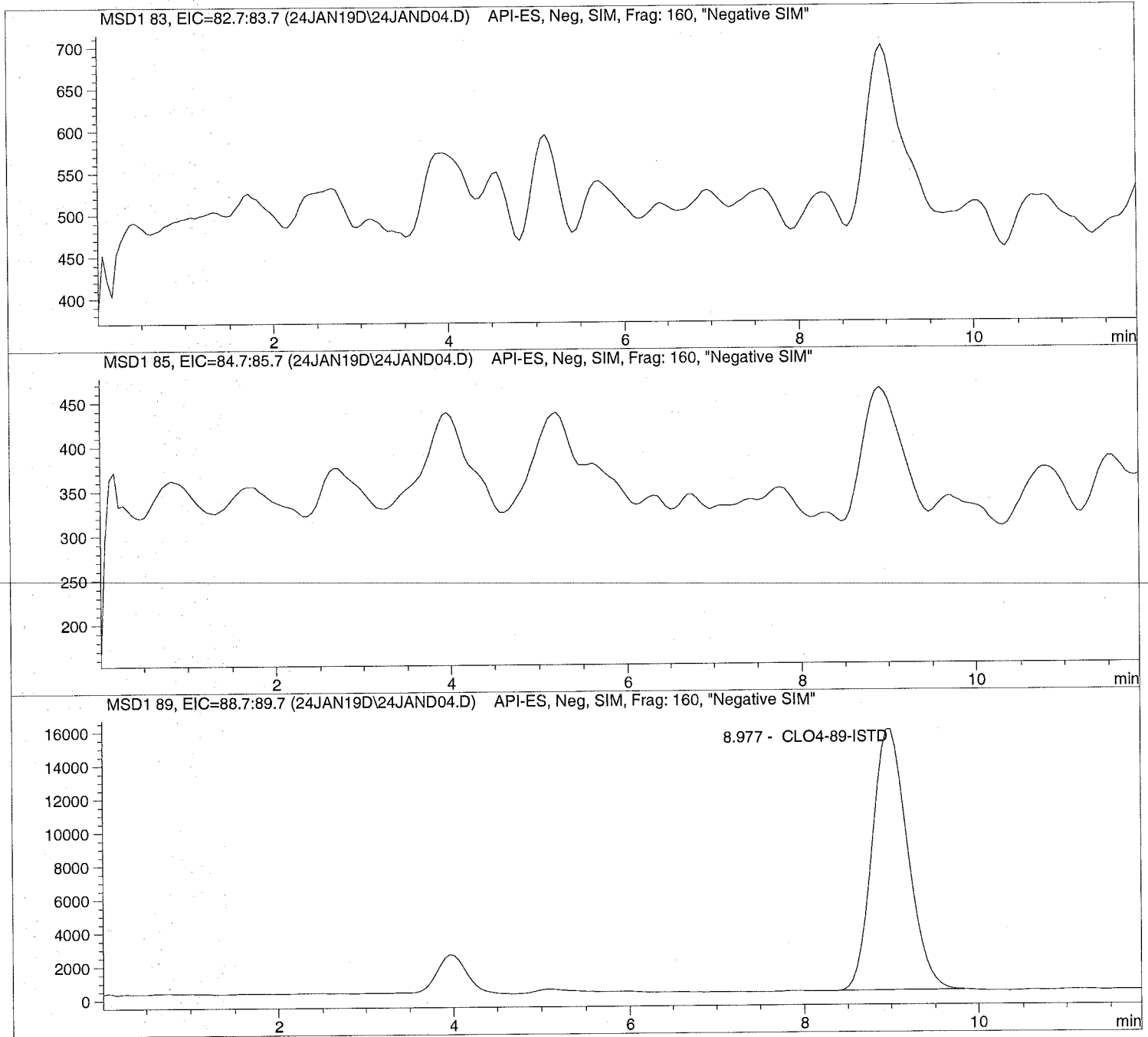


Injection Date: 1/24/2019 11:18:05
Sample Name: 637286 LMB
Acq Operator: TNB

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-DPR.M
Last Changed: 12/3/2018 12:46:06

Perchlorate analysis



```

=====
Injection Date: 1/24/2019 11:18:05      Seq Line: 4
Sample Name: 637286 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-DPR.M
Last Changed: 12/3/2018 12:46:06
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 3. Dec. 2018, 00:29:27 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
8.977	PBA	439745.7	5.0000	CLO4-89-ISTD

```

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

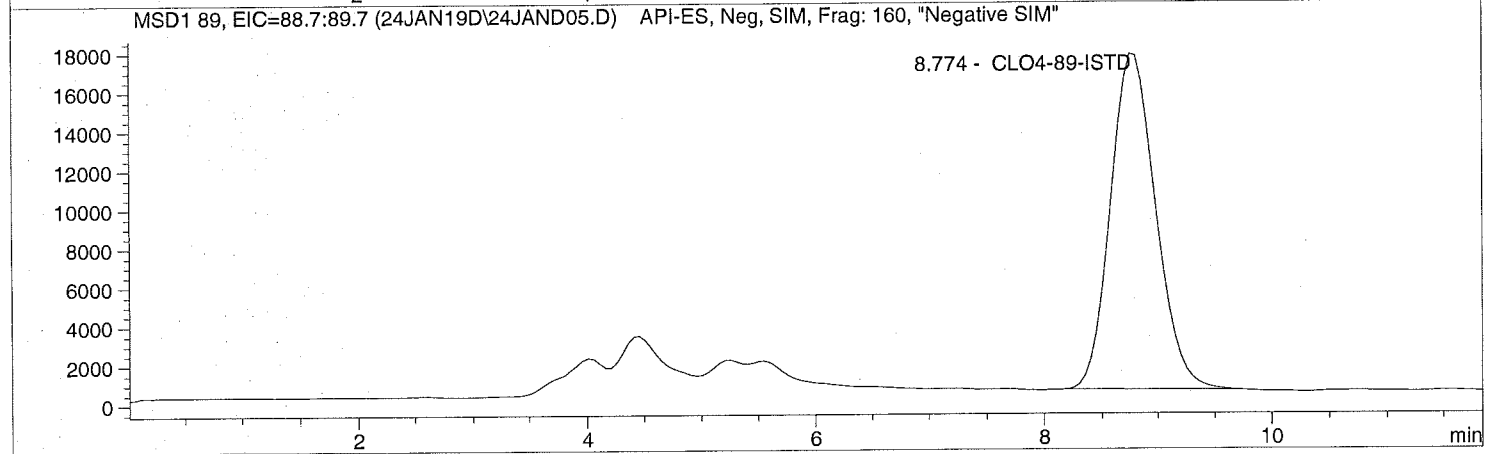
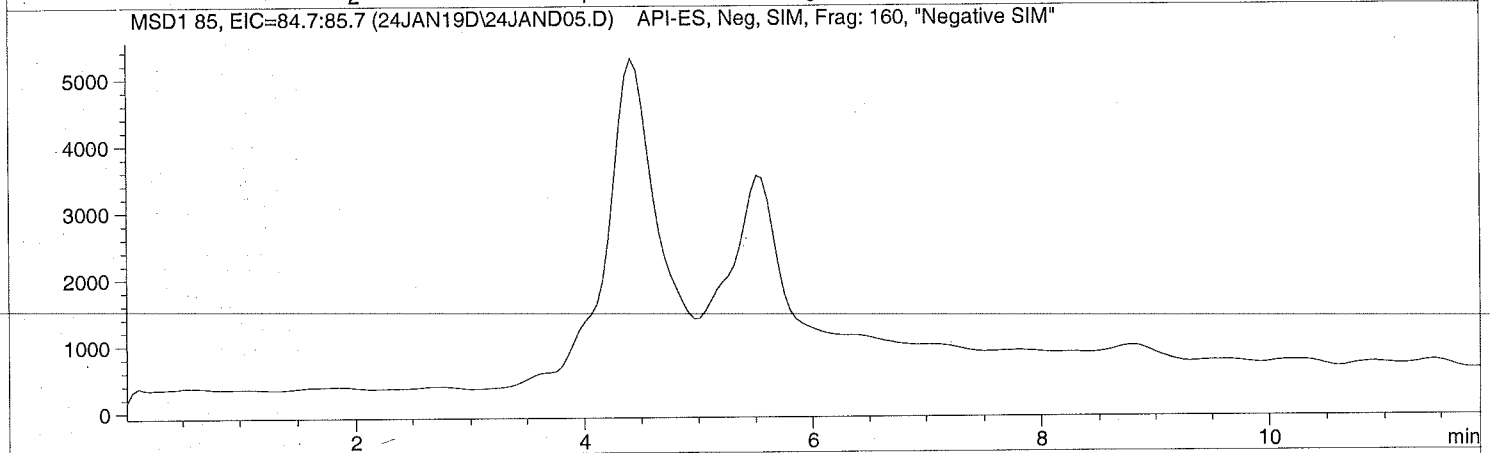
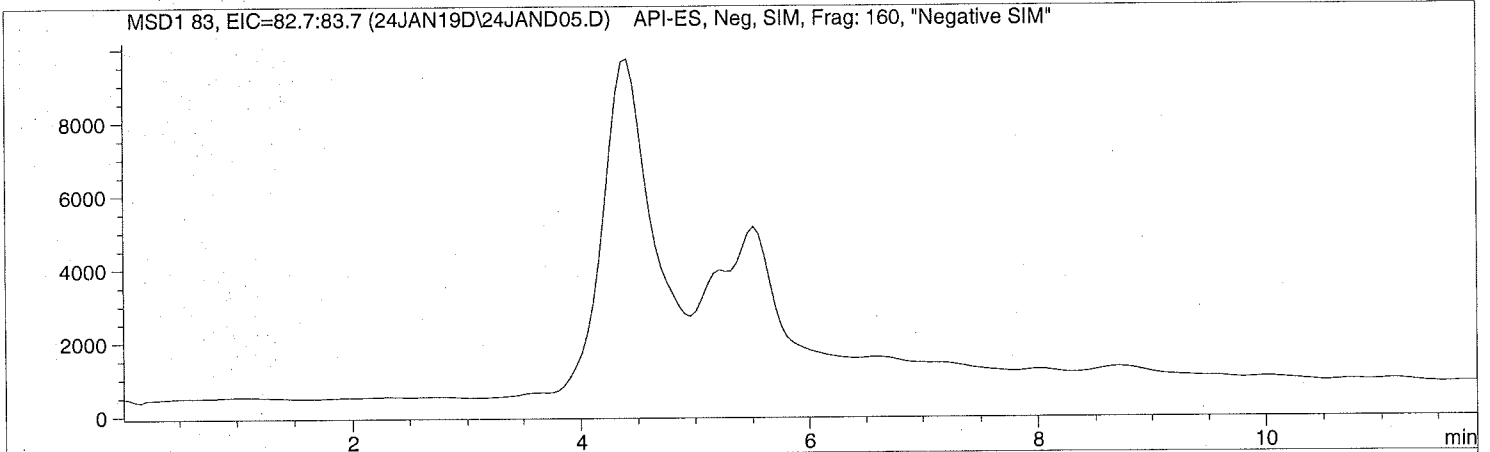
```



=====
Injection Date: 1/24/2019 11:31:50 Seq Line: 5
Sample Name: 1901759001 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-DPR.M
Last Changed: 12/3/2018 12:46:06

Perchlorate analysis
=====



```

=====
Injection Date: 1/24/2019 11:31:50      Seq Line: 5
Sample Name: 1901759001                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-DPR.M
Last Changed: 12/3/2018 12:46:06

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 3. Dec. 2018, 00:29:27 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
8.774	PBA	477515.0	5.0000	CLO4-89-ISTD

```

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

```

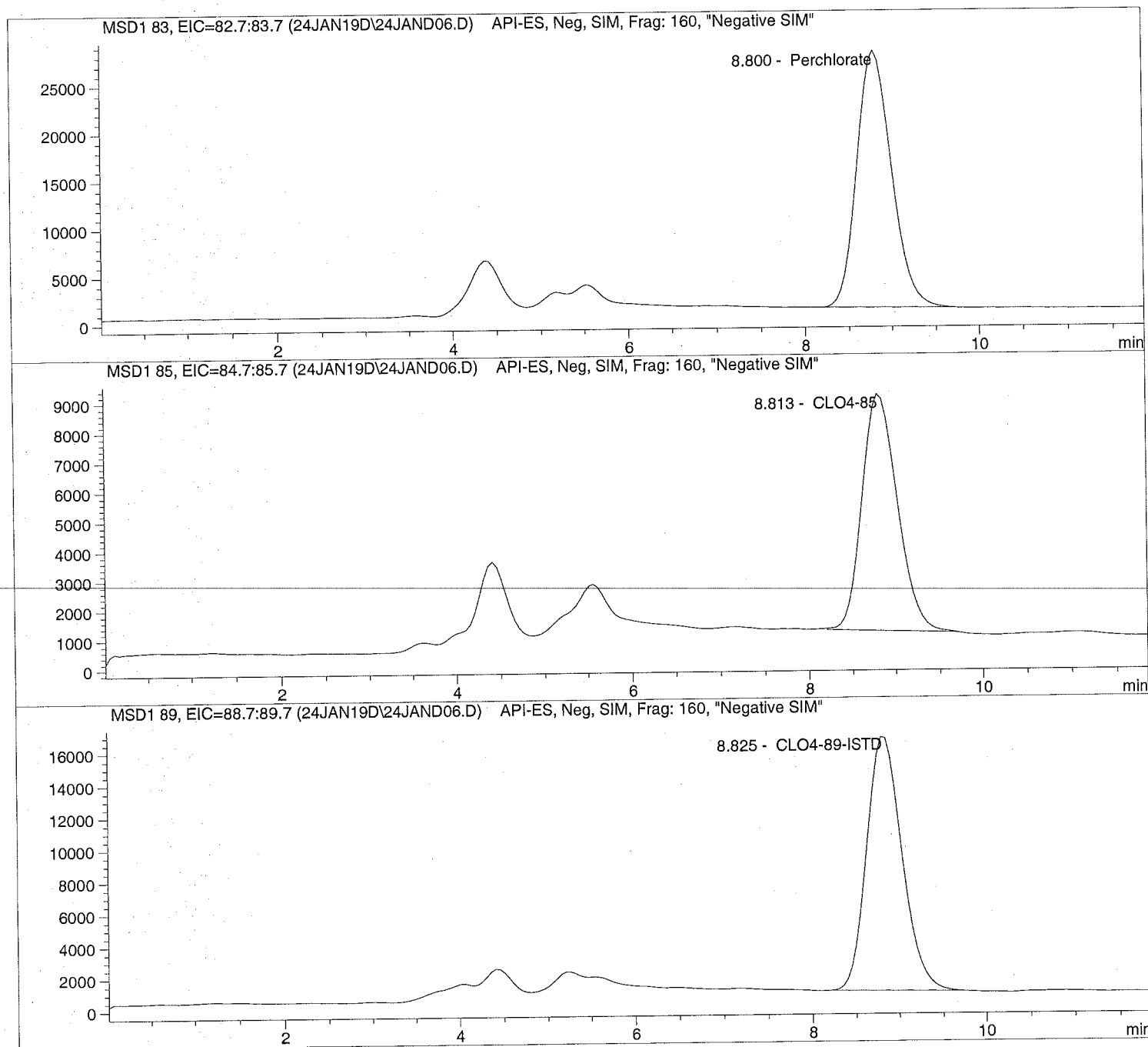


Injection Date: 1/24/2019 11:45:36
Sample Name: 637288 17591MS
Acq Operator: TNB

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-DPR.M
Last Changed: 12/3/2018 12:46:06

Perchlorate analysis



```
=====  
Injection Date: 1/24/2019 11:45:36      Seq Line: 6  
Sample Name: 637288 17591MS           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-DPR.M  
Last Changed: 12/3/2018 12:46:06
```

Perchlorate analysis

=====
Sample Information
=====

```
Sorted By: Signal  
Calib. Data Modified: Mon, 3. Dec. 2018, 00:29:27 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
8.800	PBA	752201.7	5.3782	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.813	BBA	227314.3	5.3552	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	PBA	445736.7	5.0000	CLO4-89-ISTD

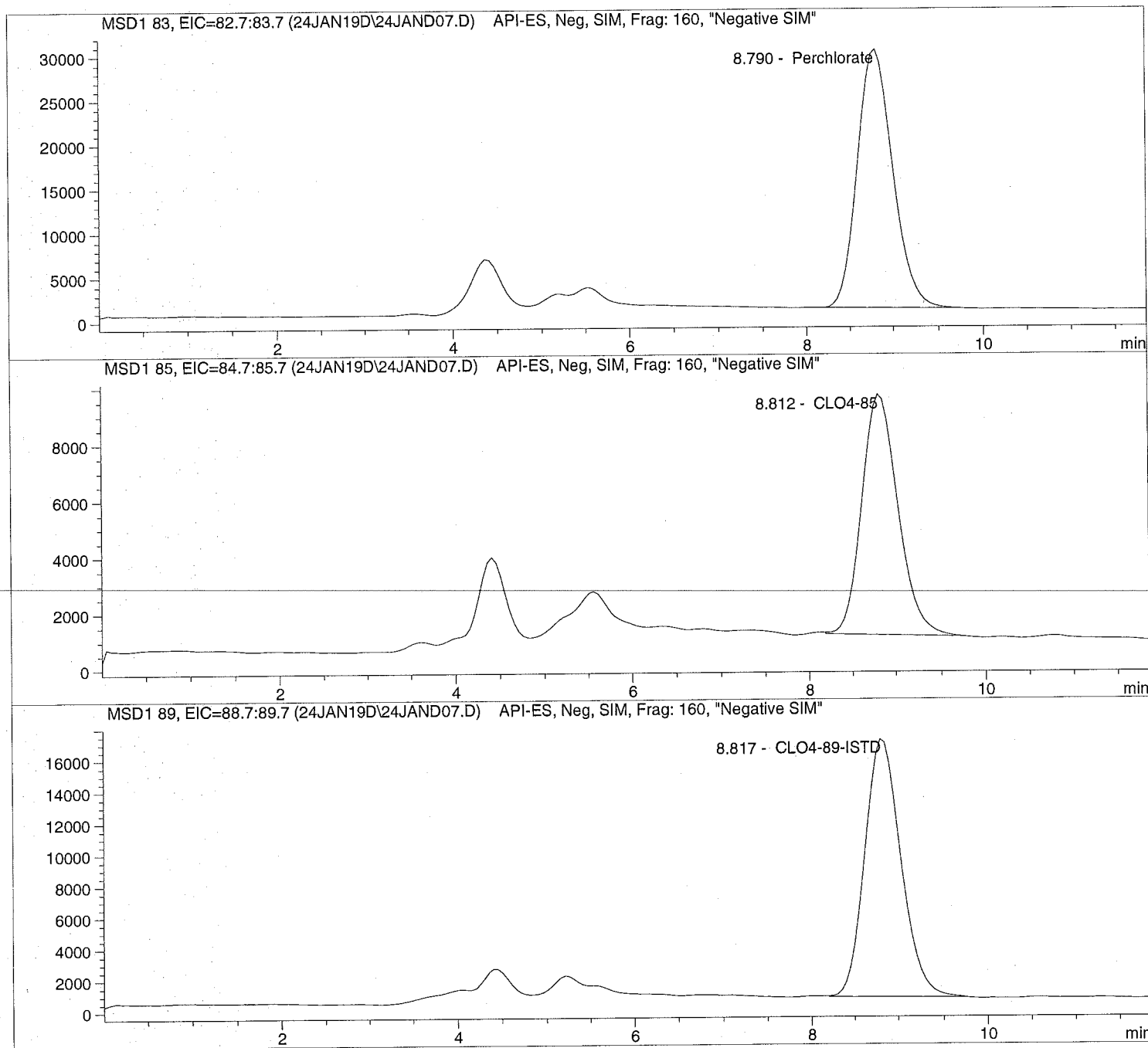
=====
*** End of Report ***

Injection Date: 1/24/2019 11:59:27
Sample Name: 637289 17591SD
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-DPR.M
Last Changed: 12/3/2018 12:46:06

Perchlorate analysis



```
=====
Injection Date: 1/24/2019 11:59:27      Seq Line: 7
Sample Name: 637289 17591SD           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-DPR.M
Last Changed: 12/3/2018 12:46:06
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By: Signal
Calib. Data Modified: Mon, 3. Dec. 2018, 00:29:27 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
8.790	BBA	822680.3	5.5995	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.812	BBA	245002.0	5.5012	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.817	BBA	467303.9	5.0000	CLO4-89-ISTD

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

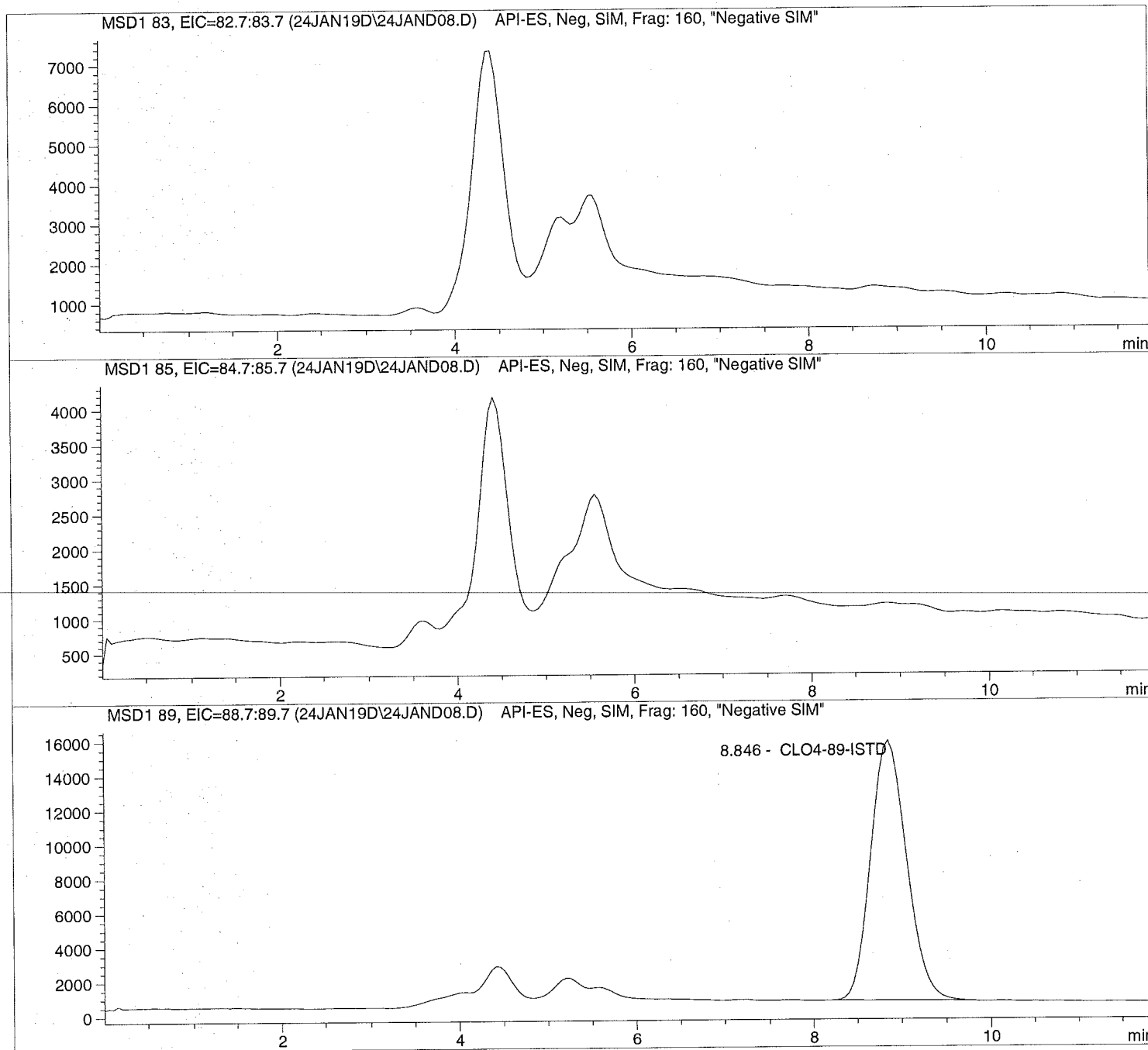


Injection Date: 1/24/2019 12:13:14
Sample Name: 1901759002
Acq Operator: TNB

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-DPR.M
Last Changed: 12/3/2018 12:46:06

Perchlorate analysis



```
=====
Injection Date: 1/24/2019 12:13:14      Seq Line: 8
Sample Name:    1901759002              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-DPR.M
Last Changed:   12/3/2018 12:46:06
=====
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Mon, 3. Dec. 2018, 00:29:27 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
8.846	BBA	425062.9	5.0000	CLO4-89-ISTD

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

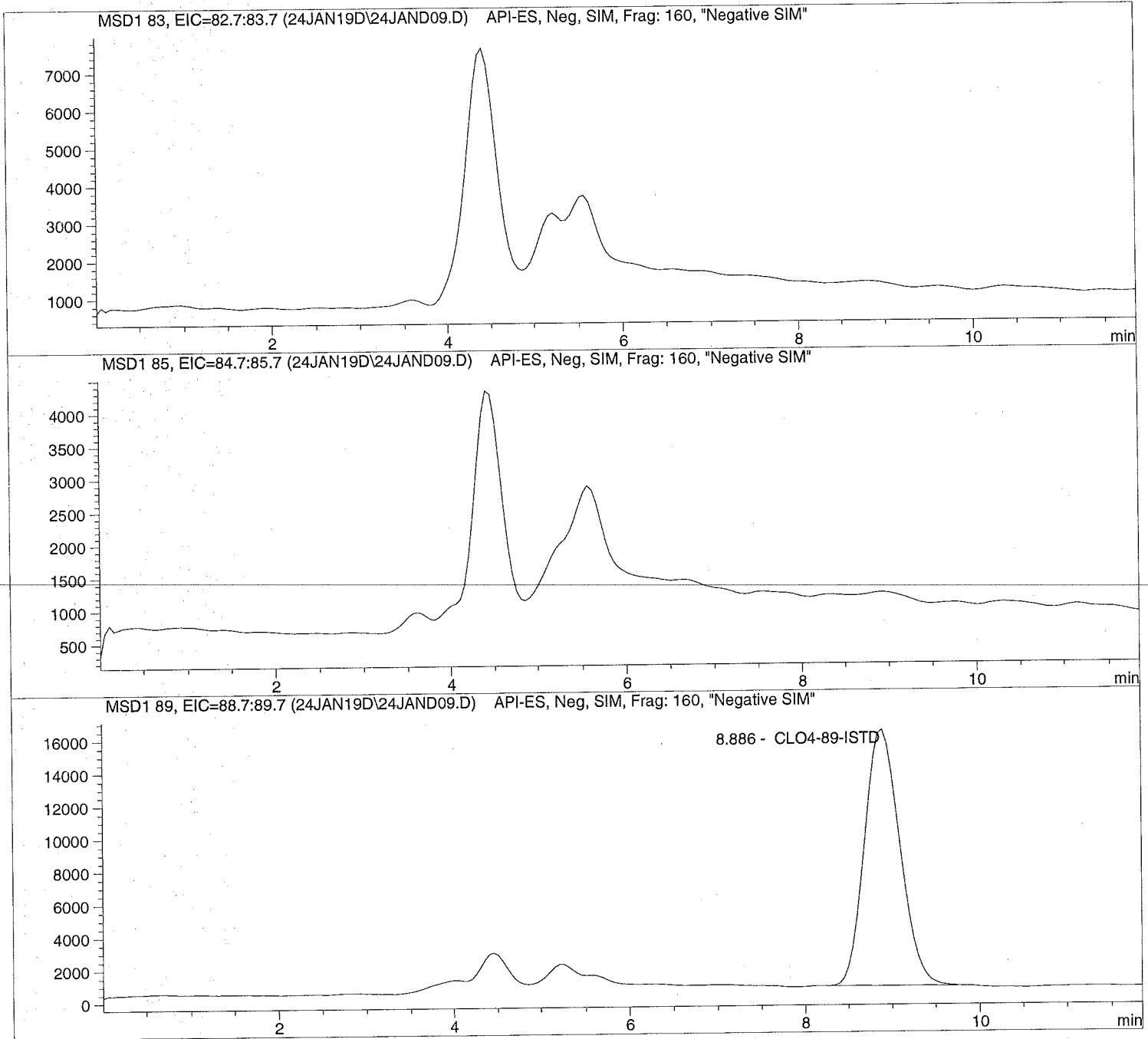


Injection Date: 1/24/2019 12:26:59
Sample Name: 1901759003
Acq Operator: TNB

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-DPR.M
Last Changed: 12/3/2018 12:46:06

Perchlorate analysis



```
=====
Injection Date: 1/24/2019 12:26:59      Seq Line:          9
Sample Name:    1901759003              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-DPR.M
Last Changed:   12/3/2018 12:46:06
=====
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Mon, 3. Dec. 2018, 00:29:27 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
8.886	BBA	436499.1	5.0000	CLO4-89-ISTD

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

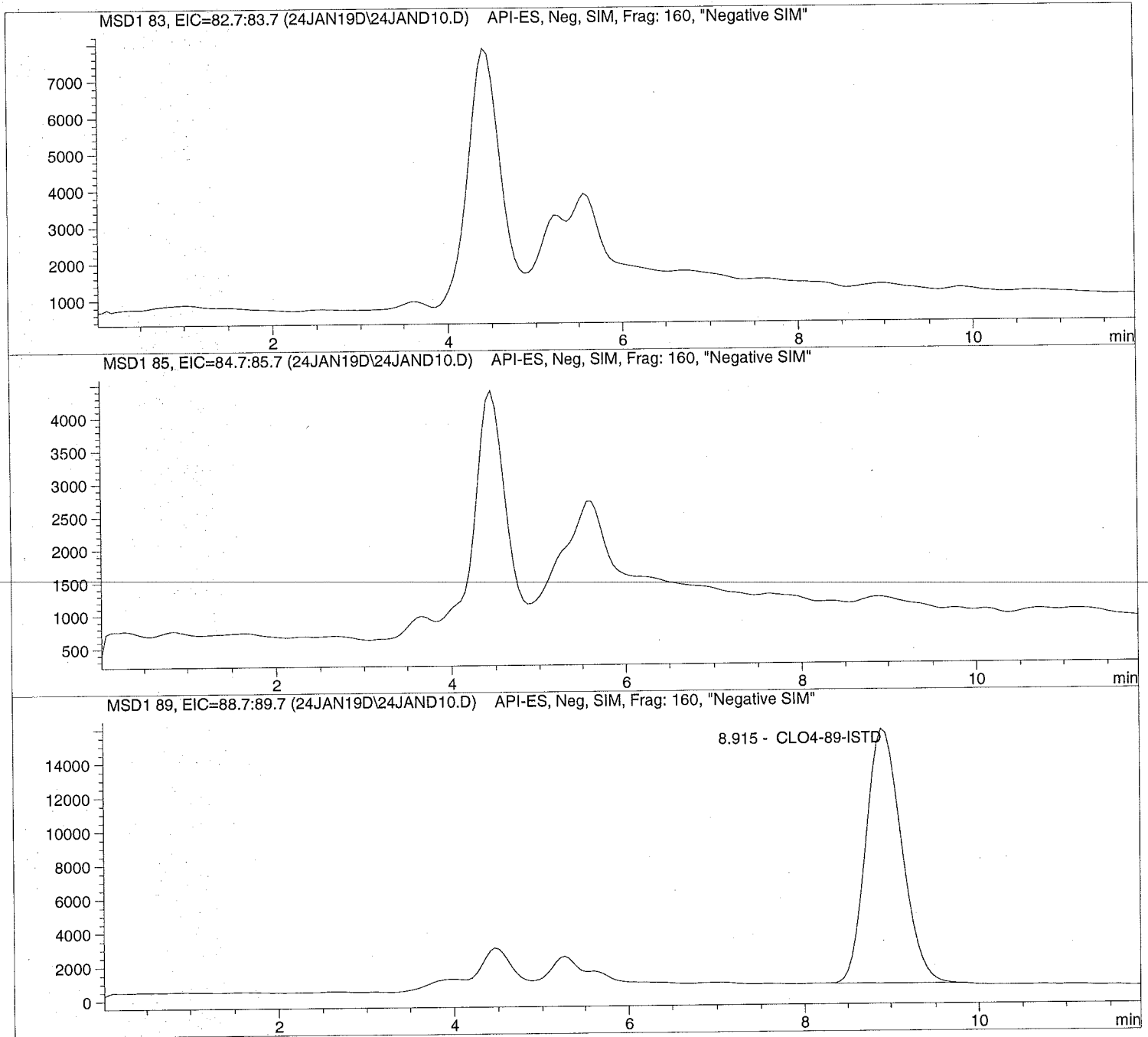


Injection Date: 1/24/2019 12:40:48
Sample Name: 1901759004
Acq Operator: TNB

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-DPR.M
Last Changed: 12/3/2018 12:46:06

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\24JAN19D\24JAND10.D Sample Name: 1901759004

```

=====
Injection Date: 1/24/2019 12:40:48      Seq Line:          10
Sample Name:   1901759004              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-DPR.M
Last Changed:  12/3/2018 12:46:06
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 3. Dec. 2018, 00:29:27 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
8.915	BBA	422938.2	5.0000	CLO4-89-ISTD

```

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

```

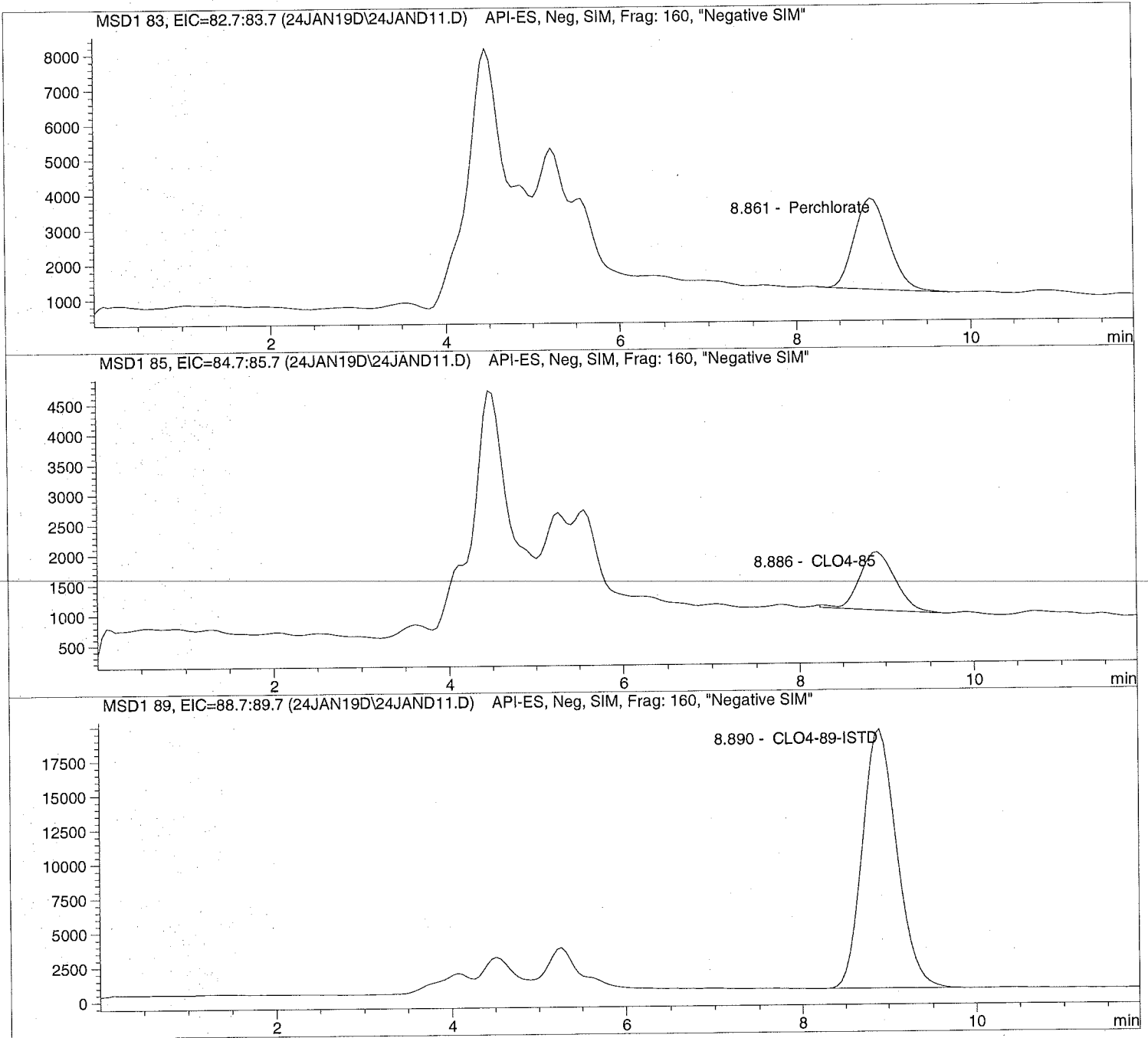


Injection Date: 1/24/2019 12:54:32
Sample Name: 1901759005
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2018 12:46:06

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\24JAN19D\24JAND11.D

Sample Name: 1901759005

```

=====
Injection Date: 1/24/2019 12:54:32      Seq Line: 11
Sample Name: 1901759005                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-DPR.M
Last Changed: 12/3/2018 12:46:06
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 3. Dec. 2018, 00:29:27 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
8.861	BBA	72122.6	0.6386	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.886	BBA	27514.8	0.6409	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.890	PBA	518078.5	5.0000	CLO4-89-ISTD

```

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

```

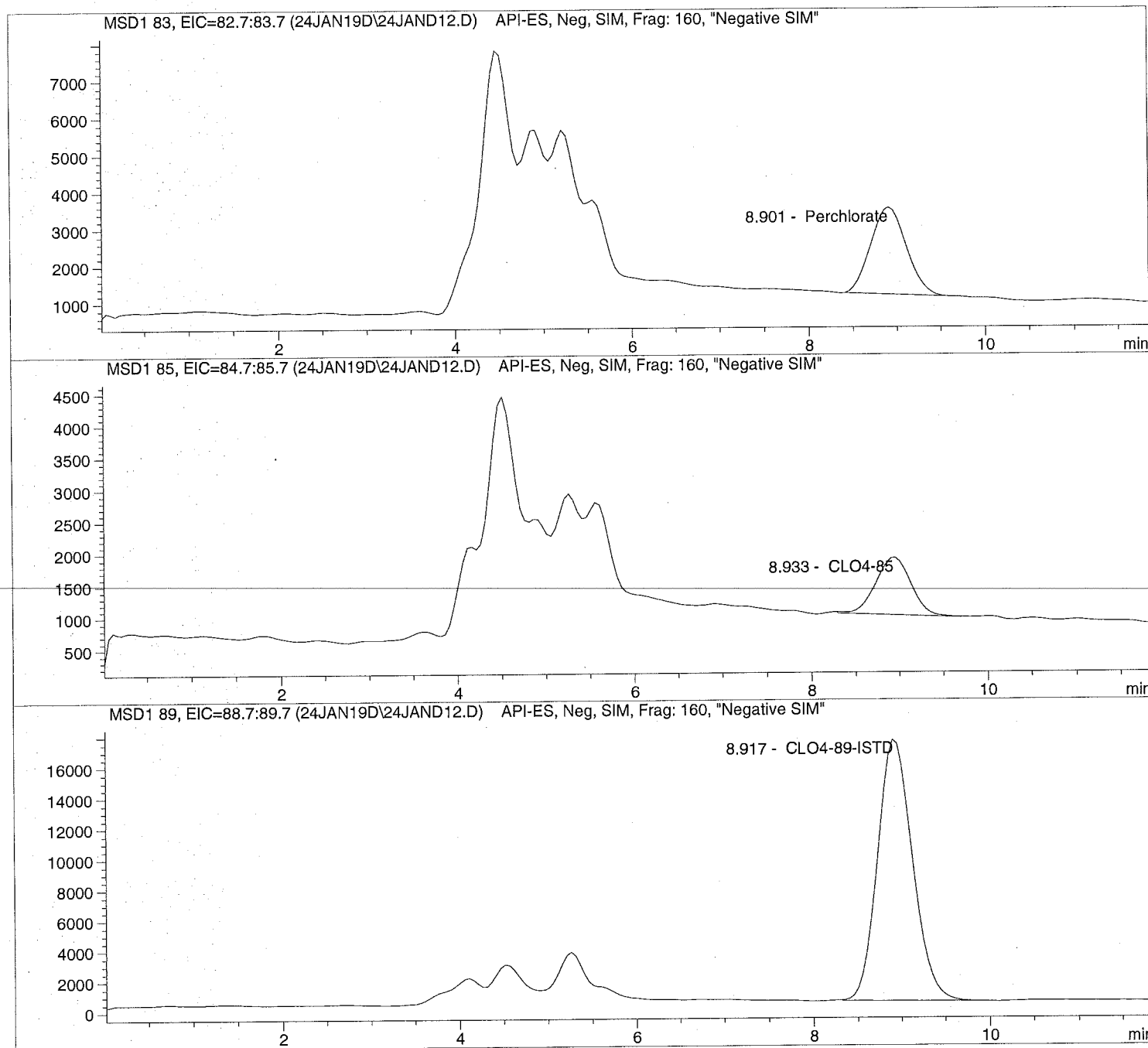


Injection Date: 1/24/2019 13:08:16
Sample Name: 1901759006
Acq Operator: TNB

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-DPR.M
Last Changed: 12/3/2018 12:46:06

Perchlorate analysis



```

=====
Injection Date: 1/24/2019 13:08:16      Seq Line: 12
Sample Name: 1901759006                 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-DPR.M
Last Changed: 12/3/2018 12:46:06
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Mon, 3. Dec. 2018, 00:29:27 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
8.901	PBA	66495.4	0.6412	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.933	BBA	25151.3	0.6395	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.917	BBA	474702.4	5.0000	CLO4-89-ISTD

```

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

```

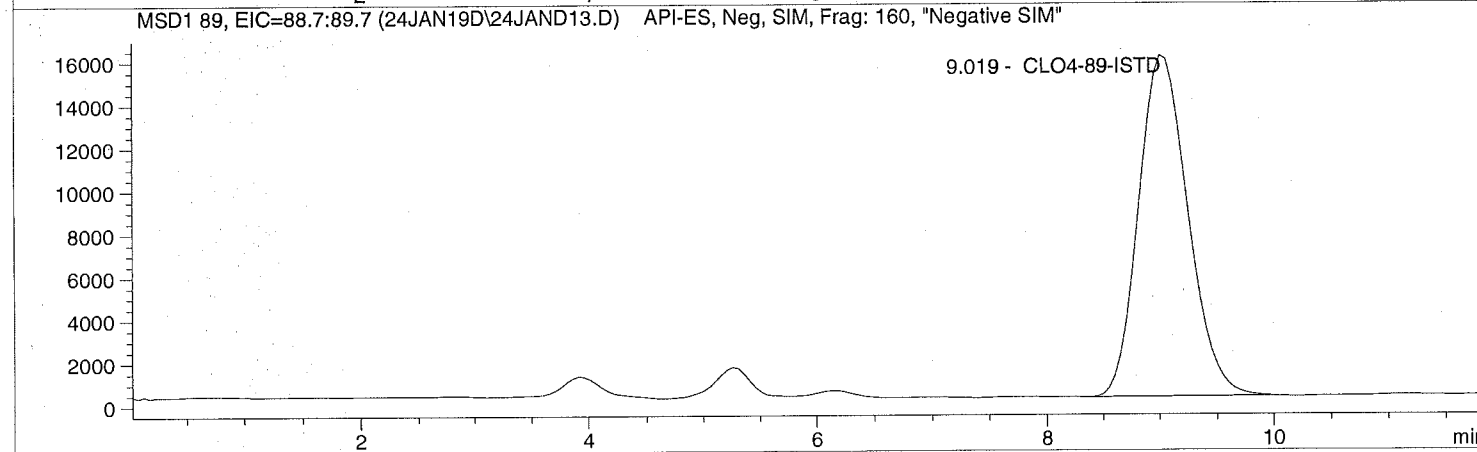
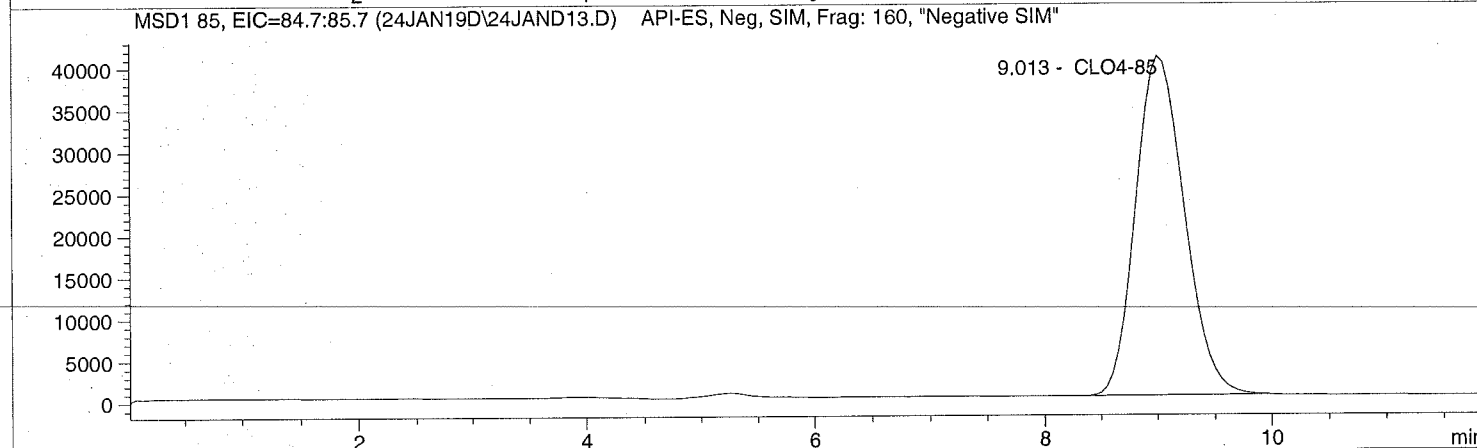
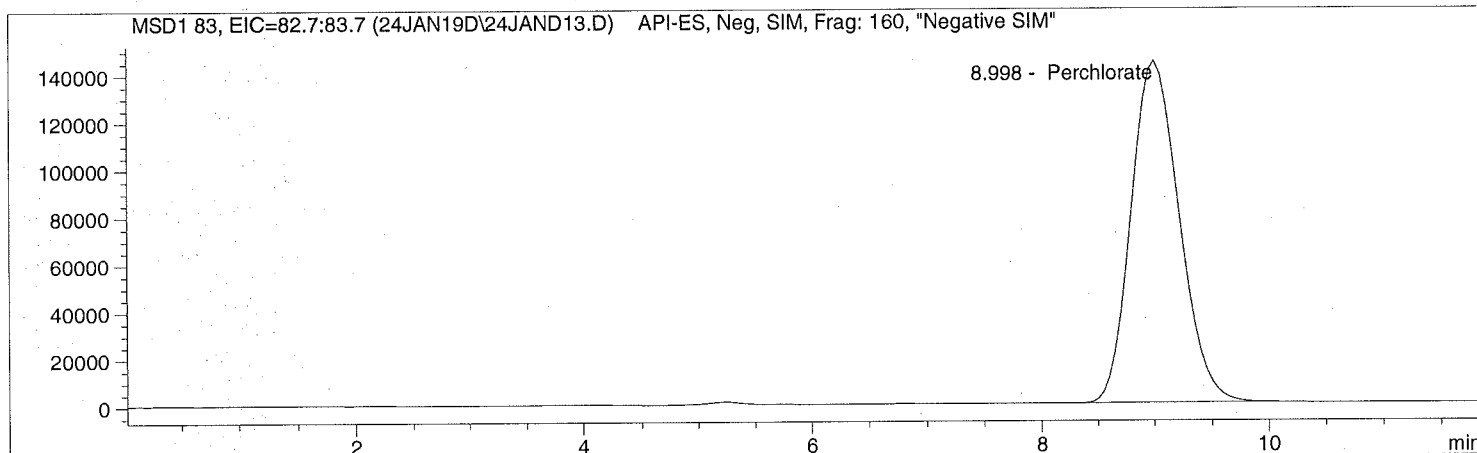


Injection Date: 1/24/2019 13:27:58
Sample Name: 637290 CCV@25
Acq Operator: TNB

Seq Line: 13
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 12/3/2018 12:46:06

Perchlorate analysis



