



**Groundwater Sample Results,
Combined Level 2 and Level 4 Laboratory Report,
Electronic Data Deliverable, Data Validation Report,
and the Sample Location Report, SDG PIS01**

*Marine Corps Recruit Depot Parris Island
South Carolina*

August 2019

M00263.SF.001646
MCRD PARRIS ISLAND
5090.3c

LABORATORY DATA PACKAGE, PIS01, MCRD PARRIS ISLAND SC
5/22/2015
EUROFINS LANCASTER LABORATORIES

Summary Data Package

Prepared for:

Tetra Tech Inc.
Foster Plaza VII
661 Andersen Drive
Pittsburgh PA 15220

Project: Parris Island, SC
Groundwater, Soil and Water Samples
Collected on 05/02/15-05/07/15

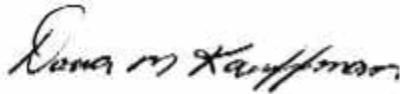
SDG# PIS01

GROUP	SAMPLE NUMBERS
1558459	7873706-7873710
1559656	7879425-7879426

PA Cert. # 36-00037
NY Cert. # 10670
NJ Cert. # PA011
NC Cert. # 521
TX Cert. # T104704194-13-10
AZ Cert. # AZ0780

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client.

Authorized by:



Date: 06/04/2015

Dana M. Kauffman
Manager

Any questions or concerns you might have regarding this data package should be directed to your client representative, Angela Miller at (717) 556-7260.

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**Sample Reference List for SDG Number PIS01
with a Data Package Type of SUMMARY**

07558 - Tetra Tech Inc.
Project: Parris Island, SC

Lab Sample Number	Lab Sample Code	Client Sample Description
7873706	PIS28	PAI04-SB28-0608 Grab Soil
7873707	PIS08	PAI13C-SS08-0001 Grab Soil
7873708	PISB5	PAI13C-SB05-0204 Grab Soil
7873709	PITW1	PAI04-TW01-20150504 Grab Groundwater
7873710	PITW3	PAI13C-TW03-20150504 Grab Groundwater
7879425	-TW02	PAI04-TW02-20150506 Groundwater
7879426	-RB01	PAI-RB01-050715 Water

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Pesticide Residue Analysis

Fraction: Perchlorate

Perchlorate in Soil LC/MS/MS

Sample #	Client ID	Matrix		DF	Comments
		Liquid	Solid		
7873706	PAI04-SB28-0608		X	1	
7873707	PAI13C-SS08-0001		X	1	
7873708	PAI13C-SB05-0204		X	1	
7873709	PAI04-TW01-20150504	X		1	
7879425	PAI04-TW02-20150506	X		1	
7879426	PAI-RB01-050715	X		1	Material Rinse Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

All QC is within specification.

SAMPLE ANALYSIS:

No problems were encountered with the analysis of the samples.

Abbreviation Key

UNSPK = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
MS = Matrix Spike	MDL = Method Detection Limit

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Pesticide Residue Analysis

Fraction: Perchlorate

MSD = Matrix Spike Duplicate	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value
D = Duplicate (DUP)	E= out of calibration range
LCS = Lab Control Sample	RE = Repreparation/Reanalysis
LCSD = Lab Control Sample Duplicate	* = Out of Specification

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Specialty Services Group
 Fraction: PFAAs by LC/MS/MS

Sample #	Client ID	Matrix		DF	Comments
		Liquid	Solid		
7873709	PAI04-TW01-20150504	X		1; 100	
7879425	PAI04-TW02-20150506	X		1	
7879426	PAI-RB01-050715	X		1	Material Rinse Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

All QC is within specification.

The LCS serves as the ICV second source check.

SAMPLE ANALYSIS:

No problems were encountered with the analysis of the samples.

Abbreviation Key

UNSPK = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
MS = Matrix Spike	MDL = Method Detection Limit
MSD = Matrix Spike Duplicate	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Specialty Services Group

Fraction: PFAAs by LC/MS/MS

D = Duplicate (DUP)	E= out of calibration range
LCS = Lab Control Sample	RE = Repreparation/Reanalysis
LCSD = Lab Control Sample Duplicate	* = Out of Specification
NC = Not Calculated	NF = Not Found

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Instrumental Water Quality
Fraction: Instrumental Wet Chemistry

Sample #	Client ID	Matrix			Comments
		Liquid	Solid	DF	
7873707	PAI13C-SS08-0001		X	1	
7873708	PAI13C-SB05-0204		X	1	
7873710	PAI13C-TW03-20150504	X		1	
7879426	PAI-RB01-050715	X		1	Material Rinse Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

(Sample number(s): 7873710: Analysis: 12868)
The holding time was not met. The client was notified and the data reported.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

All QC is within specification.

SAMPLE ANALYSIS:

No problems were encountered with the analysis of the samples.

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Instrumental Water Quality
Fraction: Instrumental Wet Chemistry

Abbreviation Key

U = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
R = Matrix Spike (MS)	MDL = Method Detection Limit
M = Matrix Spike Duplicate (MSD)	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value
D = Duplicate (DUP)	NA = Not Applicable
HS = High Spike	ME = Method
LS = Low Spike	CO = Colorimetric
SS = Soluble Spike	G = Gravimetric
IS = Insoluble Spike	IR = Infrared Spectrophotometry
ISD = Insoluble Spike Duplicate	MTR = Meter
PDS = Post Digestion Spike	OD = Oven Dried
* = Out of Specification	TI = Titration
V = Visual	TOC = Total Organic Carbon
AK = Alpkem	IC = Ion Chromatography
TC = Total Carbon	RA = Rapid Analyzer

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Water Quality

Fraction: Wet Chemistry

Sample #	Client ID	Matrix			Comments
		Liquid	Solid	DF	
7873707	PAI13C-SS08-0001		X	1	
7873708	PAI13C-SB05-0204		X	1	
7873710	PAI13C-TW03-20150504	X		1	
7879426	PAI-RB01-050715	X		1	Material Rinse Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

MS/MSD

Matrix QC may not be included if site-specific QC were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, laboratory spike data (LCS) are provided.

SAMPLE ANALYSIS:

(Sample number(s): 7873707: Analysis: 00394)
The pH was measured in water at 19 C.