```

=====
Injection Date: 1/24/2019 13:27:58      Seq Line:          13
Sample Name:    637290  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-DPR.M
Last Changed:   12/3/2018 12:46:06
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Mon, 3. Dec. 2018, 00:29:27 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
8.998	PBA	4212936.5	26.5096	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.013	PBA	1201760.1	25.1128	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.019	PBA	472889.8	5.0000	CLO4-89-ISTD

```

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

```





ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration



Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DPR.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
#*	CLO4@ 1.0u	Vial 74	1	Control	4	9.40790e4	9.287	9.73826e-1
#*	CLO4@ 2.0u	Vial 75	1	Control	5	2.26957e5	9.259	2.19167
#*	CLO4@ 5.0u	Vial 76	1	Control	6	5.50307e5	9.208	4.80912
#*	CLO4@ 10.u	Vial 77	1	Control	7	1.07623e6	9.246	9.38291
#*	CLO4@ 25.u	Vial 78	1	Control	8	2.88097e6	9.175	25.83039
#*	CLO4@ 50.u	Vial 79	1	Control	9	6.29507e6	9.261	49.91981
#*	CLO4@ 75.u	Vial 80	1	Control	10	9.45737e6	9.236	74.88523
*	ICAL Verf@	Vial 81	1	Control	11	1.10069e6	9.244	9.38952

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-ISTD RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0u	Vial 74	1	Control	4	3.79545e5	9.314	5.00000
#*	CLO4@ 2.0u	Vial 75	1	Control	5	3.52582e5	9.297	5.00000
#*	CLO4@ 5.0u	Vial 76	1	Control	6	3.66805e5	9.223	5.00000
#*	CLO4@ 10.u	Vial 77	1	Control	7	3.56815e5	9.266	5.00000
#*	CLO4@ 25.u	Vial 78	1	Control	8	3.32340e5	9.196	5.00000
#*	CLO4@ 50.u	Vial 79	1	Control	9	3.59393e5	9.277	5.00000
#*	CLO4@ 75.u	Vial 80	1	Control	10	3.45193e5	9.253	5.00000
*	ICAL Verf@	Vial 81	1	Control	11	3.64657e5	9.264	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0u	Vial 74	1	Control	4	3.17987e4	9.316	9.60861e-1
#*	CLO4@ 2.0u	Vial 75	1	Control	5	7.05436e4	9.273	2.16955
#*	CLO4@ 5.0u	Vial 76	1	Control	6	1.69833e5	9.217	4.87565
#*	CLO4@ 10.u	Vial 77	1	Control	7	3.31565e5	9.259	9.58732
#*	CLO4@ 25.u	Vial 78	1	Control	8	8.62978e5	9.187	25.62680
#*	CLO4@ 50.u	Vial 79	1	Control	9	1.91847e6	9.278	49.74848
#*	CLO4@ 75.u	Vial 80	1	Control	10	2.93835e6	9.251	75.02646
*	ICAL Verf@	Vial 81	1	Control	11	3.27974e5	9.261	9.28908

*** End of Report ***



=====
 Calibration Table
 =====

Perchlorate

Calib. Data Modified : 10/9/2018 8:01:57 AM

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

#	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
9.287	1	1.00000	9.40790e4	1.06294e-5	1		Perchlorate
	2	2.00000	2.26957e5	8.81224e-6			
	3	5.00000	5.50307e5	9.08584e-6			
	4	10.00000	1.07623e6	9.29172e-6			
	5	25.00000	2.88097e6	8.67764e-6			
	6	50.00000	6.29507e6	7.94272e-6			
	7	75.00000	9.45737e6	7.93033e-6			
9.314	3	5.00000	3.79545e5	1.31737e-5	+I1		CLO4-89-ISTD
	2	5.00000	3.52582e5	1.41811e-5			
	3	5.00000	3.66805e5	1.36312e-5			
	4	5.00000	3.56815e5	1.40129e-5			
	5	5.00000	3.32340e5	1.50448e-5			
	6	5.00000	3.59393e5	1.39124e-5			
	7	5.00000	3.45193e5	1.44847e-5			
9.316	2	1.00000	3.17987e4	3.14479e-5	1		CLO4-85
	2	2.00000	7.05436e4	2.83513e-5			
	3	5.00000	1.69833e5	2.94406e-5			
	4	10.00000	3.31565e5	3.01600e-5			
	5	25.00000	8.62978e5	2.89695e-5			
	6	50.00000	1.91847e6	2.60625e-5			



RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp Name
7		75.00000	2.93835e6	2.55246e-5	

More compound-specific settings:

Compound: Perchlorate

Time Window : From 7.196 min To 11.196 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333

Compound: CLO4-89-ISTD

Time Window : From 7.207 min To 11.192 min
 Curve Type : Linear
 Origin : Included
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 1
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1

Compound: CLO4-85

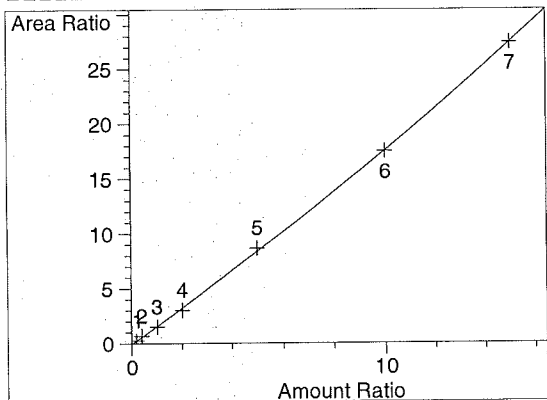
Time Window : From 7.211 min To 11.211 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333

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

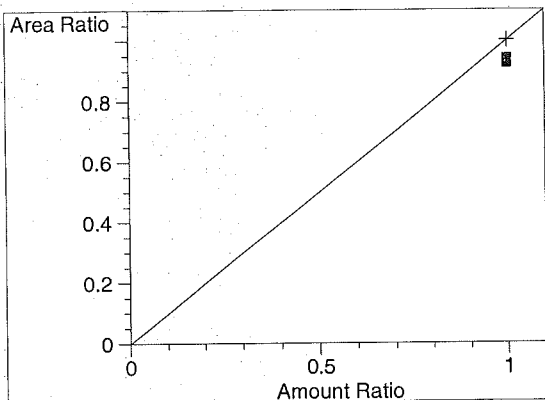
No Entries in table
 =====



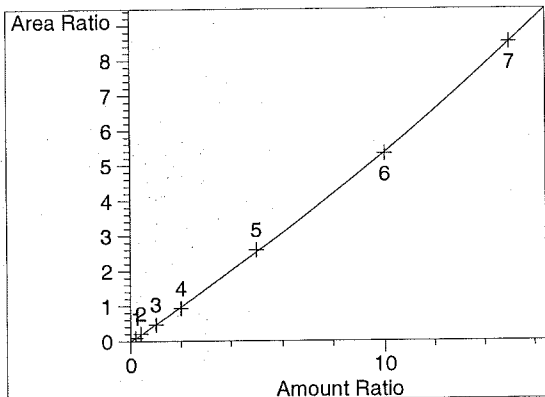
=====
 Calibration Curves
 =====



Perchlorate at exp. RT: 9.287
 MSD1 83, EIC=82.7:83.7
 Correlation: 0.99971
 Residual Std. Dev.: 0.16701
 Formula: $y = ax^2 + bx + c$
 a: 1.45482e-2
 b: 1.61590
 c: -6.73998e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 9.314
 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 1 : 1
 Level 2 : 1
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1



CLO4-85 at exp. RT: 9.316
 MSD1 85, EIC=84.7:85.7
 Correlation: 0.99984
 Residual Std. Dev.: 0.03901
 Formula: $y = ax^2 + bx + c$
 a: 6.03220e-3
 b: 4.77309e-1
 c: -8.16718e-3
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333



Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	CLO4@ .10ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ .20ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
11	Vial 81	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

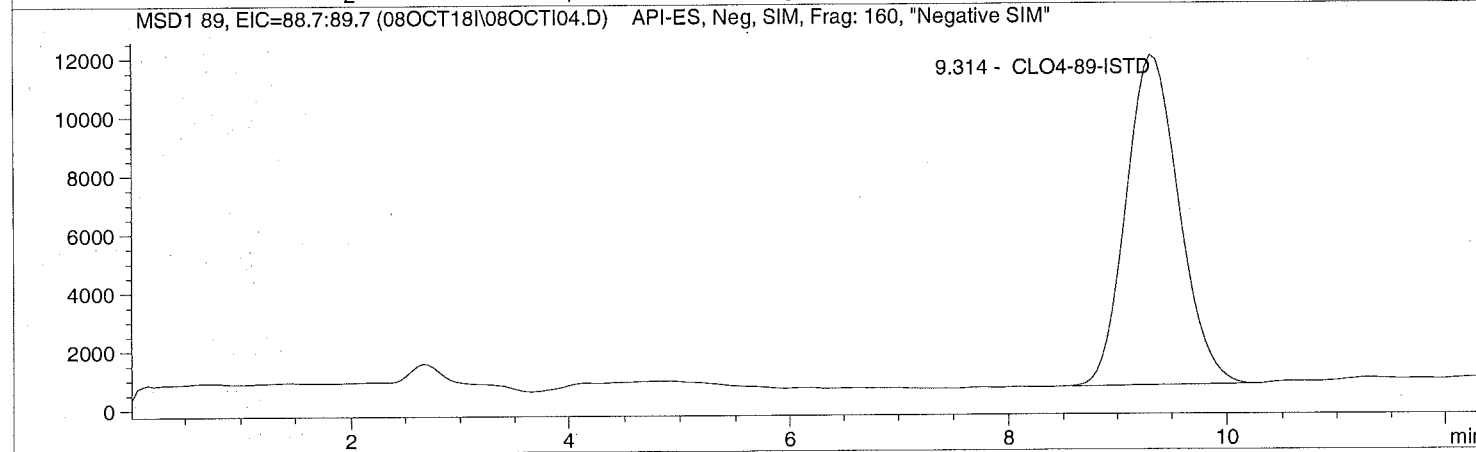
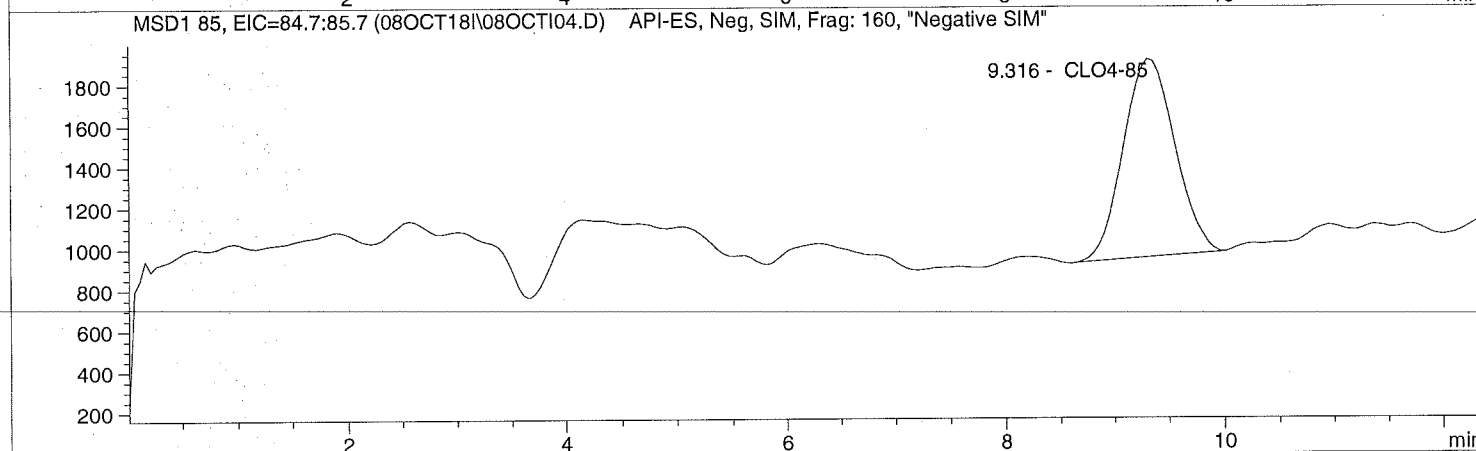
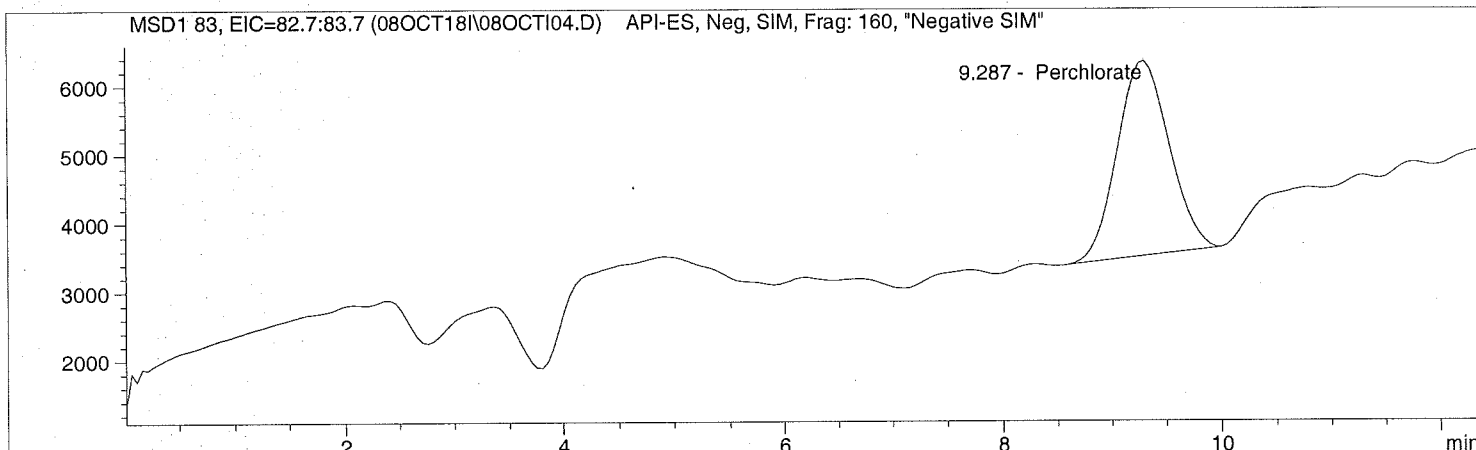


Injection Date: 10/08/2018 11:37:35
Sample Name: CLO4@ 1.0ug/L
Acq Operator: TNB

Seq Line: 4
Location: Vial 74
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 10/9/2018 08:22:51

Perchlorate analysis



```

=====
Injection Date: 10/08/2018 11:37:35      Seq Line: 4
Sample Name:    CLO4@ 1.0ug/L            Location:  Vial 74
Acq Operator:   TNB                      Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   10/9/2018 08:22:51
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 9. Oct. 2018, 08:01:57 am
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
9.287	PBA	94079.0	0.9738	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.316	PBA	31798.7	0.9609	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.314	PBA	379544.7	5.0000	CLO4-89-ISTD

```

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

```

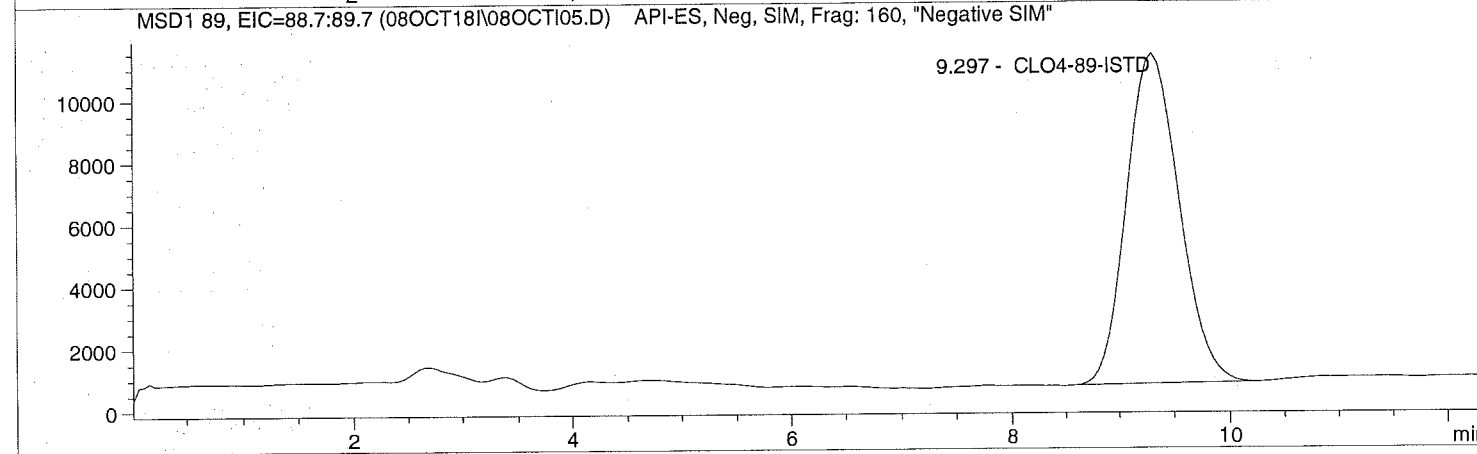
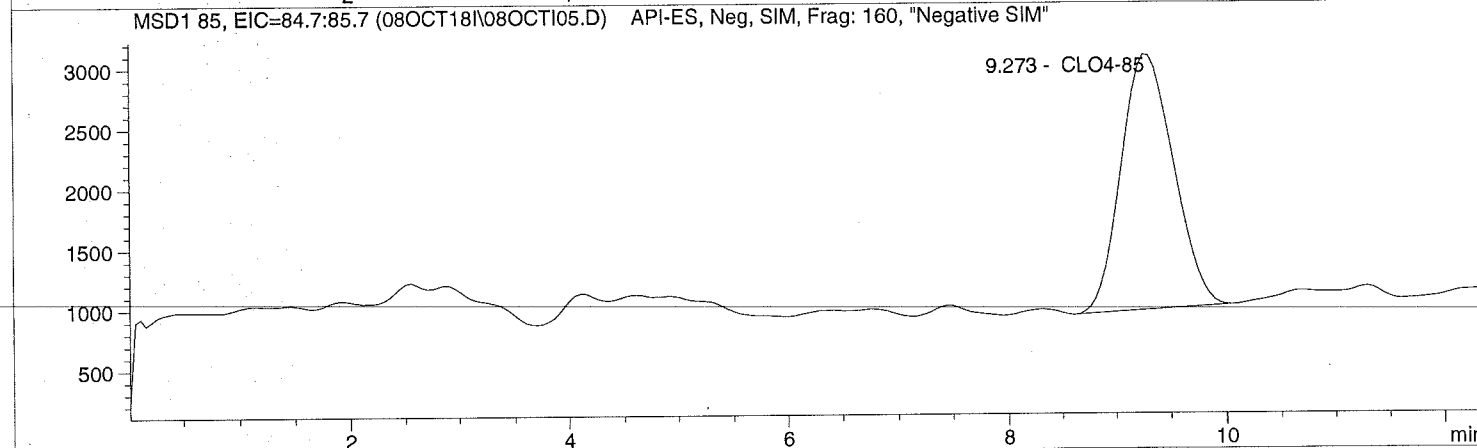
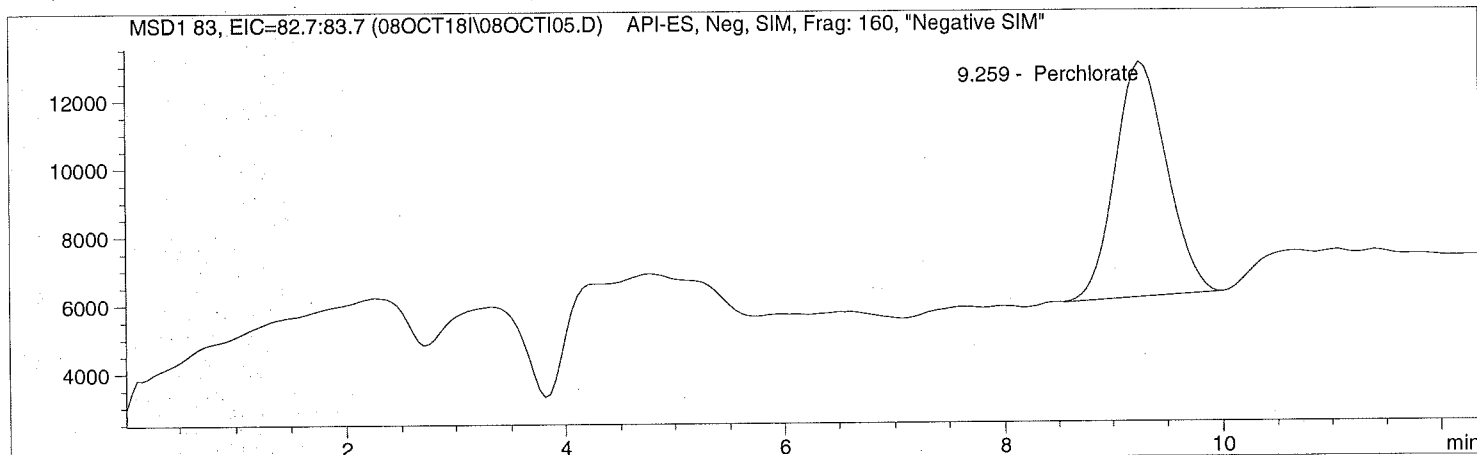


Injection Date: 10/08/2018 11:51:45
Sample Name: CLO4@ 2.0ug/L
Acq Operator: TNB

Seq Line: 5
Location: Vial 75
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 10/9/2018 08:22:51

Perchlorate analysis



```
=====
Injection Date: 10/08/2018 11:51:45      Seq Line:          5
Sample Name:    CLO4@ 2.0ug/L            Location:          Vial 75
Acq Operator:   TNB                      Inj. No.:         1
                                           Inj. Vol.:        25 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   10/9/2018 08:22:51
=====
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Tue, 9. Oct. 2018, 08:01:57 am
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
9.259	BBA	226957.1	2.1917	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.273	PBA	70543.6	2.1695	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.297	PBA	352581.8	5.0000	CLO4-89-ISTD

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

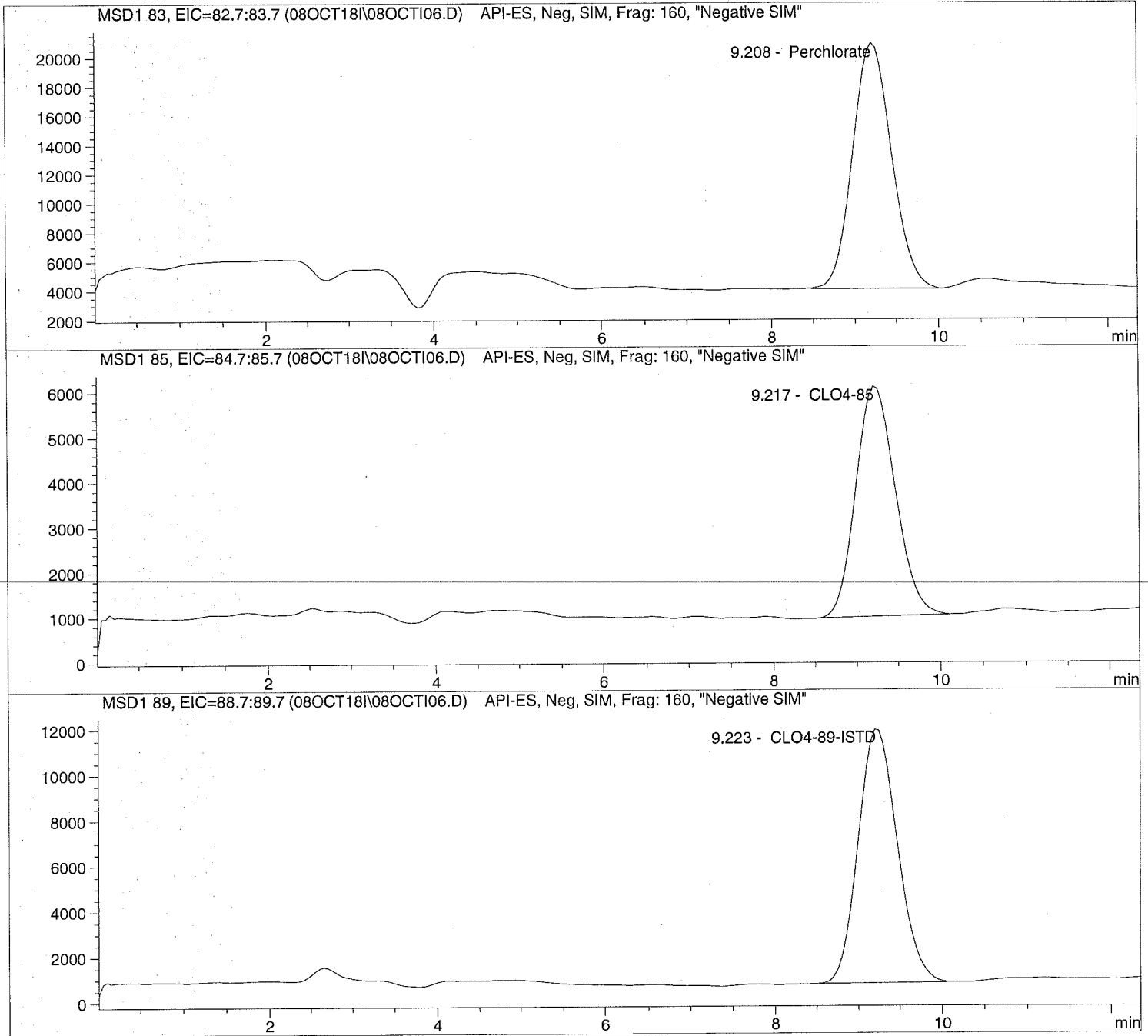


Injection Date: 10/08/2018 12:05:59
Sample Name: CLO4@ 5.0ug/L
Acq Operator: TNB

Seq Line: 6
Location: Vial 76
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 10/9/2018 08:22:51

Perchlorate analysis



```

=====
Injection Date: 10/08/2018 12:05:59      Seq Line: 6
Sample Name:    CLO4@ 5.0ug/L            Location:  Vial 76
Acq Operator:   TNB                      Inj. No.: 1
                                           Inj. Vol.: 25 µl

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   10/9/2018 08:22:51

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 9. Oct. 2018, 08:01:57 am
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
9.208	BBA	550306.9	4.8091	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.217	PBA	169833.3	4.8757	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.223	PBA	366804.8	5.0000	CLO4-89-ISTD

```

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

```

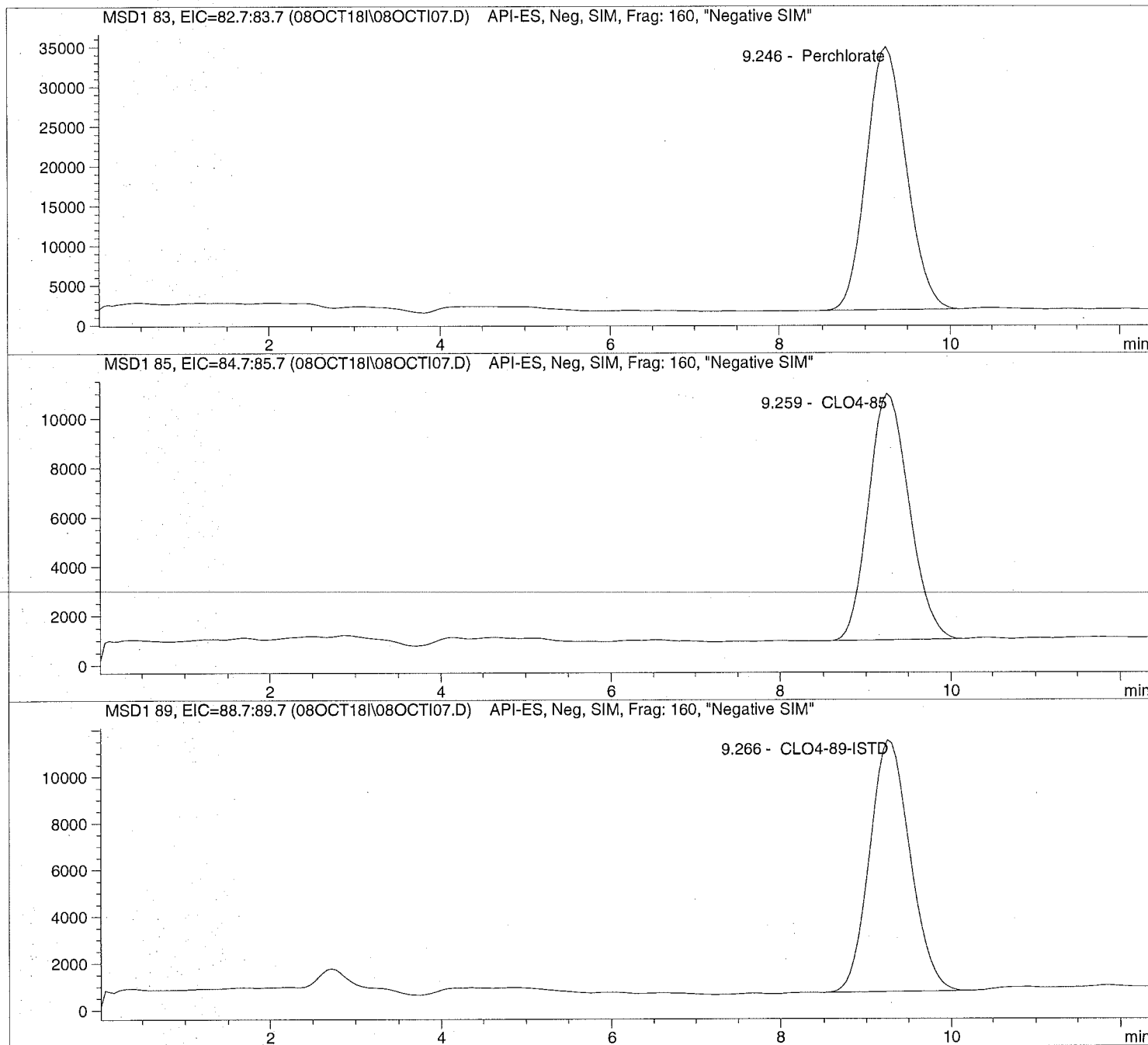


Injection Date: 10/08/2018 12:20:10
Sample Name: CLO4@ 10.ug/L
Acq Operator: TNB

Seq Line: 7
Location: Vial 77
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 10/9/2018 08:22:51

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\08OCT18I\08OCTI07.D Sample Name: CLO4@ 10.ug/L

```

=====
Injection Date: 10/08/2018 12:20:10      Seq Line:          7
Sample Name:    CLO4@ 10.ug/L            Location:         Vial 77
Acq Operator:   TNB                      Inj. No.:        1
                                           Inj. Vol.:       25 µl
=====

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   10/9/2018 08:22:51
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 9. Oct. 2018, 08:01:57 am
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
9.246	PBA	1076227.4	9.3829	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.259	PBA	331564.9	9.5873	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.266	PBA	356815.3	5.0000	CLO4-89-ISTD

```

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

```

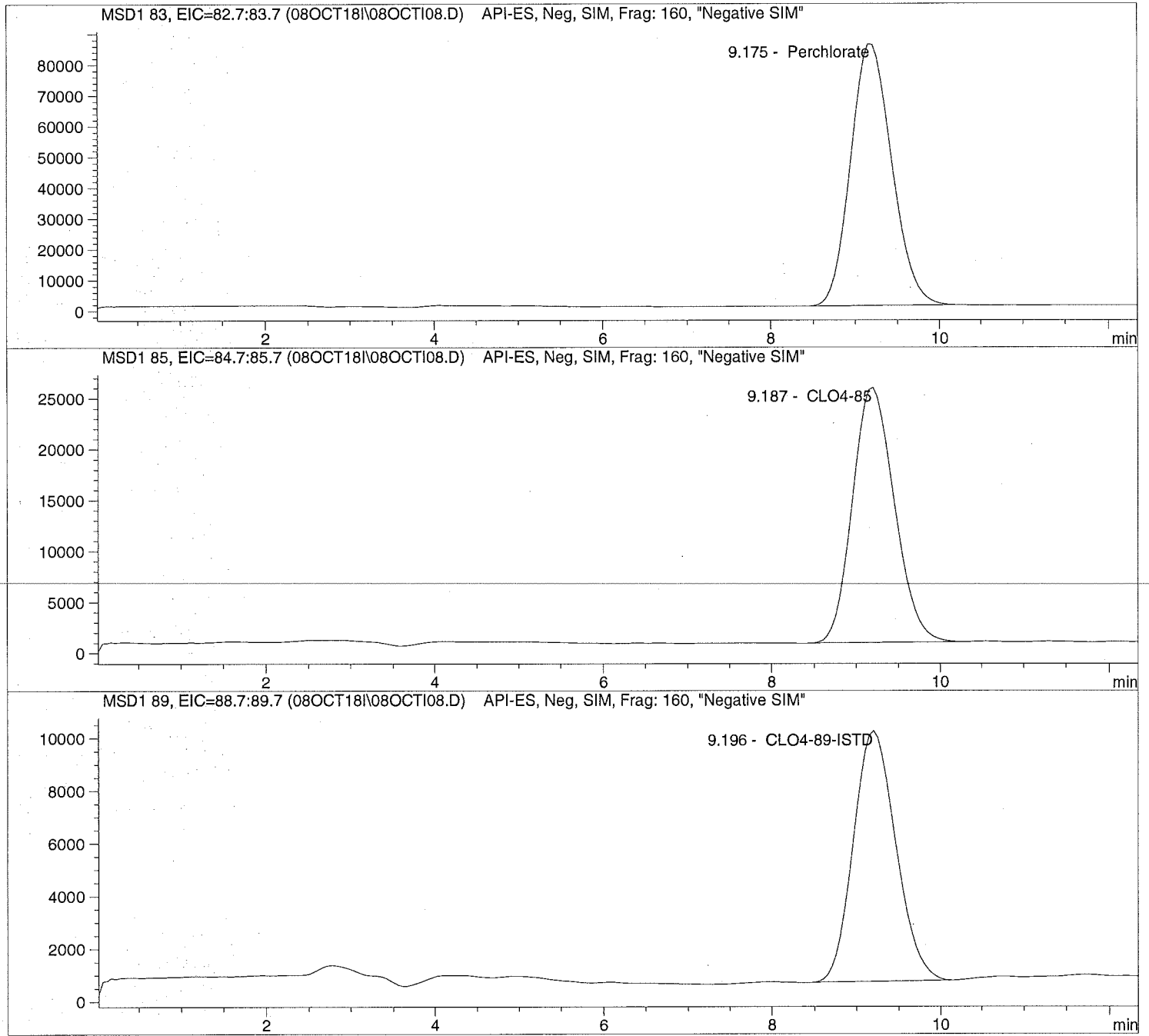


Injection Date: 10/08/2018 12:34:24
Sample Name: CLO4@ 25.ug/L
Acq Operator: TNB

Seq Line: 8
Location: Vial 78
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 10/9/2018 08:22:51

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\08OCT18I\08OCTI08.D

Sample Name: CLO4@ 25.ug/L

```

=====
Injection Date: 10/08/2018 12:34:24      Seq Line:      8
Sample Name:    CLO4@ 25.ug/L            Location:      Vial 78
Acq Operator:   TNB                      Inj. No.:     1
                                           Inj. Vol.:    25 µl

```

```

Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   10/9/2018 08:22:51

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 9. Oct. 2018, 08:01:57 am
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
9.175	PBA	2880966.0	25.8304	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.187	PBA	862978.0	25.6268	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.196	PBA	332339.7	5.0000	CLO4-89-ISTD

```

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

```

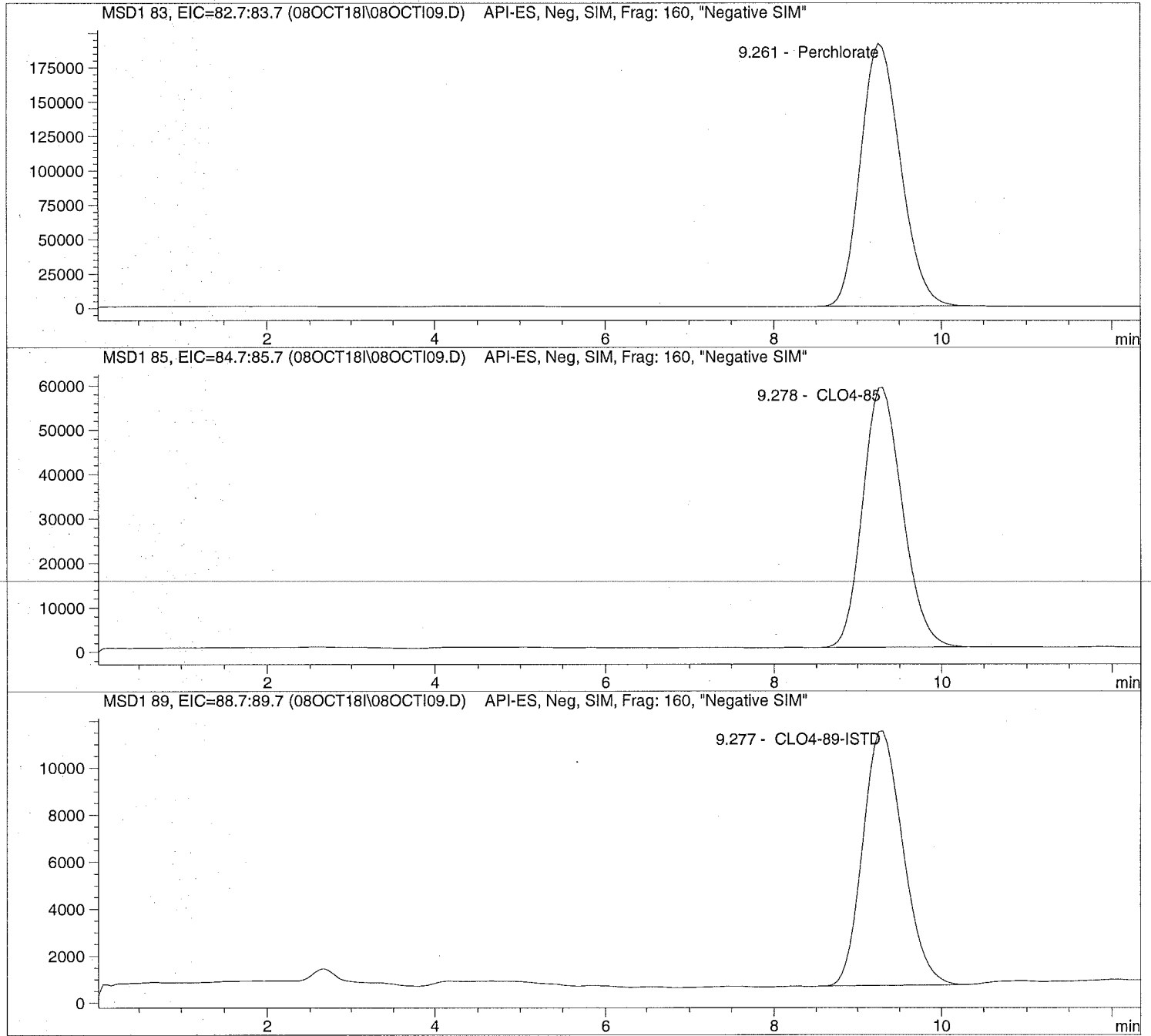


Injection Date: 10/08/2018 12:48:34
Sample Name: CLO4@ 50.ug/L
Acq Operator: TNB

Seq Line: 9
Location: Vial 79
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 10/9/2018 08:22:51

Perchlorate analysis



```
=====
Injection Date: 10/08/2018 12:48:34      Seq Line:          9
Sample Name:    CLO4@ 50.ug/L            Location:         Vial 79
Acq Operator:  TNB                      Inj. No.:        1
                                           Inj. Vol.:       25 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   10/9/2018 08:22:51
=====
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Tue, 9. Oct. 2018, 08:01:57 am
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
9.261	PBA	6295070.5	49.9198	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.278	PBA	1918466.9	49.7485	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.277	PBA	359392.8	5.0000	CLO4-89-ISTD

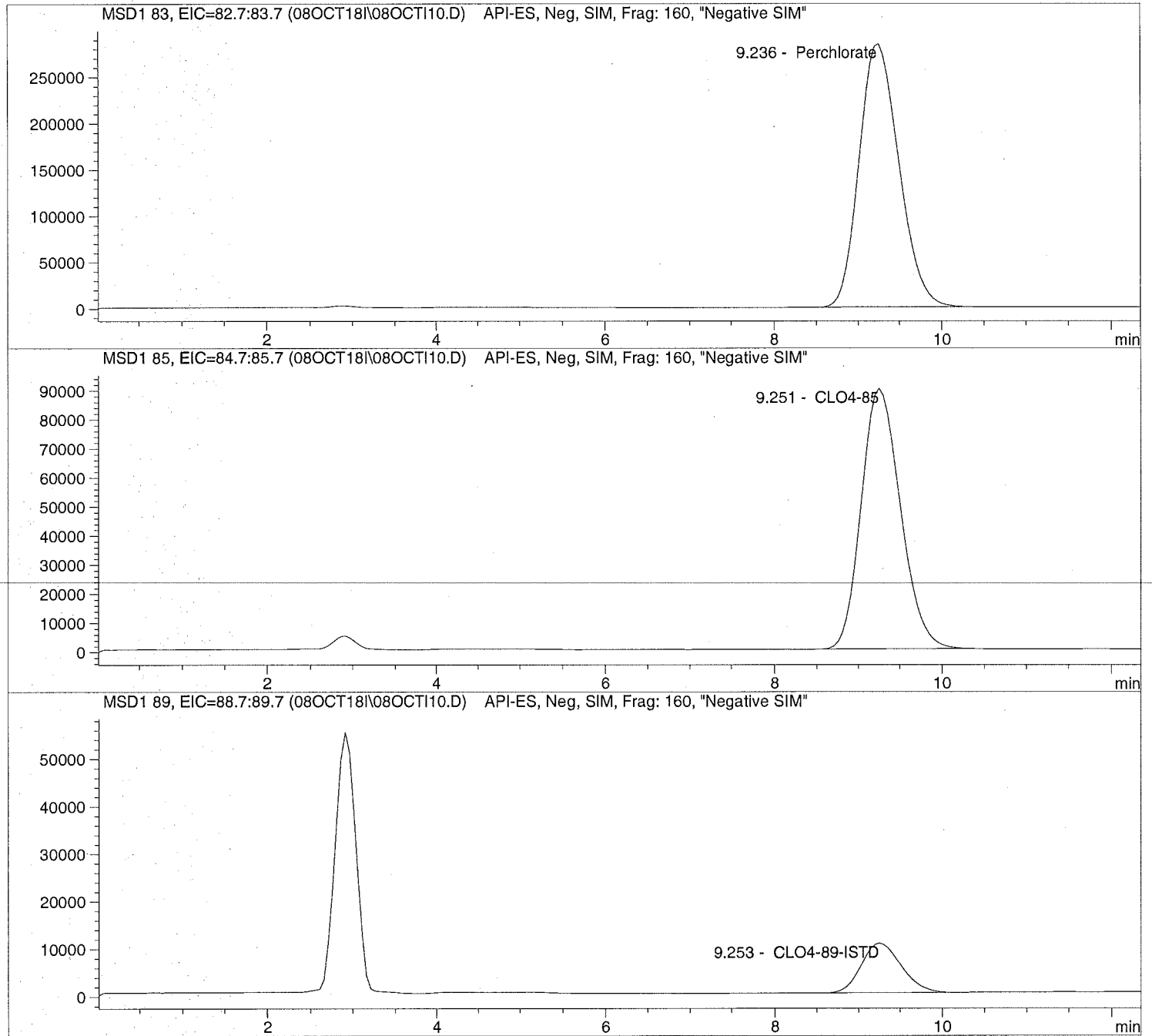
=====
*** End of Report ***



=====
Injection Date: 10/08/2018 13:02:48 Seq Line: 10
Sample Name: CLO4@ 75.ug/L Location: Vial 80
Acq Operator: TNB Inj. No.: 1
 Inj. Vol.: 25 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 10/9/2018 08:22:51