(Sample number(s): 7873708: Analysis: 00394)
The pH was measured in water at 18.9 C.

No other problems were encountered with the analysis of the samples.

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Water Quality

Fraction: Wet Chemistry

Abbreviation Key

U = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
R = Matrix Spike (MS)	MDL = Method Detection Limit
M = Matrix Spike Duplicate (MSD)	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value
D = Duplicate (DUP)	NA = Not Applicable
HS = High Spike	ME = Method
LS = Low Spike	CO = Colorimetric
SS = Soluble Spike	G = Gravimetric
IS = Insoluble Spike	IR = Infrared Spectrophotometry
ISD = Insoluble Spike Duplicate	MTR = Meter
PDS = Post Digestion Spike	OD = Oven Dried
* = Out of Specification	TI = Titration
V = Visual	TOC = Total Organic Carbon
AK = Alpkem	IC = Ion Chromatography
TC = Total Carbon	RA = Rapid Analyzer

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 · 717-656-2300 Fax: 717-656-2681 · www.lancasterlabs.com

06386 Perchlorate in Water LC/MS/MS**06568 Perchlorate Soil Prep**

Water samples are filtered through a 0.45-um syringe filter, followed by direct injection into a LC/MS/MS system followed by multiple reaction monitoring. Quantitation is performed using an isotopic internal standard.

Reference: Test Methods for Evaluating Solid Waste, EPA SW-846, Method 6850, 1/2007.

06557 Perchlorate in Soil LC/MS/MS

Soil samples are extracted with water, then filtered through a 0.45-um syringe filter and analyzed by LC/MS/MS. Quantitation is performed using an isotopic internal standard.

Reference: Test Methods for Evaluating Solid Waste, EPA SW-846, Method 6850, 1/2007.

12868 Hexavalent Chromium

A measured volume of sample is introduced into the ion chromatograph using a well buffered ammonium sulfate, ammonium hydroxide eluent. A guard column removes organics from the sample before hex chrome is separated on an anion exchange separator column. Postcolumn derivatization of the Cr(VI) with diphenylcarbohydrazide is followed by detection of the colored complex at 530 nm.

Reference: Method 218.6, Methods for the Chemical Analysis of Water and Wastes USEPA 600, Rev. May 1994

05892 Hexavalent Chromium by IC

A measured volume of sample is introduced into the ion chromatograph using a well buffered ammonium sulfate, ammonium hydroxide eluent. A guard column removes organics from the sample before hex chrome is separated on an anion exchange separator column. Postcolumn derivatization of the Cr(VI) with diphenylcarbohydrazide is followed by detection of the colored complex at 530 nm.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 7199, December 1996.

12152 pH

The activity of hydrogen ions in the sample is measured using a glass electrode and a reference electrode.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 9040C.

00394 pH

A 1:1 slurry is prepared. The activity of hydrogen ions in the supernatant is measured using a glass electrode and a reference electrode.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 9045C Modified, September 1994.

01821 Oxidation Reduction Potential

The oxidation-reduction potential is measured using a platinum electrode and a reference electrode. The potential reported is the electromotive force between the platinum electrode and the reference electrode, referred to the standard hydrogen scale.

Reference: Annual Book of ASTM Standards, Method D 1498

02432 Hexavalent Cr Extraction - IC

The sample is digested using a 3% sodium carbonate - 2% sodium hydroxide solution and then filtered through a 0.45 micron filter.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 3060A, December 1996

10954 PFAAs in Water by LC/MS/MS

A 100 ml sample of water is extracted using a solid phase extraction (SPE) cartridge. The resulting extract is analyzed by LC/MS/MS in negative electrospray ionization (ESI) mode.

Reference: Determination of Selected Perfluorinated Alkyl Acids (PFAAs) in Aqueous Samples by LC/MS/MS

00111 Moisture

A well-mixed sample is placed in a tared container and dried to a constant weight in an oven at 103-105C. The increase in weight is the total solids.

Reference: Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998, Method 2540 G-1997

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Tetra Tech Inc.
Foster Plaza VII
661 Andersen Drive
Pittsburgh PA 15220

June 01, 2015

Project: Parris Island, SC

Submittal Date: 05/05/2015

Group Number: 1558459

SDG: PIS01

PO Number: 1110299

State of Sample Origin: SC

Client Sample Description

PAI04-SB28-0608 Grab Soil
PAI13C-SS08-0001 Grab Soil
PAI13C-SB05-0204 Grab Soil
PAI04-TW01-20150504 Grab Groundwater
PAI13C-TW03-20150504 Grab Groundwater

Lancaster Labs (LL)

7873706
7873707
7873708
7873709
7873710

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

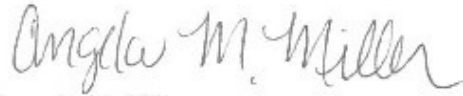
Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>.

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Tetra Tech Inc.
Tetra Tech Inc.
Tetra Tech Inc.
Tetra Tech, Inc.

Attn: Peggy Churchill
Attn: Shannon Hill
Attn: Kelly Carper
Attn: Amy Thomson

Respectfully Submitted,



Angela M. Miller
Specialist

(717) 556-7260

Project Name: Parris Island, SC
LL Group #: 1558459

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:**EPA 218.6, Wet Chemistry**

Sample #s: 7873710

The holding time was not met. The client was notified and the data reported.

SW-846 7199, Wet Chemistry

Batch #: 15126243201A (Sample number(s): 7873707-7873708 UNSPK: P874922 BKG: P874922)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Hexavalent Chromium by IC

SW-846 9045C modified, wet Chemistry

Sample #s: 7873708

The pH was measured in water at 18.9 C.

Sample #s: 7873707

The pH was measured in water at 19 C.

SM 2540 G-1997, Wet Chemistry

Batch #: 15133820001A (Sample number(s): 7873706-7873708 BKG: 7873707)

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Moisture

Sample Description: PAI04-SB28-0608 Grab Soil
Parris Island, SC

LL Sample # SW 7873706
LL Group # 1558459
Account # 07558

Project Name: Parris Island, SC

Collected: 05/02/2015 12:30 by TR

Tetra Tech Inc.

Submitted: 05/05/2015 09:10

Foster Plaza VII

Reported: 06/01/2015 15:12

661 Andersen Drive

Pittsburgh PA 15220

PIS28 SDG#: PIS01-01

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Detection Limit*	Dry Limit of Detection	Dry Limit of Quantitation	DF
Perchlorate							
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007 14797-73-0	ug/kg N.D.	ug/kg 2.7	ug/kg 5.4	ug/kg 6.4	1
Wet Chemistry							
00111	Moisture	SM 2540 G-1997 n.a.	% 21.6	% 0.50	% 0.50	% 0.50	1
Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.							

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	151320023A	05/13/2015 14:02	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	2	151320023A	05/13/2015 07:40	Maria Davenport	1
00111	Moisture	SM 2540 G-1997	1	15133820001A	05/13/2015 18:31	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: PAI13C-SS08-0001 Grab Soil
Parris Island, SC

LL Sample # SW 7873707
LL Group # 1558459
Account # 07558

Project Name: Parris Island, SC

Collected: 05/03/2015 13:15 by TR

Tetra Tech Inc.

Submitted: 05/05/2015 09:10

Foster Plaza VII

Reported: 06/01/2015 15:12

661 Andersen Drive

Pittsburgh PA 15220

PIS08 SDG#: PIS01-02

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Detection Limit*	Dry Limit of Detection	Dry Limit of Quantitation	DF
Perchlorate							
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007 14797-73-0	ug/kg N.D.	ug/kg 3.4	ug/kg 6.9	ug/kg 8.2	1
Wet Chemistry							
05892	Hexavalent Chromium by IC	SW-846 7199 18540-29-9	mg/kg 2.7	mg/kg 0.23	mg/kg 0.64	mg/kg 0.64	1
ASTM D1498							
01821	Oxidation Reduction Potential The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.	n.a.	mV 478	mV 10.0	mV 10.0	mV 10.0	1
SW-846 9045C modified							
00394	pH The pH was measured in water at 19 C.	n.a.	Std. Units 5.97	Std. Units 0.0100	Std. Units 0.0100	Std. Units 0.0100	1
Wet Chemistry							
00111	Moisture Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.	SM 2540 G-1997 n.a.	% 38.7	% 0.50	% 0.50	% 0.50	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	151320023A	05/13/2015 14:40	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	2	151320023A	05/13/2015 07:40	Maria Davenport	1
05892	Hexavalent Chromium by IC	SW-846 7199	1	15126243201A	05/07/2015 09:21	Clinton M Wilson	1
01821	Oxidation Reduction Potential	ASTM D1498	1	15126182102B	05/06/2015 21:00	Michelle L Lalli	1
00394	pH	SW-846 9045C modified	1	15126039401B	05/06/2015 21:00	Michelle L Lalli	1
02432	Hexavalent Cr Extraction - IC	SW-846 3060A	1	15126243201A	05/06/2015 19:10	Daniel S Smith	1
00111	Moisture	SM 2540 G-1997	1	15133820001A	05/13/2015 18:31	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: PAI13C-SB05-0204 Grab Soil
Parris Island, SC

LL Sample # SW 7873708
LL Group # 1558459
Account # 07558

Project Name: Parris Island, SC

Collected: 05/03/2015 13:30 by TR

Tetra Tech Inc.

Submitted: 05/05/2015 09:10

Foster Plaza VII

Reported: 06/01/2015 15:12

661 Andersen Drive

Pittsburgh PA 15220

PISB5 SDG#: PIS01-03

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Detection Limit*	Dry Limit of Detection	Dry Limit of Quantitation	DF
Perchlorate							
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007 14797-73-0	ug/kg N.D.	ug/kg 3.5	ug/kg 6.9	ug/kg 8.2	1
Wet Chemistry							
05892	Hexavalent Chromium by IC	SW-846 7199 18540-29-9	mg/kg 1.2	mg/kg 0.23	mg/kg 0.66	mg/kg 0.66	1
ASTM D1498							
01821	Oxidation Reduction Potential The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.	n.a.	mV 432	mV 10.0	mV 10.0	mV 10.0	1
SW-846 9045C modified							
00394	pH The pH was measured in water at 18.9 C.	n.a.	Std. Units 5.89	Std. Units 0.0100	Std. Units 0.0100	Std. Units 0.0100	1
Wet Chemistry							
00111	Moisture Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.	SM 2540 G-1997 n.a.	% 39.3	% 0.50	% 0.50	% 0.50	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	151320023A	05/13/2015 14:53	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	2	151320023A	05/13/2015 07:40	Maria Davenport	1
05892	Hexavalent Chromium by IC	SW-846 7199	1	15126243201A	05/07/2015 09:29	Clinton M Wilson	1
01821	Oxidation Reduction Potential	ASTM D1498	1	15126182102B	05/06/2015 21:00	Michelle L Lalli	1
00394	pH	SW-846 9045C modified	1	15126039401B	05/06/2015 21:00	Michelle L Lalli	1
02432	Hexavalent Cr Extraction - IC	SW-846 3060A	1	15126243201A	05/06/2015 19:10	Daniel S Smith	1
00111	Moisture	SM 2540 G-1997	1	15133820001A	05/13/2015 18:31	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: PAI04-TW01-20150504 Grab Groundwater
Parris Island, SC

LL Sample # WW 7873709
LL Group # 1558459
Account # 07558

Project Name: Parris Island, SC

Collected: 05/04/2015 08:55 by TR

Tetra Tech Inc.

Submitted: 05/05/2015 09:10

Foster Plaza VII

Reported: 06/01/2015 15:12

661 Andersen Drive

Pittsburgh PA 15220

PITW1 SDG#: PIS01-04

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Perchlorate							
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007 14797-73-0	ug/l N.D.	ug/l 0.20	ug/l 0.40	ug/l 1.0	1
Misc. Organics							
EPA 537 Rev. 1.1 modified							
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	10	10	1
10954	Perfluorooctanoic acid	335-67-1	11,000	100	200	200	100

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007	1	151340030A	05/14/2015 17:35	Richard A Shober	1
10954	PFAAs in Water by LC/MS/MS	EPA 537 Rev. 1.1 modified	1	15138004	05/29/2015 20:34	Meng Yu	100
10954	PFAAs in Water by LC/MS/MS	EPA 537 Rev. 1.1 modified	1	15138004	05/29/2015 20:50	Meng Yu	1

*=This limit was used in the evaluation of the final result

Sample Description: PAI13C-TW03-20150504 Grab Groundwater
Parris Island, SC

LL Sample # WW 7873710
LL Group # 1558459
Account # 07558

Project Name: Parris Island, SC

Collected: 05/04/2015 16:45 by TR

Tetra Tech Inc.