Perchlorate analysis
=====



Data file: C:\HPCHEM\1\DATA\08OCT18I\08OCTI10.D

Sample Name: CLO4@ 75.ug/L

```

=====
Injection Date: 10/08/2018 13:02:48      Seq Line:          10
Sample Name:   CLO4@ 75.ug/L             Location:         Vial 80
Acq Operator:  TNB                       Inj. No.:        1
                                           Inj. Vol.:       25 µl
=====

```

```

Acq. Method:   CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:  10/9/2018 08:22:51
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 9. Oct. 2018, 08:01:57 am
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
9.236	PBA	9457367.0	74.8852	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.251	PBA	2938347.5	75.0265	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.253	PBA	345192.7	5.0000	CLO4-89-ISTD

```

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

```

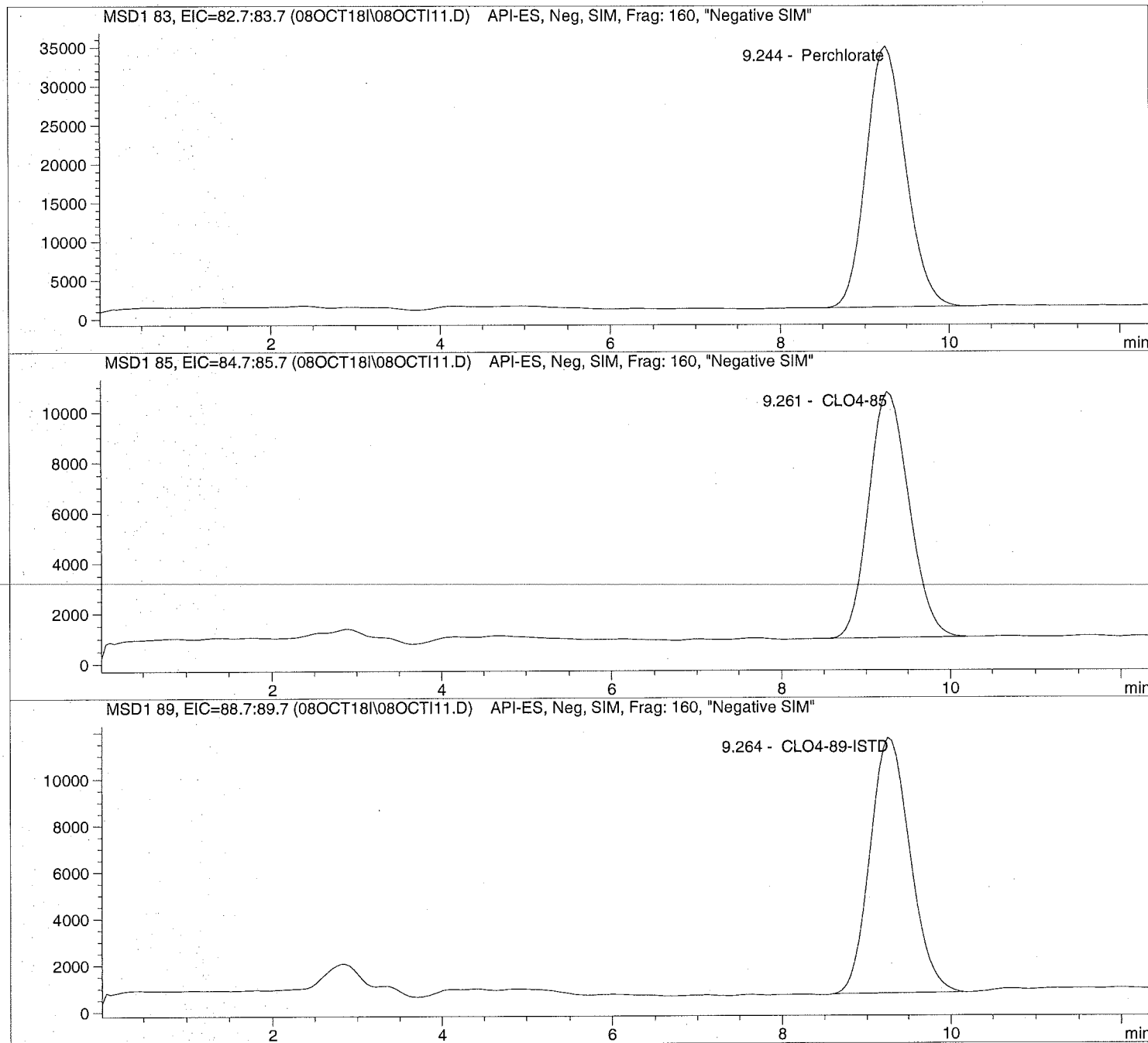


Injection Date: 10/08/2018 13:17:00
Sample Name: ICAL Verf@10ug/L
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
Inj. No.: 1
Inj. Vol.: 25 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed: 10/9/2018 08:22:51

Perchlorate analysis



```
=====
Injection Date: 10/08/2018 13:17:00      Seq Line: 11
Sample Name:    ICAL Verf@10ug/L         Location:  Vial 81
Acq Operator:   TNB                      Inj. No.: 1
                                           Inj. Vol.: 25 µl
=====
```

```
Acq. Method:    CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DPR.M
Last Changed:   10/9/2018 08:22:51
=====
```

Perchlorate analysis

```
=====
                          Sample Information
=====
```

```
Sorted By:      Signal
Calib. Data Modified: Tue, 9. Oct. 2018, 08:01:57 am
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
9.244	PBA	1100685.7	9.3895	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.261	PBA	327974.4	9.2891	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.264	PBA	364657.2	5.0000	CLO4-89-ISTD

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



HS19040315 LHAAP Quarterly Surface Water Final

ALS WO# HS19040315





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

HS19040315 LHAAP Quarterly Surface Water Final

CoverPage

CoverLetter

Sample Summary

CaseNarrative

HBW7_040119

HBW7_040119_a

HBW10_040119

HBW1_040119

GPW1_040119

GPW3_040119

Dates Report

Acronyms

Certifications

Sample Tracking Record

SampleReceiptCheckList

COC

HS19040315 ALS Salt Lake City Combined Report 1909949





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

WorkOrder: HS19040315

LHAAP / Quarterly Surface Water

Bhate Environmental Associates, Inc.

Marcia Olive
445 Union Blvd Ste 129
Lakewood CO 80228

15-Apr-2019





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

April 15, 2019

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

Work Order: **HS19040315**

Laboratory Results for: **LHAAP / Quarterly Surface Water**

Dear Marcia,

ALS Environmental received 6 sample(s) on Apr 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 simple black oval.

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager



ALS Houston, US

Date: 15-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Quarterly Surface Water
Work Order: HS19040315

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19040315-01	HBW7_040119	Surface Water		03-Apr-2019 09:35	05-Apr-2019 08:40	<input type="checkbox"/>
HS19040315-02	HBW7_040119_a	Surface Water		03-Apr-2019 09:35	05-Apr-2019 08:40	<input type="checkbox"/>
HS19040315-03	HBW10_040119	Surface Water		03-Apr-2019 09:45	05-Apr-2019 08:40	<input type="checkbox"/>
HS19040315-04	HBW1_040119	Surface Water		03-Apr-2019 09:57	05-Apr-2019 08:40	<input type="checkbox"/>
HS19040315-05	GPW1_040119	Surface Water		03-Apr-2019 10:12	05-Apr-2019 08:40	<input type="checkbox"/>
HS19040315-06	GPW3_040119	Surface Water		03-Apr-2019 10:23	05-Apr-2019 08:40	<input type="checkbox"/>



ALS Houston, US

Date: 15-Apr-19

Client: Bhate Environmental Associates, Inc.

CASE NARRATIVE

Project: LHAAP / Quarterly Surface Water

Work Order:

Work Order Comments

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



ALS Houston, US

Date: 15-Apr-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP / Quarterly Surface Water
 Sample ID: HBW7_040119
 Collection Date: 03-Apr-2019 09:35

ANALYTICAL REPORT

WorkOrder:HS19040315
 Lab ID:HS19040315-01
 Matrix:Surface 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-Apr-2019 09:48

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



ALS Houston, US

Date: 15-Apr-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP / Quarterly Surface Water
 Sample ID: HBW7_040119_a
 Collection Date: 03-Apr-2019 09:35

ANALYTICAL REPORT

WorkOrder:HS19040315
 Lab ID:HS19040315-02
 Matrix:Surface 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-Apr-2019 09:48

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



ALS Houston, US

Date: 15-Apr-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP / Quarterly Surface Water
 Sample ID: HBW10_040119
 Collection Date: 03-Apr-2019 09:45

ANALYTICAL REPORT

WorkOrder:HS19040315
 Lab ID:HS19040315-03
 Matrix:Surface 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-Apr-2019 09:48

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



ALS Houston, US

Date: 15-Apr-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP / Quarterly Surface Water
 Sample ID: HBW1_040119
 Collection Date: 03-Apr-2019 09:57

ANALYTICAL REPORT

WorkOrder:HS19040315
 Lab ID:HS19040315-04
 Matrix:Surface 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-Apr-2019 09:48

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



ALS Houston, US

Date: 15-Apr-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP / Quarterly Surface Water
 Sample ID: GPW1_040119
 Collection Date: 03-Apr-2019 10:12

ANALYTICAL REPORT

WorkOrder:HS19040315
 Lab ID:HS19040315-05
 Matrix:Surface 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-Apr-2019 09:48

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



ALS Houston, US

Date: 15-Apr-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP / Quarterly Surface Water
 Sample ID: GPW3_040119
 Collection Date: 03-Apr-2019 10:23

ANALYTICAL REPORT

WorkOrder:HS19040315
 Lab ID:HS19040315-06
 Matrix:Surface 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-Apr-2019 09:48

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



ALS Houston, US

Date: 15-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Quarterly Surface Water
WorkOrder: HS19040315

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R336563	Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850) Matrix: Surface Water					
HS19040315-01	HBW7_040119	03 Apr 2019 09:35			15 Apr 2019 09:48	1
HS19040315-02	HBW7_040119_a	03 Apr 2019 09:35			15 Apr 2019 09:48	1
HS19040315-03	HBW10_040119	03 Apr 2019 09:45			15 Apr 2019 09:48	1
HS19040315-04	HBW1_040119	03 Apr 2019 09:57			15 Apr 2019 09:48	1
HS19040315-05	GPW1_040119	03 Apr 2019 10:12			15 Apr 2019 09:48	1
HS19040315-06	GPW3_040119	03 Apr 2019 10:23			15 Apr 2019 09:48	1



ALS Houston, US

Date: 15-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Quarterly Surface Water
WorkOrder: HS19040315

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

ALS Houston, US

Date: 15-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Quarterly Surface Water
Work Order: HS19040315

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19040315-01	HBW7_040119	Login	4/5/2019 11:19:17 AM	NDR	Sub
HS19040315-02	HBW7_040119_a	Login	4/5/2019 11:19:17 AM	NDR	Sub
HS19040315-03	HBW10_040119	Login	4/5/2019 11:19:17 AM	NDR	Sub
HS19040315-04	HBW1_040119	Login	4/5/2019 11:19:17 AM	NDR	Sub
HS19040315-05	GPW1_040119	Login	4/5/2019 11:19:17 AM	NDR	Sub
HS19040315-06	GPW3_040119	Login	4/5/2019 11:19:17 AM	NDR	Sub



Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19040315

Date/Time Received: **05-Apr-2019 08:40**
 Received by: **NDR**

Checklist completed by: Nilesh D. Ranchod 5-Apr-2019
 eSignature Date

Reviewed by: RJ Modashia 5-Apr-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 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):

3.5c UC/C	IR11
-----------	------

Cooler(s)/Kit(s):

Red

Date/Time sample(s) sent to storage:

04/05/2019 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:

--





1608 13th Avenue South, Suite 300
 Birmingham Alabama 35205
 Tel: 205-918-4000
 Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____
 Project/Phase No: NWO1312.0150
 COC Number(1): _____
 LIMS Number: _____

Facility/Base ID.: **LHAAP**

Project/Site Name: **LHAAP / Quarterly Surface Water Samples**

Client Name:

Collected by: **Scott Beesinger**

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mm-yyyy)	Time Collected (Military (hhmm))	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers
HBW7_040119		03 Apr 2019	09:35	-	N		WS	1
HBW7_040119_a		03 Apr 2019	09:35	-	FD		WS	1
HBW10_040119		03 Apr 2019	09:45	-	N		WS	1
HBW1_040119		03 Apr 2019	09:57	-	N		WS	1
GPW1_040119		03 Apr 2019	10:12	-	N		WS	1
GPW3_040119		03 Apr 2019	10:23	-	N		WS	1

COMMENTS:

Sample Analysis Requested (5)

Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number

HS19040315

Bhate Environmental Associates, Inc.
 LHAAP / Quarterly Surface Water



Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signature) Scott Beesinger Date 4/4/19 Time 1430
 Received by (signed) Na Date 4/5/19 Time 08:40
 2. _____
 3. _____

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped _____
 Method of Shipment: Fed _____ Ek _____ Airbill _____
 Analytical Lab: ALS 10450 Stanchiff Rd., Suite 210 Houston, TX 77099 (281) 530-5656
 Lab Recipient: ATTN: SONIA WEST
 Delivery Date/Time: _____
 No.: _____
 Number: _____

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)
 2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)
 3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)
 4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks
 5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.
 6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

Handwritten notes:
 IR N 11
 TEMP 3.5
 44557



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

CUSTODY SEAL

Date: <u>4.5.19</u>	Time: <u>12:30</u>	Seal Broken By: NR
Name: <u>Scott Redinger</u>		Date: 4.5.19
Company: <u>BHATE</u>		

FedEx
 TRK# 4809 7831 3395
 0221

FRI - 05 APR 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
 TX-US
IAH



FID 162785 04APR19 GGGG 553C1/07E5/0C8A





Case Narrative

Method: 6850

Analysis: Perchlorate

Analysis SOP: LC-MS-CLO4

ALS WO ID(s): 1909152; 1909153; 1909154;
1909947; 1909949

Client: ALS Laboratories (Houston, TX)

Matrix: Water

ELMS Batch (HBN): 2233 (236356)

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

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

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 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 1909153001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 647198) was less than 1/2 the CRDL. The recovery for the LCS (647199) was within acceptable parameters.





ANALYTICAL REPORT

Report Date: April 11, 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: **34-1909949**

Project ID: HS19040315

Purchase Order: HS19040315

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
HBW7_040119	1909949001	04/03/19	04/06/19	
HBW7_040119-a	1909949002	04/03/19	04/06/19	
HBW10_040119	1909949003	04/03/19	04/06/19	
HBW1_040119	1909949004	04/03/19	04/06/19	
GPW1_040119	1909949005	04/03/19	04/06/19	
GPW3_040119	1909949006	04/03/19	04/06/19	

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: **34-1909949**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: HBW7_040119	Sampling Site: NA	Collected: 04/03/2019				
Lab ID: 1909949001	Media: 125 mL Nalgene	Received: 04/06/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2233 (HBN: 236356) Analyzed: 04/10/2019 12:15	Instrument ID: LCMS04 Percent Solid: 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

Sample ID: HBW7_040119-a	Sampling Site: NA	Collected: 04/03/2019				
Lab ID: 1909949002	Media: 125 mL Nalgene	Received: 04/06/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2233 (HBN: 236356) Analyzed: 04/10/2019 12:28	Instrument ID: LCMS04 Percent Solid: 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

Sample ID: HBW10_040119	Sampling Site: NA	Collected: 04/03/2019				
Lab ID: 1909949003	Media: 125 mL Nalgene	Received: 04/06/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2233 (HBN: 236356) Analyzed: 04/10/2019 12:41	Instrument ID: LCMS04 Percent Solid: 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

Sample ID: HBW1_040119	Sampling Site: NA	Collected: 04/03/2019				
Lab ID: 1909949004	Media: 125 mL Nalgene	Received: 04/06/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2233 (HBN: 236356) Analyzed: 04/10/2019 12:55	Instrument ID: LCMS04 Percent Solid: 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



ANALYTICAL REPORT

Workorder: **34-1909949**Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: GPW1_040119	Sampling Site: NA	Collected: 04/03/2019				
Lab ID: 1909949005	Media: 125 mL Nalgene	Received: 04/06/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2233 (HBN: 236356) Analyzed: 04/10/2019 13:08	Instrument ID: LCMS04 Percent Solid: 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

Sample ID: GPW3_040119	Sampling Site: NA	Collected: 04/03/2019				
Lab ID: 1909949006	Media: 125 mL Nalgene	Received: 04/06/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2233 (HBN: 236356) Analyzed: 04/10/2019 13:21	Instrument ID: LCMS04 Percent Solid: 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: 236356)

Field sample 1909153001 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 04/11/2019 09:27	/S/ Stephen Brose 04/11/2019 15:00

Laboratory Contact Information

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

Phone: (801) 266-7700
Email: als@alsglobal.com
Web: www.als.com





ANALYTICAL REPORT

Workorder: 34-1909949

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
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf	
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

00953527

Analysis Information

Workorder: 1909949

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2233 (HBN: 236356)
Analyzed By: Thomas Bosch

Blank

LMB: 647198 Analyzed: 04/10/2019 10:42 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 647199 Analyzed: 04/10/2019 10:15 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	3.68	4.00	91.9	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1909152001 Analyzed: 04/10/2019 10:55 Dilution: 1 Units: ug/L		MS: 647200 Analyzed: 04/10/2019 11:08 Dilution: 1 Units: ug/L				MSD: 647201 Analyzed: 04/10/2019 11:22 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	2.60	6.18	4 #	154	78.8 123.8	6.36 #	159	2.92	0.0 20.0

Comments

Field sample 1909153001 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 04/11/2019 13:48	/S/ Stephen Brose 04/11/2019 15:00

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

18698/#2

Subcontract Chain of Custody

COC ID: 11077

1909949

SUBCONTRACT TO:

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

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

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

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19040315
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS19040315-01	HBW7_040119	Surface Water	03 Apr 2019 09:35
	SUB_Perch-6850			19 Apr 2019
2.	HS19040315-02	HBW7_040119_a	Surface Water	03 Apr 2019 09:35
	SUB_Perch-6850			19 Apr 2019
3.	HS19040315-03	HBW10_040119	Surface Water	03 Apr 2019 09:45
	SUB_Perch-6850			19 Apr 2019
4.	HS19040315-04	HBW1_040119	Surface Water	03 Apr 2019 09:57
	SUB_Perch-6850			19 Apr 2019
5.	HS19040315-05	GPW1_040119	Surface Water	03 Apr 2019 10:12
	SUB_Perch-6850			19 Apr 2019
6.	HS19040315-06	GPW3_040119	Surface Water	03 Apr 2019 10:23
	SUB_Perch-6850			19 Apr 2019

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

QC Level: DOD IV (DoD Data Package)

RIGHT SOLUTIONS | RIGHT PARTNER





Subcontract Chain of Custody

COC ID: 11077

Relinquished By: J. [Signature]

Date/Time: 4/5/19 18:00

Received By: [Signature]

Date/Time: 4/6/19 9:05

Cooler ID(s): 9292

Temperature(s): 2°



ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston Project/Task/Site: 1909949
 Date/Time of Receipt: 4/16/19 905 Number of Coolers Received: 1

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> Cyanide <u>Yes/No/NA</u> Sulfide <u>Yes/No/NA</u> Ammonia <u>Yes/No/NA</u>	Total Phenolics <u>Yes/No/NA</u> TPH - 418.1 <u>Yes/No/NA</u> COD <u>Yes/No/NA</u> TKN <u>Yes/No/NA</u>
NO3/NO2 <u>Yes/No/NA</u> Oil & Grease <u>Yes/No/NA</u> Total Phosphorous <u>Yes/No/NA</u> Gross A.B, Gamma Spec <u>Yes/No/NA</u>	

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 <u>9292</u>	<u>7</u> °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: [Signature] [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!



Part # 150469-434 RITZ EXP 01/20

ORIGIN ID: 9GR1 (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

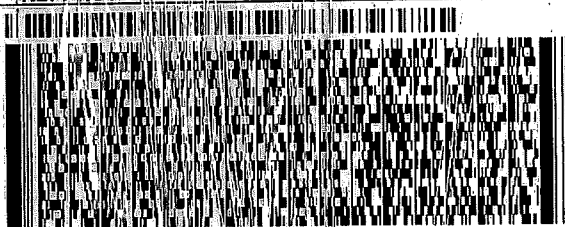
SHIP DATE: 05APR19
ACTWGT: 60.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN
BILL THIRD PARTY

TO **SAMPLE RECEIVING**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123

(801) 210-7701

REF: HS19040347/3147/313/15 - SUBS



FedEx
Express



SATURDAY 12:00P

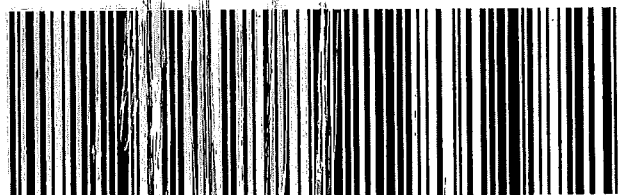
PRIORITY OVERNIGHT

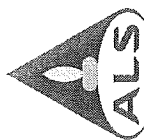
TRK# 4809 7832 6009
0201

XO BTFA

84123

UT-US SLC





Batch Worklist

HBN: 236356

Instrument: LCMS04



Created: 4/9/2019 08:42

Status: WP

Analyst: T. Bosch

Batch: ELMS/ 2233
 Rule: EPA 6850, DoD QSM Water

- Workorder: 1909152 [ENV_LVL4]
- Workorder: 1909153 [ENV_LVL4]
- Workorder: 1909154 [ENV_LVL4]
- Workorder: 1909947 [ENV_LVL4]
- Workorder: 1909949 [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	647195	CCV for HBN 236356 [ELMS/2233]				CCV	3		E685041C3Q	5311		4/11/2019	4/10/2019
2	647199	LCS for HBN 236356 [ELMS/2233]				LCS	3		E6850Q413Q	5311		4/11/2019	4/10/2019
3	647197	ICS for HBN 236356 [ELMS/2233]				ICS	3		E6850..D3Q	5311		4/11/2019	4/10/2019
4	647198	LMB for HBN 236356 [ELMS/2233]				LMB	3		E6850Q413Q	5311		4/11/2019	4/10/2019
5	1909152001	LH18/24-SP650_032719_BIX				SAMPLE	3	1909152001-A	E6850Q41.3	5480	4/24/2019	4/11/2019	4/10/2019
6	647200	LH18/24-SP650...(1909152001MS)				MS	3		E6850Q413Q	5311		4/11/2019	4/10/2019
7	647201	LH18/24-SP65...(1909152001MSD)				MSD	3		E6850Q413Q	5311		4/11/2019	4/10/2019
8	1909153001	LH18-24-SP140_032719				SAMPLE	3	1909153001-A	E6850Q41.3	5480	4/24/2019	4/11/2019	4/10/2019
9	1909154001	LH18/24-SP650_032719_BIX				SAMPLE	3	1909154001-A	E6850Q41.3	5480	4/24/2019	4/11/2019	4/10/2019
10	1909947001	LH18/25-SP650_040419_BIX				SAMPLE	3	1909947001-A	E6850Q41.3	5480	5/2/2019	4/18/2019	4/10/2019
11	1909949001	HBW7_040119				SAMPLE	3	1909949001-A	E6850Q41.3	5480	5/1/2019	4/18/2019	4/10/2019
12	1909949002	HBW7_040119-a				SAMPLE	3	1909949002-A	E6850Q41.3	5480	5/1/2019	4/18/2019	4/10/2019
13	1909949003	HBW10_040119				SAMPLE	3	1909949003-A	E6850Q41.3	5480	5/1/2019	4/18/2019	4/10/2019
14	1909949004	HBW1_040119				SAMPLE	3	1909949004-A	E6850Q41.3	5480	5/1/2019	4/18/2019	4/10/2019
15	1909949005	GPW1_040119				SAMPLE	3	1909949005-A	E6850Q41.3	5480	5/1/2019	4/18/2019	4/10/2019
16	1909949006	GPW3_040119				SAMPLE	3	1909949006-A	E6850Q41.3	5480	5/1/2019	4/18/2019	4/10/2019
17	647196	RLVS for HBN 236356 [ELMS/2233]				RLVS	3		E685041C3Q	5311		4/11/2019	4/10/2019
18	647202	CCV for HBN 236356 [ELMS/2233]				CCV	3		E685041C3Q	5311		4/11/2019	4/10/2019



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation



ALS Work Order #'s & Sample #()'s: 1909152 (001); 1909153 (001); 1909154 (001); 1909947 (001); 1909949 (001-06) ELMS Batch/HBN ID: 2233 (236356)
 Prep Date: 04/09/2019 Analysis Date: 04/10/2019 Analyst: T. Bosch
 Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
 Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\28MAR19D.s
 Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

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

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

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

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.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: 6 Injection Volume: 30µL
 Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

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: 4.0µL of QC Solution Horizon ID 41830 was used for LCS 647199; Target = 4.0µg/L. ASTM type II water was used for LMB 647198.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1909152001 (Client ID's: LH18/24-SP650_032719_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

- Results reported in µg/L. Field sample 1909153001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.
- All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD – 647200/01 failed QC acceptance criteria for percent recoveries, biased high. This is due to the fact that the unspiked sample result of 2.574µg/L was not subtracted from the MS/MSD results. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
- Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\APR\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- Notebook: \\slstws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\236356-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATA\REVIEW\HBN#
- The Reporting Limit Verification Standard (RLVS – 647196) is reported from the analysis of the Laboratory Control Sample (LCS – 647199) at a level 4.0µg/L.
- Due to limitations of the Chemstation Software, many of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03).



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.

<u>Chromatography (GC, HPLC, LC/MS) Technical Review Criteria</u>	<u>Analyst Initials</u>	<u>Reviewer Initials</u>
Batch(es)/SDG: E LMS: <u>2233</u> HBN: <u>236356</u> 1909947 / 1909949		
Sample Set IDs if Applicable: <u>1909152/1909153/1909154</u>		
<u>Calibration standards analyzed and meets criteria</u>	TB	SB
<u>Standards traceability checked and meets criteria</u>	TB	SB
<u>Standard curve coefficients evaluated and meet criteria</u>	TB	SB
<u>ICVs analyzed and meet acceptance criteria</u>	TB	SB
<u>CCVs analyzed and meet acceptance criteria</u>	TB	SB
<u>Method Blanks analyzed and meet acceptance criteria</u>	TB	SB
<u>Retention Time Windows checked</u>	TB	SB
<u>For method 8081A, Endrin/DDT Breakdown is checked for compliance</u>	—	—
<u>Surrogate recoveries checked and appropriately addressed</u>	—	—
<u>Method Preparation Blanks analyzed and meet acceptance criteria</u>	TB	SB
<u>MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed</u>	TB	SB
<u>RLVS analyzed</u>	TB	SB
<u>Preparation and analysis hold times met</u>	TB	SB
<u>Preparation deviations and re-preparations noted when performed</u>	TB	SB
<u>Analysis deviations and re-analyses noted when performed</u>	TB	SB
<u>Sample dilution factors noted on reports</u>	TB	SB
<u>Electronic records in HBN transcription accuracy and completeness checked</u>	TB	SB
<u>Preparation and analysis calculations checked</u>	TB	SB
<u>NCRs are completed as necessary NC/CAR#</u>	—	—
<u>Report forms are complete and accurate</u>	TB	SB
<u>Manual integrations checked</u>	TB	SB



STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK			Description - 6850 WKG Std 100.ug/L		
Standard: 43702		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/18/2018 02:09PM		Expires: 09/18/2019	
MFG Lot: TNB: 09/18/2018				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 WRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019





STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK			Description - 6850 Stock AccStd 1,000ug/mL
Standard: 43659		Created By: Thomas Bosch	
MFG: AccuStandard		Create Date: 09/17/2018 09:09AM	
MFG Lot: 218065075		Amount: 100 mL	
Part ID: IC-PER-10X-1		Expires: 07/25/2020	
		Usable: No	
		Lab Lot: CLO4 STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	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: 43701		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/18/2018 02:09PM		Expires: 09/18/2019	
MFG Lot: TNB: 09/18/2018				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 INT	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020



STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK		Description: 6850 QC WKG STD 100ug/L			
Standard: 41831		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 05/09/2018 10:05AM		Expires: 05/09/2019	
MFG Lot: TNB: 05/09/2018				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
41830	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	05/09/2019





STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT		Description - 6850 QC-Intmddf Std-QC 10ug/mL	
Standard: 41830	Created By: Thomas Bosch	Amount: 10 mL	
MFG: ALS/SLC	Create Date: 05/09/2018 10:05AM	Expires: 05/09/2019	
MFG Lot: TNB: 05/09/2018		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





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	
MFG: Ultra Scientific		Create Date: 05/11/2017 01:05PM	
MFG Lot: CP-0860		Amount: 100 mL	
Part ID: ICC-013		Expires: 03/31/2020	
		Usable: Yes	
		Lab Lot: CLO4 QC STOCK	
Pos	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL





STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK			Description - Perchlorate ISTD Wrk 1,000ug/L		
Standard: 43730	Created By: Thomas Bosch	Amount: 25 mL			
MFG: ALS/SLC	Create Date: 09/20/2018 09:09AM	Expires: 09/20/2019			
MFG Lot: TNB: 05/09/2018	Verified By: Thomas Bosch	Usable: Yes			
Pipette ID: Not Provided	Verify Date:	Lab Lot: CLO4ISTDWRK			
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026





STANDARD REPORT

Constituent

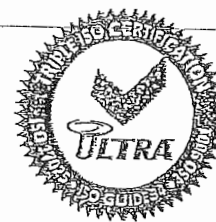
Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock	
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL	
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026	
MFG Lot: SDFP-012A	Verified By: Thomas Bosch	Usable: Yes	
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK	
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL





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.

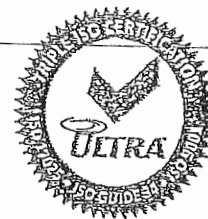
Expiration of Certification:

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.





Certificate of Analysis



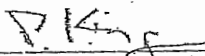
ISO Guide 34 Reference Material

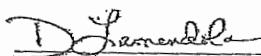
Product Number: ICC-013
Lot Number: CP-0860

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/QA



125 Market Street
New Haven, CT 06513
USA



AccuStandard®

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

CERTIFICATE OF ANALYSIS



S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (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. 822-275B72-11

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:

Melgan O'Leary

Melgan 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

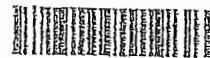
QR-ORG/INO-001
Rev. 5/18



Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

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



23118

Product Name: PERCHLORIC ACID, SODIUM SALT
 (Isotopic Label & Enrichment Specification) (18O4, 90%+) 100 UG/ML IN WATER

Lot Number: SDDG-013

Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$
 Labeled CAS Number: NA
 Unlabeled CAS Number: 7601-89-0
 MW*: 130.4
 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.

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

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

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

Approved by: T. J. Eckersley

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

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 $\mu\text{g/mL}$
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 \pm 2.8 $\mu\text{g/mL}$ (k=2)





ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data



Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP2.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
#*	647195	CCV@25	Vial 71	1	Control	1	1.06336e6	21.31933
#*	647199	QC@4.0	Vial 72	1	Control	2	1.97600e5	3.67714
#*	647197	ICS@4.0	Vial 73	1	Control	3	1.49399e5	3.21517
#*	647198	LMB	Vial 74	1	Control	4	0.00000	0.00000
#*	1909152001		Vial 75	1	Sample	5	9.15156e4	2.57433
#*	647200	91521MS	Vial 76	1	Sample	6	2.25049e5	6.17769
#*	647201	91521SD	Vial 77	1	Sample	7	2.49579e5	6.36091
#*	1909153001	1K	Vial 78	1	Sample	8	3.70174e5	6532.86203
#*	1909154001		Vial 79	1	Sample	9	7.79123e4	2.34023
#*	1909947001		Vial 80	1	Sample	10	0.00000	0.00000
#*	1909949001		Vial 81	1	Sample	11	0.00000	0.00000
#*	1909949002		Vial 82	1	Sample	12	0.00000	0.00000
#*	1909949003		Vial 83	1	Sample	13	0.00000	0.00000
#*	1909949004		Vial 84	1	Sample	14	0.00000	0.00000
#*	1909949005		Vial 85	1	Sample	15	0.00000	0.00000
#*	1909949006		Vial 86	1	Sample	16	0.00000	0.00000
*	647202	CCV@25	Vial 71	1	Control	17	1.08007e6	22.59518

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	647195	CCV@25	Vial 71	1	Control	1	3.43635e5	23.09461
#*	647199	QC@4.0	Vial 72	1	Control	2	7.01681e4	4.22460
#*	647197	ICS@4.0	Vial 73	1	Control	3	5.45965e4	3.77625
#*	647198	LMB	Vial 74	1	Control	4	0.00000	0.00000
#*	1909152001		Vial 75	1	Sample	5	3.18275e4	2.84107
#*	647200	91521MS	Vial 76	1	Sample	6	7.61114e4	6.88356
#*	647201	91521SD	Vial 77	1	Sample	7	8.42686e4	7.08137
#*	1909153001	1K	Vial 78	1	Sample	8	1.21054e5	7051.77497
#*	1909154001		Vial 79	1	Sample	9	2.76117e4	2.61418
#*	1909947001		Vial 80	1	Sample	10	0.00000	0.00000
#*	1909949001		Vial 81	1	Sample	11	0.00000	0.00000
#*	1909949002		Vial 82	1	Sample	12	0.00000	0.00000
#*	1909949003		Vial 83	1	Sample	13	0.00000	0.00000
#*	1909949004		Vial 84	1	Sample	14	0.00000	0.00000
#*	1909949005		Vial 85	1	Sample	15	0.00000	0.00000
#*	1909949006		Vial 86	1	Sample	16	0.00000	0.00000
*	647202	CCV@25	Vial 71	1	Control	17	3.36319e5	23.63294

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	647195	CCV@25	Vial 71	1	Control	1	1.53120e5	5.00000
#*	647199	QC@4.0	Vial 72	1	Control	2	1.77838e5	5.00000
#*	647197	ICS@4.0	Vial 73	1	Control	3	1.54931e5	5.00000
#*	647198	LMB	Vial 74	1	Control	4	1.76915e5	5.00000
#*	1909152001		Vial 75	1	Sample	5	1.20240e5	5.00000
#*	647200	91521MS	Vial 76	1	Sample	6	1.17757e5	5.00000
#*	647201	91521SD	Vial 77	1	Sample	7	1.26683e5	5.00000
#*	1909153001	1K	Vial 78	1	Sample	8	1.82758e5	5000.00000
#*	1909154001		Vial 79	1	Sample	9	1.13404e5	5.00000
#*	1909947001		Vial 80	1	Sample	10	1.15130e5	5.00000
#*	1909949001		Vial 81	1	Sample	11	1.14791e5	5.00000
#*	1909949002		Vial 82	1	Sample	12	1.24046e5	5.00000
#*	1909949003		Vial 83	1	Sample	13	1.23373e5	5.00000
#*	1909949004		Vial 84	1	Sample	14	1.20241e5	5.00000
#*	1909949005		Vial 85	1	Sample	15	1.27767e5	5.00000
#*	1909949006		Vial 86	1	Sample	16	1.23965e5	5.00000
*	647202	CCV@25	Vial 71	1	Control	17	1.46281e5	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	647195	CCV@25	CLO4-AQN	1	Ctrl Samp	
2	Vial 72	647199	QC@4.0	CLO4-AQN	1	Ctrl Samp	
3	Vial 73	647197	ICS@4.0	CLO4-AQN	1	Ctrl Samp	
4	Vial 74	647198	LMB	CLO4-AQN	1	Ctrl Samp	
5	Vial 75	1909152001		CLO4-AQN	1	Sample	
6	Vial 76	647200	91521MS	CLO4-AQN	1	Sample	
7	Vial 77	647201	91521SD	CLO4-AQN	1	Sample	
8	Vial 78	1909153001	1K	CLO4-AQN	1	Sample	
9	Vial 79	1909154001		CLO4-AQN	1	Sample	
10	Vial 80	1909947001		CLO4-AQN	1	Sample	
11	Vial 81	1909949001		CLO4-AQN	1	Sample	
12	Vial 82	1909949002		CLO4-AQN	1	Sample	
13	Vial 83	1909949003		CLO4-AQN	1	Sample	
14	Vial 84	1909949004		CLO4-AQN	1	Sample	
15	Vial 85	1909949005		CLO4-AQN	1	Sample	
16	Vial 86	1909949006		CLO4-AQN	1	Sample	
17	Vial 71	647202	CCV@25	CLO4-AQN	1	Ctrl Samp	

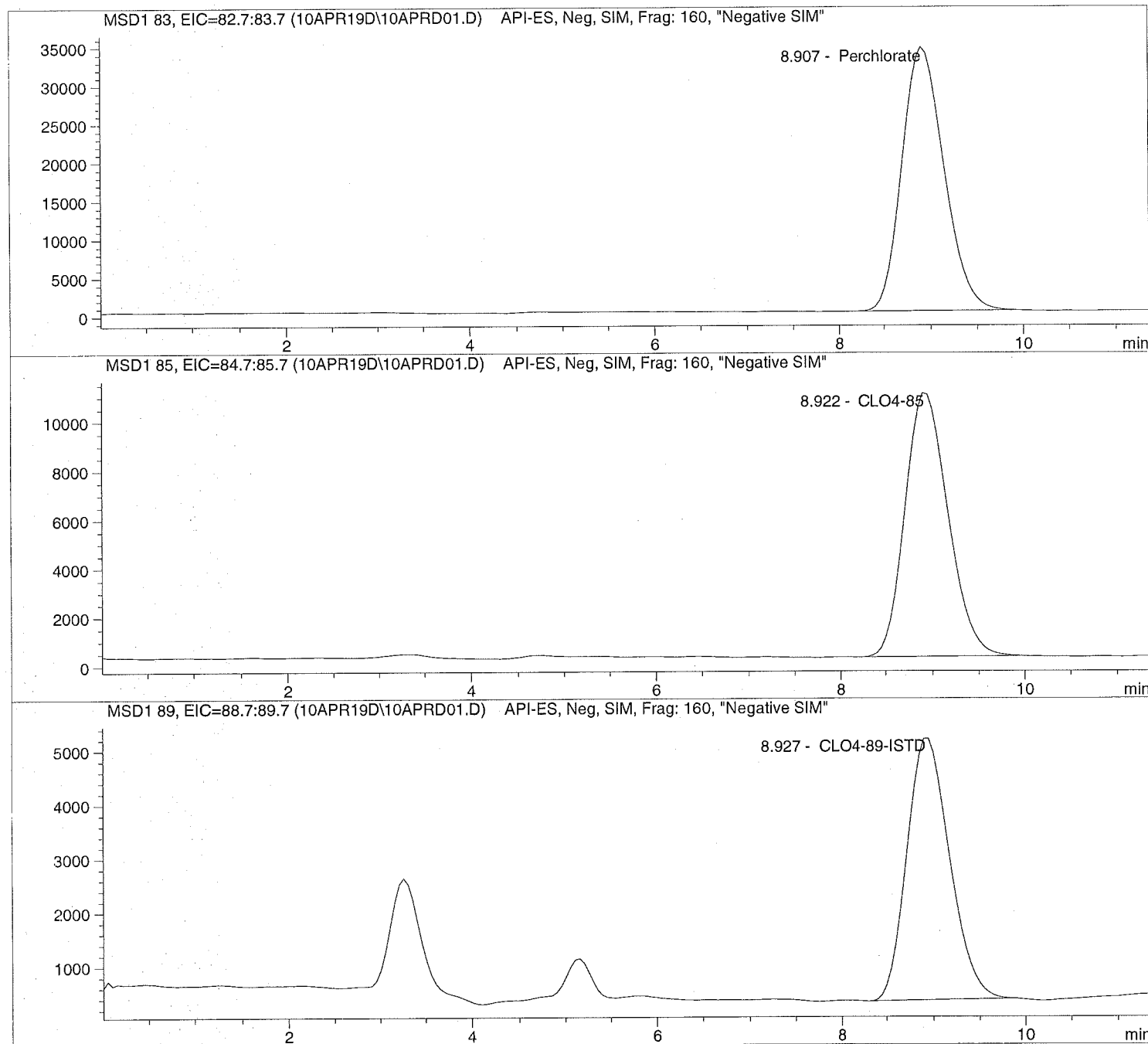


Injection Date: 4/10/2019 10:01:38
Sample Name: 647195 CCV@25
Acq Operator: TNB

Seq Line: 1
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



```

=====
Injection Date: 4/10/2019 10:01:38      Seq Line: 1
Sample Name: 647195 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-DP2.M
Last Changed: 3/19/2019 14:48:09

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019, 02:35:19 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
8.907	PBA	1063358.2	21.3193	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.922	PBA	343635.4	23.0946	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.927	PBA	153120.0	5.0000	CLO4-89-ISTD

```

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

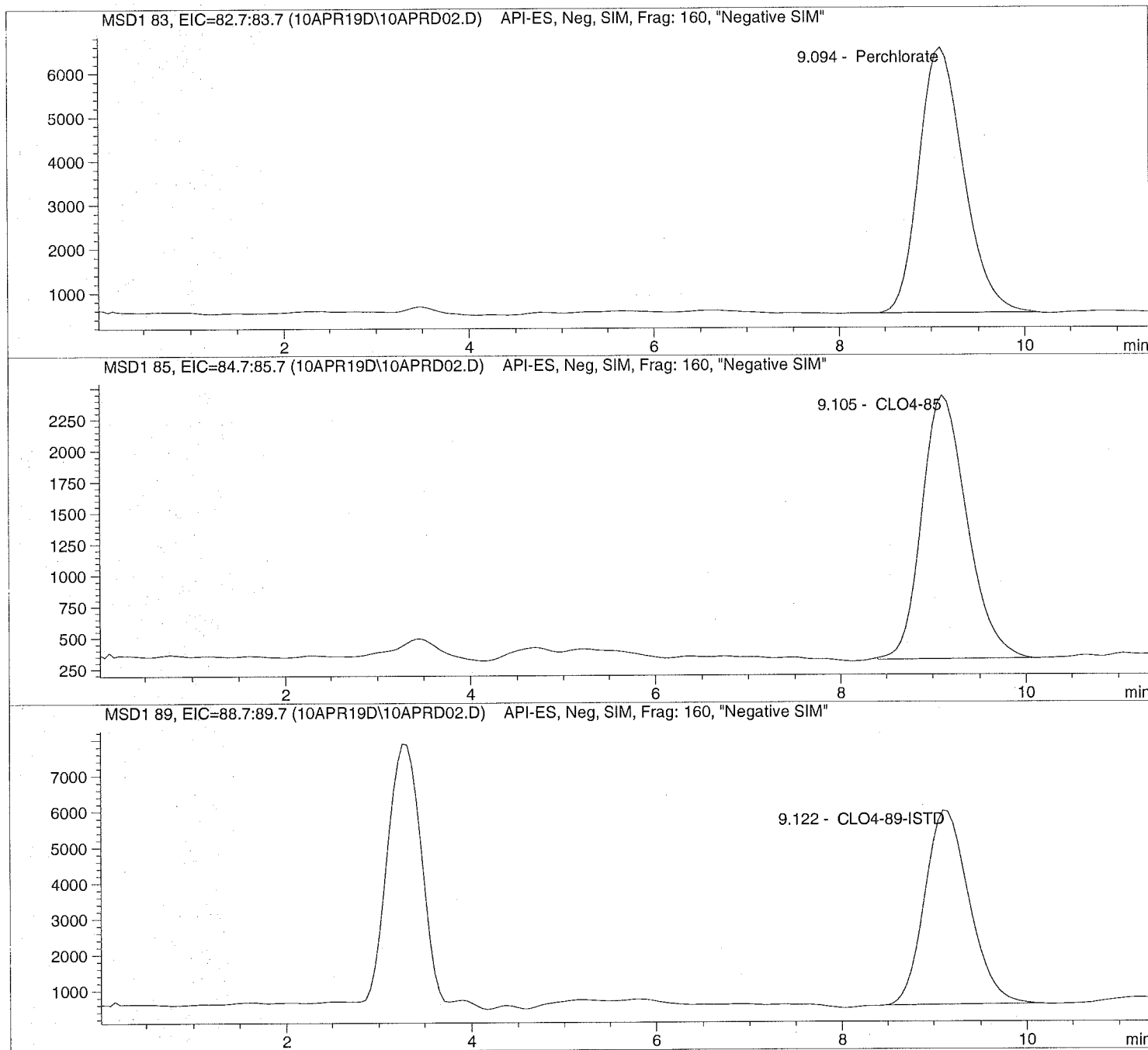
```


Injection Date: 4/10/2019 10:15:40
Sample Name: 647199 QC@4.0
Acq Operator: TNB

Seq Line: 2
Location: Vial 72
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