Submitted: 05/05/2015 09:10

Foster Plaza VII

Reported: 06/01/2015 15:12

661 Andersen Drive

Pittsburgh PA 15220

PITW3 SDG#: PIS01-05

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Wet Chemistry							
	EPA 218.6		ug/l	ug/l	ug/l	ug/l	
12868	Hexavalent Chromium The holding time was not met. The client was notified and the data reported.	18540-29-9	N.D.	0.015	0.050	0.050	1
	ASTM D1498		mV	mV	mV	mV	
01821	Oxidation Reduction Potential The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.	n.a.	412	10.0	10.0	10.0	1
	SW-846 9040C		Std. Units	Std. Units	Std. Units	Std. Units	
12152	pH The 40 CFR Part 136 requires that this analysis be performed immediately (within 15 minutes) upon sample collection. Because this was not possible, the result may not be used for reporting purposes.	n.a.	7.4	0.010	0.010	0.010	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12868	Hexavalent Chromium	EPA 218.6	1	15126987141A	05/06/2015 12:06	Clinton M Wilson	1
01821	Oxidation Reduction Potential	ASTM D1498	1	15126182101B	05/06/2015 20:30	Michelle L Lalli	1
12152	pH	SW-846 9040C	1	15126121521B	05/06/2015 20:30	Michelle L Lalli	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Tetra Tech Inc.
Reported: 06/01/2015 15:12

Group Number: 1558459

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank DL**</u>	<u>Blank LOD</u>	<u>Blank LOQ</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Batch number: 151320023A Perchlorate in Soil LC/MS/MS	N.D.	2.1	4.2	5.0	ug/kg	98		84-121		
Batch number: 151340030A Perchlorate in Water LC/MS/MS	N.D.	0.20	0.40	1.0	ug/l	88		84-119		
Batch number: 15138004 Perfluoro-octanesulfonate	N.D.	5	10	10	ng/l	107	104	70-130	3	30
Perfluorooctanoic acid	N.D.	1	2	2	ng/l	105	113	70-130	7	30
Batch number: 15126243201A Hexavalent Chromium by IC	N.D.	0.14	0.40	0.40	mg/kg	90		80-120		
Batch number: 15126987141A Hexavalent Chromium	N.D.	0.015	0.050	0.050	ug/l	97		90-110		
Batch number: 15126039401B pH						101		95-105		
Batch number: 15126121521B pH						100		95-105		
Batch number: 15126182101B Oxidation Reduction Potential						102		98-102		
Batch number: 15126182102B Oxidation Reduction Potential						101		98-102		
Batch number: 15133820001A Moisture						100		99-101		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS %REC</u>	<u>MSD %REC</u>	<u>MS/MSD Limits</u>	<u>RPD</u>	<u>RPD MAX</u>	<u>BKG Conc</u>	<u>DUP Conc</u>	<u>DUP RPD</u>	<u>Dup RPD Max</u>
Batch number: 151320023A									
	Sample number(s): 7873706-7873708 UNSPK: 7873706								

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.
- (3) The surrogate spike amount was less than the LOD.

Quality Control Summary

Client Name: Tetra Tech Inc.
Reported: 06/01/2015 15:12

Group Number: 1558459

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS</u> <u>%REC</u>	<u>MSD</u> <u>%REC</u>	<u>MS/MSD</u> <u>Limits</u>	<u>RPD</u> <u>RPD</u>	<u>RPD</u> <u>MAX</u>	<u>BKG</u> <u>Conc</u>	<u>DUP</u> <u>Conc</u>	<u>DUP</u> <u>RPD</u>	<u>Dup RPD</u> <u>Max</u>
Perchlorate in Soil LC/MS/MS	98	102	84-121	4	15				
Batch number: 151340030A	Sample number(s): 7873709 UNSPK: 7873709								
Perchlorate in Water LC/MS/MS	111	101	84-119	9	15				
Batch number: 15138004	Sample number(s): 7873709 UNSPK: 7879426								
Perfluoro-octanesulfonate	102		70-130						
Perfluorooctanoic acid	95		70-130						
Batch number: 15126243201A	Sample number(s): 7873707-7873708 UNSPK: P874922 BKG: P874922								
Hexavalent Chromium by IC	0*		75-125			N.D.	N.D.	0 (1)	20
Batch number: 15126987141A	Sample number(s): 7873710 UNSPK: 7873710 BKG: 7873710								
Hexavalent Chromium	93		90-110			N.D.	N.D.	0 (1)	20
Batch number: 15126039401B	Sample number(s): 7873707-7873708 BKG: P874922								
pH						8.81	8.80	0	3
Batch number: 15126121521B	Sample number(s): 7873710 BKG: P874716								
pH						8.2	8.2	0	3
Batch number: 15126182101B	Sample number(s): 7873710 BKG: P874716								
Oxidation Reduction Potential						340	339	0	5
Batch number: 15126182102B	Sample number(s): 7873707-7873708 BKG: P874922								
Oxidation Reduction Potential						314	313	0	5
Batch number: 15133820001A	Sample number(s): 7873706-7873708 BKG: 7873707								
Moisture						38.7	34.4	12*	5

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.
- (3) The surrogate spike amount was less than the LOD.



TETRA TECH NUS, INC.

7558 | 1558459 | 7873706-10

CHAIN OF CUSTODY

NUMBER

No 1603

PAGE 1 OF 1

PROJECT NO: 112G01509	FACILITY: PARRIS ISLAND	PROJECT MANAGER P. CHURCHILL	PHONE NUMBER (321) 636-6470	LABORATORY NAME AND CONTACT: LANCASTER LABORATORIES
SAMPLERS (SIGNATURE) <i>Taylor</i>		FIELD OPERATIONS LEADER S. HILL	PHONE NUMBER (973) 607-7988	ADDRESS 2425 NEW HOLLAND PIKE
CARRIER/WAYBILL NUMBER FED Ex AB # 8631 3888 2244			CITY, STATE LANCASTER PA 17601	

DATE YEAR	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS										COMMENTS					
									PERCHLORATE (SOIL)	402 JAS	Hex CHROM (Cr6+)	ORP & moisture	PERCHLORATE / PH (Soil)	4041 Vial	PFAA	PFAA	Hex CHROM (Cr6+)	PH		Na2S2O3 P	R	R		
5/2	1230	PAI04-SB28-0608	SB28	6	8	SO	G	1	1															
5/3	1315	PAI13C-SS08-0001	SS08	0	1	SO	G	2	-	1	1													
5/3	1330	PAI13C-SB05-0204	SB05	2	4	SO	G	2	-	1	1													
5/4	0855	PAI04-TW01-20150504	TW01	-	-	GW	G	3	-	-	-	1	1	1										
5/4	1645	PAI13C-TW03-20150504	TW03	-	-	GW	G	2	-	-	-	-	-	-	1	1								

1. RELINQUISHED BY <i>Taylor</i>	DATE 5-04-15	TIME 2000	1. RECEIVED BY FED EX	DATE 5-04-15	TIME 2000
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY <i>Brennly Buckley</i>	DATE 5:15	TIME 910

COMMENTS

Angela Miller

From: Angela Miller
Sent: Tuesday, May 05, 2015 4:52 PM
To: Christine Jampo; Coffman, Michelle Hill, Shannon
Cc:
Subject: RE: Final Redline SAP and response to EPA feedback on the redline

Good afternoon,

We received the first sample submission today for this project and unfortunately, we were not able to meet the 24 hour hold time for the hexavalent chromium analysis for the groundwater sample we received.

Please let me know when we can expect to receive the second hexavalent chromium water sample and equipment blank sample so that our technical center can be prepared for the next submittal.

Kind regards,
Angela

Angela Miller
Specialist

150-1-25 of 99
Eurofins Lancaster Laboratories Environmental, LLC
2425 New Holland Pike
Lancaster, PA 17601
USA
Phone: +1 717-556-7260
www.LancasterLabsEnv.com

Look for Eurofins Lancaster Laboratories Environmental at these [upcoming conferences and industry events](#).

From: Christine Jampo
Sent: Tuesday, April 28, 2015 1:33 PM
To: Coffman, Michelle; Angela Miller
Cc: Hill, Shannon
Subject: RE: Final Redline SAP and response to EPA feedback on the redline

Directly to Vista if you can.

Christine Jampo
Senior Account Manager

Eurofins Lancaster Laboratories Environmental, LLC
2425 New Holland Pike
Lancaster, PA. 17601
Mobile: 717-327-7726

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	BMQL	Below Minimum Quantitation Level
N.D.	none detected	MPN	Most Probable Number
TNTC	Too Numerous To Count	CP Units	cobalt-chloroplatinate units
IU	International Units	NTU	nephelometric turbidity units
umhos/cm	micromhos/cm	ng	nanogram(s)
C	degrees Celsius	F	degrees Fahrenheit
meq	milliequivalents	lb.	pound(s)
g	gram(s)	kg	kilogram(s)
µg	microgram(s)	mg	milligram(s)
mL	milliliter(s)	L	liter(s)
m³	cubic meter(s)	µL	microliter(s)
		pg/L	picogram/liter
<	less than		
>	greater than		
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
ppb	parts per billion		
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

Laboratory Data Qualifiers:

- B - Analyte detected in the blank
- C - Result confirmed by reanalysis
- E - Concentration exceeds the calibration range
- J (or G, I, X) - estimated value \geq the Method Detection Limit (MDL or DL) and the $<$ Limit of Quantitation (LOQ or RL)
- P - Concentration difference between the primary and confirmation column $>40\%$. The lower result is reported.
- U - Analyte was not detected at the value indicated
- V - Concentration difference between the primary and confirmation column $>100\%$. The reporting limit is raised due to this disparity and evident interference...

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, ISO17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Tetra Tech Inc.
Foster Plaza VII
661 Andersen Drive
Pittsburgh PA 15220

June 01, 2015

Project: Parris Island, SC

Submittal Date: 05/08/2015
Group Number: 1559656
SDG: PIS01
PO Number: 1110299
State of Sample Origin: SC

Client Sample Description

PAI04-TW02-20150506 Groundwater
PAI-RB01-050715 Water

Lancaster Labs (LL) #

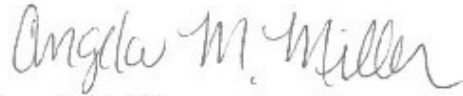
7879425
7879426

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>.

ELECTRONIC COPY TO	Tetra Tech Inc.	Attn: Peggy Churchill
ELECTRONIC COPY TO	Tetra Tech Inc.	Attn: Shannon Hill
ELECTRONIC COPY TO	Tetra Tech Inc.	Attn: Kelly Carper
ELECTRONIC COPY TO	Tetra Tech, Inc.	Attn: Amy Thomson

Respectfully Submitted,



Angela M. Miller
Specialist

(717) 556-7260

Project Name: Parris Island, SC
LL Group #: 1559656

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

No additional comments are necessary.

Sample Description: PAI04-TW02-20150506 Groundwater
PARRIS ISLAND

LL Sample # WW 7879425
LL Group # 1559656
Account # 07558

Project Name: Parris Island, SC

Collected: 05/06/2015 09:55 by TR

Tetra Tech Inc.