```
=====  
Injection Date: 4/10/2019 10:15:40      Seq Line: 2  
Sample Name: 647199 QC@4.0             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-DP2.M  
Last Changed: 3/19/2019 14:48:09
```

Perchlorate analysis

=====
Sample Information
=====

```
Sorted By: Signal  
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm  
Multiplier: 1.000000  
Dilution: 1.000000  
Sample Amount: 4.000
```

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.094	BBA	197600.1	3.6771	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.105	BBA	70168.1	4.2246	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.122	BBA	177837.9	5.0000	CLO4-89-ISTD

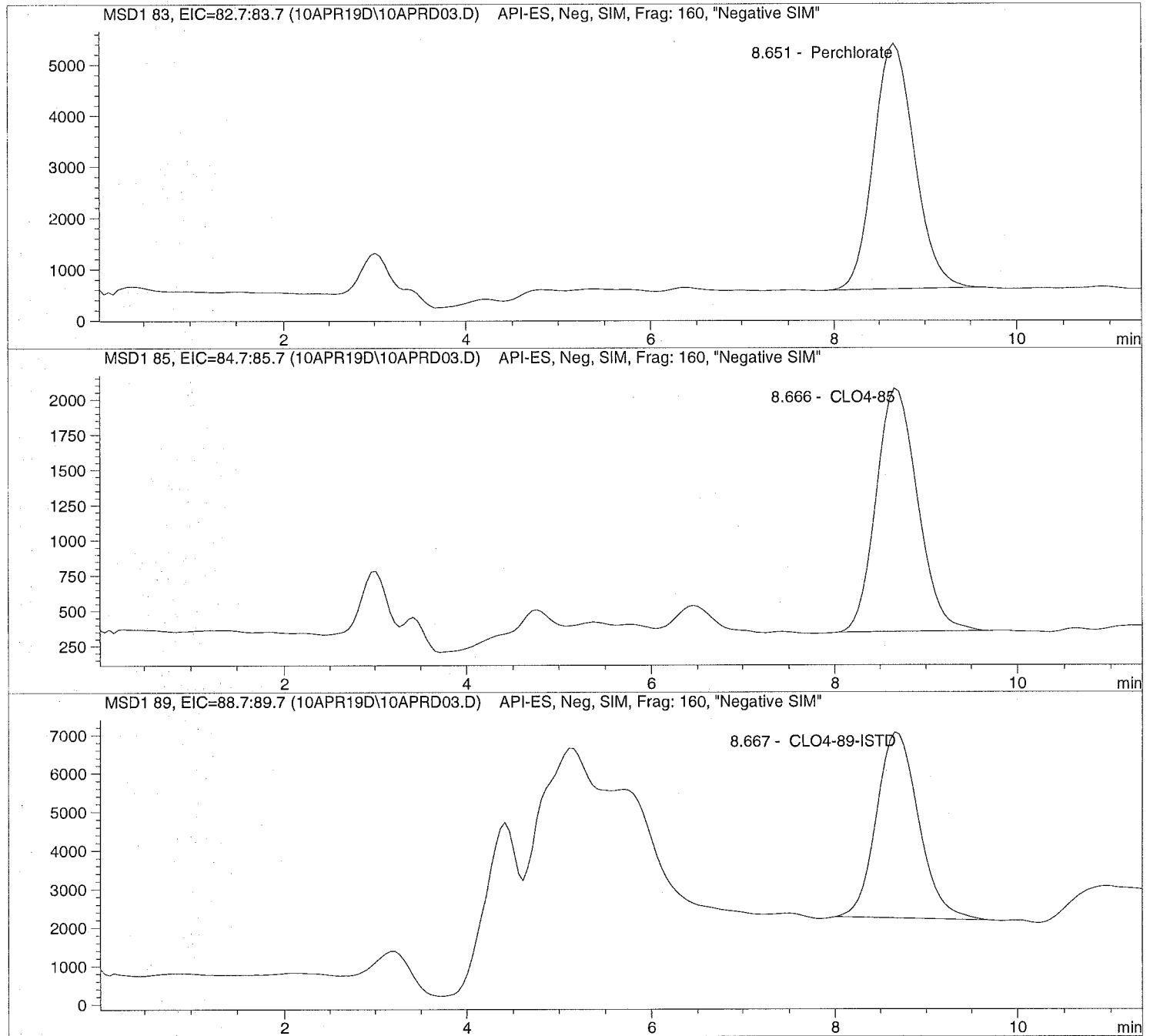
=====
*** End of Report ***
=====

Injection Date: 4/10/2019 10:28:57
Sample Name: 647197 ICS@4.0
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-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



Injection Date: 4/10/2019 10:28:57 Seq Line: 3
Sample Name: 647197 ICS@4.0 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-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.651	PBA	149398.5	3.2152	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.666	BBA	54596.5	3.7763	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.667	PBA	154930.6	5.0000	CLO4-89-ISTD

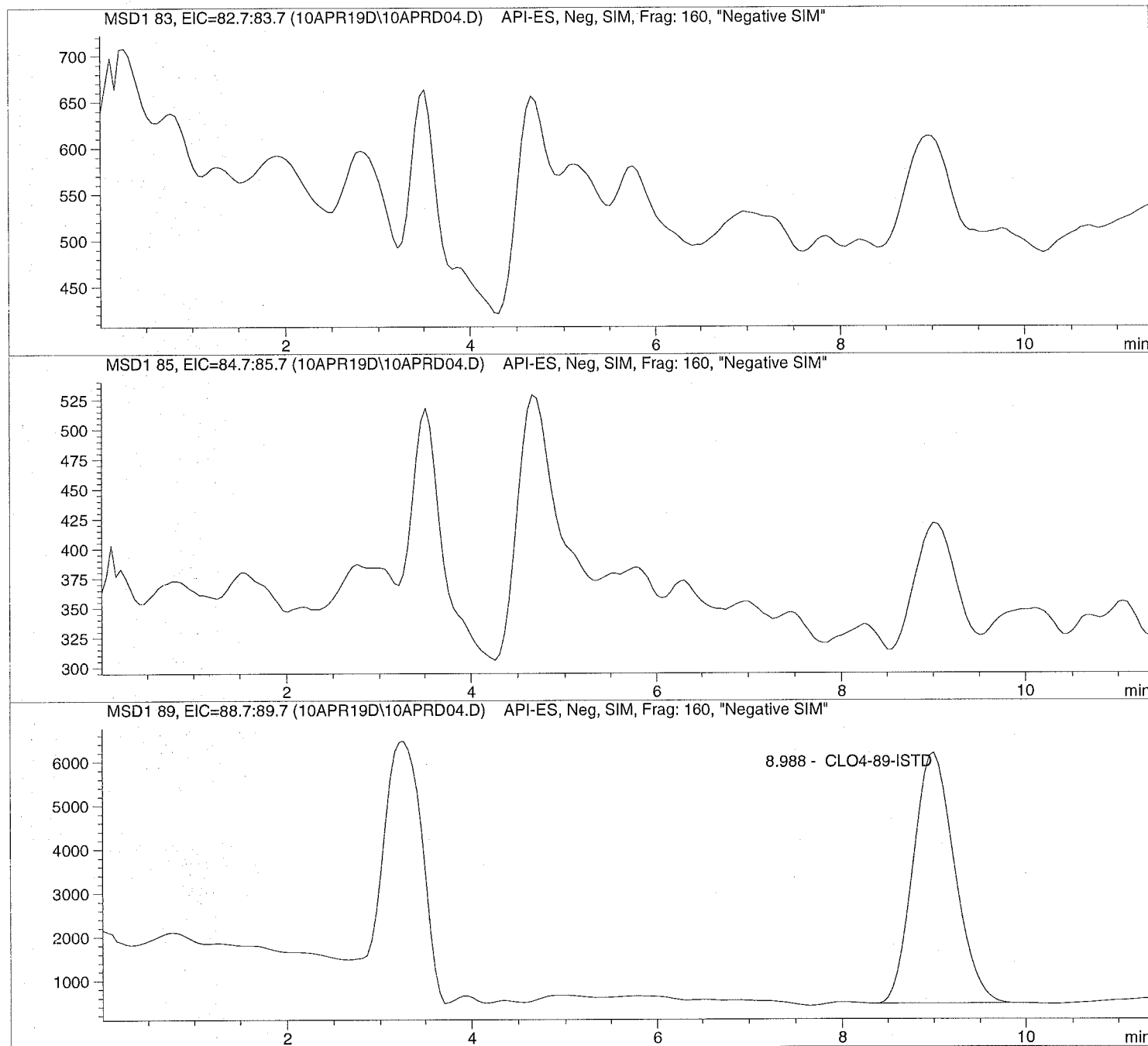
*** End of Report ***

Injection Date: 4/10/2019 10:42:16
Sample Name: 647198 LMB
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-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



```

=====
Injection Date: 4/10/2019 10:42:16      Seq Line: 4
Sample Name: 647198 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-DP2.M
Last Changed: 3/19/2019 14:48:09
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019, 02:35:19 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
8.988	PBA	176915.0	5.0000	CLO4-89-ISTD

```

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

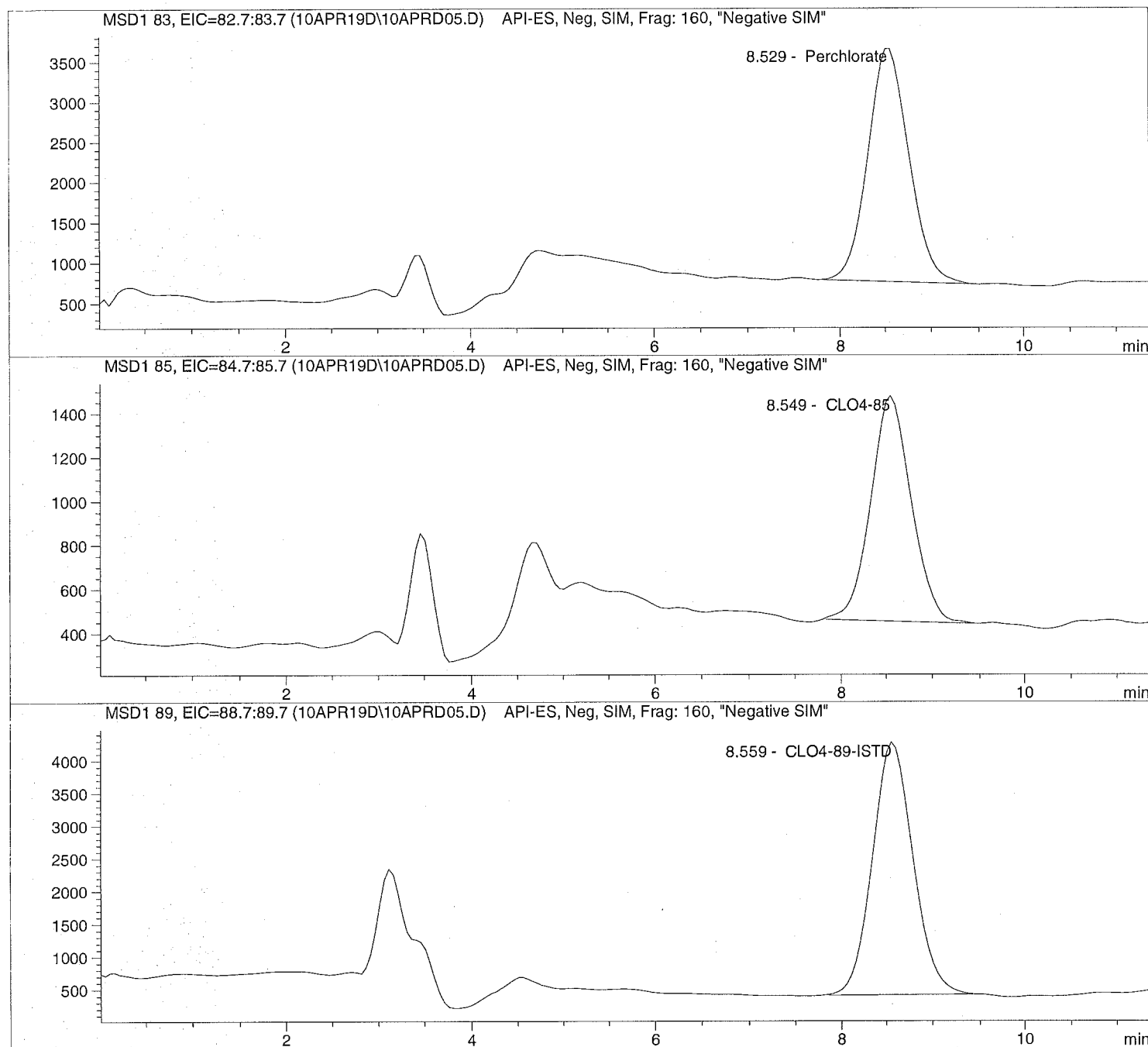
```

Injection Date: 4/10/2019 10:55:33
Sample Name: 1909152001
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-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



```

=====
Injection Date: 4/10/2019 10:55:33      Seq Line: 5
Sample Name: 1909152001                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-DP2.M
Last Changed: 3/19/2019 14:48:09
=====

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019, 02:35:19 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
8.529	BBA	91515.6	2.5743	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.549	BBA	31827.5	2.8411	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.559	BBA	120239.7	5.0000	CLO4-89-ISTD

```

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

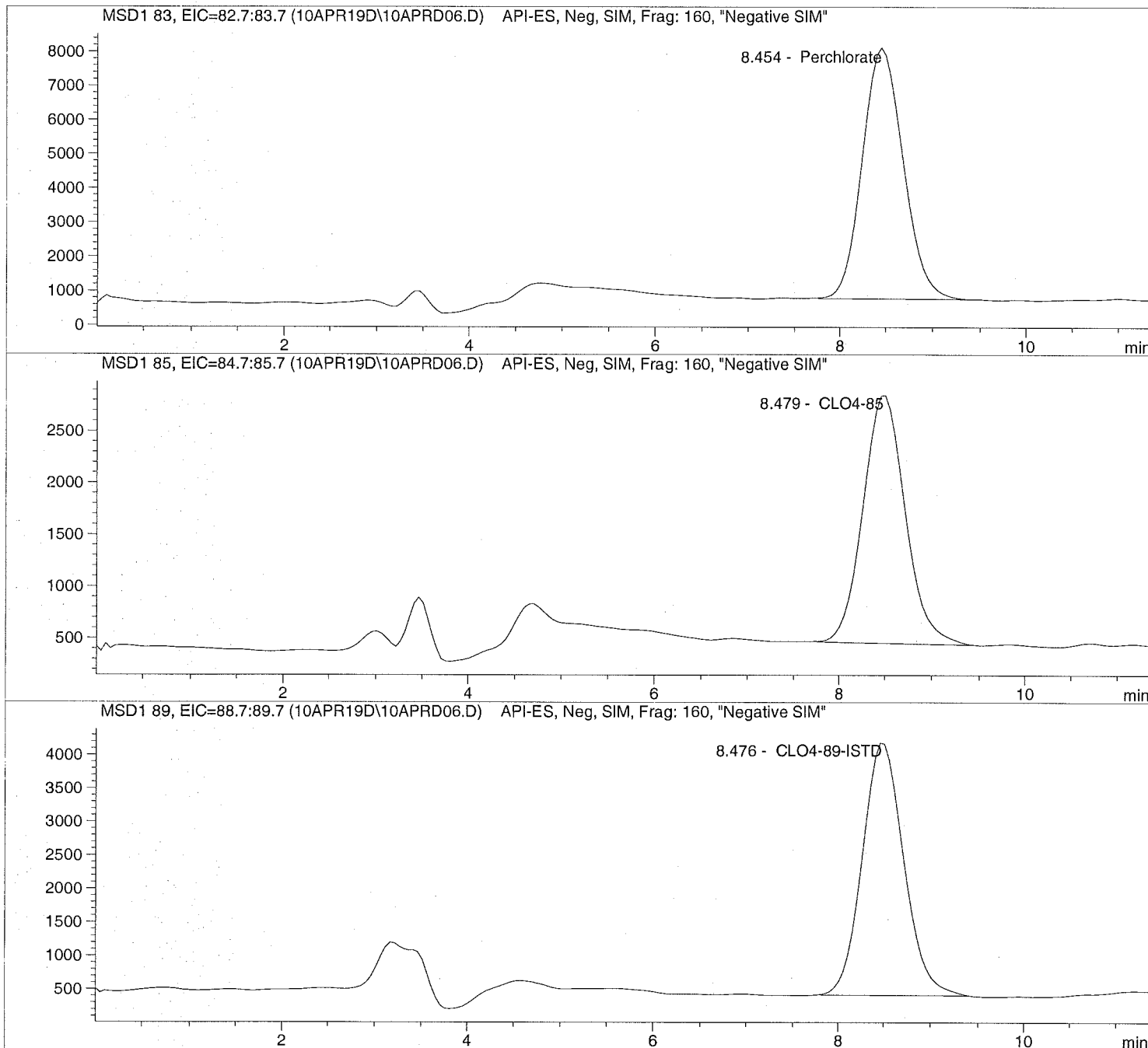
```


Injection Date: 4/10/2019 11:08:49
Sample Name: 647200 91521MS
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-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



```
=====  
Injection Date: 4/10/2019 11:08:49      Seq Line: 6  
Sample Name: 647200 91521MS           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-DP2.M  
Last Changed: 3/19/2019 14:48:09
```

Perchlorate analysis

=====
Sample Information
=====

```
Sorted By: Signal  
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.454	BBA	225049.5	6.1777	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.479	BBA	76111.4	6.8836	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.476	BBA	117756.7	5.0000	CLO4-89-ISTD

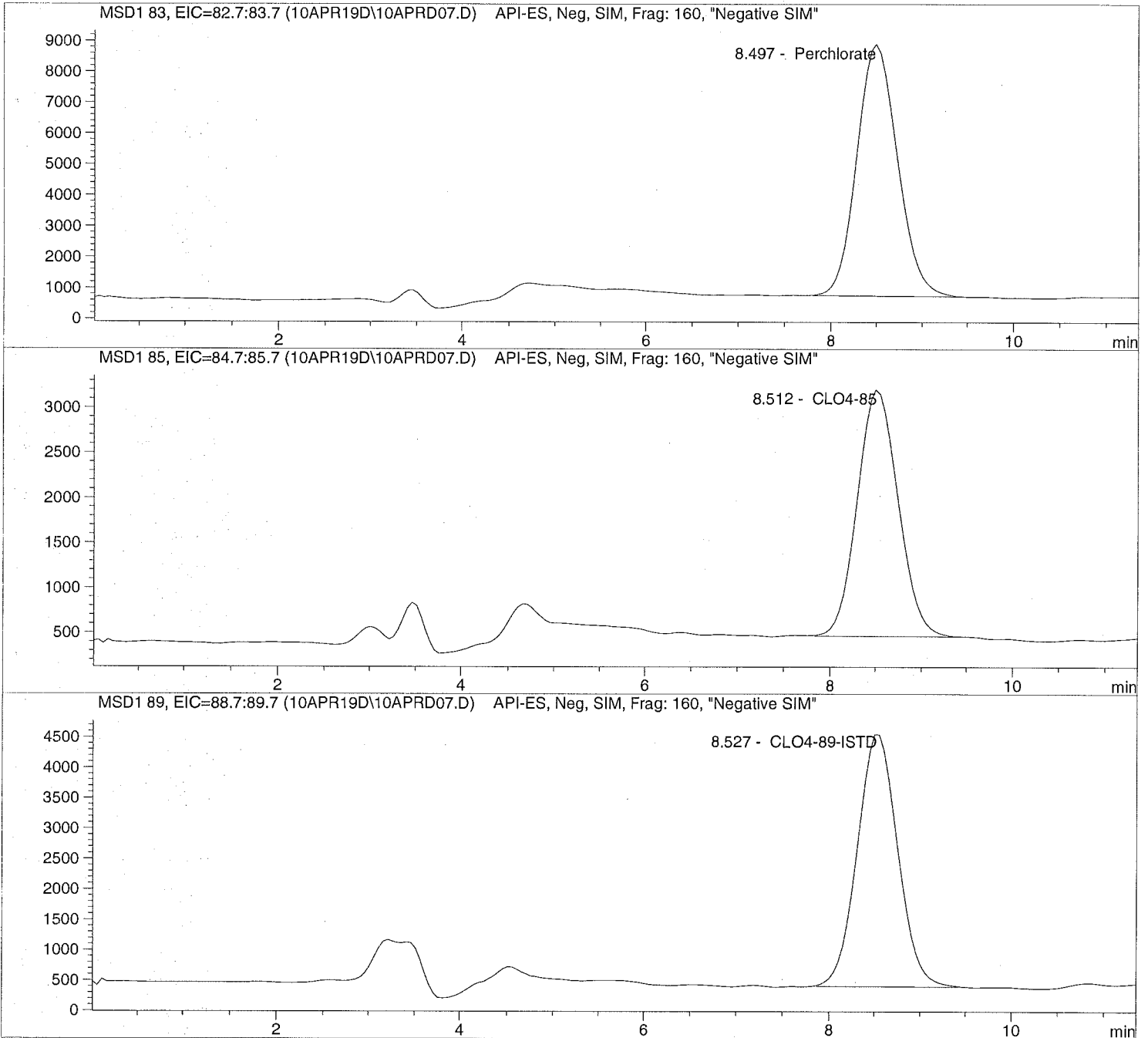
=====
*** End of Report ***
=====

Injection Date: 4/10/2019 11:22:09
Sample Name: 647201 91521SD
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-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



Injection Date: 4/10/2019 11:22:09 Seq Line: 7
Sample Name: 647201 91521SD 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-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.497	BBA	249579.0	6.3609	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.512	BBA	84268.6	7.0814	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.527	BBA	126683.1	5.0000	CLO4-89-ISTD

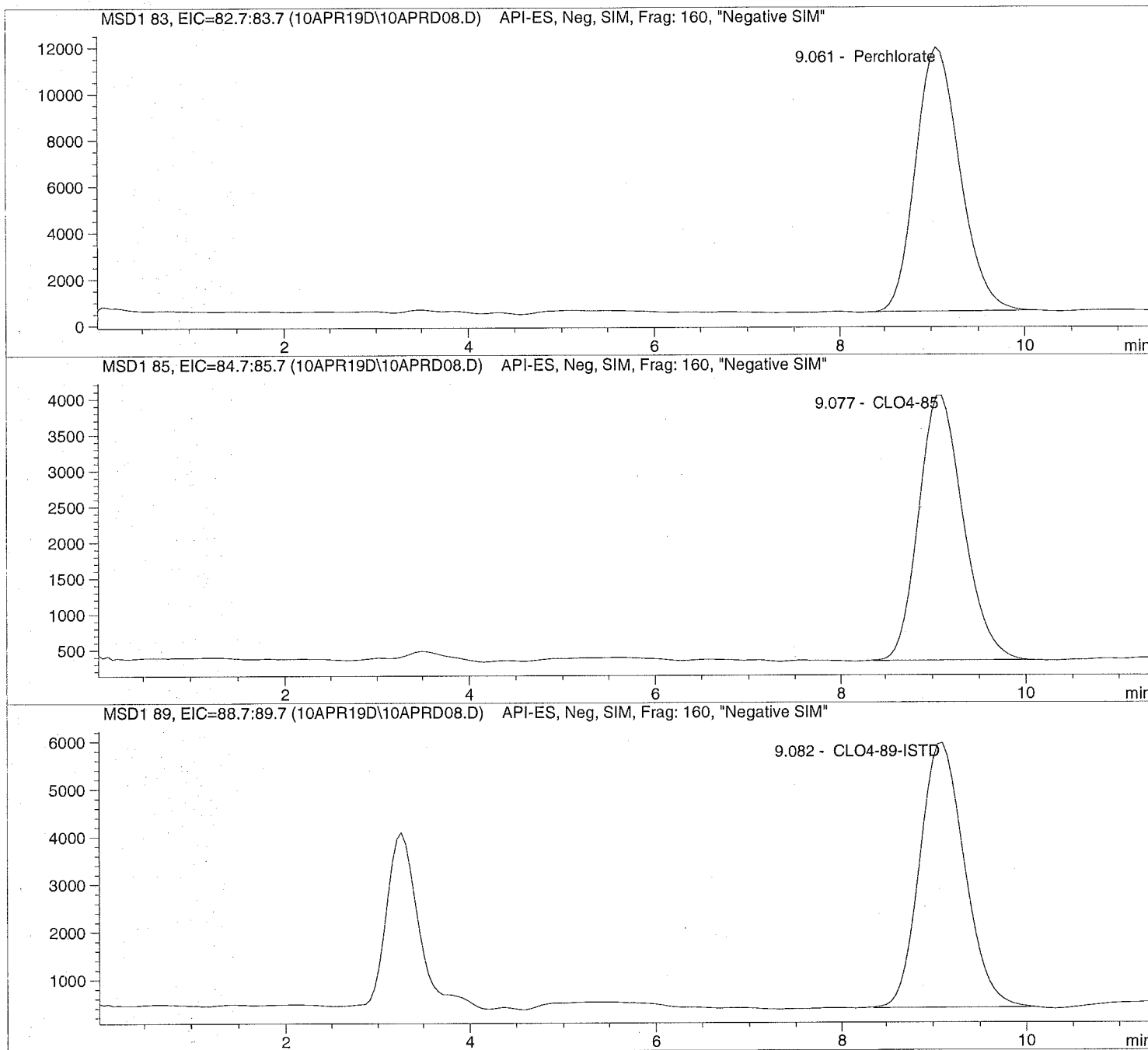
*** End of Report ***

Injection Date: 4/10/2019 11:35:27
Sample Name: 1909153001 1K
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-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



```
=====  
Injection Date: 4/10/2019 11:35:27      Seq Line:      8  
Sample Name:    1909153001 1K           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-DP2.M  
Last Changed:   3/19/2019 14:48:09
```

Perchlorate analysis

=====
Sample Information
=====

```
Sorted By:      Signal  
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
9.061	PBA	370174.3	6532.8620	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.077	BBA	121053.5	7051.7750	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.082	BBA	182757.9	5000.0000	CLO4-89-ISTD

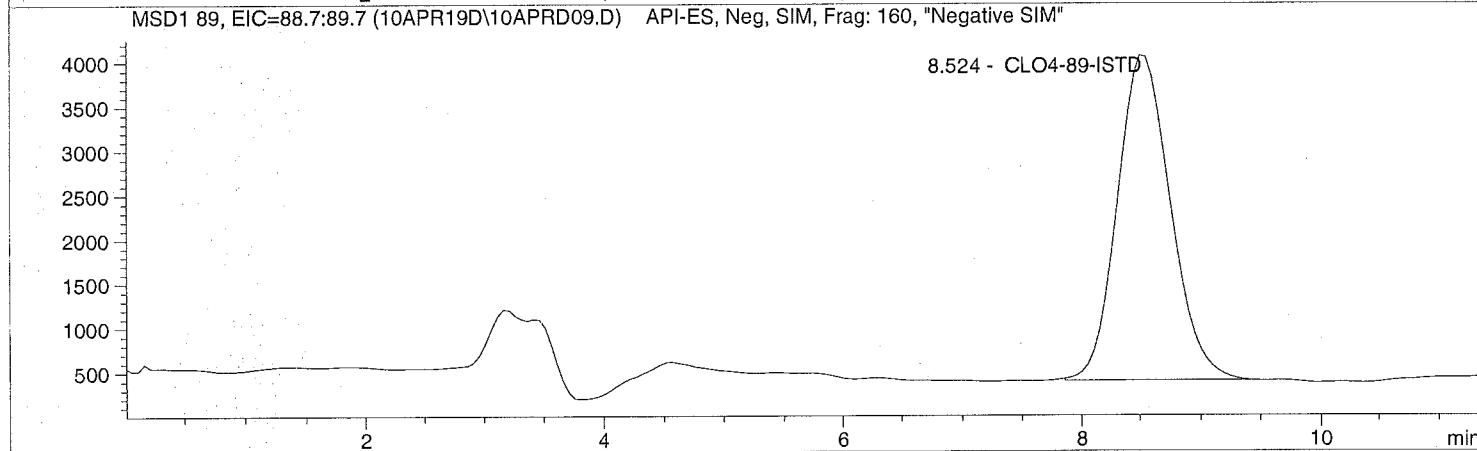
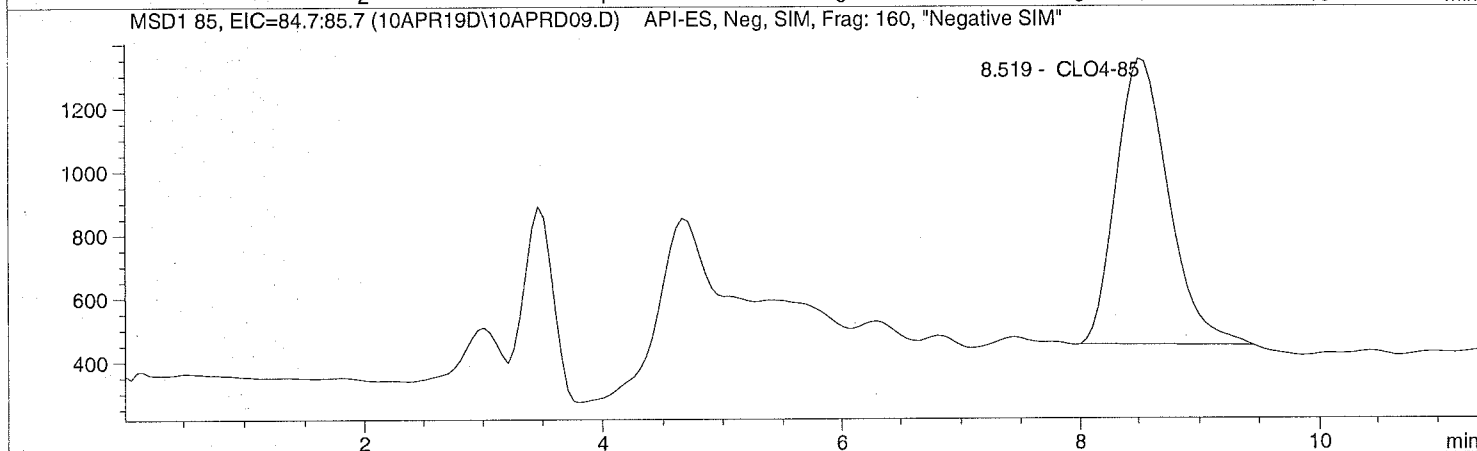
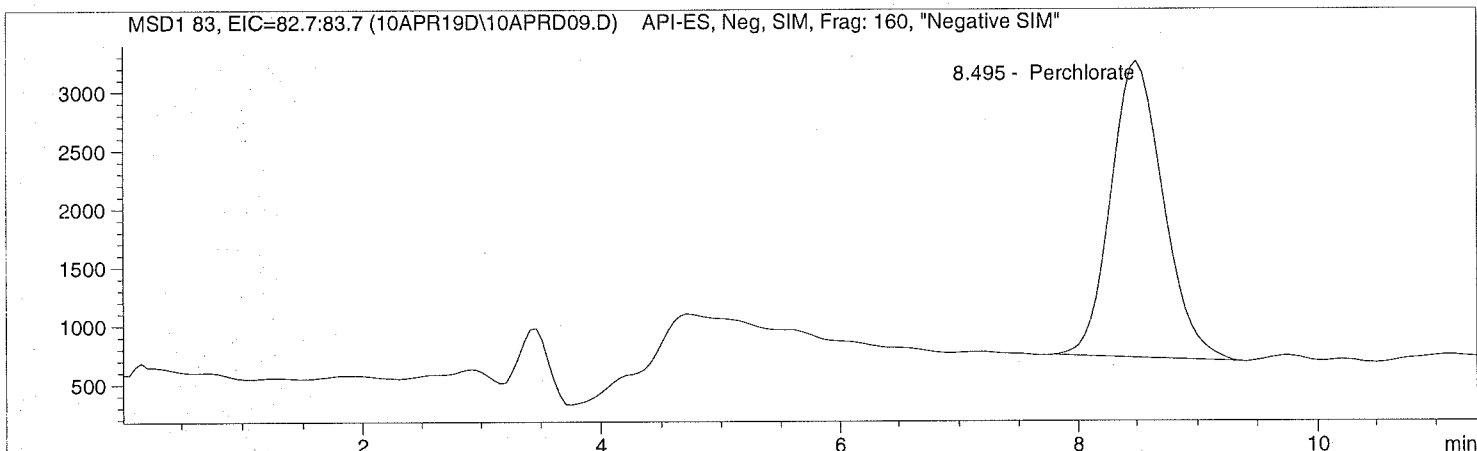
=====
*** End of Report ***

Injection Date: 4/10/2019 11:48:52
Sample Name: 1909154001
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-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



```

=====
Injection Date: 4/10/2019 11:48:52      Seq Line: 9
Sample Name: 1909154001                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-DP2.M
Last Changed: 3/19/2019 14:48:09

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019, 02:35:19 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
8.495	PBA	77912.3	2.3402	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.519	PBA	27611.7	2.6142	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.524	BBA	113404.4	5.0000	CLO4-89-ISTD

```

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

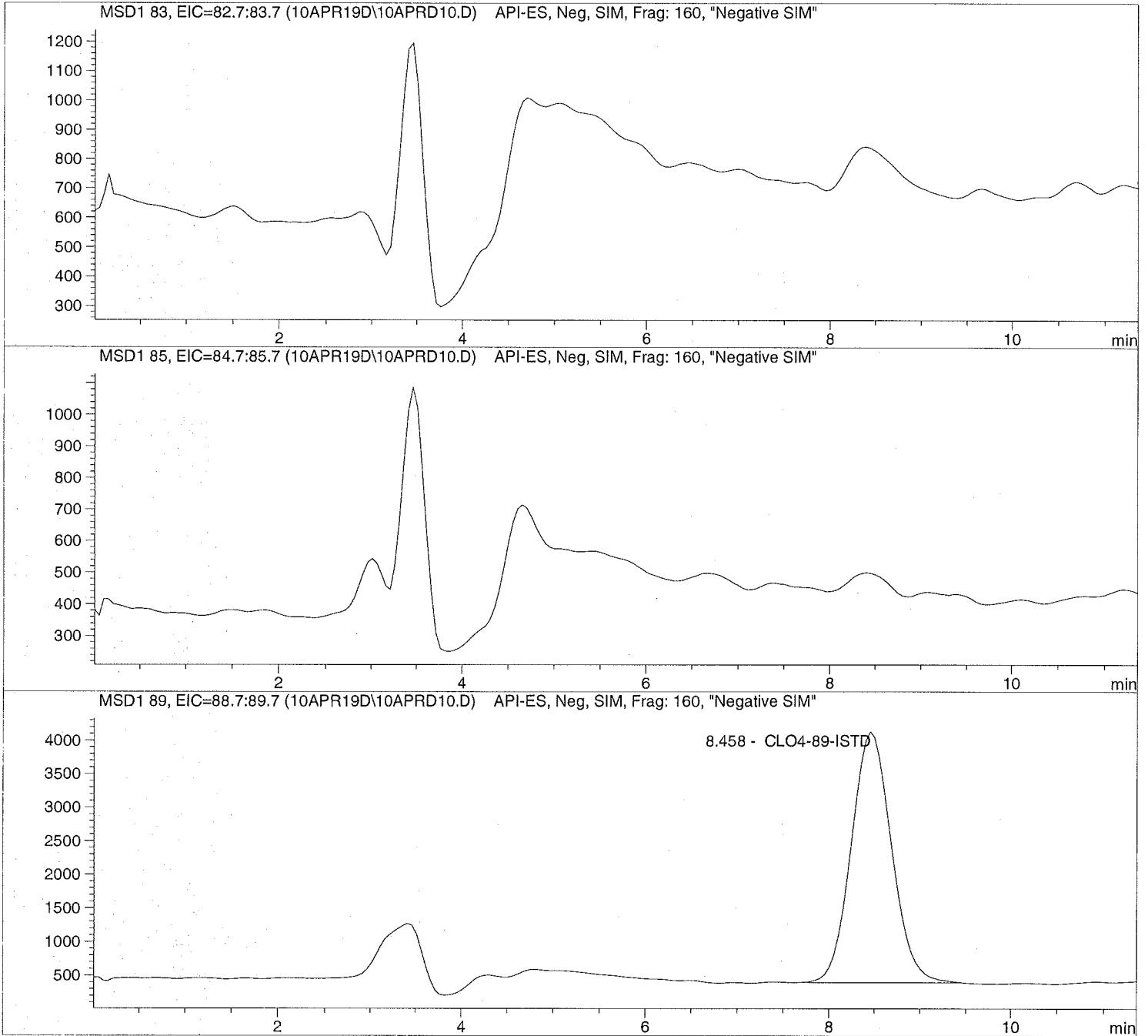
```


Injection Date: 4/10/2019 12:02:10
Sample Name: 1909947001
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-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



```

=====
Injection Date: 4/10/2019 12:02:10      Seq Line:          10
Sample Name:    1909947001              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-DP2.M
Last Changed:   3/19/2019 14:48:09

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.458	BBA	115129.6	5.0000	CLO4-89-ISTD

```

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

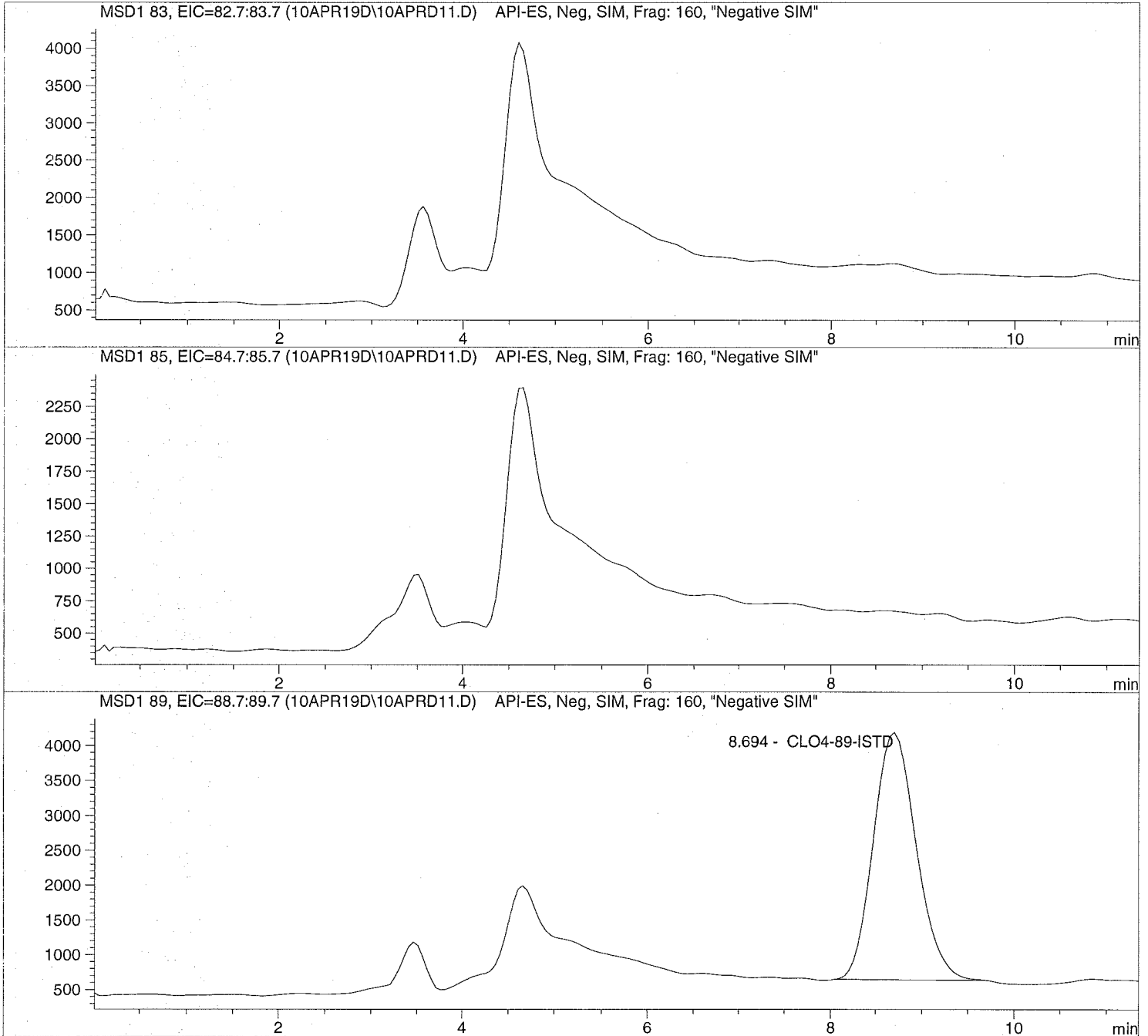
```

Injection Date: 4/10/2019 12:15:27
Sample Name: 1909949001
Acq Operator: TNB

Seq Line: 11
Location: Vial 81
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



```

=====
Injection Date: 4/10/2019 12:15:27      Seq Line:          11
Sample Name:    1909949001              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-DP2.M
Last Changed:   3/19/2019 14:48:09

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019, 02:35:19 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
8.694	PBA	114791.4	5.0000	CLO4-89-ISTD

```

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

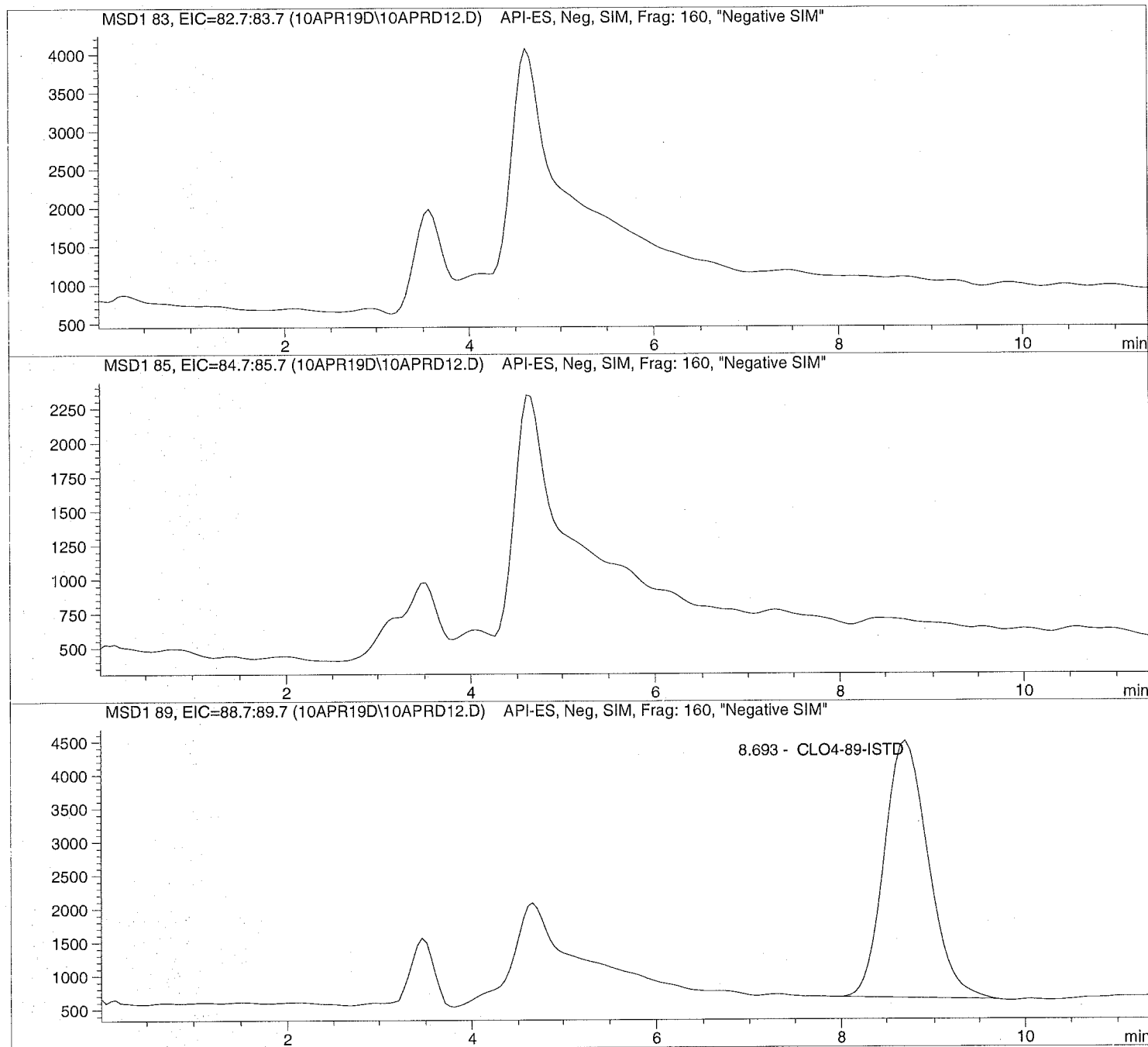
```