Submitted: 05/08/2015 09:25

Foster Plaza VII

Reported: 06/01/2015 15:13

661 Andersen Drive

Pittsburgh PA 15220

-TW02 SDG#: PIS01-06

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Perchlorate							
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007 14797-73-0	ug/l N.D.	ug/l 0.20	ug/l 0.40	ug/l 1.0	1
Misc. Organics							
EPA 537 Rev. 1.1 modified							
10954	Perfluoro-octanesulfonate	1763-23-1	78	5	10	10	1
10954	Perfluorooctanoic acid	335-67-1	12	1	2	2	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007	1	151340030A	05/14/2015 18:38	Richard A Shober	1
10954	PFAAs in Water by LC/MS/MS	EPA 537 Rev. 1.1 modified	1	15138004	05/29/2015 21:05	Meng Yu	1

*=This limit was used in the evaluation of the final result

Sample Description: PAI-RB01-050715 Water
PARRIS ISLAND

LL Sample # WW 7879426
LL Group # 1559656
Account # 07558

Project Name: Parris Island, SC

Collected: 05/07/2015 14:00 by TR

Tetra Tech Inc.

Submitted: 05/08/2015 09:25

Foster Plaza VII

Reported: 06/01/2015 15:13

661 Andersen Drive

Pittsburgh PA 15220

-RB01 SDG#: PIS01-07RB

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Perchlorate							
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007 14797-73-0	ug/l N.D.	ug/l 0.20	ug/l 0.40	ug/l 1.0	1
Misc. Organics							
EPA 537 Rev. 1.1 modified							
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	10	10	1
10954	Perfluorooctanoic acid	335-67-1	1 J	1	2	2	1
Wet Chemistry							
EPA 218.6							
12868	Hexavalent Chromium	18540-29-9	N.D.	0.015	0.050	0.050	1
ASTM D1498							
01821	Oxidation Reduction Potential	n.a.	255	10.0	10.0	10.0	1
The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.							
SW-846 9040C							
12152	pH	n.a.	9.3	0.010	0.010	0.010	1
The 40 CFR Part 136 requires that this analysis be performed immediately (within 15 minutes) upon sample collection. Because this was not possible, the result may not be used for reporting purposes.							

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007	1	151340030A	05/14/2015 18:51	Richard A Shober	1
10954	PFAAs in Water by LC/MS/MS	EPA 537 Rev. 1.1 modified	1	15138004	05/29/2015 19:47	Meng Yu	1
12868	Hexavalent Chromium	EPA 218.6	1	15128987141A	05/08/2015 12:38	Clinton M Wilson	1
01821	Oxidation Reduction Potential	ASTM D1498	1	15131182101A	05/11/2015 18:00	Michelle L Lalli	1
12152	pH	SW-846 9040C	1	15131121521A	05/11/2015 18:00	Michelle L Lalli	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Tetra Tech Inc.
Reported: 06/01/2015 15:13

Group Number: 1559656

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank DL**</u>	<u>Blank LOD</u>	<u>Blank LOQ</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Batch number: 151340030A Perchlorate in Water LC/MS/MS	N.D.	0.20	0.40	1.0	ug/l	88		84-119		
Batch number: 15138004 Perfluoro-octanesulfonate	N.D.	5	10	10	ng/l	107	104	70-130	3	30
Perfluorooctanoic acid	N.D.	1	2	2	ng/l	105	113	70-130	7	30
Batch number: 15128987141A Hexavalent Chromium	N.D.	0.015	0.050	0.050	ug/l	103		90-110		
Batch number: 15131121521A pH						100		95-105		
Batch number: 15131182101A Oxidation Reduction Potential						101		98-102		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS %REC</u>	<u>MSD %REC</u>	<u>MS/MSD Limits</u>	<u>RPD</u>	<u>RPD MAX</u>	<u>BKG Conc</u>	<u>DUP Conc</u>	<u>DUP RPD</u>	<u>Dup RPD Max</u>
Batch number: 151340030A Perchlorate in Water LC/MS/MS	111	101	84-119	9	15				
Batch number: 15138004 Perfluoro-octanesulfonate	102		70-130						
Perfluorooctanoic acid	95		70-130						
Batch number: 15128987141A Hexavalent Chromium	95	97	90-110	2	2	0.089	0.081	9 (1)	20
Batch number: 15131121521A pH						11.9	11.9	0	3
Batch number: 15131182101A Oxidation Reduction Potential						349	345	1	5

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.
- (3) The surrogate spike amount was less than the LOD.

Quality Control Summary

Client Name: Tetra Tech Inc.
Reported: 06/01/2015 15:13

Group Number: 1559656

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.
- (3) The surrogate spike amount was less than the LOD.



TETRA TECH NUS, INC.

7558/1559656/7879425-26

CHAIN OF CUSTODY

NUMBER

No 1610

PAGE 1 OF 1

PROJECT NO: 112601509	FACILITY: PARRIS ISLAND	PROJECT MANAGER P. CHURCHILL	PHONE NUMBER (321)636-6470	LABORATORY NAME AND CONTACT: LANCASTER LABS / A. Miller
SAMPLERS (SIGNATURE) <i>Troy Royal</i>		FIELD OPERATIONS LEADER S. Hill	PHONE NUMBER (973)607-7988	ADDRESS 2425 NEW HOLLAND PIKE
CARRIER/WAYBILL NUMBER FED EX AB# 806518981677			CITY, STATE LANCASTER PA 17601	

DATE YEAR	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS										COMMENTS					
									PERCHLORATE ANAL VIAL	PFAAS	PFAAS	PH	"Cr6"" / ORP	40C	40C	40C	40C	40C		40C				
5/06	0955	PAI04-TW02-20150506	TW02	-	-	GW	G	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
5/07	1400	PAI-RB01-050715	QC	-	-	QC	G	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	*"SHORT HOLD"

1. RELINQUISHED BY <i>Troy Royal</i>	DATE 5-07-15	TIME 1800	1. RECEIVED BY FED EX	DATE 5-07-15	TIME 1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY <i>ELIE</i>	DATE 5/8/15	TIME 0925
COMMENTS					

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	BMQL	Below Minimum Quantitation Level
N.D.	none detected	MPN	Most Probable Number
TNTC	Too Numerous To Count	CP Units	cobalt-chloroplatinate units
IU	International Units	NTU	nephelometric turbidity units
umhos/cm	micromhos/cm	ng	nanogram(s)
C	degrees Celsius	F	degrees Fahrenheit
meq	milliequivalents	lb.	pound(s)
g	gram(s)	kg	kilogram(s)
µg	microgram(s)	mg	milligram(s)
mL	milliliter(s)	L	liter(s)
m3	cubic meter(s)	µL	microliter(s)
		pg/L	picogram/liter
<	less than		
>	greater than		
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
ppb	parts per billion		
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

Laboratory Data Qualifiers:

- B - Analyte detected in the blank
- C - Result confirmed by reanalysis
- E - Concentration exceeds the calibration range
- J (or G, I, X) - estimated value \geq the Method Detection Limit (MDL or DL) and the $<$ Limit of Quantitation (LOQ or RL)
- P - Concentration difference between the primary and confirmation column $>40\%$. The lower result is reported.
- U - Analyte was not detected at the value indicated
- V - Concentration difference between the primary and confirmation column $>100\%$. The reporting limit is raised due to this disparity and evident interference...

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, ISO17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Client: Tetra Tech

Delivery and Receipt Information

Delivery Method: Fed Ex Arrival Timestamp: 05/05/2015 9:10
 Number of Packages: 1 Number of Projects: 1

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	Yes	VOA Vial Headspace \geq 6mm:	No
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	0
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Brandy Barclay (2299) at 09:31 on 05/05/2015

Samples Chilled Details

Thermometer Types: *DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.*

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	8013596-IR	0.1	IR	Wet	Y	Loose	N

Client: TETRA TECH NUS

112G01509 PARRIS ISLAND

Delivery and Receipt Information

Delivery Method:	<u>Fed Ex</u>	Arrival Timestamp:	<u>05/08/2015 9:25</u>
Number of Packages:	<u>1</u>	Number of Projects:	<u>1</u>

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace \geq 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	0
Paperwork Enclosed:	Yes	Air Quality Samples Present:	No
Samples Intact:	Yes		
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Corey Eshleman (3647) at 09:53 on 05/08/2015

Samples Chilled Details: 112G01509 PARRIS ISLAND

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT121	0.7	DT	Wet	Y	Loose	N

Perchlorate



Lancaster Laboratories
Environmental

Quality Control Reference List
Pesticide Residue Analysis

CLIENT: Tetra Tech Inc.
SDG: PIS01

Fraction: Perchlorate

Analysis	Batch Number	Sample Number	Analysis Date
Perchlorate in Soil LC/MS/MS	151320023A	PBLK23132	05/13/2015 13:36:00
		LCS23132	05/13/2015 13:49:00
		7873706 UNSPK	05/13/2015 14:02:00
		7873706 MS	05/13/2015 14:15:00
		7873706 MSD	05/13/2015 14:27:00
		7873707	05/13/2015 14:40:00
		7873708	05/13/2015 14:53:00
		Perchlorate in Water LC/MS/MS	151340030A
LCS30134	05/14/2015 17:09:00		
7873709 UNSPK	05/14/2015 17:35:00		
7873709 MS	05/14/2015 17:48:00		
7873709 MSD	05/14/2015 18:00:00		
7879425	05/14/2015 18:38:00		
7879426	05/14/2015 18:51:00		



Lancaster Laboratories
Environmental

Quality Control Summary
Method Blank
Pesticide Residue Analysis
SDG: PIS01
Matrix: LIQUID

Fraction: Perchlorate

151340030A / PBLK30134 Analyte	Analysis Date	Blank Results	Units	DL	LOD	LOQ
Perchlorate in Water LC/MS/MS	05/14/15	N.D.	ug/l	0.20	0.40	1.0



Lancaster Laboratories
Environmental

Quality Control Summary
Method Blank
Pesticide Residue Analysis
SDG: PIS01
Matrix: SOLID

Fraction: Perchlorate

151320023A / PBLK23132 Analyte	Analysis Date	Blank Results	Units	DL	LOD	LOQ
Perchlorate in Soil LC/MS/MS	05/13/15	N.D.	ug/kg	2.1	4.2	5.0



Lancaster Laboratories
Environmental

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: PIS01
Matrix: LIQUID

Pesticide Residue Analysis
Fraction: Perchlorate

LCS: LCS30134	Batch: 151340030A (Sample number(s): 7873709, 7879425-7879426)							
	Spike Added ug/l	LCS Conc ug/l	LCSD Conc ug/l	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Analyte								
Perchlorate in Water LC/MS/MS	1.00	0.879	NA	88	NA	84-119	NA	NA



Lancaster Laboratories
Environmental

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: PIS01
Matrix: SOLID

Pesticide Residue Analysis
Fraction: Perchlorate

LCS: LCS23132	Batch: 151320023A (Sample number(s): 7873706-7873708)							
	Spike Added ug/kg	LCS Conc ug/kg	LCSD Conc ug/kg	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Analyte								
Perchlorate in Soil LC/MS/MS	100	98.1	NA	98	NA	84-121	NA	NA

Pesticide Residue Analysis

Fraction: Perchlorate

UNSPK: 7873709 MS: 7873709 MSD: 7873709 Analyte	Batch: 151340030A (Sample number(s): 7873709, 7879425-7879426)								
	Spike Added ug/l	Unspiked Conc ug/l	MS Conc ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	%Rec Limits	%RPD	%RPD Limits
Perchlorate in Water LC/MS/MS	1.00	N.D.	1.11	1.01	111	101	84-119	9	15

Comments:

- (2) The unspiked sample result is greater than four times the spike added.
- * = Out of Specification

Results are being reported on an as received basis.

Pesticide Residue Analysis
Fraction: Perchlorate

UNSPK: 7873706 MS: 7873706 MSD: 7873706 Analyte	Batch: 151320023A (Sample number(s): 7873706-7873708)								
	Spike Added ug/kg	Unspiked Conc ug/kg	MS Conc ug/kg	MSD Conc ug/kg	MS %Rec	MSD %Rec	%Rec Limits	%RPD	%RPD Limits
Perchlorate in Soil LC/MS/MS	100	N.D.	98.1	102.2	98	102	84-121	4	15

Comments:

(2) The unspiked sample result is greater than four times the spike added.
* = Out of Specification

Results are being reported on an as received basis.