Injection Date: 4/10/2019 12:28:41
Sample Name: 1909949002
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-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



```
=====
Injection Date: 4/10/2019 12:28:41      Seq Line: 12
Sample Name: 1909949002                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-DP2.M
Last Changed: 3/19/2019 14:48:09
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.693	PBA	124045.6	5.0000	CLO4-89-ISTD

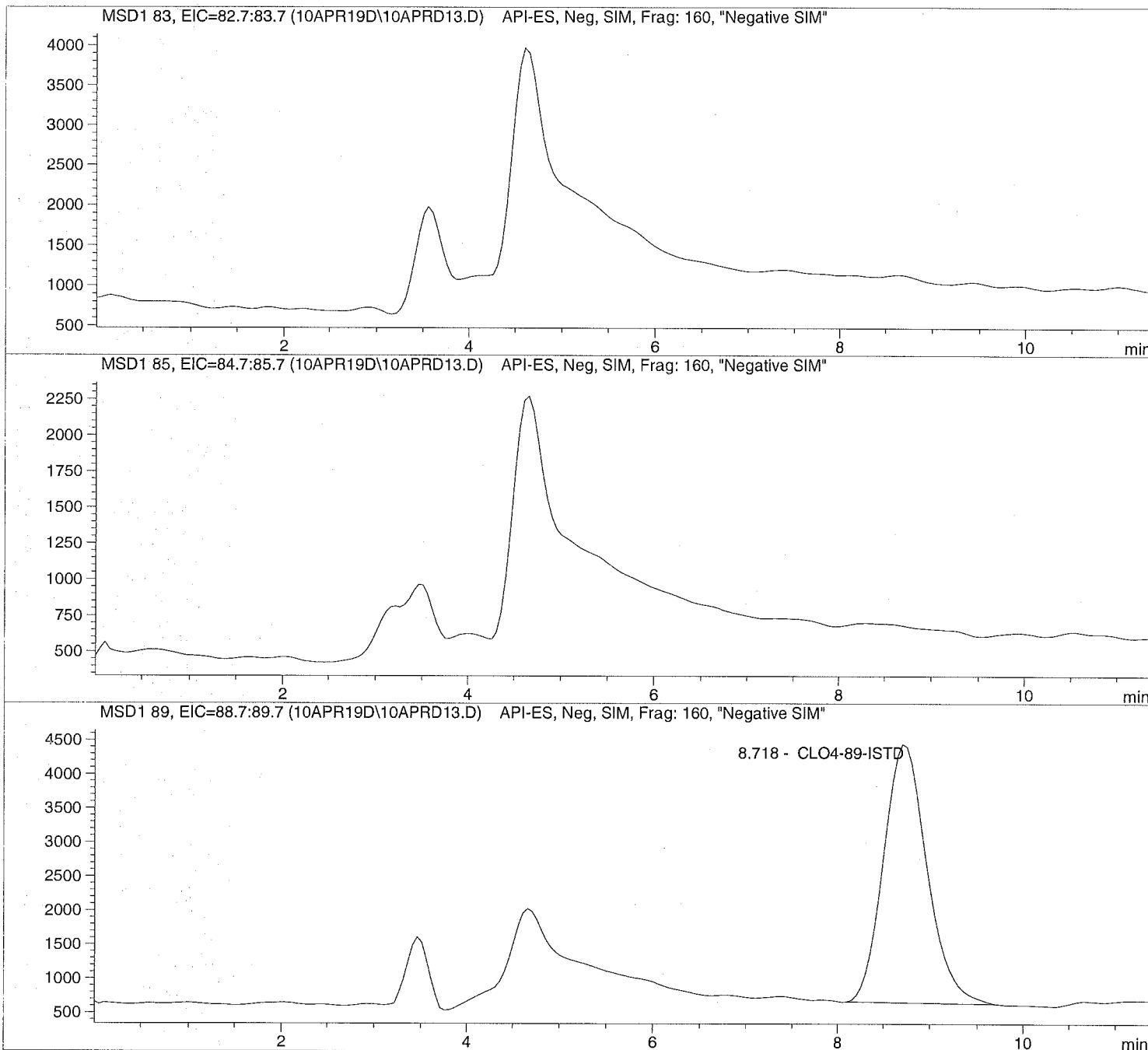
=====
*** End of Report ***

Injection Date: 4/10/2019 12:41:59
Sample Name: 1909949003
Acq Operator: TNB

Seq Line: 13
Location: Vial 83
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



```

=====
Injection Date: 4/10/2019 12:41:59      Seq Line: 13
Sample Name: 1909949003                 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-DP2.M
Last Changed: 3/19/2019 14:48:09
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.718	PBA	123373.0	5.0000	CLO4-89-ISTD

```

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

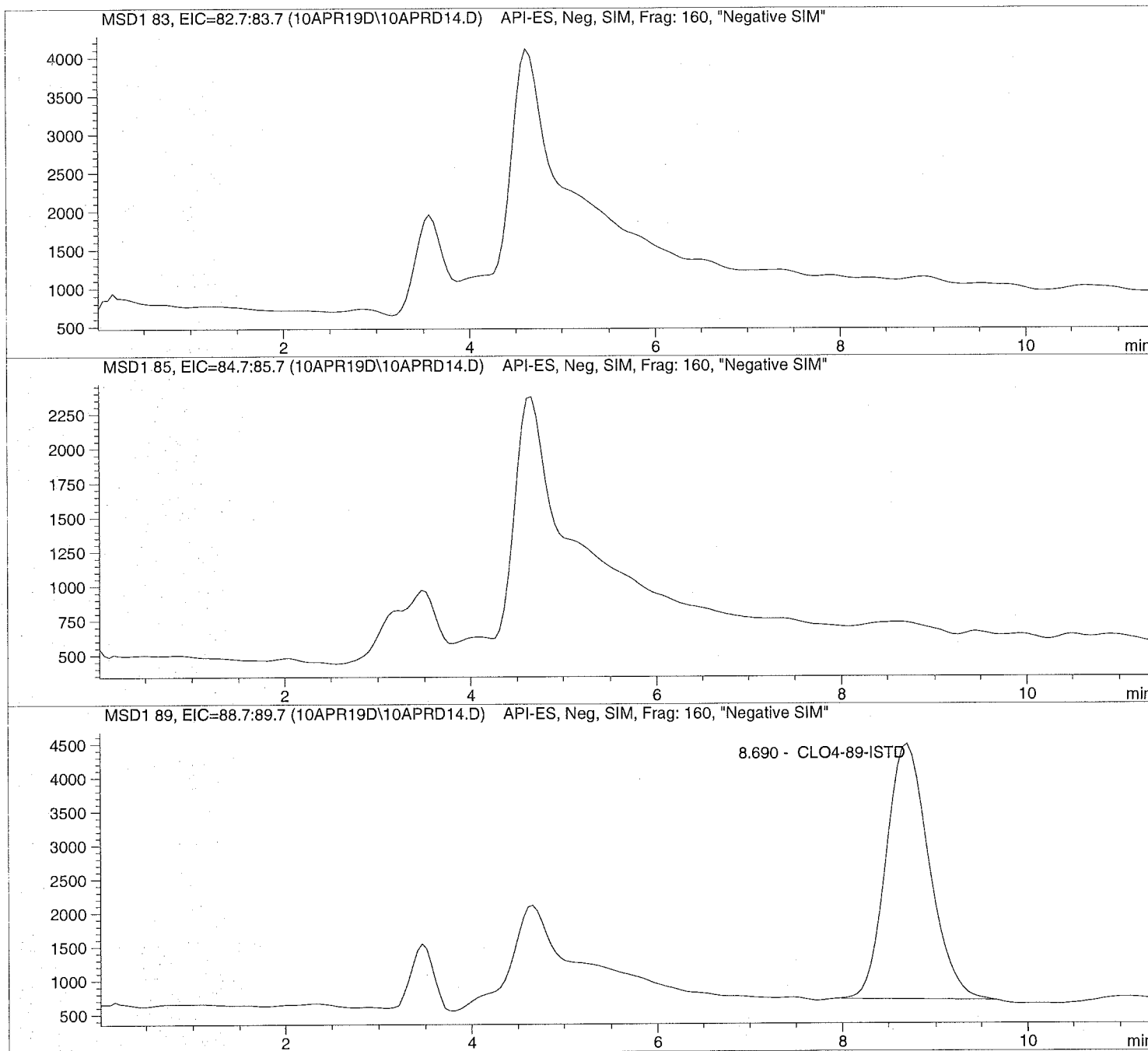
```


Injection Date: 4/10/2019 12:55:15
Sample Name: 1909949004
Acq Operator: TNB

Seq Line: 14
Location: Vial 84
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



```
=====  
Injection Date: 4/10/2019 12:55:15      Seq Line: 14  
Sample Name: 1909949004                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-DP2.M  
Last Changed: 3/19/2019 14:48:09
```

Perchlorate analysis

=====
Sample Information
=====

```
Sorted By: Signal  
Calib. Data Modified: Tue, 19. Mar. 2019, 02:35:19 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
8.690	BBA	120241.5	5.0000	CLO4-89-ISTD

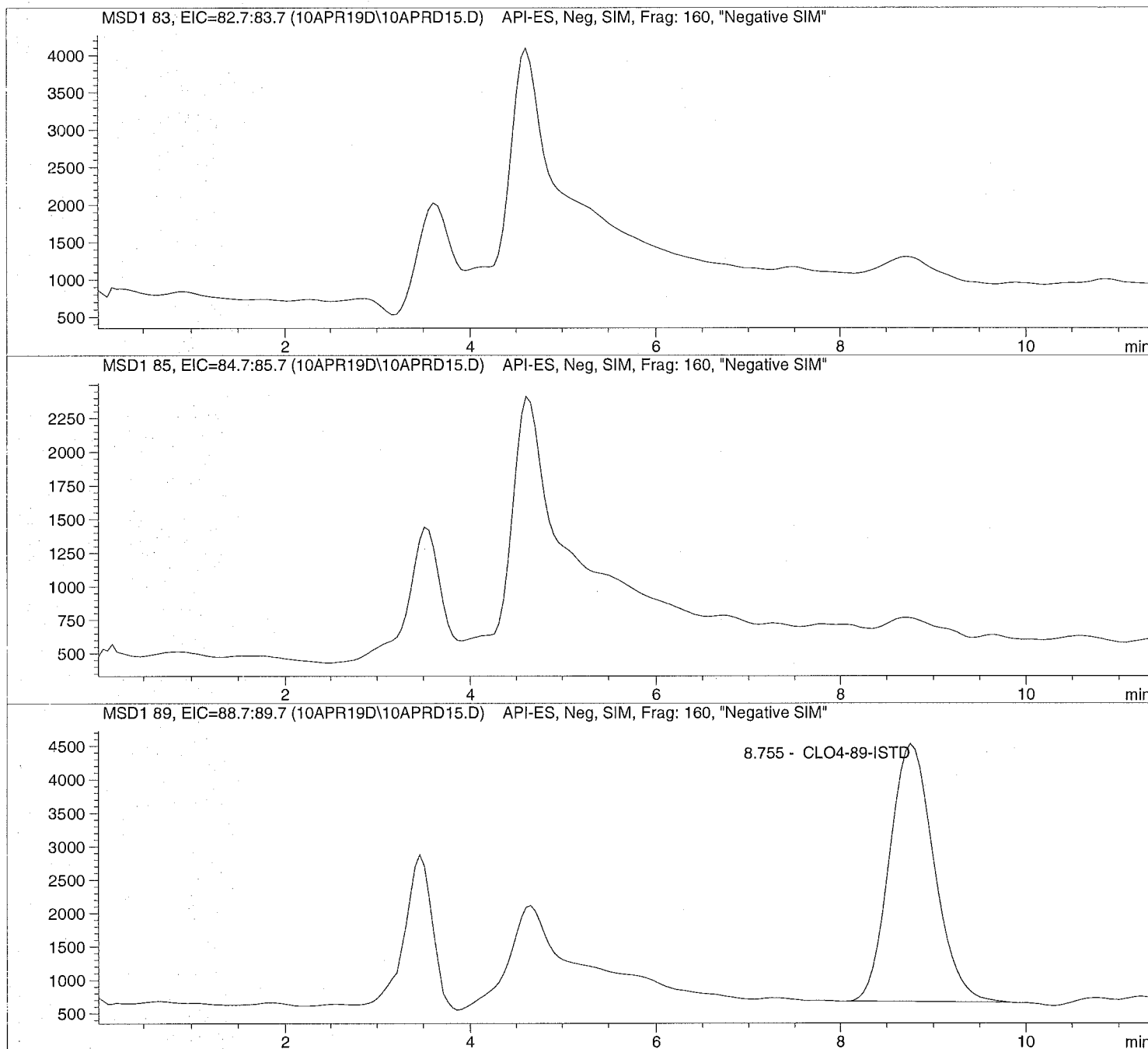
=====
*** End of Report ***
=====

Injection Date: 4/10/2019 13:08:30
Sample Name: 1909949005
Acq Operator: TNB

Seq Line: 15
Location: Vial 85
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



```

=====
Injection Date: 4/10/2019 13:08:30      Seq Line: 15
Sample Name: 1909949005                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-DP2.M
Last Changed: 3/19/2019 14:48:09

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.755	PBA	127767.0	5.0000	CLO4-89-ISTD

```

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

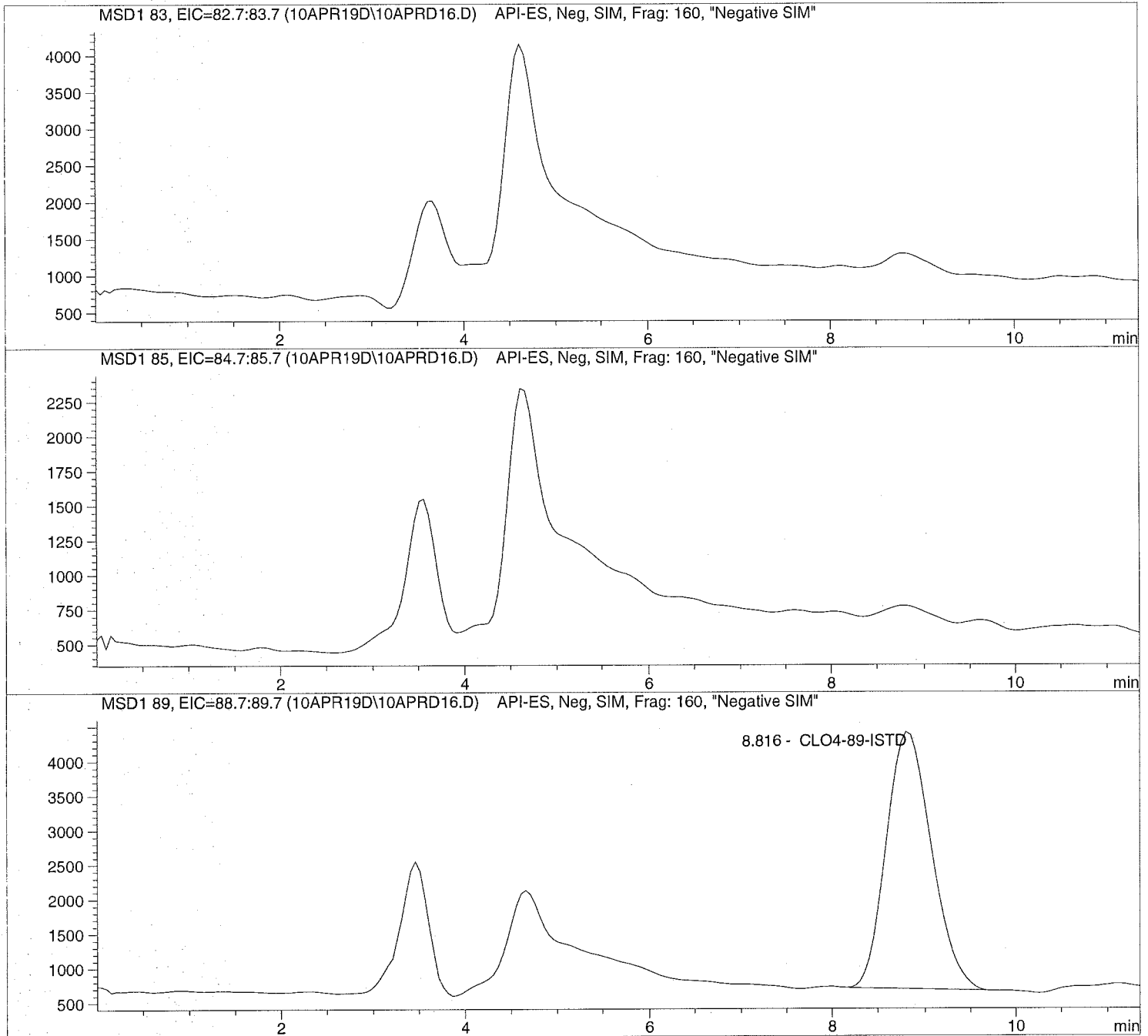
```

Injection Date: 4/10/2019 13:21:46
Sample Name: 1909949006
Acq Operator: TNB

Seq Line: 16
Location: Vial 86
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



```

=====
Injection Date: 4/10/2019 13:21:46      Seq Line: 16
Sample Name: 1909949006                 Location: Vial 86
Acq Operator: TNB                       Inj. No.: 1
                                           Inj. Vol.: 30 µl

```

```

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.816	BBA	123964.7	5.0000	CLO4-89-ISTD

```

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

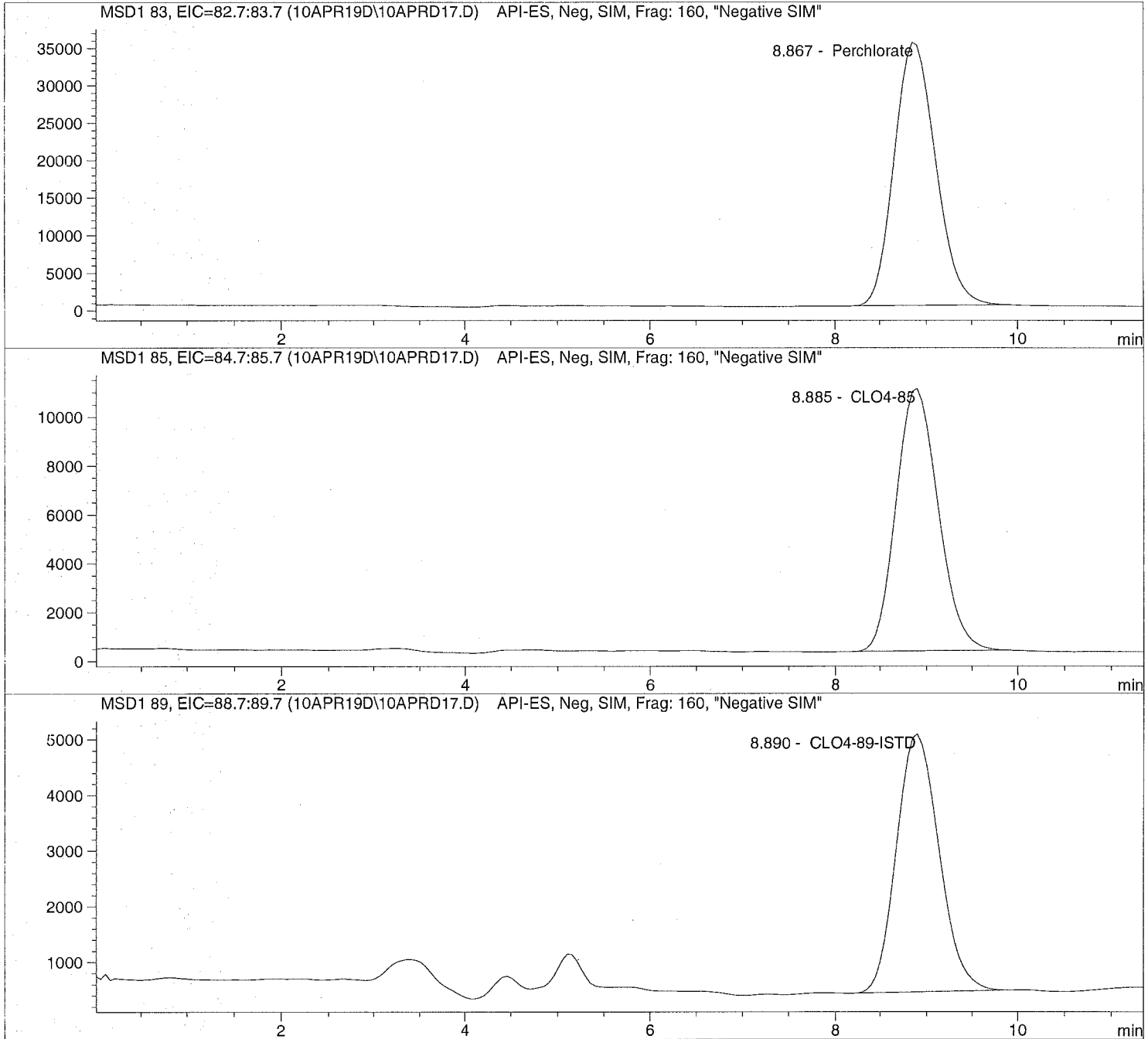
```

Injection Date: 4/10/2019 13:35:04
Sample Name: 647202 CCV@25
Acq Operator: TNB

Seq Line: 17
Location: Vial 71
Inj. No.: 1
Inj. Vol.: 30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



Injection Date: 4/10/2019 13:35:04 Seq Line: 17
Sample Name: 647202 CCV025 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-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019, 02:35:19 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
8.867	PBA	1080071.3	22.5952	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.885	PBA	336319.0	23.6329	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.890	PBA	146280.5	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 : 3/19/2019 2:35:19 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
8.744	1	1.00000	7.76074e4	1.28854e-5	1		Perchlorate
	2	2.00000	1.35273e5	1.47849e-5			
	3	5.00000	3.37764e5	1.48033e-5			
	4	10.00000	6.83454e5	1.46316e-5			
	5	25.00000	2.08433e6	1.19943e-5			
	6	50.00000	4.13334e6	1.20968e-5			
	7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1.00000	2.36780e4	4.22333e-5	1		CLO4-85
	2	2.00000	4.69486e4	4.25998e-5			
	3	5.00000	1.06124e5	4.71147e-5			
	4	10.00000	2.13523e5	4.68335e-5			
	5	25.00000	6.14295e5	4.06971e-5			
	6	50.00000	1.19814e6	4.17315e-5			
	7	75.00000	1.78355e6	4.20509e-5			
8.766	3	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
	2	5.00000	2.24886e5	2.22335e-5			
	3	5.00000	2.33196e5	2.14412e-5			
	4	5.00000	2.34454e5	2.13262e-5			
	5	5.00000	2.50568e5	1.99547e-5			
	6	5.00000	2.30977e5	2.16472e-5			



RetTime [min]	Lvl Sig	Amount	Area	Amt/Area	Ref Grp Name
7		5.00000	2.21504e5	2.25729e-5	

More compound-specific settings:

Compound: Perchlorate

Time Window : From 6.654 min To 12.544 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333

Compound: CLO4-85

Time Window : From 6.650 min To 12.505 min
 Curve Type : Quadratic
 Origin : Ignored
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333

Compound: CLO4-89-ISTD

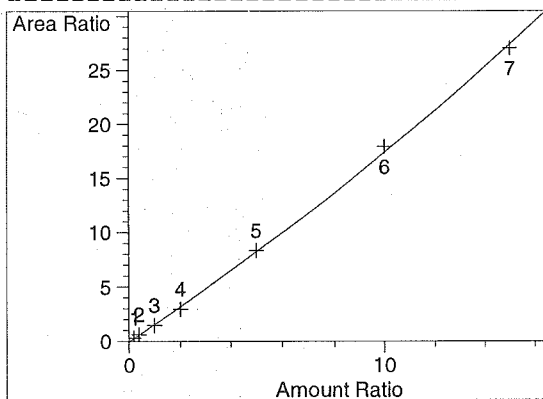
Time Window : From 6.659 min To 12.466 min
 Curve Type : Linear
 Origin : Included
 Calibration Level Weights:/
 Level 1 : 1
 Level 2 : 1
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1

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

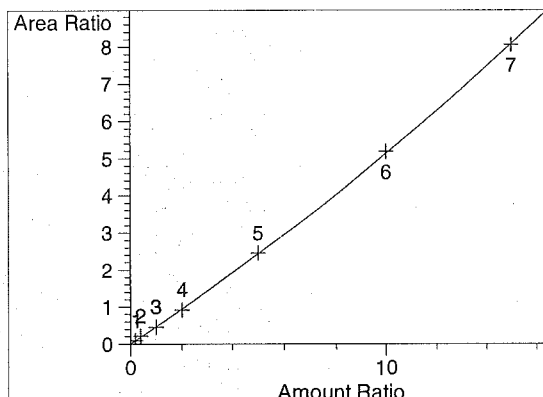
No Entries in table
 =====



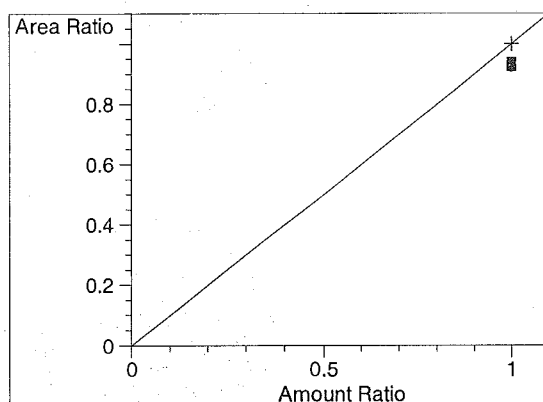
=====
 Calibration Curves
 =====



Perchlorate at exp. RT: 8.744
 MSD1 83, EIC=82.7:83.7
 Correlation: 0.99957
 Residual Std. Dev.: 0.30744
 Formula: $y = ax^2 + bx + c$
 a: 1.76988e-2
 b: 1.56480
 c: -4.92430e-2
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
 MSD1 85, EIC=84.7:85.7
 Correlation: 0.99983
 Residual Std. Dev.: 0.03473
 Formula: $y = ax^2 + bx + c$
 a: 5.13396e-3
 b: 4.62055e-1
 c: 4.97209e-4
 x: Amount Ratio
 y: Area Ratio
 Calibration Level Weights:
 Level 1 : 1
 Level 2 : 0.5
 Level 3 : 0.2
 Level 4 : 0.1
 Level 5 : 0.04
 Level 6 : 0.02
 Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
 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 1 : 1
 Level 2 : 1
 Level 3 : 1
 Level 4 : 1
 Level 5 : 1
 Level 6 : 1
 Level 7 : 1



Batch Review Method:

C:\HPCHEM\1\METHODS\CLO4-DP2.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	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#*	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	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** 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 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

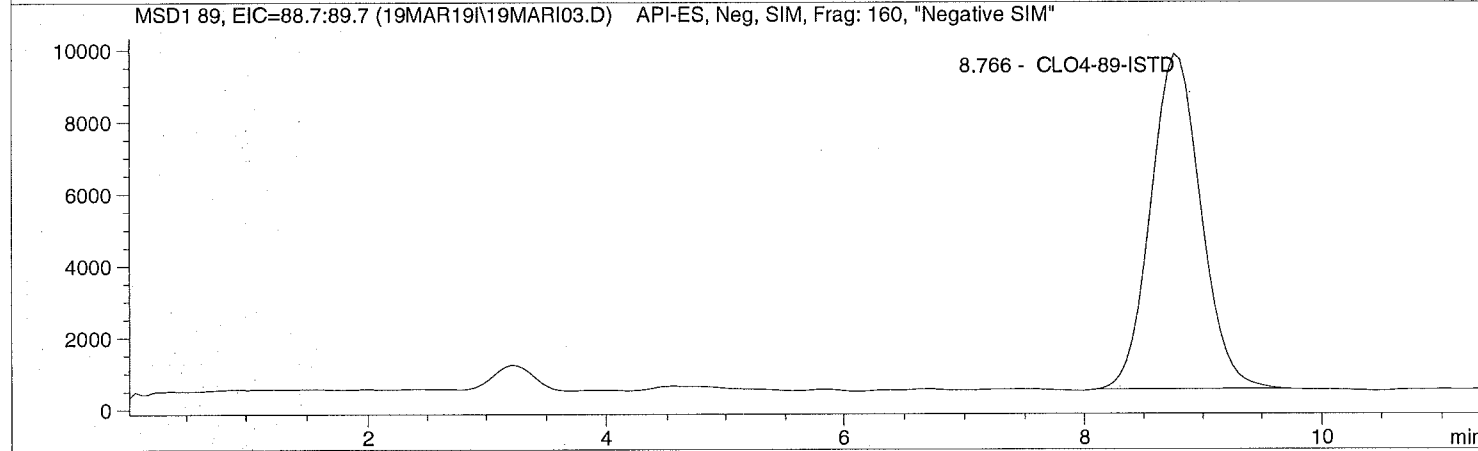
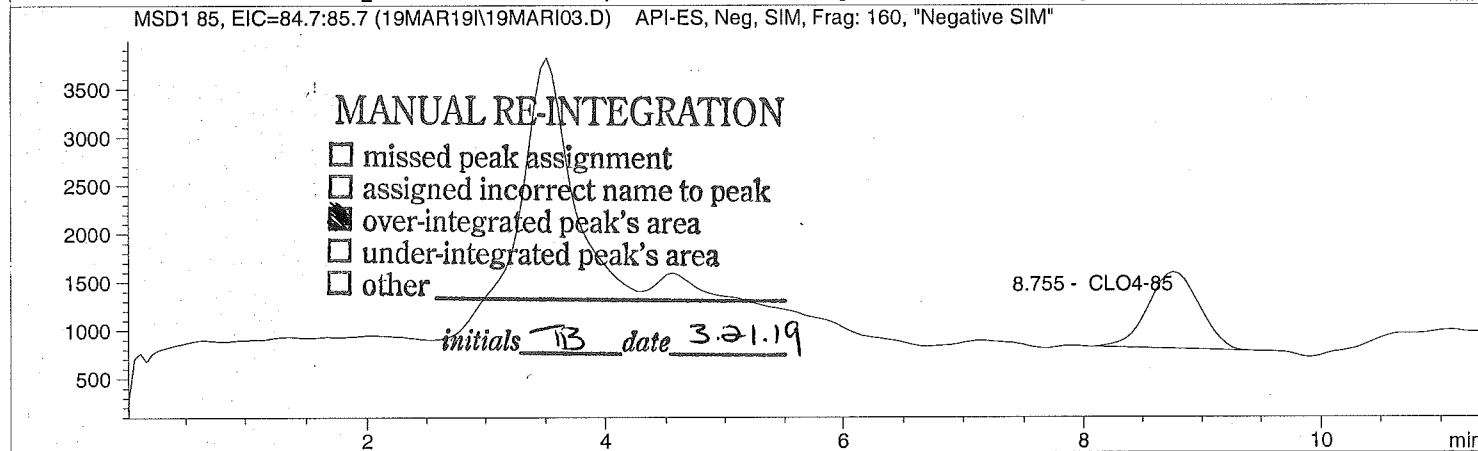
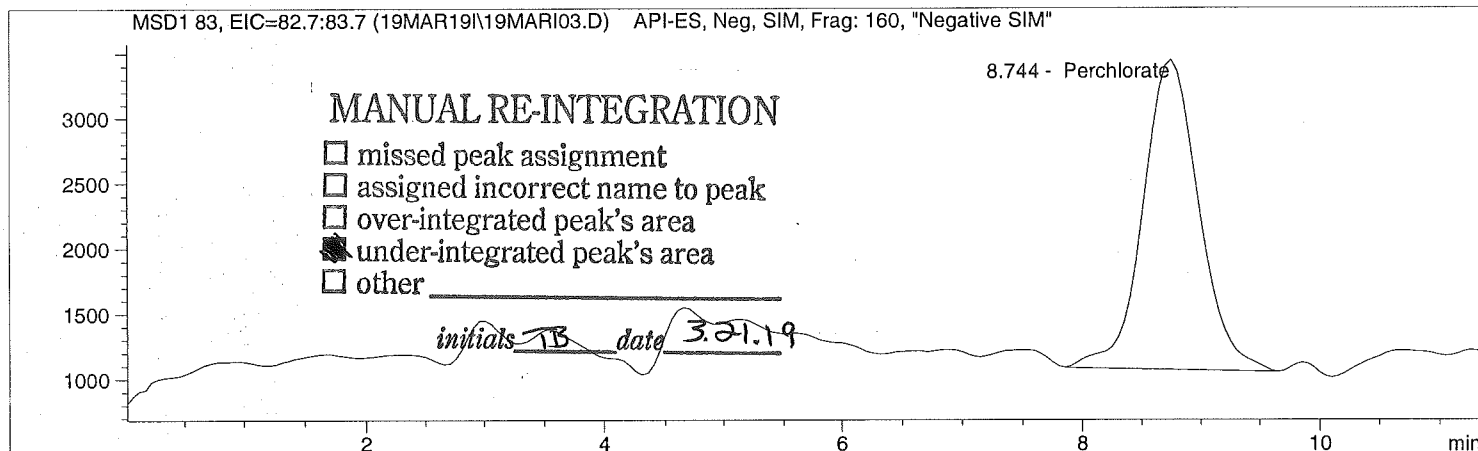


Injection Date: 3/19/2019 09:39:40
Sample Name: CLO4@ 1.0ug/L
Acq Operator: TNB

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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



```
=====
Injection Date: 3/19/2019 09:39:40      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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

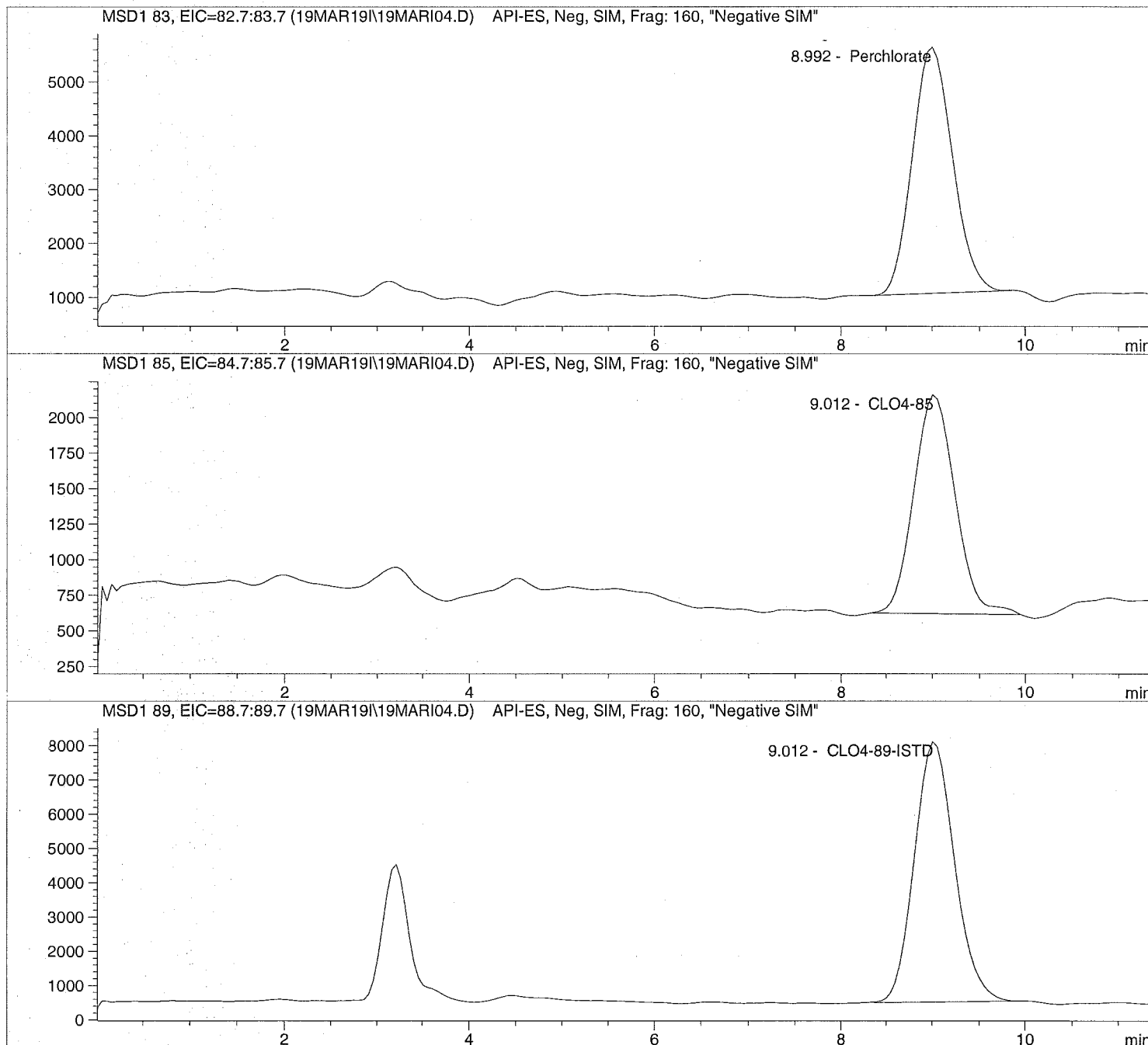
RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

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

=====
Injection Date: 3/19/2019 09:53:00 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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



```
=====
Injection Date: 3/19/2019 09:53:00      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-DP2.M
Last Changed:   3/19/2019 14:35:22
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

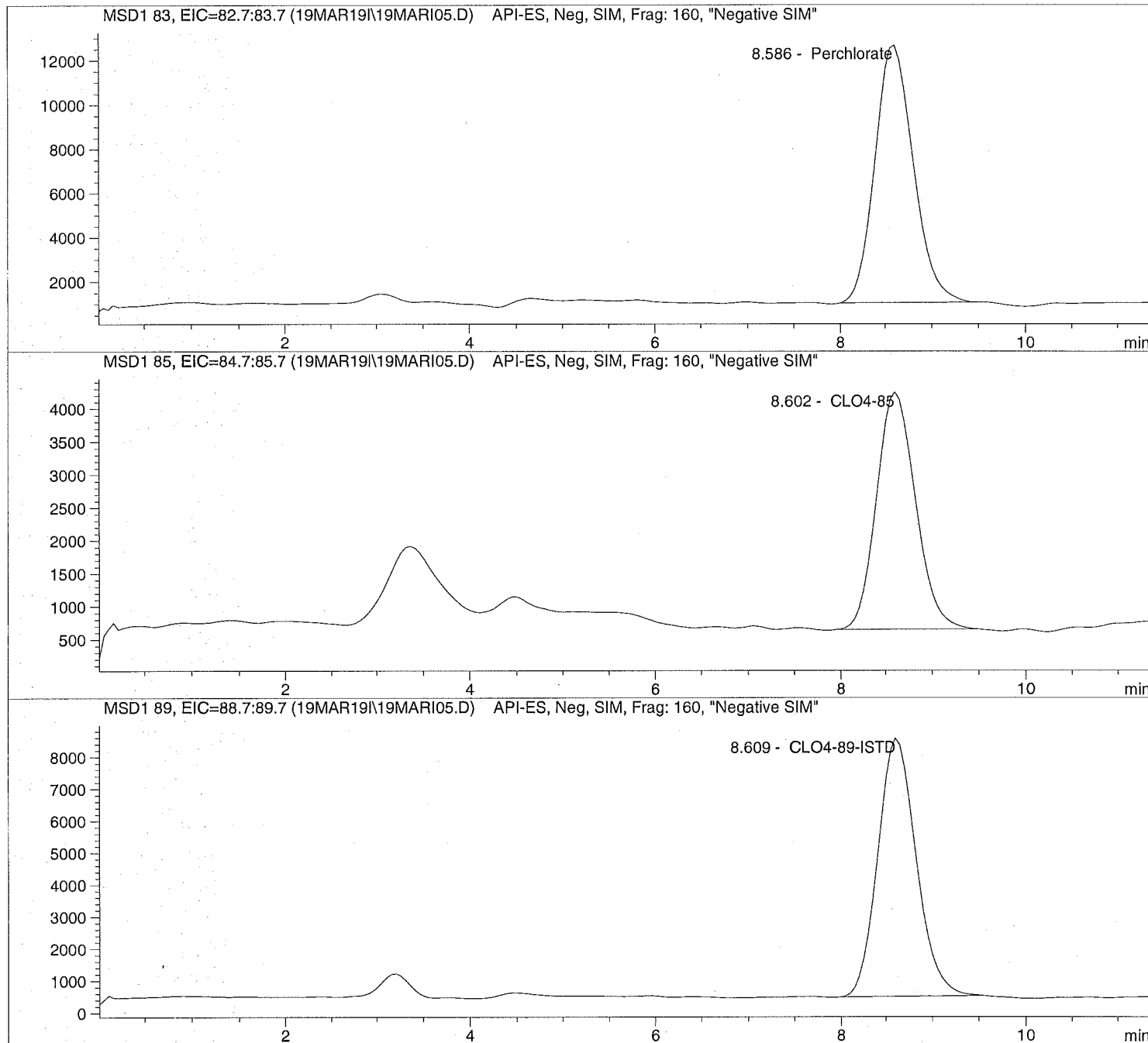
=====
*** End of Report ***

Injection Date: 3/19/2019 10:06:16
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



```

=====
Injection Date: 3/19/2019 10:06:16      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-DP2.M
Last Changed:   3/19/2019 14:35:22

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

```

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

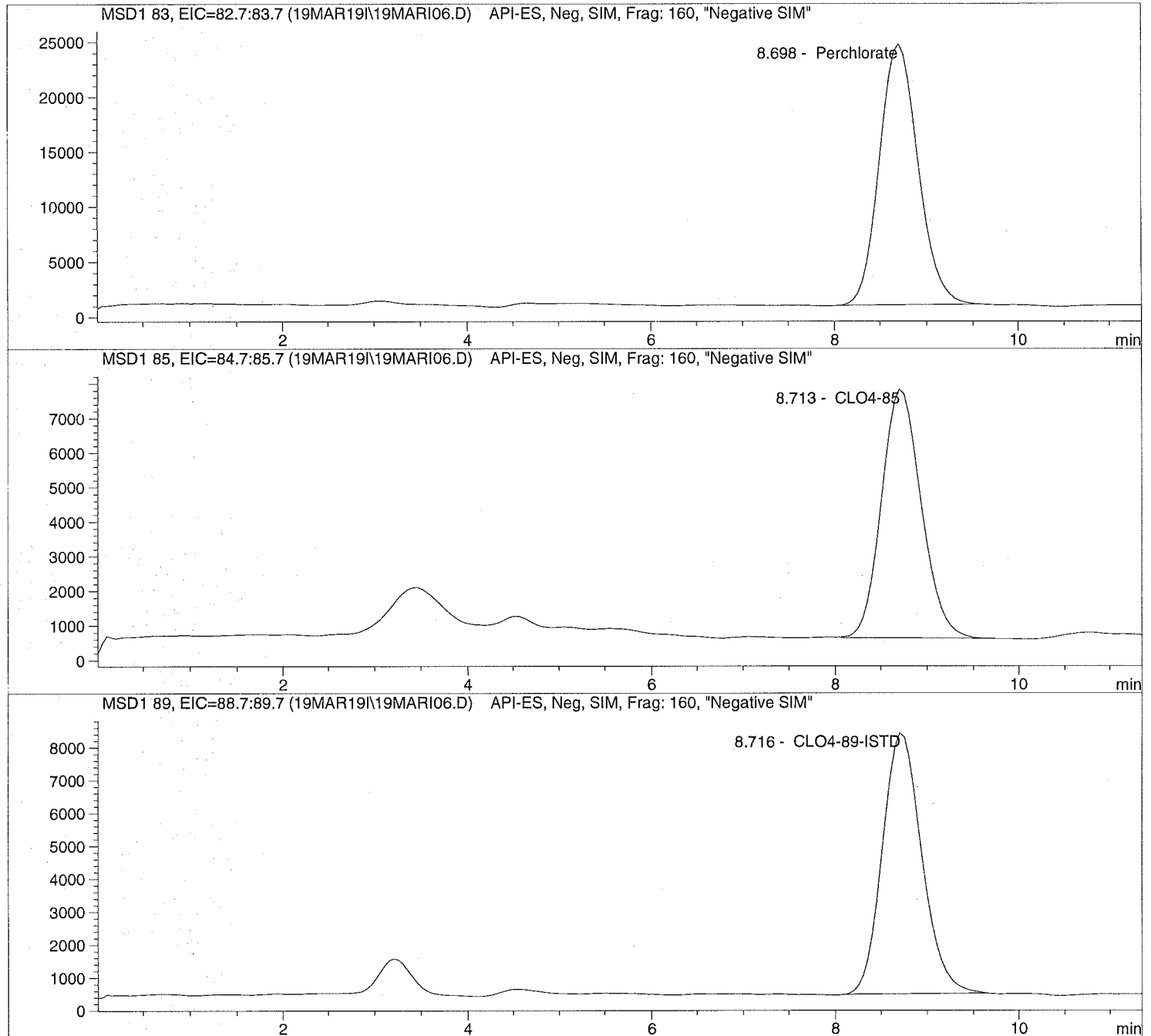
```

Injection Date: 3/19/2019 10:19:32
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



```
=====  
Injection Date: 3/19/2019 10:19:32      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-DP2.M  
Last Changed:   3/19/2019 14:35:22
```

Perchlorate analysis

=====
Sample Information
=====

```
Sorted By:      Signal  
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

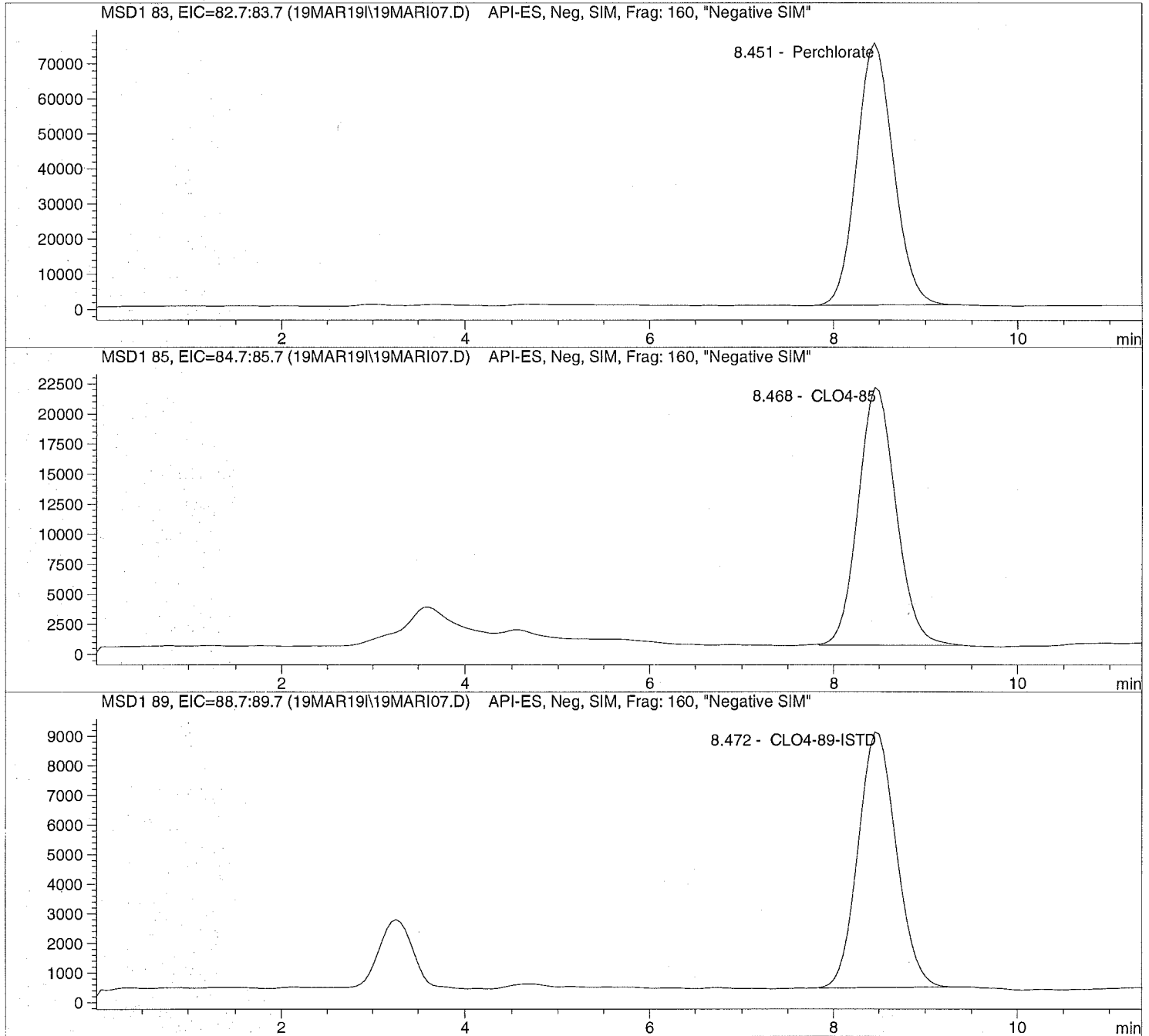
=====
*** End of Report ***

Injection Date: 3/19/2019 10:32:49
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



```

=====
Injection Date: 3/19/2019 10:32:49      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-DP2.M
Last Changed:   3/19/2019 14:35:22

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

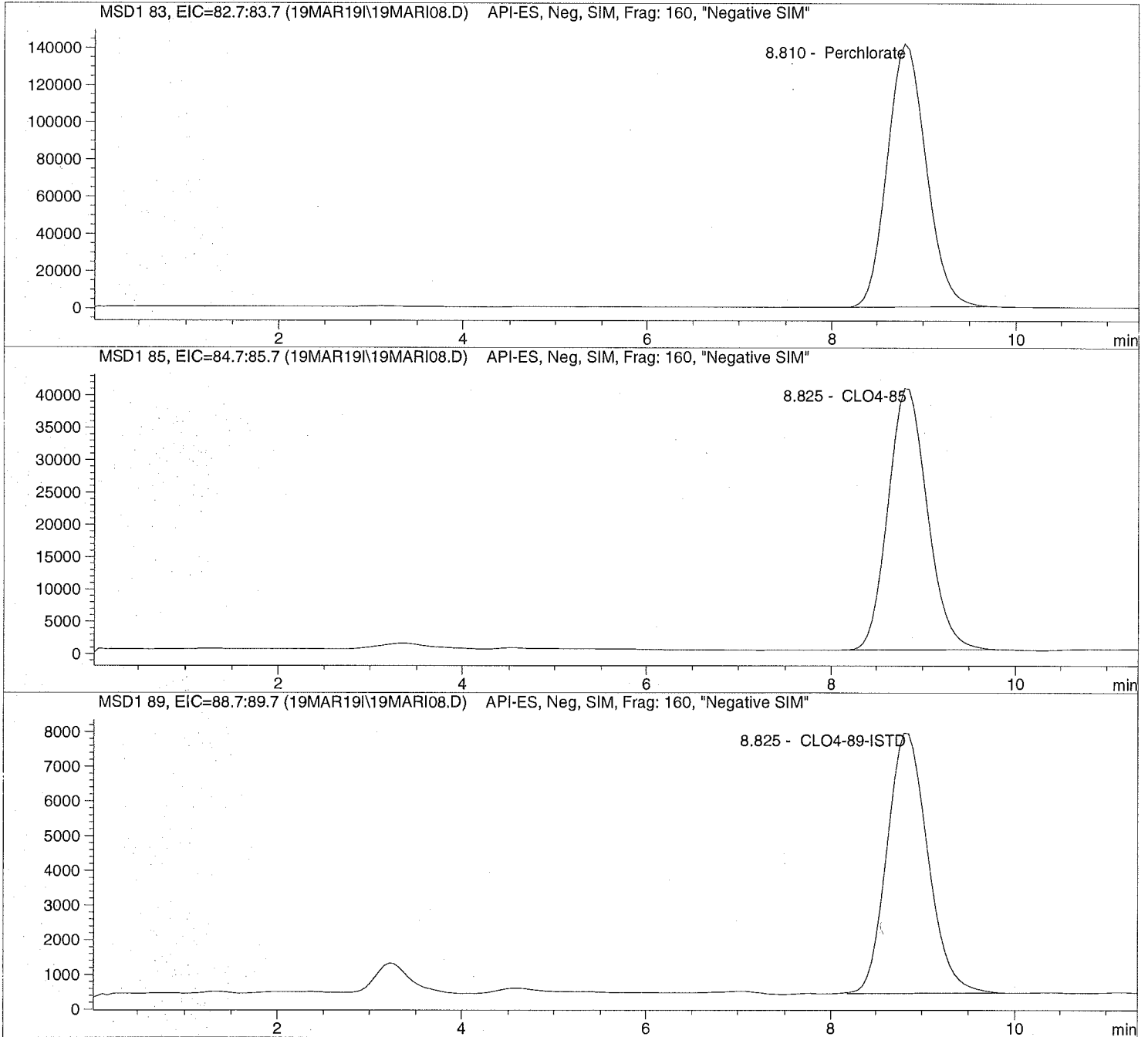
*** End of Report ***

Injection Date: 3/19/2019 10:46:05
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



```

=====
Injection Date: 3/19/2019 10:46:05      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-DP2.M
Last Changed:   3/19/2019 14:35:22

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

```

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

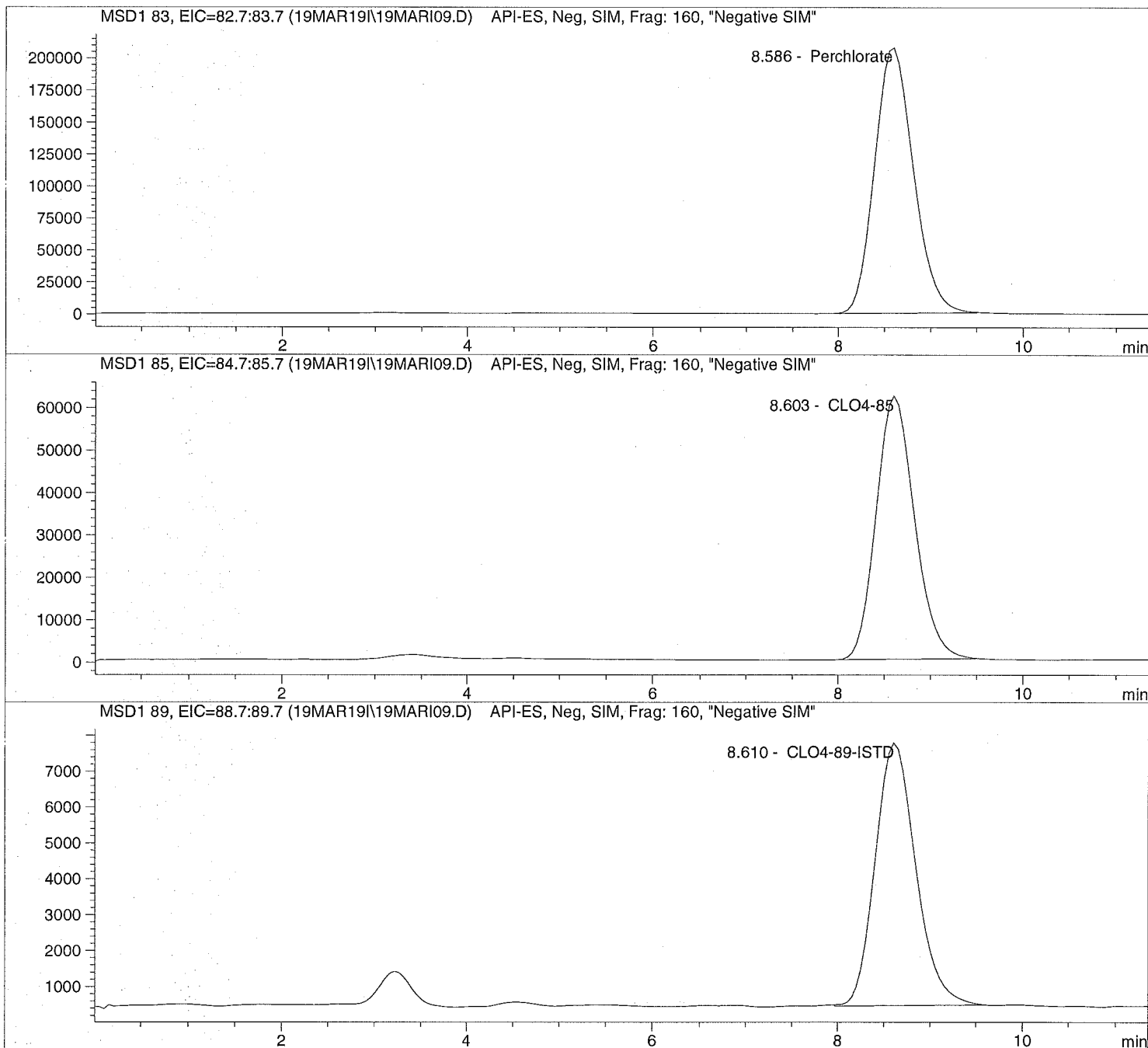
```

Injection Date: 3/19/2019 10:59:22
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



```

=====
Injection Date:  3/19/2019  10:59:22           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-DP2.M
Last Changed:   3/19/2019  14:35:22

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified:  Tue, 19. Mar. 2019,02:35:19 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
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

```

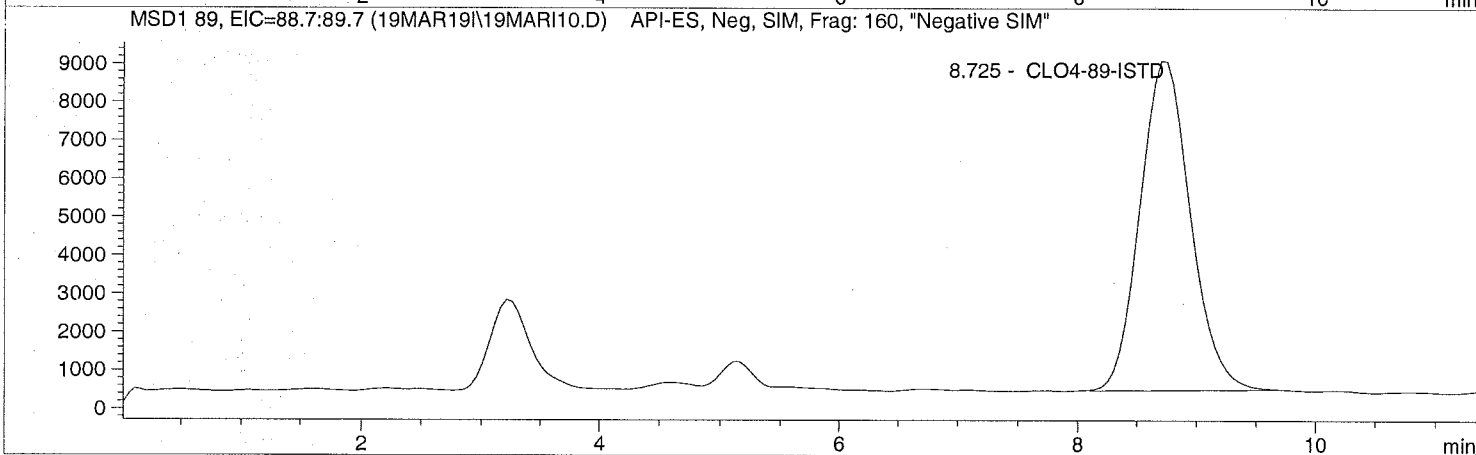
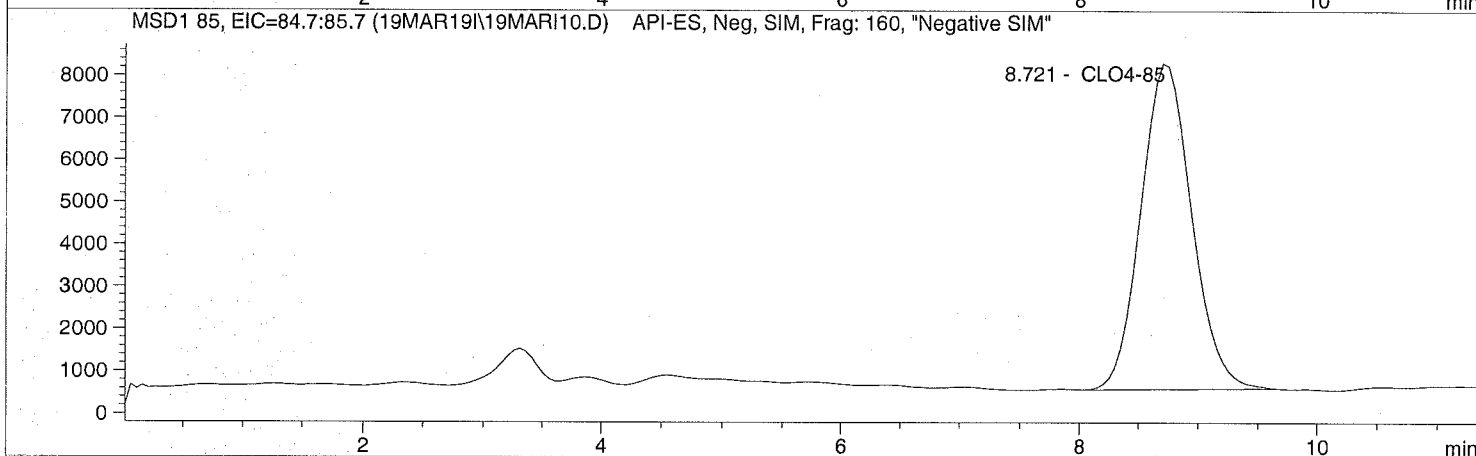
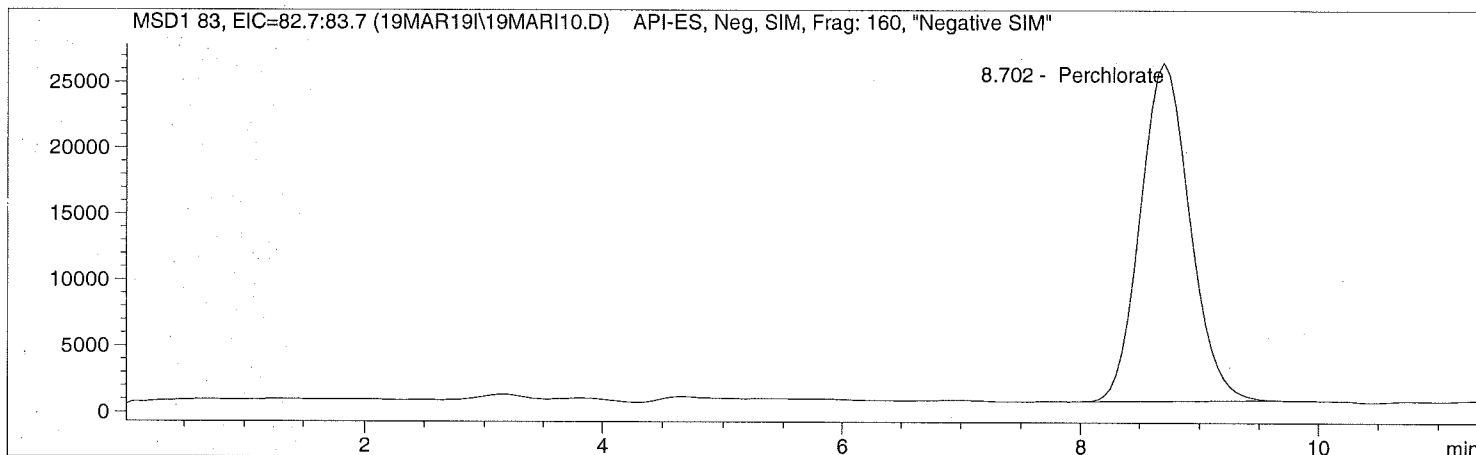
=====
*** End of Report ***

```

Injection Date: 3/19/2019 11:12:42 Seq Line: 10
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-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



```

=====
Injection Date: 3/19/2019 11:12:42      Seq Line:      10
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-DP2.M
Last Changed:   3/19/2019 14:35:22
=====

```

Perchlorate analysis

```

=====
Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

```

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

```



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

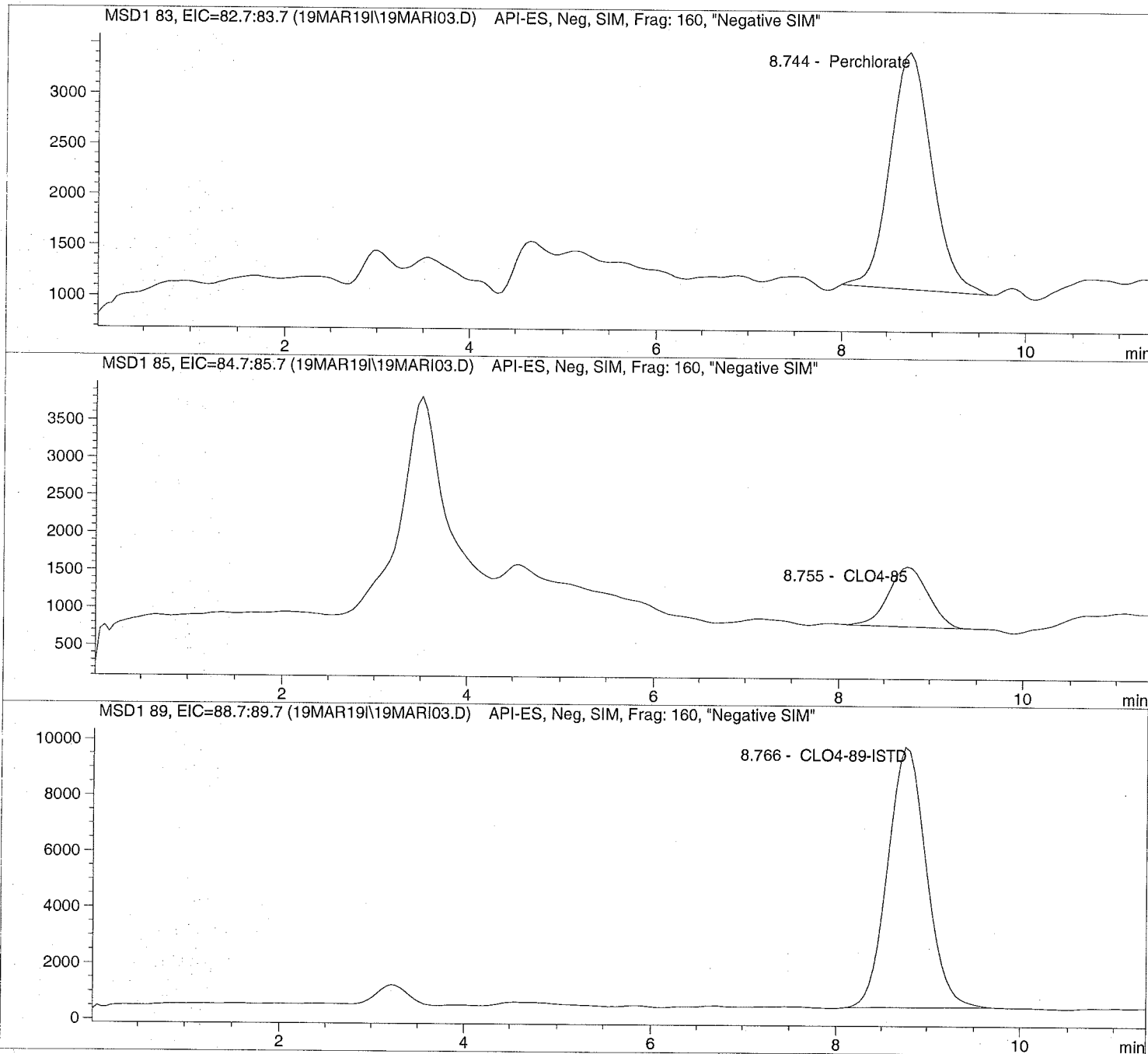


Injection Date: 3/19/2019 09:39:40
Sample Name: CLO4@ 1.0ug/L
Acq Operator: TNB

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-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis




```
=====
Injection Date:  3/19/2019  09:39:40      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-DP2.M
Last Changed:   3/19/2019  14:38:25
```

Perchlorate analysis

Sample Information

```
Sorted By:      Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 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
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	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
www.alsglobal.com

WorkOrder: HS19070619

LHAAP / Quarterly Surface Water

Bhate Environmental Associates, Inc.

Marcia Olive
445 Union Blvd Ste 129
Lakewood CO 80228

25-Jul-2019



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

July 25, 2019

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

Work Order: **HS19070619**

Laboratory Results for: **LHAAP / Quarterly Surface Water**

Dear Marcia,

ALS Environmental received 6 sample(s) on Jul 12, 2019 for the analysis presented in the following report.

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

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

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

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US

Date: 25-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Quarterly Surface Water
Work Order: HS19070619

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19070619-01	HBW7_071119	Surface Water		11-Jul-2019 08:35	12-Jul-2019 09:00	<input type="checkbox"/>
HS19070619-02	HBW10_071119	Surface Water		11-Jul-2019 08:47	12-Jul-2019 09:00	<input type="checkbox"/>
HS19070619-03	HBW1_071119	Surface Water		11-Jul-2019 08:57	12-Jul-2019 09:00	<input type="checkbox"/>
HS19070619-04	GPW1_071119	Surface Water		11-Jul-2019 09:10	12-Jul-2019 09:00	<input type="checkbox"/>
HS19070619-05	GPW1_071119_a	Surface Water		11-Jul-2019 09:10	12-Jul-2019 09:00	<input type="checkbox"/>
HS19070619-06	GPW3_071119	Surface Water		11-Jul-2019 09:23	12-Jul-2019 09:00	<input type="checkbox"/>

Client: Bhate Environmental Associates, Inc.

CASE NARRATIVE

Project: LHAAP / Quarterly Surface Water

Work Order:

Work Order Comments

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

ALS Houston, US

Date: 25-Jul-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP / Quarterly Surface Water
 Sample ID: HBW7_071119
 Collection Date: 11-Jul-2019 08:35

ANALYTICAL REPORT

WorkOrder:HS19070619
 Lab ID:HS19070619-01
 Matrix:Surface 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	25-Jul-2019 18:13

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

ALS Houston, US

Date: 25-Jul-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP / Quarterly Surface Water
 Sample ID: HBW10_071119
 Collection Date: 11-Jul-2019 08:47

ANALYTICAL REPORT

WorkOrder:HS19070619
 Lab ID:HS19070619-02
 Matrix:Surface 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	25-Jul-2019 18:13

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

ALS Houston, US

Date: 25-Jul-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP / Quarterly Surface Water
 Sample ID: HBW1_071119
 Collection Date: 11-Jul-2019 08:57

ANALYTICAL REPORT

WorkOrder:HS19070619
 Lab ID:HS19070619-03
 Matrix:Surface 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	25-Jul-2019 18:13

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

ALS Houston, US

Date: 25-Jul-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP / Quarterly Surface Water
 Sample ID: GPW1_071119
 Collection Date: 11-Jul-2019 09:10

ANALYTICAL REPORT

WorkOrder:HS19070619
 Lab ID:HS19070619-04
 Matrix:Surface 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	25-Jul-2019 18:13

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

ALS Houston, US

Date: 25-Jul-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP / Quarterly Surface Water
 Sample ID: GPW1_071119_a
 Collection Date: 11-Jul-2019 09:10

ANALYTICAL REPORT

WorkOrder:HS19070619
 Lab ID:HS19070619-05
 Matrix:Surface 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	25-Jul-2019 18:13

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

ALS Houston, US

Date: 25-Jul-19

Client: Bhate Environmental Associates, Inc.
 Project: LHAAP / Quarterly Surface Water
 Sample ID: GPW3_071119
 Collection Date: 11-Jul-2019 09:23

ANALYTICAL REPORT

WorkOrder:HS19070619
 Lab ID:HS19070619-06
 Matrix:Surface 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	25-Jul-2019 18:13

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

ALS Houston, US

Date: 25-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Quarterly Surface Water
WorkOrder: HS19070619

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R343073 (0)		Test Name : SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			Matrix: Surface Water	
HS19070619-01	HBW7_071119	11 Jul 2019 08:35			25 Jul 2019 18:13	1
HS19070619-02	HBW10_071119	11 Jul 2019 08:47			25 Jul 2019 18:13	1
HS19070619-03	HBW1_071119	11 Jul 2019 08:57			25 Jul 2019 18:13	1
HS19070619-04	GPW1_071119	11 Jul 2019 09:10			25 Jul 2019 18:13	1
HS19070619-05	GPW1_071119_a	11 Jul 2019 09:10			25 Jul 2019 18:13	1
HS19070619-06	GPW3_071119	11 Jul 2019 09:23			25 Jul 2019 18:13	1

ALS Houston, US

Date: 25-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Quarterly Surface Water
WorkOrder: HS19070619

**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
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US

Date: 25-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP / Quarterly Surface Water
Work Order: HS19070619

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19070619-01	HBW7_071119	Login	12/07/2019 15:46:54	NDR	Sub
HS19070619-02	HBW10_071119	Login	12/07/2019 15:46:54	NDR	Sub
HS19070619-03	HBW1_071119	Login	12/07/2019 15:46:54	NDR	Sub
HS19070619-04	GPW1_071119	Login	12/07/2019 15:46:54	NDR	Sub
HS19070619-05	GPW1_071119_a	Login	12/07/2019 15:46:54	NDR	Sub
HS19070619-06	GPW3_071119	Login	12/07/2019 15:46:54	NDR	Sub

Sample Receipt Checklist

Client Name: Bhate Environmental
 Work Order: HS19070619

Date/Time Received: **12-Jul-2019 09:00**
 Received by: **NDR**

Checklist completed by: Nilesh D. Ranchod 12-Jul-2019
 eSignature Date

Reviewed by: RJ Modashia 13-Jul-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 COC IDs:N/A
- Samplers name present on COC? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time? Yes No
- Container/Temp Blank temperature in compliance? Yes No

Temperature(s)/Thermometer(s):

1.4c UC/C	IR #25
-----------	--------

Cooler(s)/Kit(s):

44888

Date/Time sample(s) sent to storage:

07/12/2019 4:00PM

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:

--



1608 13th Avenue South, Suite 300
 Birmingham Alabama 35205
 Tel: 205-918-4000
 Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____
 Project/Phase No.: NWO1312.0150
 COC Number(1): _____
 LIMS Number: _____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Quarterly Surface Water Samples

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (1)	Sample Matrix (4)	Number of containers
HBW7_071119		11 July 2019	08:35	-	N		WS	1
HBW10_071119		11 July 2019	08:47	-	N		WS	1
HBW1_071119		11 July 2019	08:57	-	N		WS	1
GPW1_071119		11 July 2019	09:10	-	N		WS	1
GPW1_071119_a		11 July 2019	09:10	-	FD		WS	1
GPW3_071119		11 July 2019	09:23	-	N		WS	1

PERCHLORATE

Sample Analysis Requested (5)

Quality Assurance Samples (6)

HS19070619

Bhate Environmental Associates, Inc.
 LHAAP / Quarterly Surface Water



Ambient Blank Lot Control Number: _____
 Equipment Blank Lot Control Number: _____
 Trip Blank Lot Control Number: _____
 Cooler ID: _____

COMMENTS:


Chain of Custody transfers prior to receipt by laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
<i>Scott Beesinger</i>	7/11/19	1430	<i>[Signature]</i>	7/12/19	09:00

Delivered Directly to Lab: _____
 Sample Delivery Details / Laboratory Receipt No.: _____
 Method of Shipment: _____
 Fed _____ Ex _____ Airbill _____
 Analytical Lab: ALS 10450 Stancil Rd., Suite 210 Houston, TX 77099 (281) 530-5656
 Lab Recipient: _____
 Delivery Date/Time: _____
 ATTN: SONIA WEST

- Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)
- Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-) Sample, FD = Field Duplicate (+) Samples, EB = Equipment Blank (-) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-)
- Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)
- Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks
- Sample Analysis Requested: Analytical method requested and number of containers provided for each.
- Quality assurance samples are assigned by date (ddmm) and the sample number associated with the sample (01, 02, etc.) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

41888
 1430
 #25 01630

 ALS Environmental 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>7/11/19</i>	Time: <i>1430</i>	Date:
	Name: <i>Scott Beesinger</i>		Date: <i>07/12/19</i>
	Company: <i>BHATE</i>		

44888

JUL 12 2019



**Must Deliver Next Business Day
Time and Temperature Sensitive!**

44888

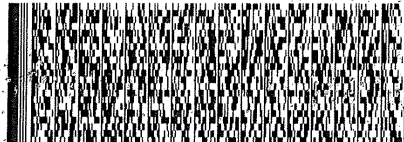
ORIGIN ID: SGRA (903) 930-6193
 SCOTT BEESINGER
 BHATE ENVIRONMENTAL ASSOCIATES
 1203-B EAST GRAND AVE. PMB202
 MARSHALL, TX 75670
 UNITED STATES US

SHIP DATE: 24MAY19
 ACT WT: 1.00 LB MAN
 CAD: 300130/CAFE3211
 DIMS: 26x14x14 IN

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
 10450 STANCLIFF ROAD
 SUITE 210
 HOUSTON TX 77099

(281) 530-6056
 REF: CHAAP/18/24 & SURFACE WATER - RJ

RMA: 01111111



FedEx
 TRACKING
 4809 7834 3218

**FRI - 12 JUL 10:30A
 PRIORITY OVERNIGHT**

AB SGRA

**77099
 TX-US
 IAH**



FID 162705 11JUL19 666A 553C2/A6F9/0CBA



Case Narrative

Method: 6850

Analysis: Perchlorate

Analysis SOP: LC-MS-CLO4

ALS WO ID(s): 1920034; 1920122; 1920123;
1920571; 1920572; 1920581

Client: ALS Laboratories (Houston, TX)

Matrix: Water

ELMS Batch (HBN): 2273 (244098)

General Set Information: There were eleven field samples in this Work Order. The samples were analyzed for perchlorate.

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

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 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 1920122001 and 1920581001 were analyzed and reported from 1:100 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 664922) was less than 1/2 the CRDL. The recovery for the LCS (664923) was within acceptable parameters.



MS/MSD Analysis: MS/MSD was performed on sample 1920123002 (Client ID: HBW10_071119). 4.0 μ l of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4. μ g/L.

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 – 664920) is reported from the analysis of the Laboratory Control Sample (LCS – 664923) at a level of 4.0 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: 19MARI03) along with datafile 23JULD03.

<u>Thomas Bosch</u>	<u>July 25, 2019</u>
Analyst	Date



ANALYTICAL REPORT

Report Date: July 25, 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: **34-1920123**

Project ID: HS19070619

Purchase Order: HS19070619

Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
HBW7_071119	1920123001	07/11/19	07/13/19	
HBW10_071119	1920123002	07/11/19	07/13/19	
HBW1_071119	1920123003	07/11/19	07/13/19	
GPW1_071119	1920123004	07/11/19	07/13/19	
GPW1_071119_a	1920123005	07/11/19	07/13/19	
GPW3_071119	1920123006	07/11/19	07/13/19	



ANALYTICAL REPORT

Workorder: 34-1920123

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: HBW7_071119	Sampling Site: NA	Collected: 07/11/2019				
Lab ID: 1920123001	Media: 125 mL Nalgene	Received: 07/13/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2274 (HBN: 244098) Analyzed: 07/23/2019 09:57	Instrument ID: LCMS04 Percent Solid: NA Report Basis: Wet				
Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	27	1.0	2.0	4.0	1	

Sample ID: HBW10_071119	Sampling Site: NA	Collected: 07/11/2019				
Lab ID: 1920123002	Media: 125 mL Nalgene	Received: 07/13/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2274 (HBN: 244098) Analyzed: 07/23/2019 10:11	Instrument ID: LCMS04 Percent Solid: 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

Sample ID: HBW1_071119	Sampling Site: NA	Collected: 07/11/2019				
Lab ID: 1920123003	Media: 125 mL Nalgene	Received: 07/13/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2274 (HBN: 244098) Analyzed: 07/23/2019 10:53	Instrument ID: LCMS04 Percent Solid: 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

Sample ID: GPW1_071119	Sampling Site: NA	Collected: 07/11/2019				
Lab ID: 1920123004	Media: 125 mL Nalgene	Received: 07/13/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2274 (HBN: 244098) Analyzed: 07/23/2019 11:07	Instrument ID: LCMS04 Percent Solid: 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



ANALYTICAL REPORT

Workorder: 34-1920123

Client: ALS Environmental
(Houston)

Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: GPW1_071119_a	Sampling Site: NA	Collected: 07/11/2019				
Lab ID: 1920123005	Media: 125 mL Nalgene	Received: 07/13/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2274 (HBN: 244098) Analyzed: 07/23/2019 11:21	Instrument ID: LCMS04 Percent Solid: 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

Sample ID: GPW3_071119	Sampling Site: NA	Collected: 07/11/2019				
Lab ID: 1920123006	Media: 125 mL Nalgene	Received: 07/13/2019				
Matrix: Water	Sampling Parameter: NA					
Analysis Method - EPA 6850, DoD QSM						
Preparation: Not Applicable	Analysis: EPA 6850, DoD QSM Water Batch: ELMS/2274 (HBN: 244098) Analyzed: 07/23/2019 11:35	Instrument ID: LCMS04 Percent Solid: 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 07/25/2019 15:05	/S/ Stephen Brose 07/25/2019 16:18

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123Phone: (801) 266-7700
Email: alsst.lab@ALSGlobal.com
Web: www.alsslc.com



ANALYTICAL REPORT

Workorder: 34-1920123

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
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf	
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

00953636

Analysis Information

Workorder: 1920123

Limits: Client SOW/Contract Specified
Basis: DoD QSM

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA 6850, DoD QSM
Batch: ELMS/2274 (HBN: 244098)
Analyzed By: Thomas Bosch

Blank

LMB: 664922 Analyzed: 07/23/2019 09:15 Units: ug/L			
Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 664923 Analyzed: 07/23/2019 08:47 Dilution: 1 Units: ug/L				
Analyte	Result	Target	% Rec	QC Limits
Perchlorate	4.24	4.00	106	78.8 123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1920123002 Analyzed: 07/23/2019 10:11 Dilution: 1 Units: ug/L		MS: 664924 Analyzed: 07/23/2019 10:25 Dilution: 1 Units: ug/L				MSD: 664925 Analyzed: 07/23/2019 10:39 Dilution: 1 Units: ug/L			
Analyte	Result	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Perchlorate	ND	4.12	4	103	78.8 123.8	4.14	104	0.46	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 07/25/2019 15:11	/S/ Stephen Brose 07/25/2019 16:18

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



1920123



10450 Standliff 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: Colorado

COC ID: 11763

SUBCONTRACT TO:

1920123

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 Standliff 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 Standliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19070619
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	HS19070619-01	HBW7_071119	Surface Water	11 Jul 2019 08:35
	SUB_Perch-6850			26 Jul 2019
2.	HS19070619-02	HBW10_071119	Surface Water	11 Jul 2019 08:47
	SUB_Perch-6850			26 Jul 2019
3.	HS19070619-03	HBW1_071119	Surface Water	11 Jul 2019 08:57
	SUB_Perch-6850			26 Jul 2019
4.	HS19070619-04	GPW1_071119	Surface Water	11 Jul 2019 09:10
	SUB_Perch-6850			26 Jul 2019
5.	HS19070619-05	GPW1_071119_a	Surface Water	11 Jul 2019 09:10
	SUB_Perch-6850			26 Jul 2019
6.	HS19070619-06	GPW3_071119	Surface Water	11 Jul 2019 09:23
	SUB_Perch-6850			26 Jul 2019

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

QC Level: DOD IV (DoD Data Package)

RIGHT SOLUTIONS | RIGHT PARTNER

13 Jul 2019

Page 3 of 1

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>7/13/19</u>		Number of Coolers Received: <u>1</u>						
Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included					
Cooler Custody Seals:	Present/Absent/NA	Location Temp Taken:	Control/Between Samples					
Container Custody Seals:	Present/Absent/NA	Are all temperatures within project specific guidelines?	Yes/No/NA					
Ice Present:	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	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 <u>9748</u>	<u>2</u> °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C
Taken By: <u>M. Orndall</u>		<u>M. Orndall</u>		Date: <u>7/13/19</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: _____

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

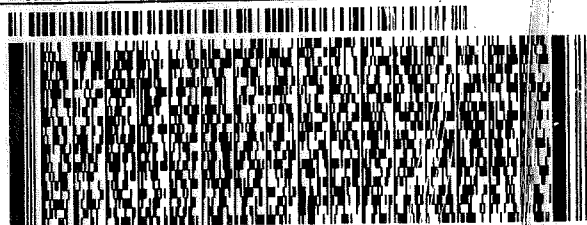
SHIP DATE: 12 JUL
ACTWGT: 28.90 LB
CAD: 300130 / CAFE
DIMS: 19x11x13 IN
BILL THIRD PARTY

TO **SAMPLE RECEIVING**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123

(801) 266-7700

REF: HS19070622/619 - RJ



FedEx
Express

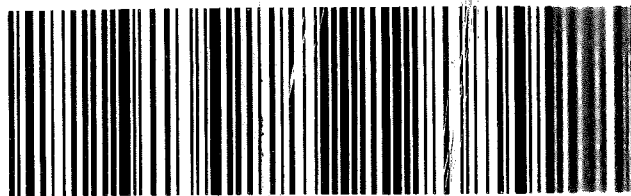


TRK# 4809 7835 8416
0201

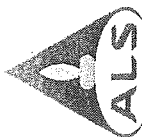
SATURDAY 12:00P
PRIORITY OVERNIGHT

XO BTFA

4123
UT - SLC



214



Batch Worklist

HBN: 244098

Instrument: WP
Status: WP

Created: 7/23/2019 08:01
Analyst: T. Bosch

Batch: ELMS/ 2274
Rule: EPA 6850, DoD QSM Water

- Workorder: 1920034 [ENV_LVL4]
- Workorder: 1920122 [ENV_LVL4]
- Workorder: 1920123 [ENV_LVL4]
- Workorder: 1920571 [ENV_LVL4]
- Workorder: 1920572 [ENV_LVL4]
- Workorder: 1920581 [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	664919	CCV for HBN 244098 [ELMS/2274]				CCV	3		E685041C3Q	5311		7/25/2019	
2	664920	RLVS for HBN 244098 [ELMS/2274]				RLVS	3		E685041C3Q	5311		7/25/2019	
3	664921	ICS for HBN 244098 [ELMS/2274]				ICS	3		E6850...D3Q	5311		7/25/2019	
4	664922	LMB for HBN 244098 [ELMS/2274]				LMB	3		E6850Q413Q	5311		7/25/2019	
5	664923	LCS for HBN 244098 [ELMS/2274]				LCS	3		E6850Q413Q	5311		7/25/2019	
6	1920034001	LH18/24-SP650_070919_BIX Water				SAMPLE	3	1920034001-A	E6850Q41.3	5480	8/6/2019	7/25/2019	
7	1920122001	ICT 13A_071119				SAMPLE	3	1920122001-A	E6850Q41.3	5480	8/8/2019	7/26/2019	
8	1920123001	HBW7_071119				SAMPLE	3	1920123001-A	E6850Q41.3	5480	8/8/2019	7/25/2019	
9	1920123002	HBW10_071119				SAMPLE	3	1920123002-A	E6850Q41.3	5480	8/8/2019	7/25/2019	
10	664924	HBW10_071119(1920123002MS)				MS	3		E6850Q413Q	5311		7/25/2019	
11	664925	HBW10_071119(1920123002MSD)				MSD	3		E6850Q413Q	5311		7/25/2019	
12	1920123003	HBW1_071119				SAMPLE	3	1920123003-A	E6850Q41.3	5480	8/8/2019	7/25/2019	
13	1920123004	GPW1_071119				SAMPLE	3	1920123004-A	E6850Q41.3	5480	8/8/2019	7/25/2019	
14	1920123005	GPW1_071119_a				SAMPLE	3	1920123005-A	E6850Q41.3	5480	8/8/2019	7/25/2019	
15	1920123006	GPW3_071119				SAMPLE	3	1920123006-A	E6850Q41.3	5480	8/8/2019	7/25/2019	
16	664926	CCV for HBN 244098 [ELMS/2274]				CCV	3		E685041C3Q	5311		7/25/2019	
17	1920571001	LH18/24-SP650_071619-BIX				SAMPLE	3	1920571001-A	E6850Q41.3	5480	8/13/2019	7/31/2019	
18	1920572001	LH18/24-SP650_071619_BIX				SAMPLE	3	1920572001-A	E6850Q41.3	5480	8/13/2019	7/31/2019	
19	1920581001	LH18/24-SP140_071619				SAMPLE	3	1920581001-A	E6850Q41.3	5480	8/13/2019	7/31/2019	
20	664927	CCV for HBN 244098 [ELMS/2274]				CCV	3		E685041C3Q	5311		7/25/2019	



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #'s: 1920034 (001); 1920122 (001); 1920123 (001-06); 1920571 (001); 1920572 (001); 1920581 (001) ELMS Batch/HBN ID: 2274 (244098)
 Prep Date: 07/19/2019 Analysis Date: 07/23/2019 Analyst: T. Bosch
 Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
 Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\23JUL19D.s
 Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

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

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

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

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MARI9D.s Offline Quantitation Method: CLO4-DP2.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

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: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 664923; Target = 4.0µg/L. ASTM type II water was used for LMB 664922.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1920123002 (Client ID: HBW10_071119). 4.0µL of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

- 1) Results reported in µg/L. Field samples 1920122001 and 1920581001 were analyzed and reported from 1:100 dilutions. The reporting limits have been adjusted accordingly.
- 2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
- 3) Sample data can be viewed at two directories within the ALS system: \\ALS\TWS013\LCMS\LCMS04\2019\JUL\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
- 4) Notebook: \\slstws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\244098-DoD-ALS-Hstn LCMS4 or through \\ALS\TWS013\DATAREVIEW\HBN#
- 5) The Reporting Limit Verification Standard (RLVS – 664920) is reported from the analysis of the Laboratory Control Sample (LCS – 664923) at a level of 4.0µg/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: 19MARI03) along with datafile 23JUL03.

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.

<u>Chromatography (GC, HPLC, LC/MS) Technical Review Criteria</u>	<u>Analyst Initials</u>	<u>Reviewer Initials</u>
Batch(es)/SDC: ELMS: 2274 HBN: 244098 1920034/1920122/1920123		
Sample Set IDs if Applicable: 1920571/1920572/1920581		
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSS, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on OC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB



STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK			Description - 6850 WKG Std 100.ug/L		
Standard: 43702		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/18/2018 02:09PM		Expires: 09/18/2019	
MFG Lot: TNB: 09/18/2018				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 WRK	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	0.1 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019



STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL	
Standard: 43659	Created By: Thomas Bosch	Amount: 100 mL	
MFG: AccuStandard	Create Date: 09/17/2018 09:09AM	Expires: 07/25/2020	
MFG Lot: 218065075		Usable: No	
Part ID: IC-PER-10X-1		Lab Lot: CLO4 STOCK	
Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL



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: 43701		Created By: Thomas Bosch		Amount: 10 mL	
MFG: ALS/SLC		Create Date: 09/18/2018 02:09PM		Expires: 09/18/2019	
MFG Lot: TNB: 09/18/2018				Usable: Yes	
Pipette ID: Not Provided				Lab Lot: CLO4 INT	
Pos.	Analyte	Name	Concentration		
1	14797-73-0	Perchlorate	10 ug/mL		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020



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



STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L			
Standard: 43730	Created By: Thomas Bosch	Amount: 25 mL			
MFG: ALS/SLC	Create Date: 09/20/2018 09:09AM	Expires: 09/20/2019			
MFG Lot: TNB: 05/09/2018	Verified By: Thomas Bosch	Usable: Yes			
Pipette ID: Not Provided	Verify Date:	Lab Lot: CLO4ISTDWRK			
Pos.	Analyte	Name	Concentration		
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L		
2	14797-73-0-89	Perchlorate 89	1000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026



STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK			Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL	
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026	
MFG Lot: SDFP-012A	Verified By: Thomas Bosch	Usable: Yes	
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK	
Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL



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.





Certificate of Analysis



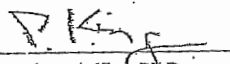
ISO Guide 34 Reference Material

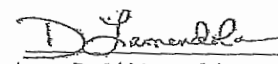
Product Number: JCC-013
Lot Number: CP-0860

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/QA



125 Market Street
New Haven, CT 06513
USA



AccuStandard®

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

CERTIFICATE OF ANALYSIS



S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (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:

Melgan O'Leary

Melgan O'Leary, Inorganic QC Manager

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

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



23118

Product Name: PERCHLORIC ACID, SODIUM SALT
 (Isotopic Label & Enrichment Specification) (18O₄, 90%+) 100 UG/ML IN WATER

Lot Number: SDDG-013

Catalog Number: OLM-7310-S

Product Information

Chemical Purity Specification: $\geq 98\%$

Labeled CAS Number: NA

Unlabeled CAS Number: 7601-89-0

MW*: 130.4

Chemical Formula: NaCl⁺O₄

Storage: Store at room temperature away from light and moisture.

Stability: See storage and expiration date.

Certification

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

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

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

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

Approved by: T. J. Eckersley

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

Quality Control Tests and Results

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



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.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
*	664919	CCV@25	Vial 71	1	Control	1	1.62672e6	25.50485
*	664923	QC@4.0	Vial 72	1	Control	2	3.26276e5	4.23719
*	664921	ICS@4.0	Vial 73	1	Control	3	2.26823e5	3.59795
*	664922	LMB	Vial 74	1	Control	4	0.00000	0.00000
*	1920034001		Vial 75	1	Sample	5	3.78721e5	5.76393
*	1920122001	100	Vial 76	1	Sample	6	3.81315e5	535.80529
*	1920123001		Vial 77	1	Sample	7	1.88703e6	27.30710
*	1920123002		Vial 78	1	Sample	8	0.00000	0.00000
*	664924	201232S	Vial 79	1	Sample	9	2.94719e5	4.12417
*	664925	201232D	Vial 80	1	Sample	10	2.98082e5	4.14318
*	1920123003		Vial 81	1	Sample	11	0.00000	0.00000
*	1920123004		Vial 82	1	Sample	12	0.00000	0.00000
*	1920123005		Vial 83	1	Sample	13	0.00000	0.00000
*	1920123006		Vial 84	1	Sample	14	0.00000	0.00000
*	664926	CCV@25	Vial 71	1	Control	15	1.58424e6	26.09295
*	1920571001		Vial 85	1	Sample	16	0.00000	0.00000
*	1920572001		Vial 86	1	Sample	17	0.00000	0.00000
*	1920581001	100	Vial 87	1	Sample	18	4.74247e6	6892.89270
*	664927	CCV@25	Vial 71	1	Control	19	1.56539e6	26.50991

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	664919	CCV@25	Vial 71	1	Control	1	4.82242e5	25.47735
*	664923	QC@4.0	Vial 72	1	Control	2	1.06930e5	4.52240
*	664921	ICS@4.0	Vial 73	1	Control	3	8.07927e4	4.14216
*	664922	LMB	Vial 74	1	Control	4	0.00000	0.00000
*	1920034001		Vial 75	1	Sample	5	1.32207e5	6.61445
*	1920122001	100	Vial 76	1	Sample	6	1.27974e5	590.20800
*	1920123001		Vial 77	1	Sample	7	5.71392e5	27.84268
*	1920123002		Vial 78	1	Sample	8	0.00000	0.00000
*	664924	201232S	Vial 79	1	Sample	9	9.30343e4	4.23661
*	664925	201232D	Vial 80	1	Sample	10	9.90502e4	4.47914
*	1920123003		Vial 81	1	Sample	11	0.00000	0.00000
*	1920123004		Vial 82	1	Sample	12	0.00000	0.00000
*	1920123005		Vial 83	1	Sample	13	0.00000	0.00000
*	1920123006		Vial 84	1	Sample	14	0.00000	0.00000
*	664926	CCV@25	Vial 71	1	Control	15	4.73538e5	26.27353
*	1920571001		Vial 85	1	Sample	16	0.00000	0.00000
*	1920572001		Vial 86	1	Sample	17	0.00000	0.00000
*	1920581001	100	Vial 87	1	Sample	18	1.37287e6	6775.22031
*	664927	CCV@25	Vial 71	1	Control	19	4.66031e5	26.59490

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	664919	CCV@25	Vial 71	1	Control	1	1.93813e5	5.00000
*	664923	QC@4.0	Vial 72	1	Control	2	2.53019e5	5.00000
*	664921	ICS@4.0	Vial 73	1	Control	3	2.08874e5	5.00000
*	664922	LMB	Vial 74	1	Control	4	2.28613e5	5.00000
*	1920034001		Vial 75	1	Sample	5	2.12986e5	5.00000
*	1920122001	100	Vial 76	1	Sample	6	2.31390e5	500.00000
*	1920123001		Vial 77	1	Sample	7	2.09097e5	5.00000
*	1920123002		Vial 78	1	Sample	8	2.14312e5	5.00000
*	664924	201232S	Vial 79	1	Sample	9	2.35117e5	5.00000
*	664925	201232D	Vial 80	1	Sample	10	2.36657e5	5.00000
*	1920123003		Vial 81	1	Sample	11	2.72320e5	5.00000
*	1920123004		Vial 82	1	Sample	12	2.70263e5	5.00000
*	1920123005		Vial 83	1	Sample	13	2.50554e5	5.00000
*	1920123006		Vial 84	1	Sample	14	2.77086e5	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount	
*	664926	CCV@25	Vial 71	1	Control	15	1.84240e5	8.170	5.00000
*	1920571001		Vial 85	1	Sample	16	2.24657e5	7.814	5.00000
*	1920572001		Vial 86	1	Sample	17	2.04102e5	7.796	5.00000
*	1920581001	100	Vial 87	1	Sample	18	1.90565e5	8.391	500.00000
*	664927	CCV@25	Vial 71	1	Control	19	1.79008e5	8.198	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

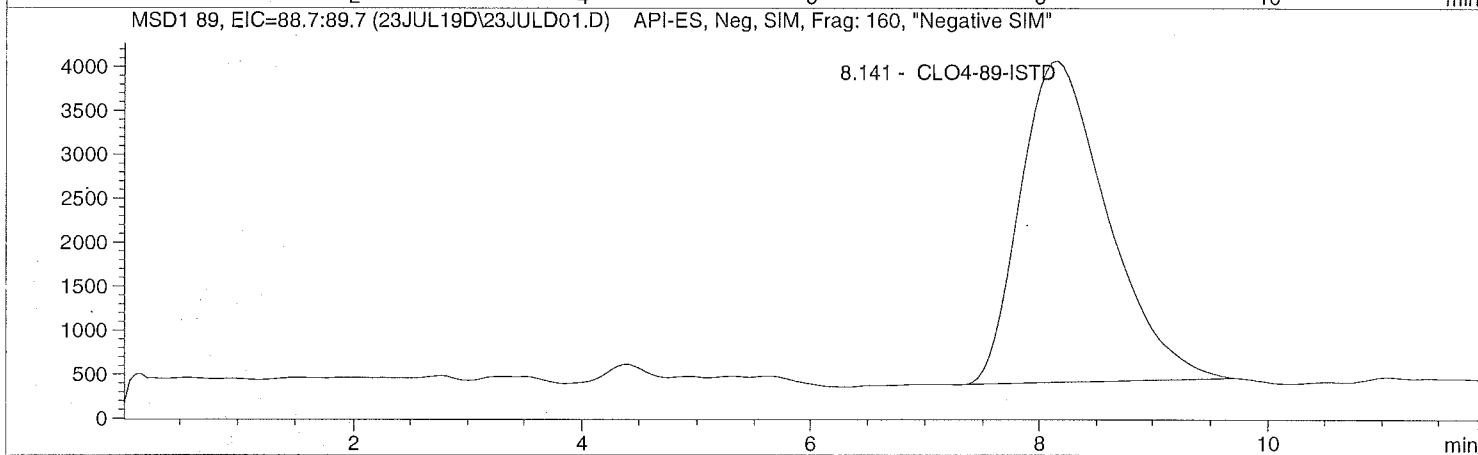
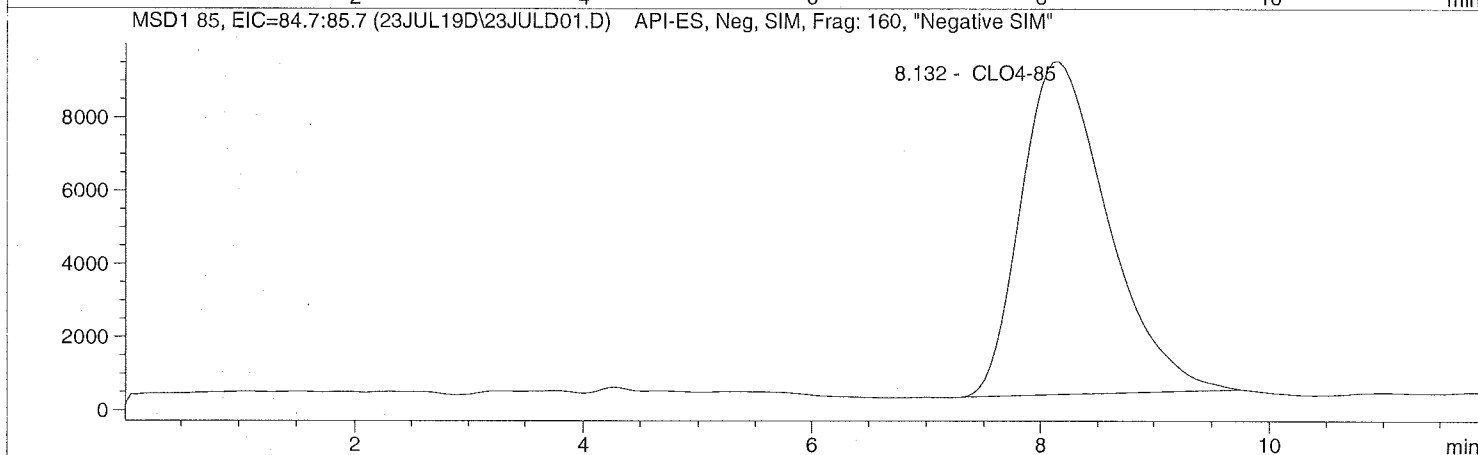
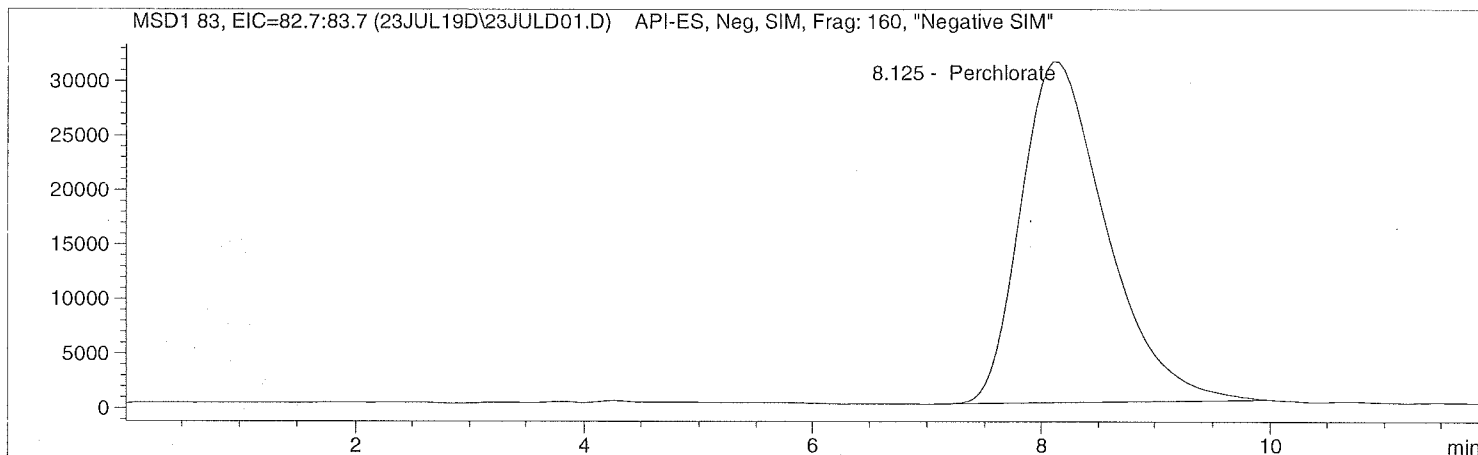
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
====	=====	=====	=====	===	=====	=====	=====
1	Vial 71	664919 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	664923 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	664921 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	664922 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1920034001	CLO4-AQN	1	Sample		
6	Vial 76	1920122001 100	CLO4-AQN	1	Sample		
7	Vial 77	1920123001	CLO4-AQN	1	Sample		
8	Vial 78	1920123002	CLO4-AQN	1	Sample		
9	Vial 79	664924 201232S	CLO4-AQN	1	Sample		
10	Vial 80	664925 201232D	CLO4-AQN	1	Sample		
11	Vial 81	1920123003	CLO4-AQN	1	Sample		
12	Vial 82	1920123004	CLO4-AQN	1	Sample		
13	Vial 83	1920123005	CLO4-AQN	1	Sample		
14	Vial 84	1920123006	CLO4-AQN	1	Sample		
15	Vial 71	664926 CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 85	1920571001	CLO4-AQN	1	Sample		
17	Vial 86	1920572001	CLO4-AQN	1	Sample		
18	Vial 87	1920581001 100	CLO4-AQN	1	Sample		
19	Vial 71	664927 CCV@25	CLO4-AQN	1	Ctrl Samp		

Injection Date: 7/23/2019 08:31:50
Sample Name: 664919 CCV025
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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



```
=====
Injection Date: 7/23/2019 08:31:50      Seq Line: 1
Sample Name: 664919 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-DP2.M
Last Changed: 4/12/2019 07:54:13
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
8.125	PBA	1626721.4	25.5049	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.132	PBA	482242.2	25.4774	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.141	PBA	193813.0	5.0000	CLO4-89-ISTD

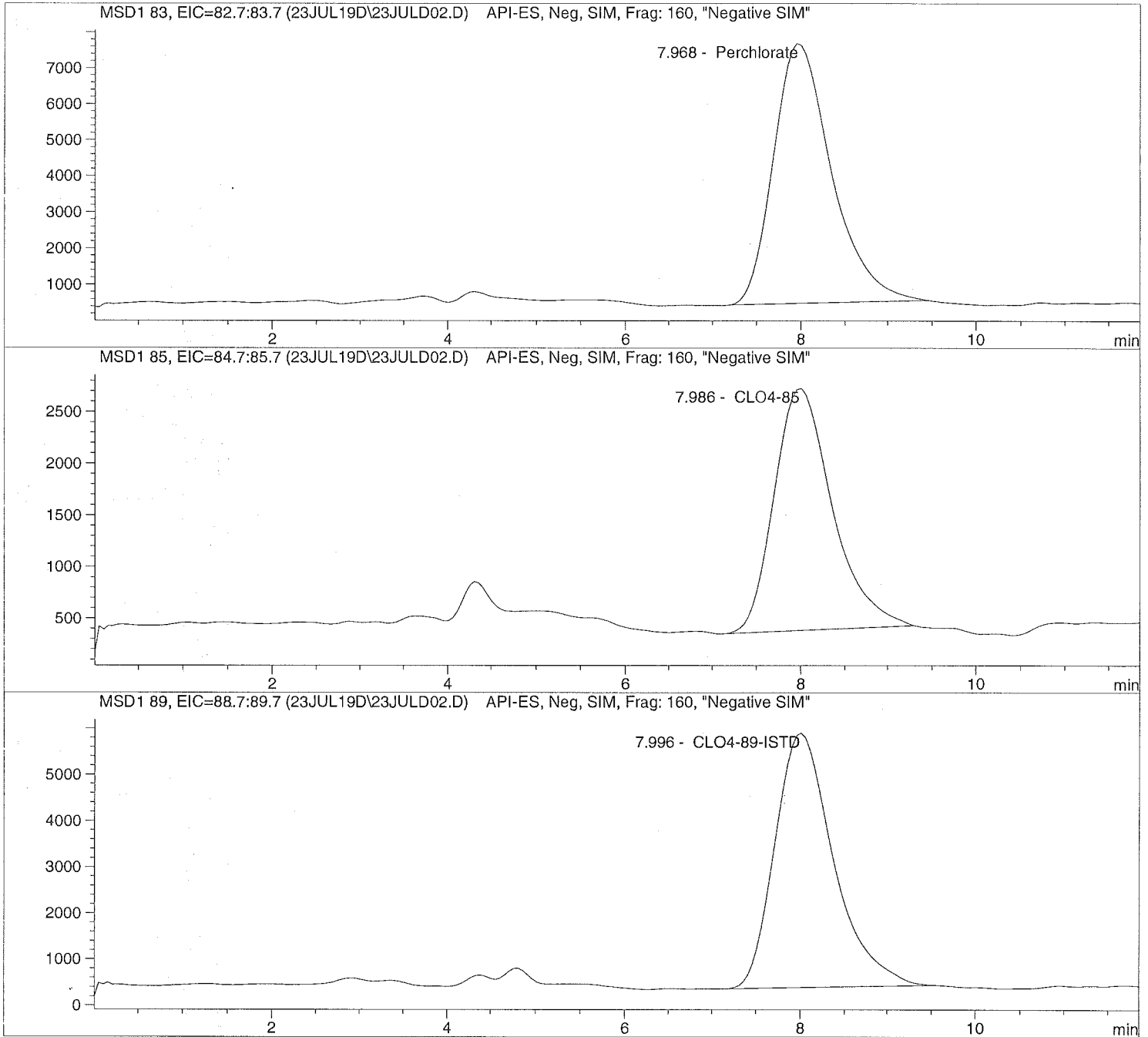
=====
*** End of Report ***

Injection Date: 7/23/2019 08:47:43
Sample Name: 664923 QC@4.0
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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



```
=====
Injection Date: 7/23/2019 08:47:43      Seq Line: 2
Sample Name: 664923 QC@4.0             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-DP2.M
Last Changed: 4/12/2019 07:54:13
=====
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 4.000
=====
```

===== LCMS Results =====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.968	PBA	326275.9	4.2372	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.986	PBA	106930.0	4.5224	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.996	PBA	253018.7	5.0000	CLO4-89-ISTD

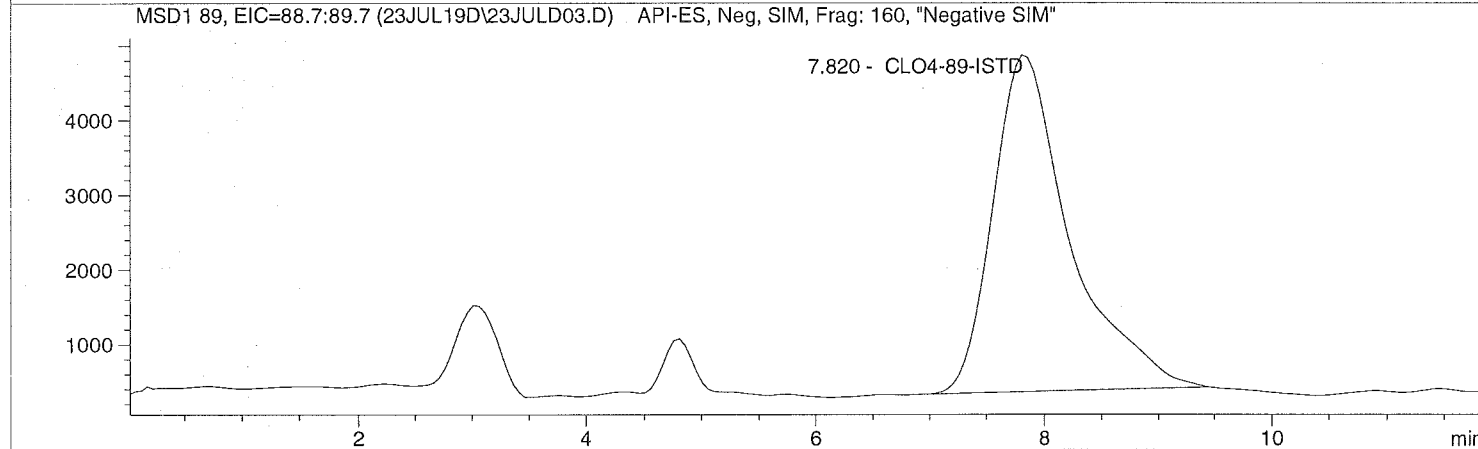
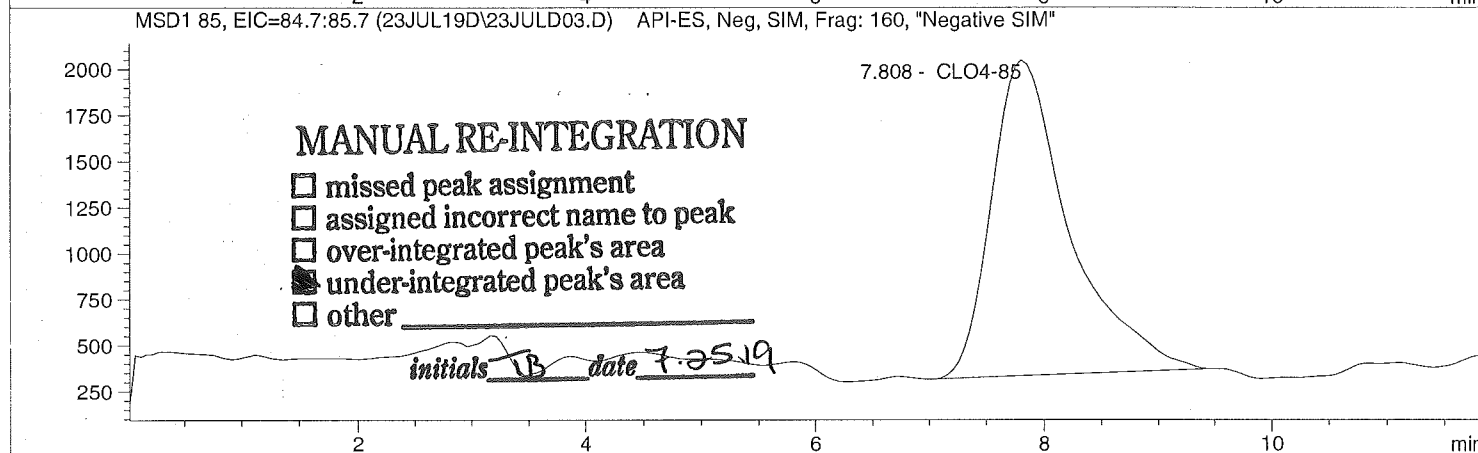
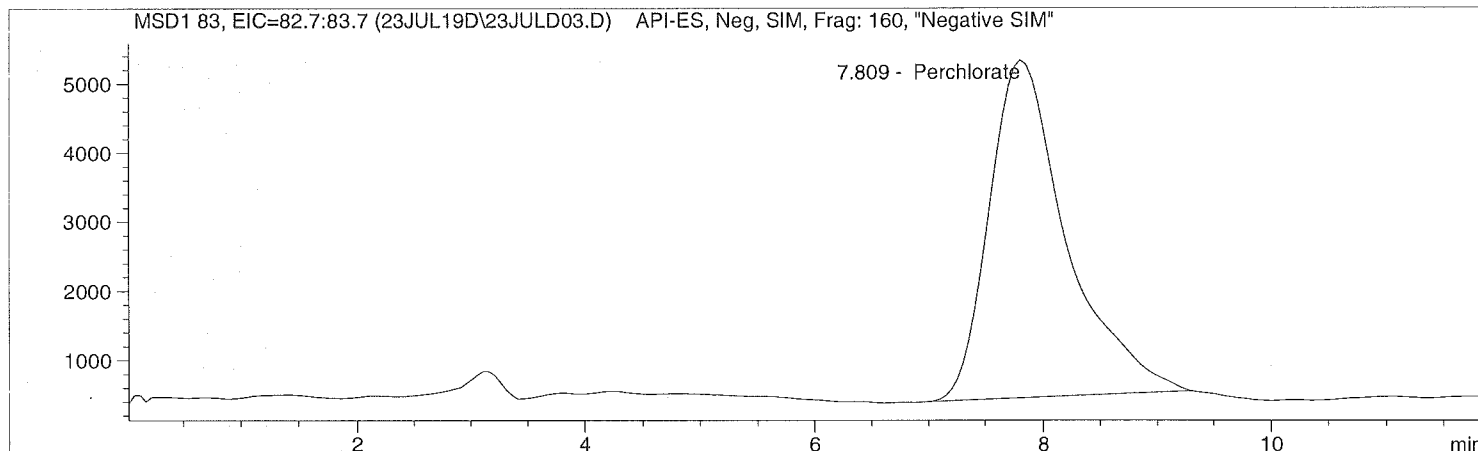
=====
*** End of Report ***

Injection Date: 7/23/2019 09:01:39
Sample Name: 664921 ICS@4.0
Acq Operator: TNB

Seq Line: 3
Location: Vial 73
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



```
=====  
Injection Date: 7/23/2019 09:01:39      Seq Line: 3  
Sample Name: 664921 ICS@4.0            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-DP2.M  
Last Changed: 4/12/2019 07:54:13
```

Perchlorate analysis

=====
Sample Information
=====

```
Sorted By: Signal  
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am  
Multiplier: 1.000000  
Dilution: 1.000000  
Sample Amount: 4.000
```

=====
LCMS Results
=====

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.809	PBA	226823.0	3.5980	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.808	MM	80792.7	4.1422	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

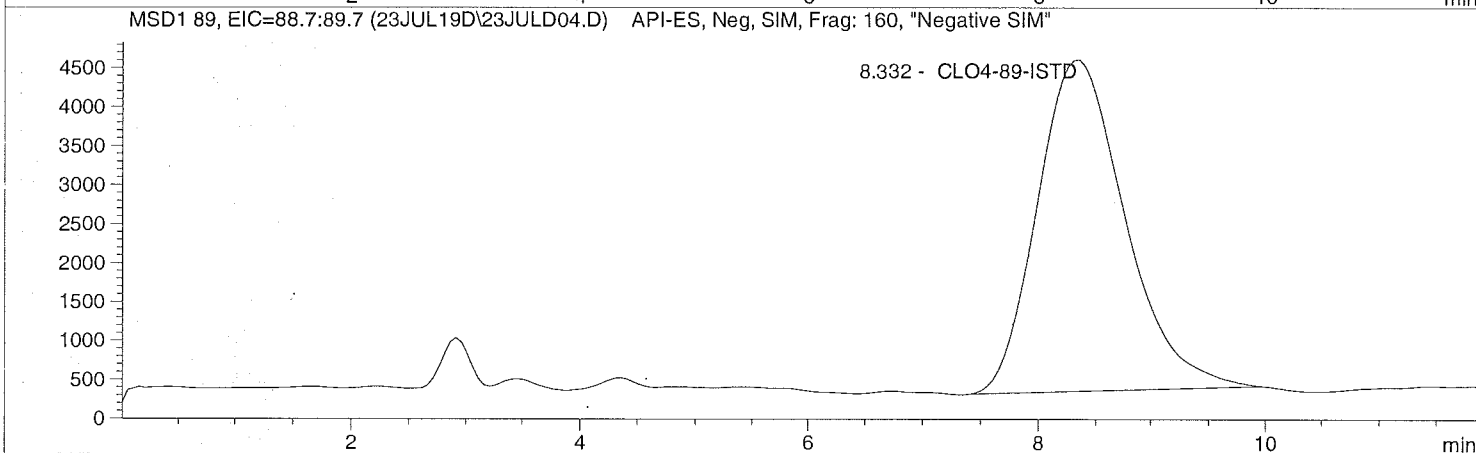
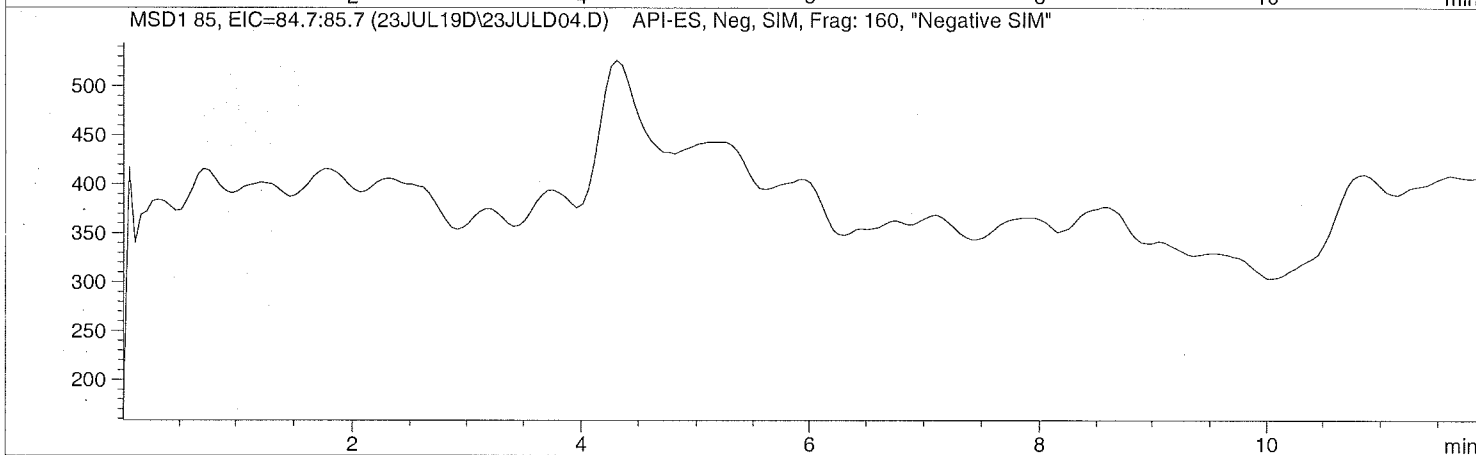
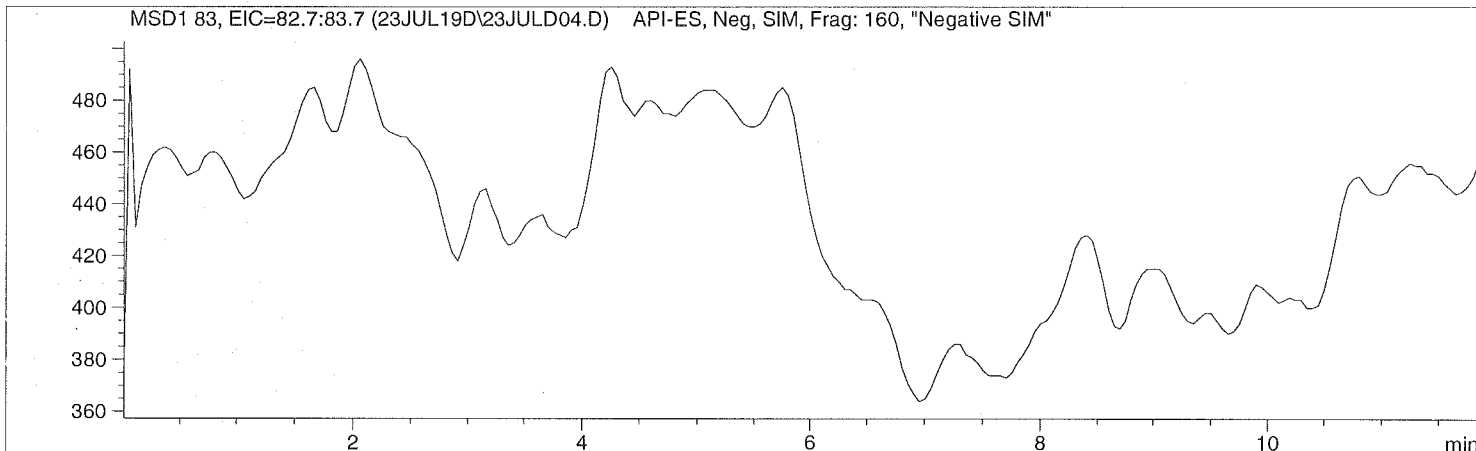
RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.820	PBA	208873.6	5.0000	CLO4-89-ISTD

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

=====
Injection Date: 7/23/2019 09:15:35 Seq Line: 4
Sample Name: 664922 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date: 7/23/2019 09:15:35 Seq Line: 4
Sample Name: 664922 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
8.332	PBA	228612.6	5.0000	CLO4-89-ISTD

*** End of Report ***


```
=====
Injection Date: 7/23/2019 09:29:31      Seq Line:          5
Sample Name:    1920034001              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-DP2.M
Last Changed:   4/12/2019 07:54:13
=====
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
7.756	PBA	378721.2	5.7639	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.757	PBA	132206.6	6.6144	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.778	PBA	212985.8	5.0000	CLO4-89-ISTD

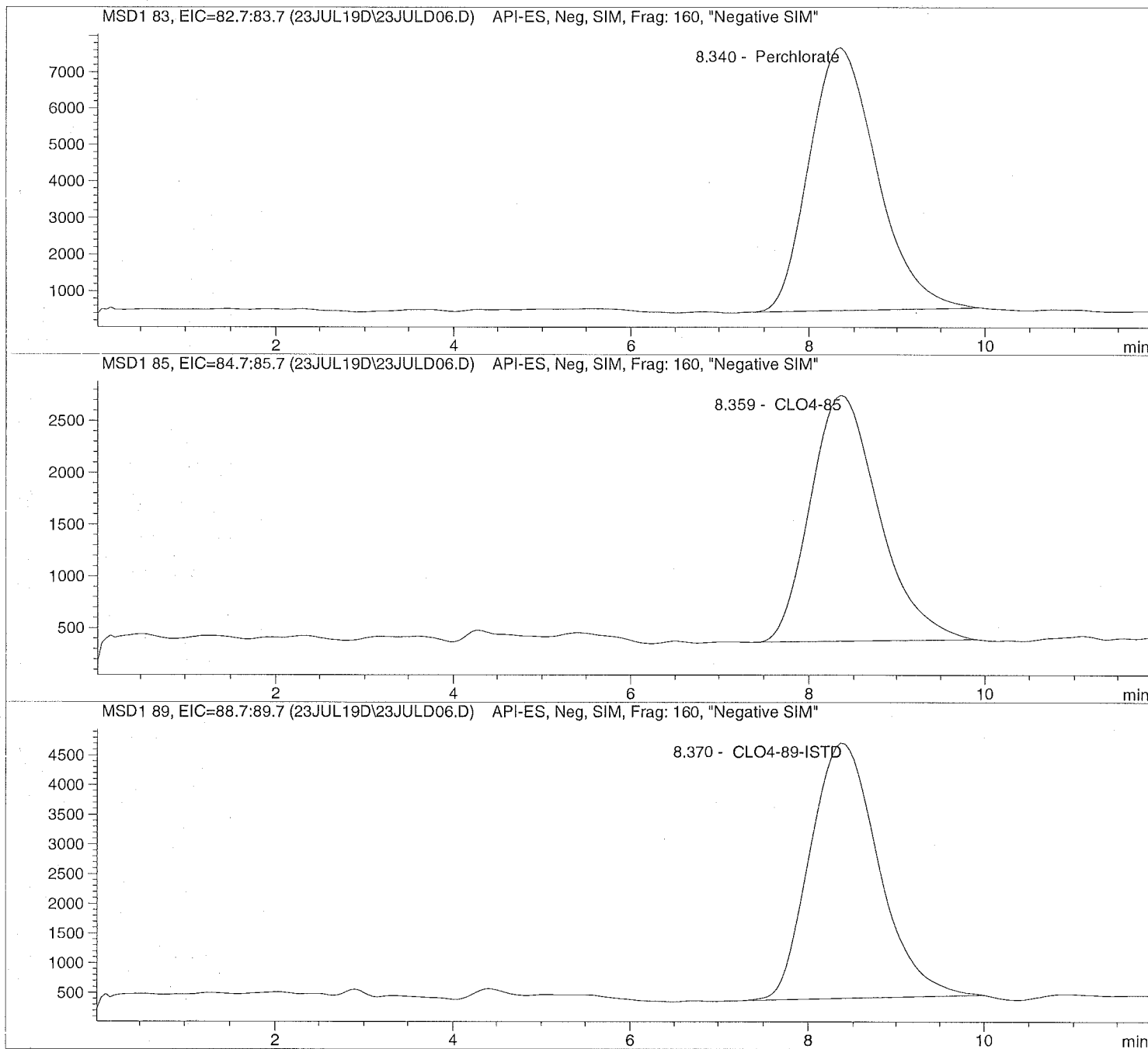
=====
*** End of Report ***

Injection Date: 7/23/2019 09:43:25
Sample Name: 1920122001 100
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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



```
=====
Injection Date: 7/23/2019 09:43:25      Seq Line: 6
Sample Name: 1920122001 100            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-DP2.M
Last Changed: 4/12/2019 07:54:13
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
8.340	PBA	381315.1	535.8053	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.359	PBA	127974.4	590.2080	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.370	PBA	231390.0	500.0000	CLO4-89-ISTD

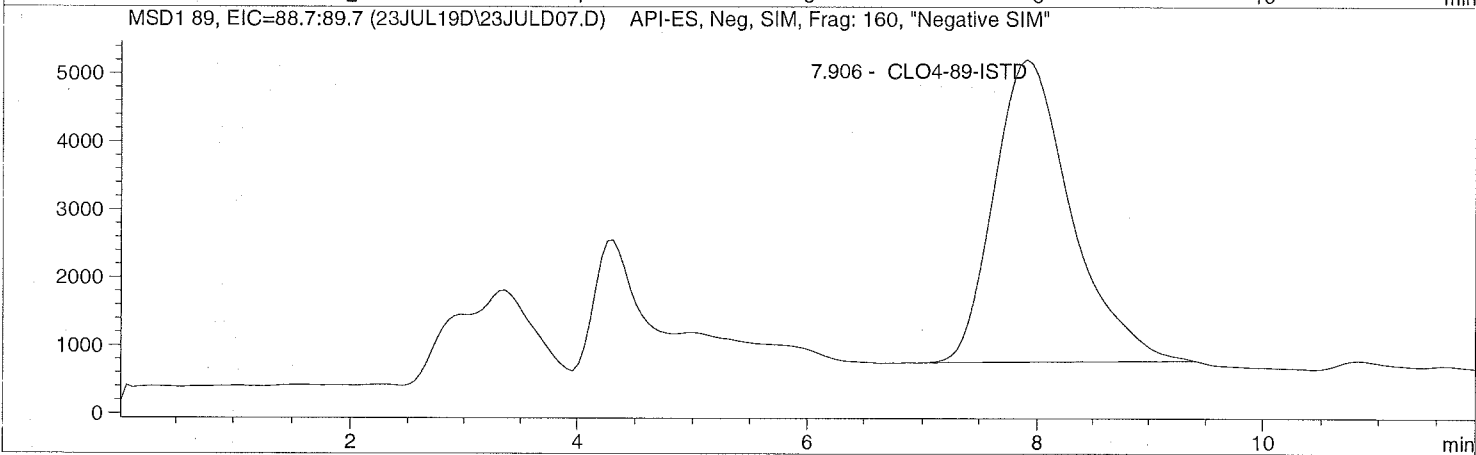
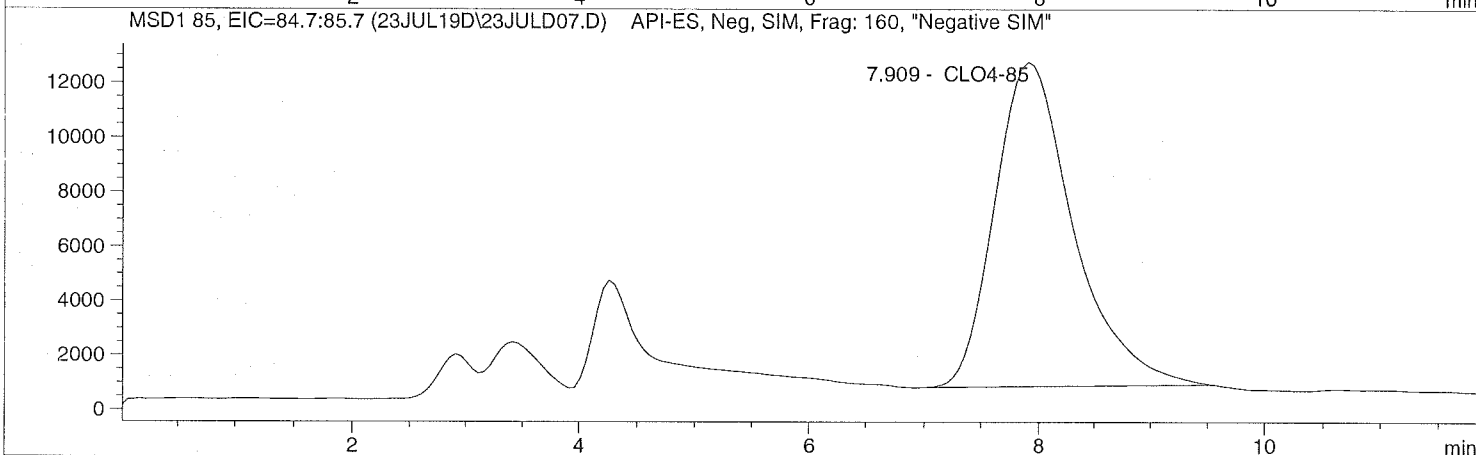
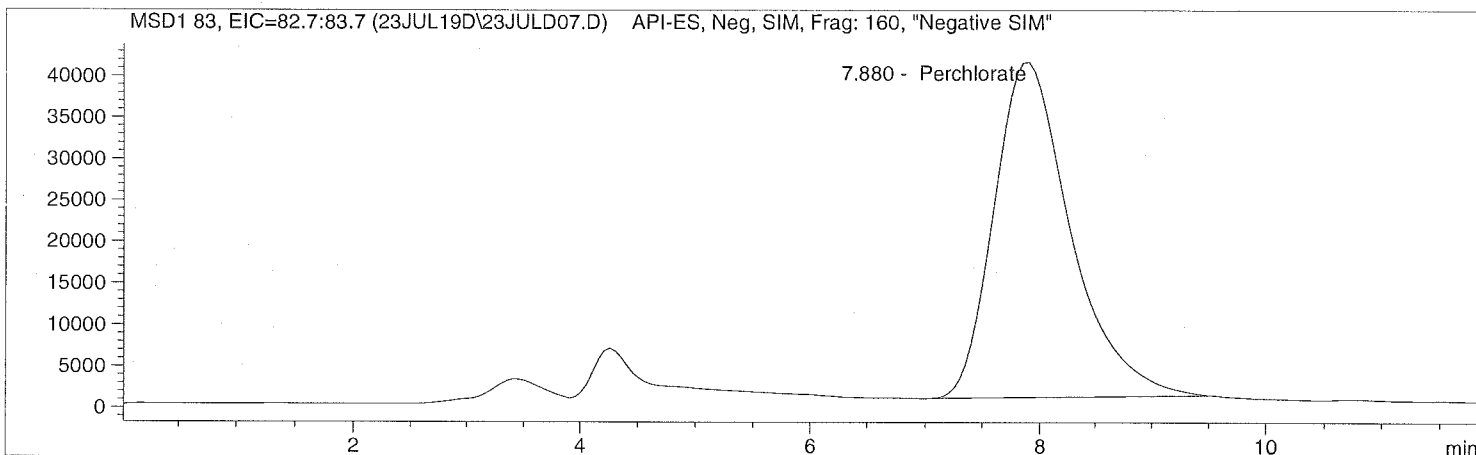
=====
*** End of Report ***

Injection Date: 7/23/2019 09:57:24
Sample Name: 1920123001
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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



```
=====
Injection Date: 7/23/2019 09:57:24      Seq Line: 7
Sample Name: 1920123001                  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-DP2.M
Last Changed: 4/12/2019 07:54:13
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
7.880	PBA	1887029.5	27.3071	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.909	PBA	571391.9	27.8427	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.906	PBA	209097.0	5.0000	CLO4-89-ISTD

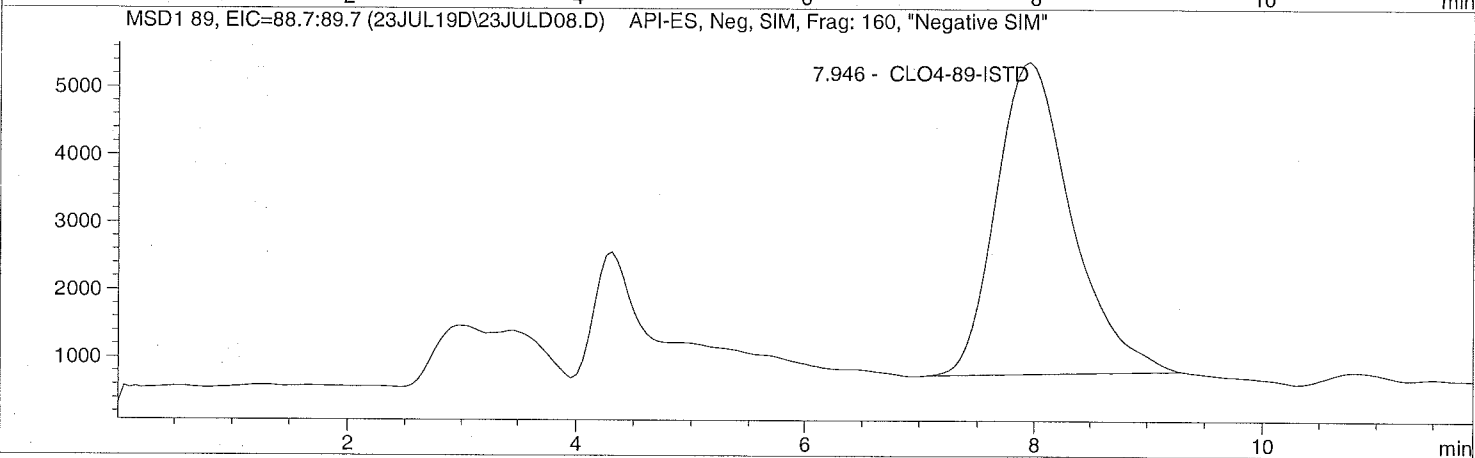
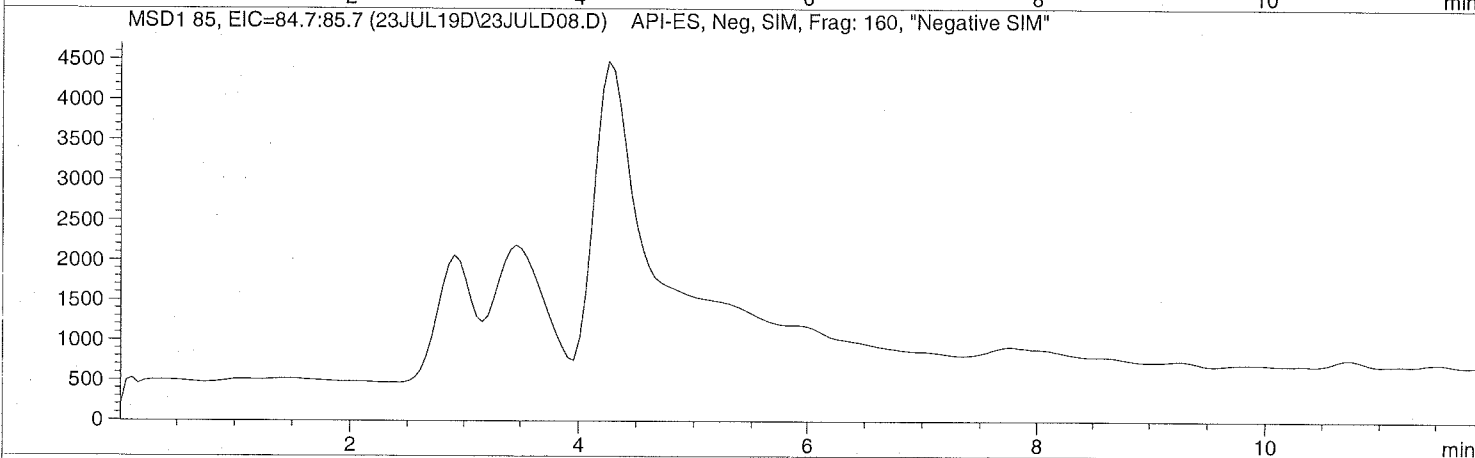
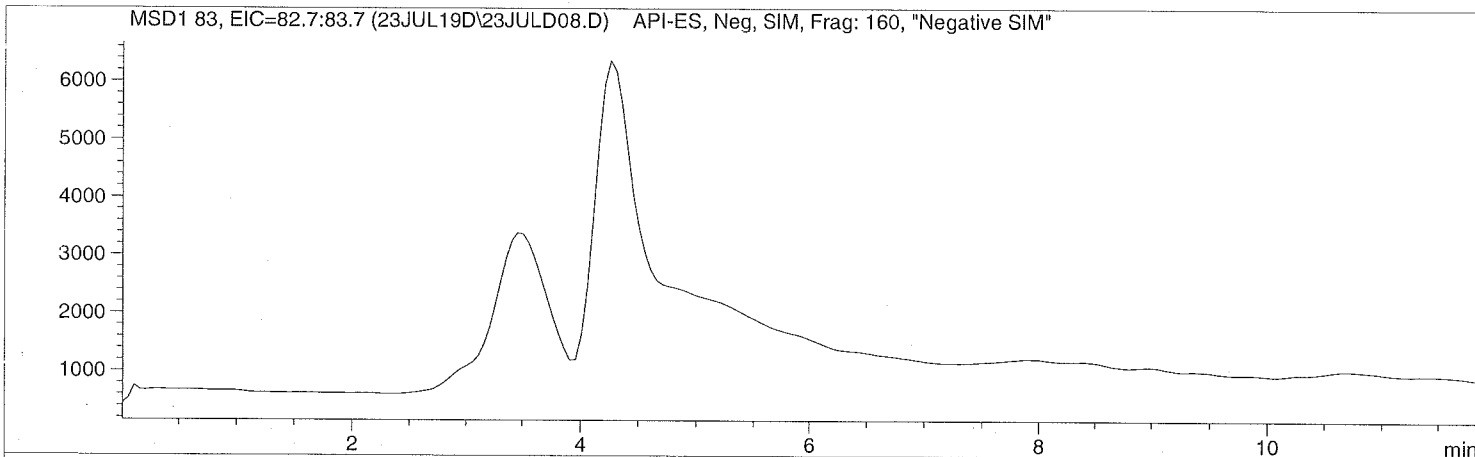
=====
*** End of Report ***

Injection Date: 7/23/2019 10:11:24
Sample Name: 1920123002
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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



```
=====
Injection Date: 7/23/2019 10:11:24      Seq Line:      8
Sample Name:    1920123002              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-DP2.M
Last Changed:   4/12/2019 07:54:13
=====
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
7.946	PBA	214312.1	5.0000	CLO4-89-ISTD

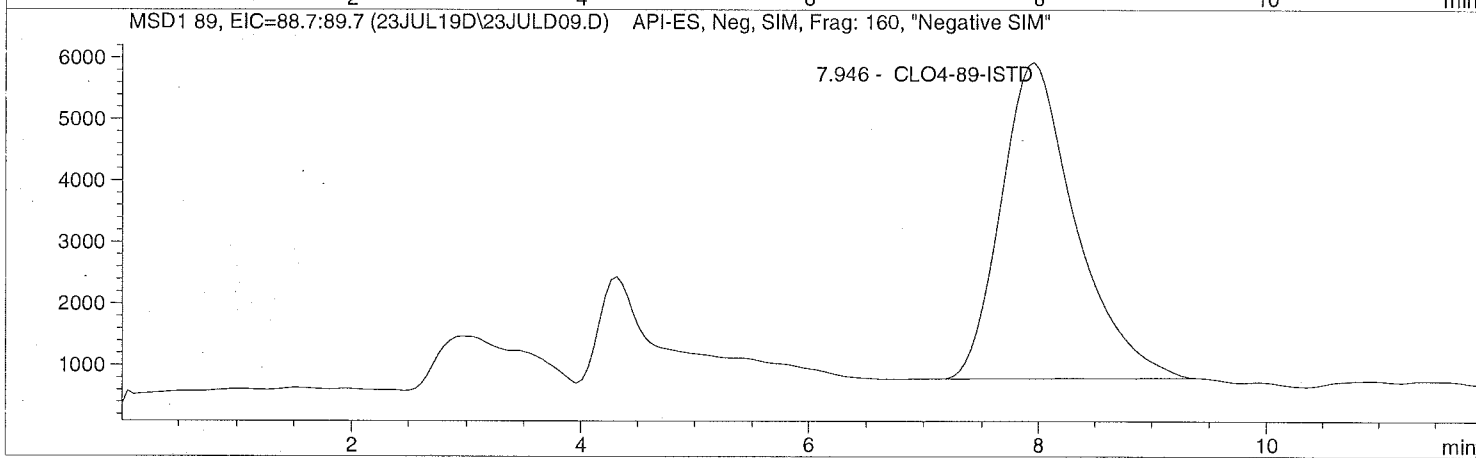
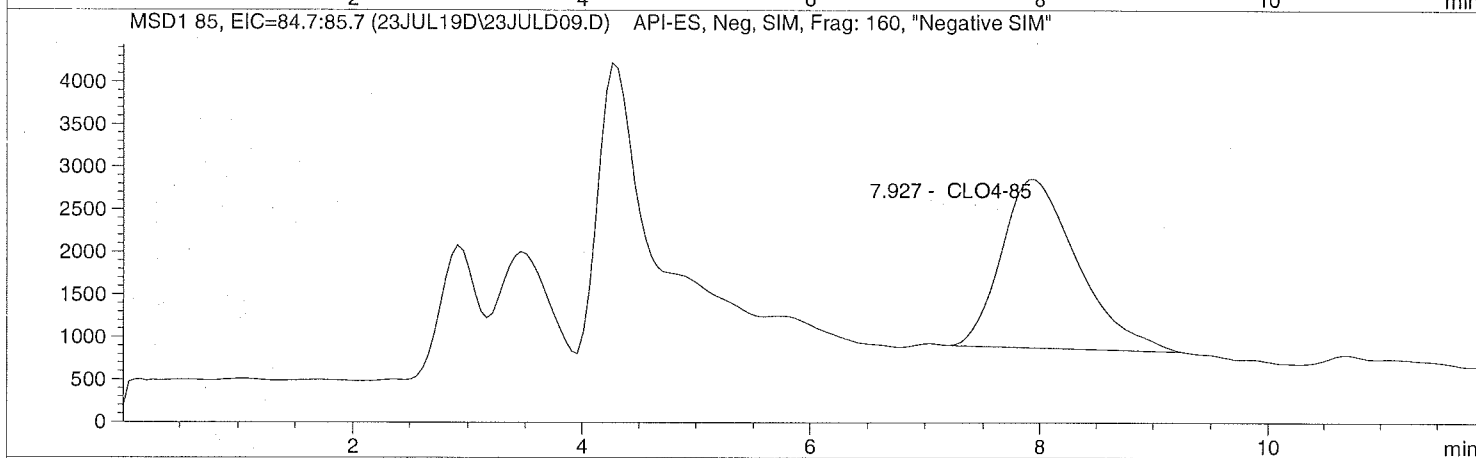
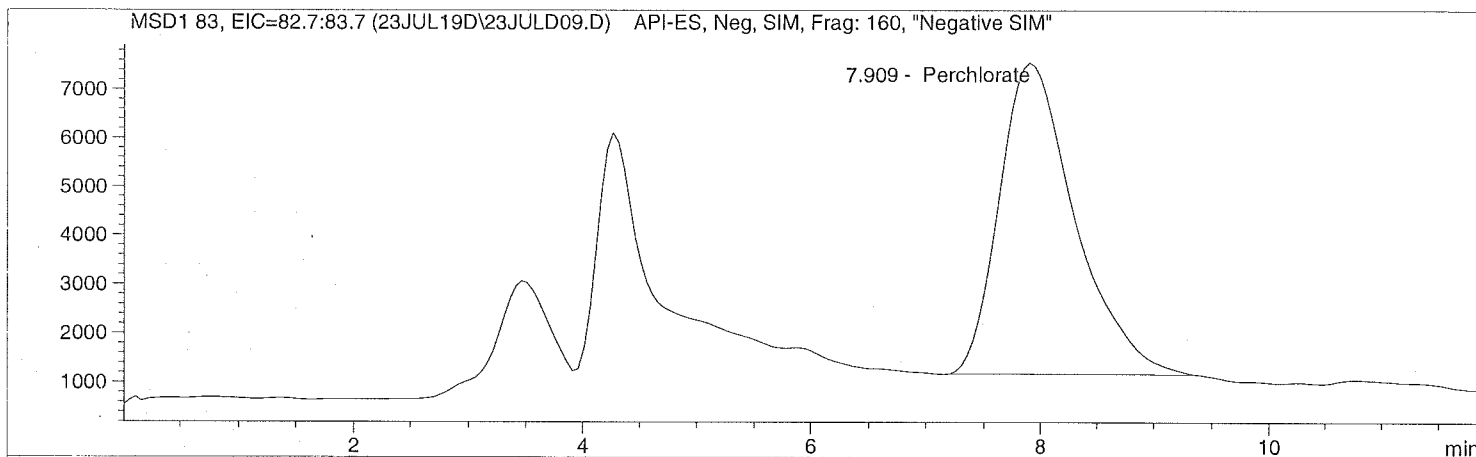
=====
*** End of Report ***

Injection Date: 7/23/2019 10:25:26
Sample Name: 664924 201232S
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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date: 7/23/2019 10:25:26 Seq Line: 9
Sample Name: 664924 201232S 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019, 07:52:58 am
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
7.909	PBA	294718.6	4.1242	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.927	PBA	93034.3	4.2366	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.946	PBA	235117.5	5.0000	CLO4-89-ISTD

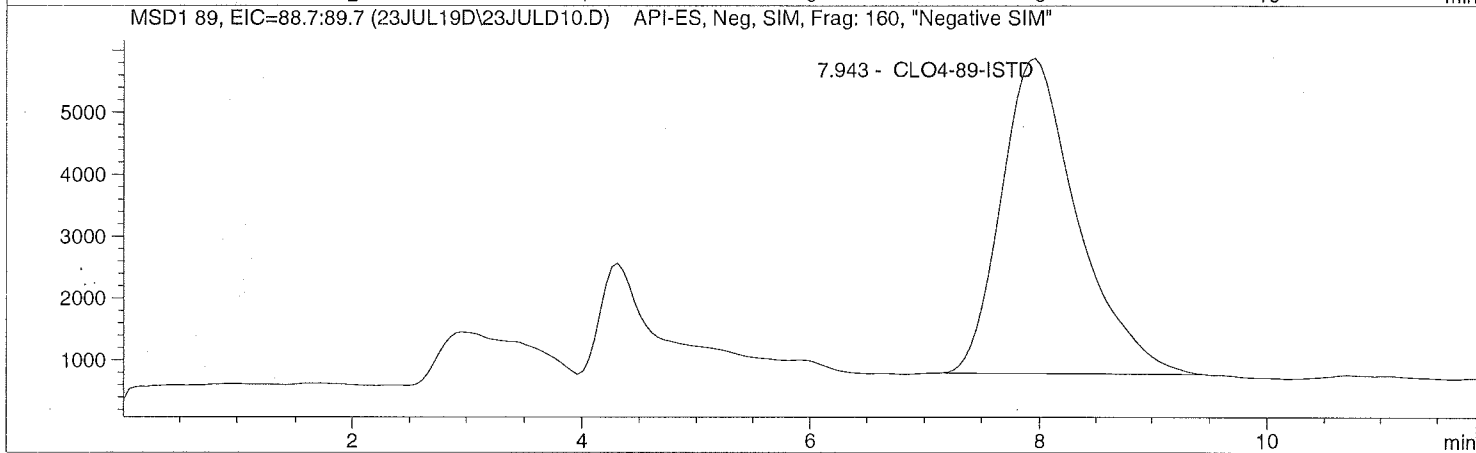
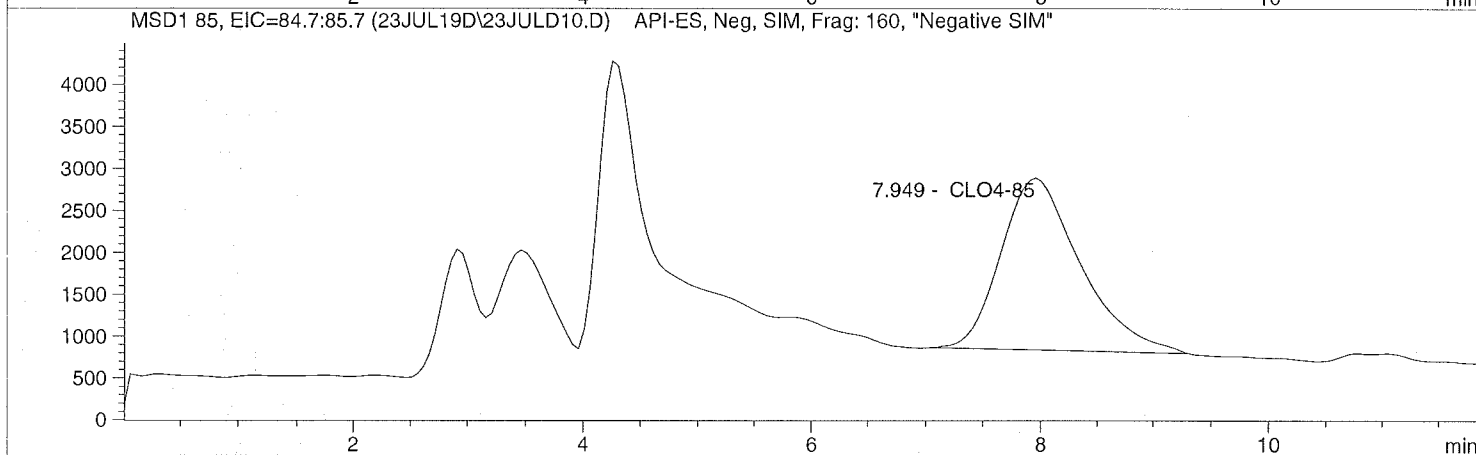
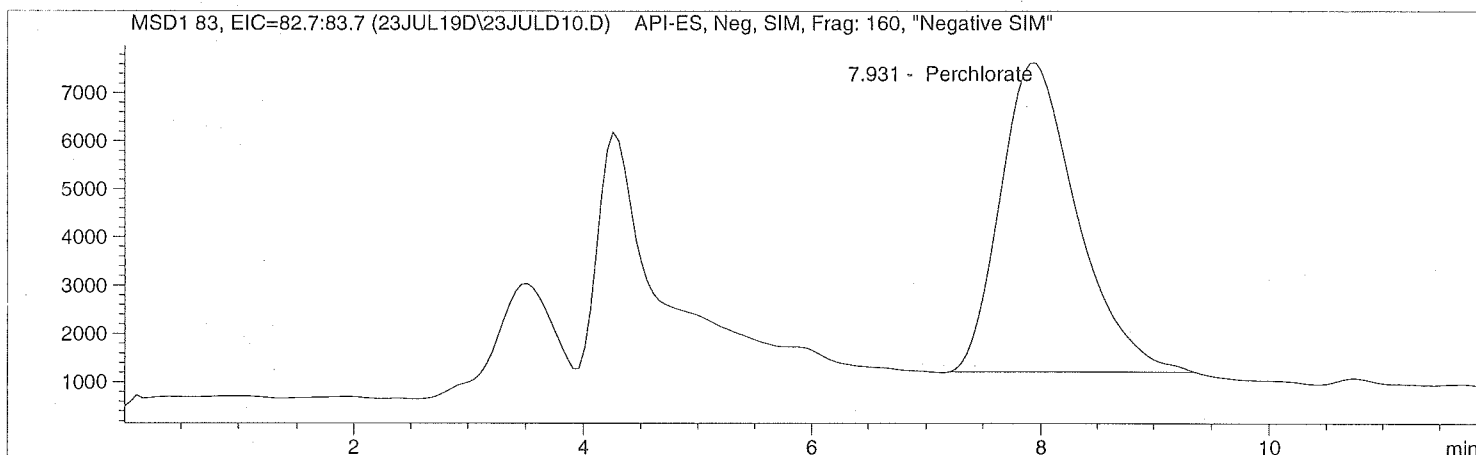
*** End of Report ***

Injection Date: 7/23/2019 10:39:29
Sample Name: 664925 201232D
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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



=====
Injection Date: 7/23/2019 10:39:29 Seq Line: 10
Sample Name: 664925 201232D 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

=====
Sample Information
=====

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
7.931	PBA	298082.3	4.1432	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.949	PBA	99050.2	4.4791	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.943	PBA	236656.9	5.0000	CLO4-89-ISTD

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


```
=====
Injection Date: 7/23/2019 10:53:24      Seq Line:          11
Sample Name:    1920123003              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-DP2.M
Last Changed:   4/12/2019 07:54:13
=====
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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

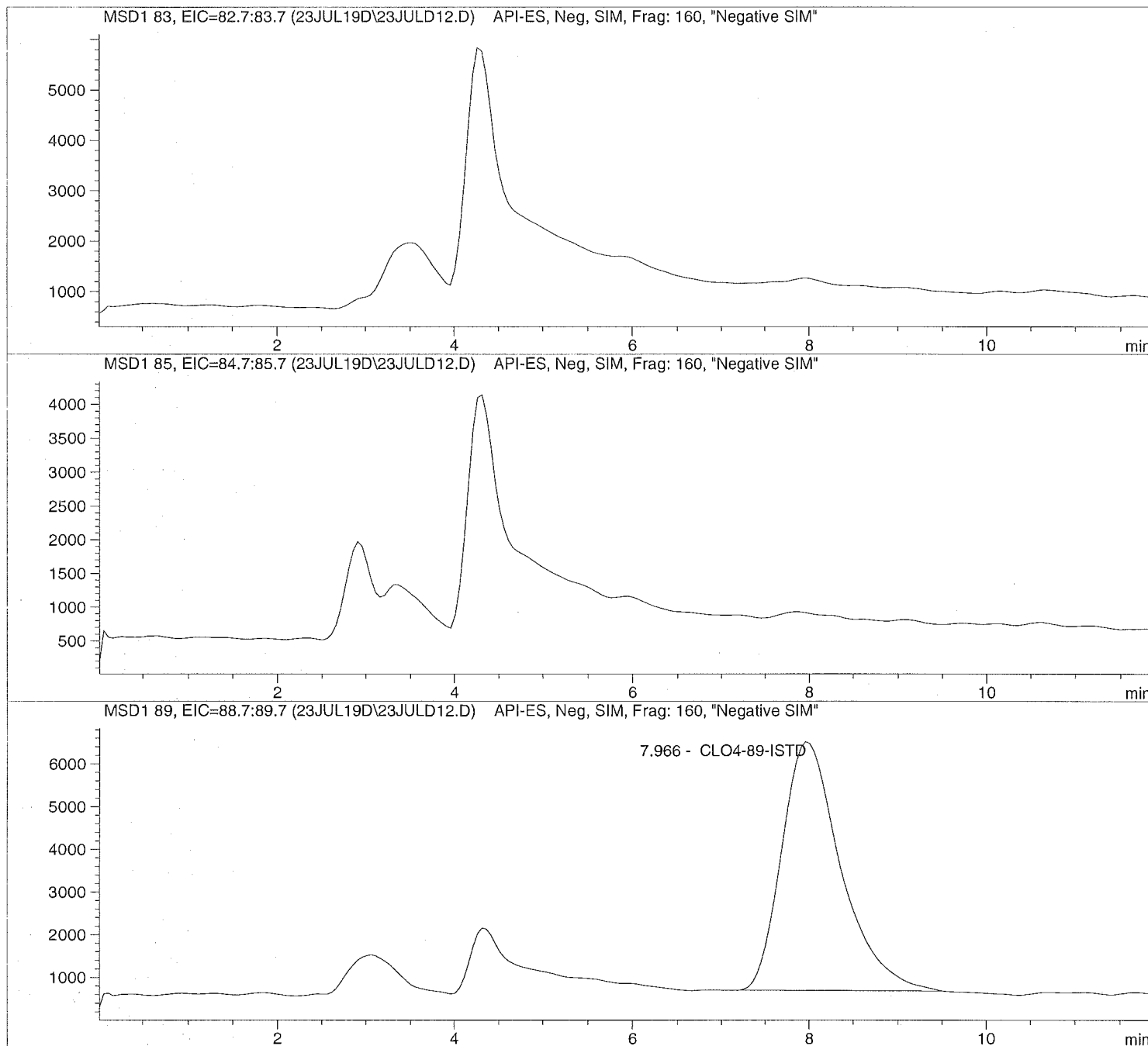
RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.956	PBA	272319.7	5.0000	CLO4-89-ISTD

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

Injection Date: 7/23/2019 11:07:17 Seq Line: 12
Sample Name: 1920123004 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



```
=====  
Injection Date: 7/23/2019 11:07:17      Seq Line:          12  
Sample Name:    1920123004              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-DP2.M  
Last Changed:   4/12/2019 07:54:13
```

Perchlorate analysis

=====
Sample Information
=====

```
Sorted By:      Signal  
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am  
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

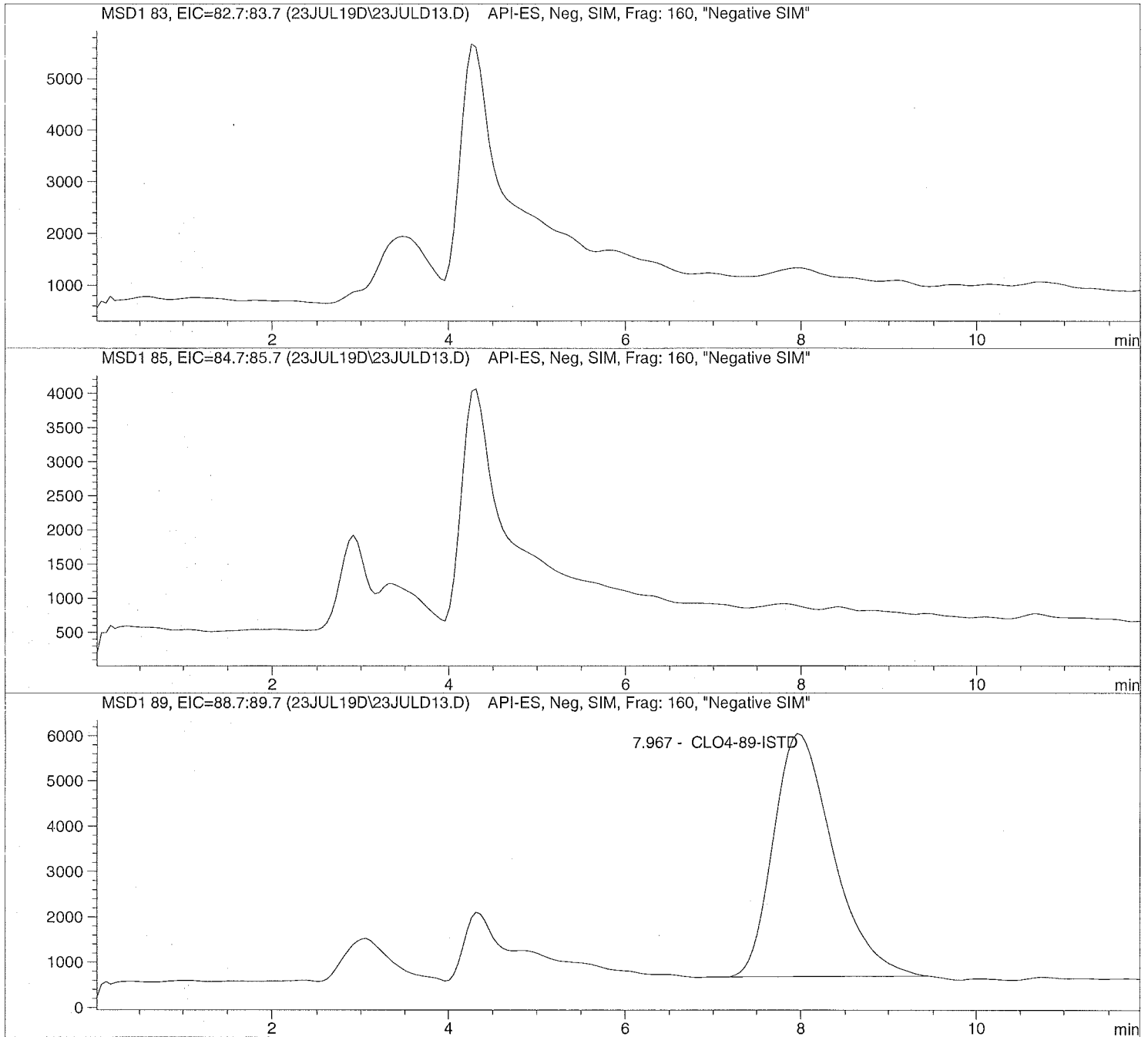
RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.966	PBA	270262.5	5.0000	CLO4-89-ISTD

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

=====
Injection Date: 7/23/2019 11:21:18 Seq Line: 13
Sample Name: 1920123005 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis
=====



```
=====  
Injection Date: 7/23/2019 11:21:18      Seq Line:          13  
Sample Name:    1920123005              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-DP2.M  
Last Changed:   4/12/2019 07:54:13
```

Perchlorate analysis

=====
Sample Information
=====

```
Sorted By:      Signal  
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am  
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
7.967	PBA	250553.8	5.0000	CLO4-89-ISTD

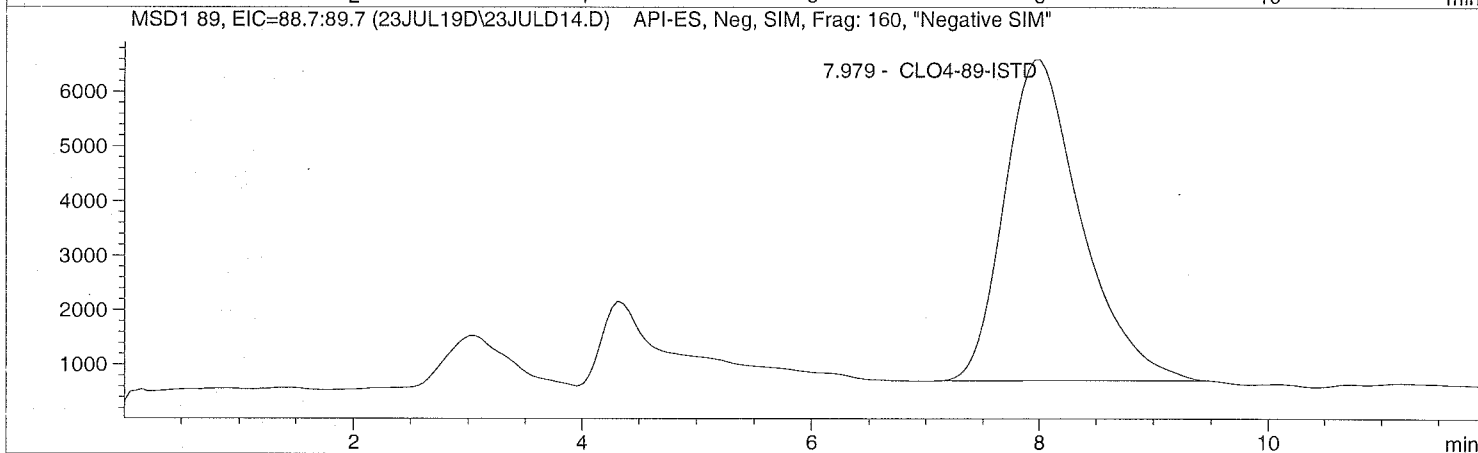
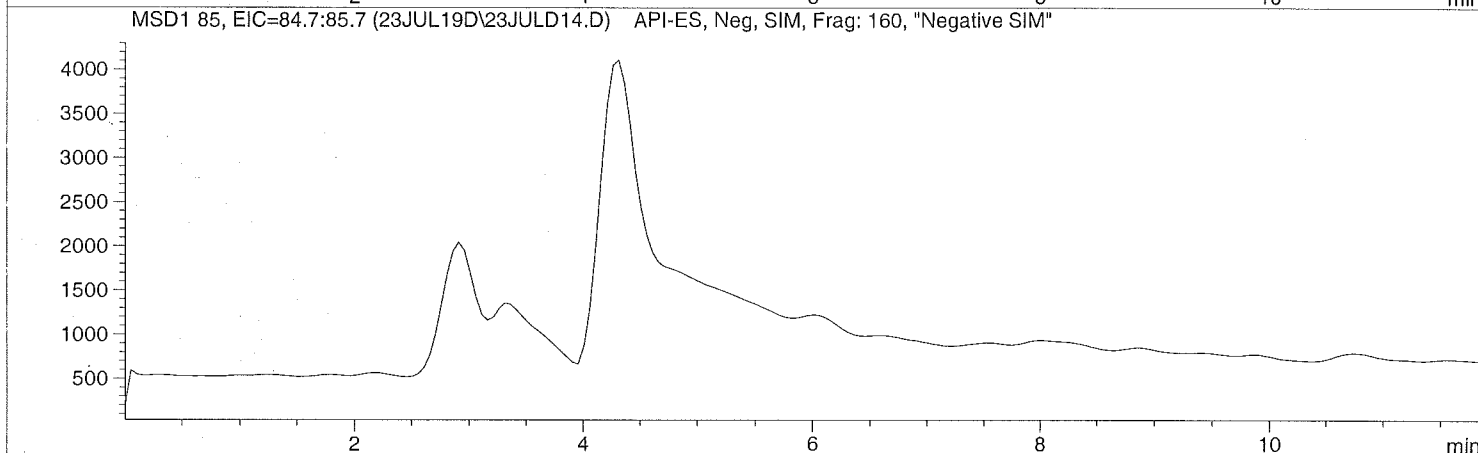
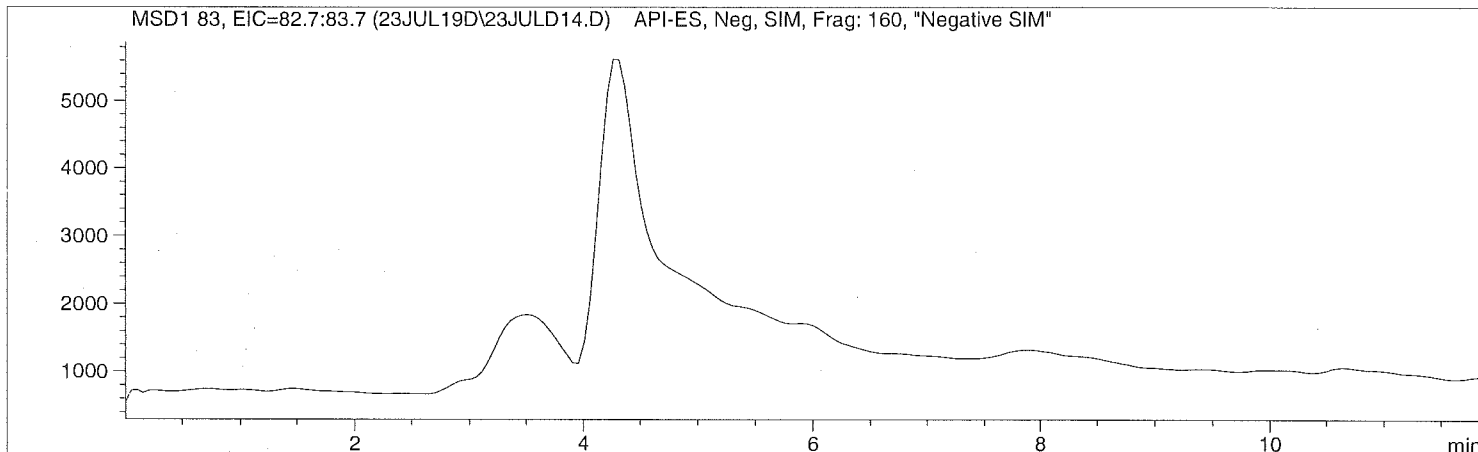
=====
*** End of Report ***

Injection Date: 7/23/2019 11:35:11
Sample Name: 1920123006
Acq Operator: TNB

Seq Line: 14
Location: Vial 84
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



```
=====
Injection Date: 7/23/2019 11:35:11      Seq Line:          14
Sample Name:    1920123006              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-DP2.M
Last Changed:   4/12/2019 07:54:13
=====
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
7.979	PBA	277086.1	5.0000	CLO4-89-ISTD

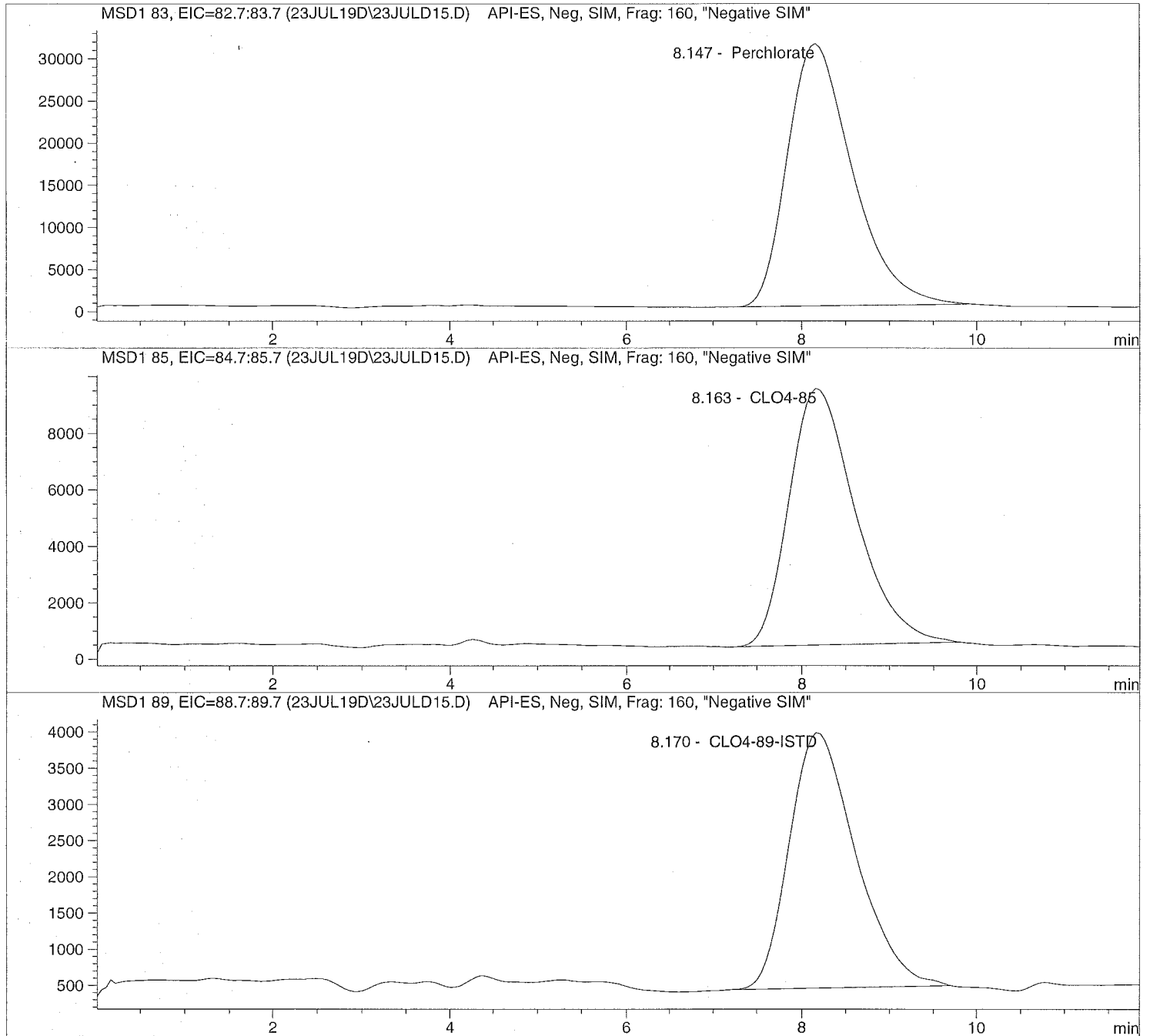
=====
*** End of Report ***

Injection Date: 7/23/2019 11:49:04
Sample Name: 664926 CCV@25
Acq Operator: TNB

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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



```

=====
Injection Date: 7/23/2019 11:49:04      Seq Line:      15
Sample Name:    664926  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-DP2.M
Last Changed:   4/12/2019 07:54:13

```

Perchlorate analysis

```

=====
                          Sample Information
=====

```

```

Sorted By:      Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
8.147	PBA	1584242.1	26.0929	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.163	PBA	473537.8	26.2735	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.170	PBA	184240.3	5.0000	CLO4-89-ISTD

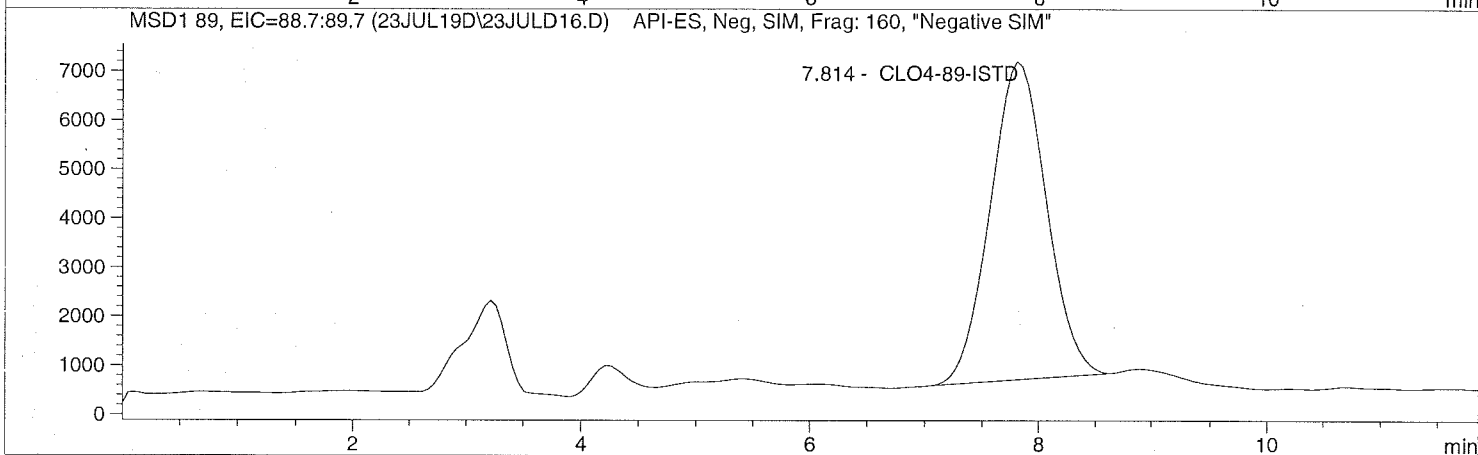
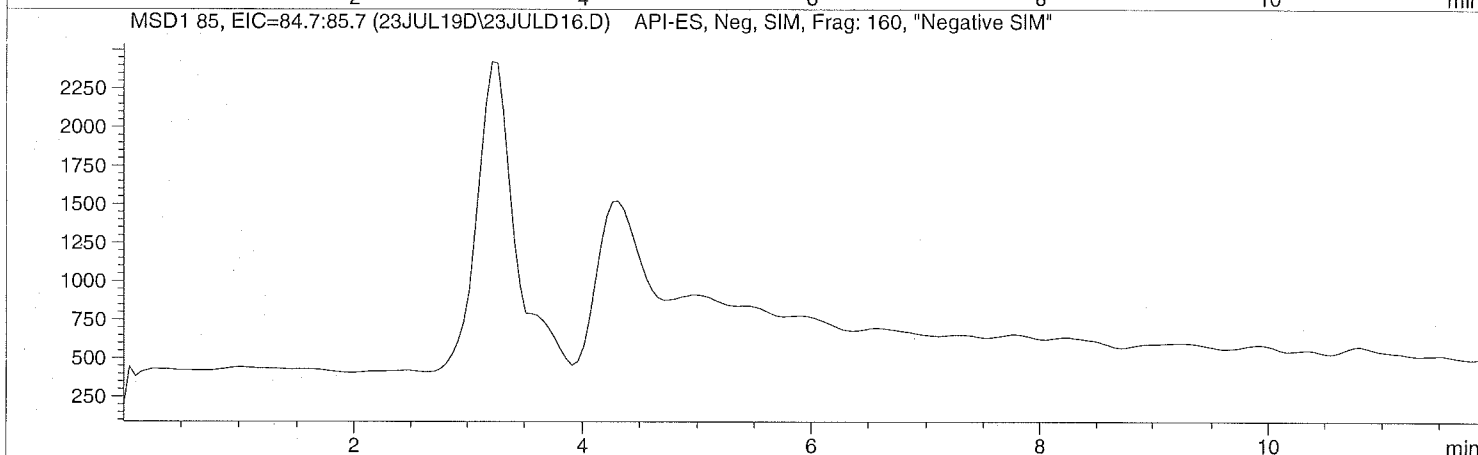
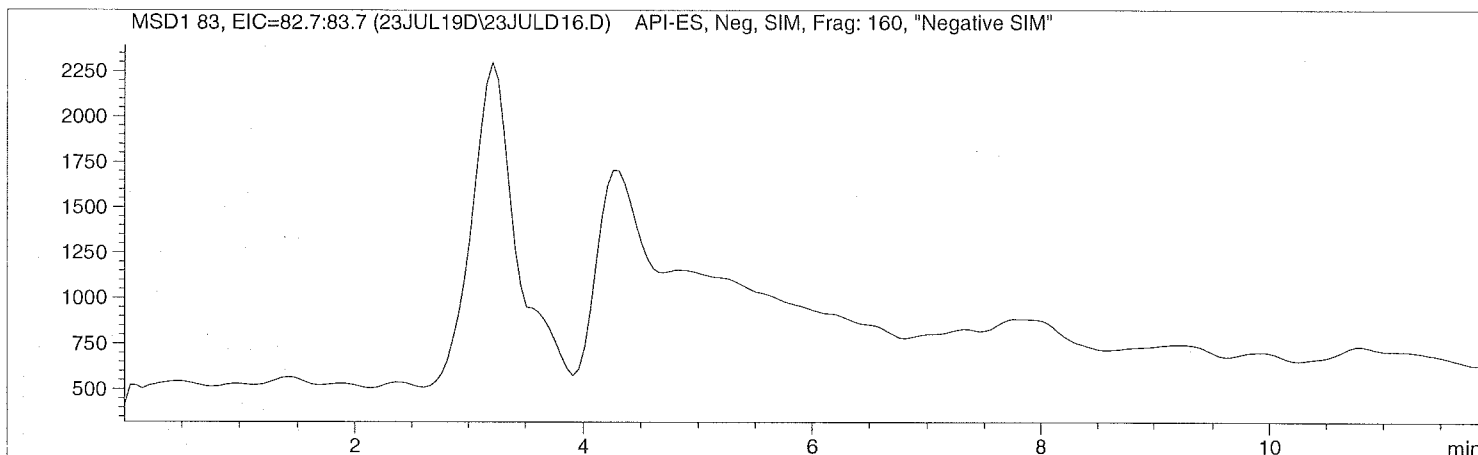
*** End of Report ***

Injection Date: 7/23/2019 12:03:02
Sample Name: 1920571001
Acq Operator: TNB

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

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



```
=====
Injection Date: 7/23/2019 12:03:02      Seq Line:          16
Sample Name:    1920571001              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-DP2.M
Last Changed:   4/12/2019 07:54:13
=====
```

Perchlorate analysis

===== Sample Information =====

```
Sorted By:      Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
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
7.814	PBA	224656.6	5.0000	CLO4-89-ISTD

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

=====
Injection Date: 7/23/2019 12:16:58 Seq Line: 17
Sample Name: 1920572001 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-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