Quant Calibration Report (ISTD)

Batch Info

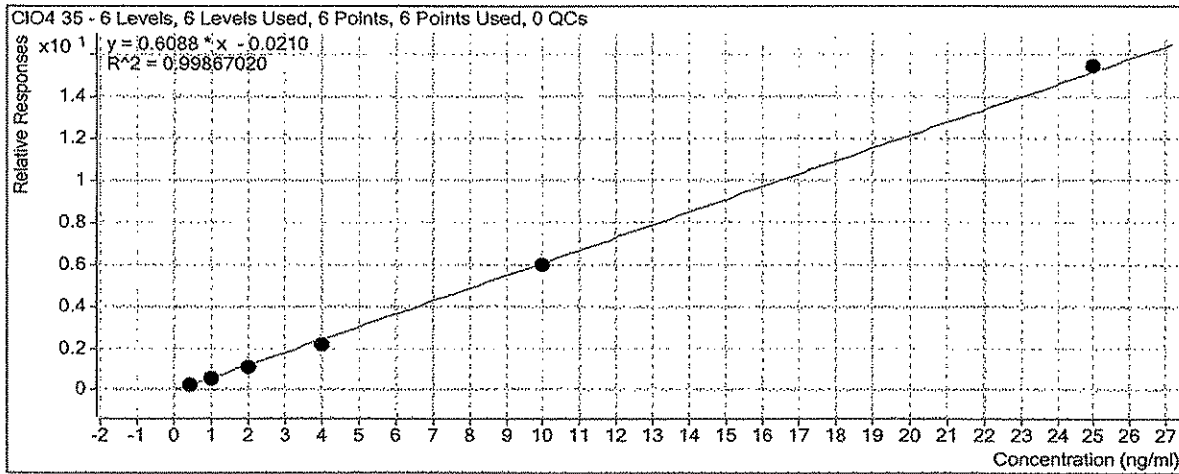
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13315.batch.xml
Analysis Time 2015-05-14 07:55 **Analyst Name** Administrator
Report Time 2015-05-14 07:56 **Reporter Name** Administrator
Last Calib Update 2015-05-14 07:51 **Batch State** ResultsDirty

Calibration Info

ISTD Compound CIO4 18 13269

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p13315004.d	Calibration	L1	<input checked="" type="checkbox"/>	13982	10.0000	1398.1985
ms5p13315005.d	Calibration	L2	<input checked="" type="checkbox"/>	13752	10.0000	1375.1688
ms5p13315006.d	Calibration	L3	<input checked="" type="checkbox"/>	13641	10.0000	1364.1199
ms5p13315007.d	Calibration	L4	<input checked="" type="checkbox"/>	14301	10.0000	1430.1211
ms5p13315008.d	Calibration	L5	<input checked="" type="checkbox"/>	12728	10.0000	1272.8137
ms5p13315009.d	Calibration	L6	<input checked="" type="checkbox"/>	11213	10.0000	1121.3033

Target Compound CIO4 35



Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p13315004.d	Calibration	L1	<input checked="" type="checkbox"/>	3422	0.4000	6.1184
ms5p13315005.d	Calibration	L2	<input checked="" type="checkbox"/>	8306	1.0000	6.0402
ms5p13315006.d	Calibration	L3	<input checked="" type="checkbox"/>	15608	2.0000	5.7209
ms5p13315007.d	Calibration	L4	<input checked="" type="checkbox"/>	31856	4.0000	5.5687
ms5p13315008.d	Calibration	L5	<input checked="" type="checkbox"/>	75765	10.0000	5.9525
ms5p13315009.d	Calibration	L6	<input checked="" type="checkbox"/>	173965	25.0000	6.2058

100% RATIO USING LEVEL 4
2.93

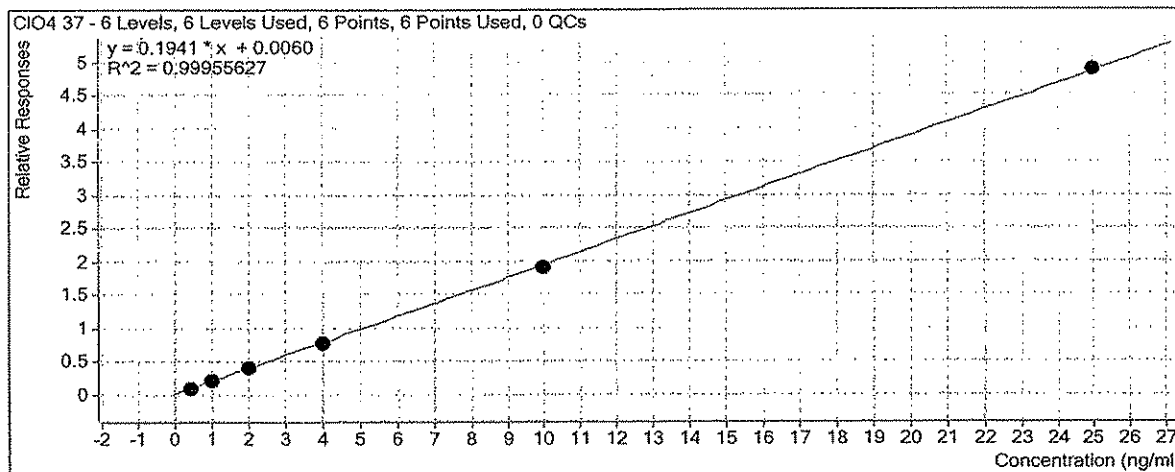
Valerie L. Tomayko
 Valerie L. Tomayko
 Principal Specialist

MAY 15 2015

JUA 84 5/14/15

Quant Calibration Report (ISTD)

Target Compound *ClO4 37*



Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p13315004.d	Calibration	L1	<input checked="" type="checkbox"/>	1115	0.4000	1.9938
ms5p13315005.d	Calibration	L2	<input checked="" type="checkbox"/>	2900	1.0000	2.1091
ms5p13315006.d	Calibration	L3	<input checked="" type="checkbox"/>	5567	2.0000	2.0404
ms5p13315007.d	Calibration	L4	<input checked="" type="checkbox"/>	10849	4.0000	1.8965
ms5p13315008.d	Calibration	L5	<input checked="" type="checkbox"/>	24337	10.0000	1.9121
ms5p13315009.d	Calibration	L6	<input checked="" type="checkbox"/>	54904	25.0000	1.9586

Quant Calibration Report (ISTD)

Batch Info

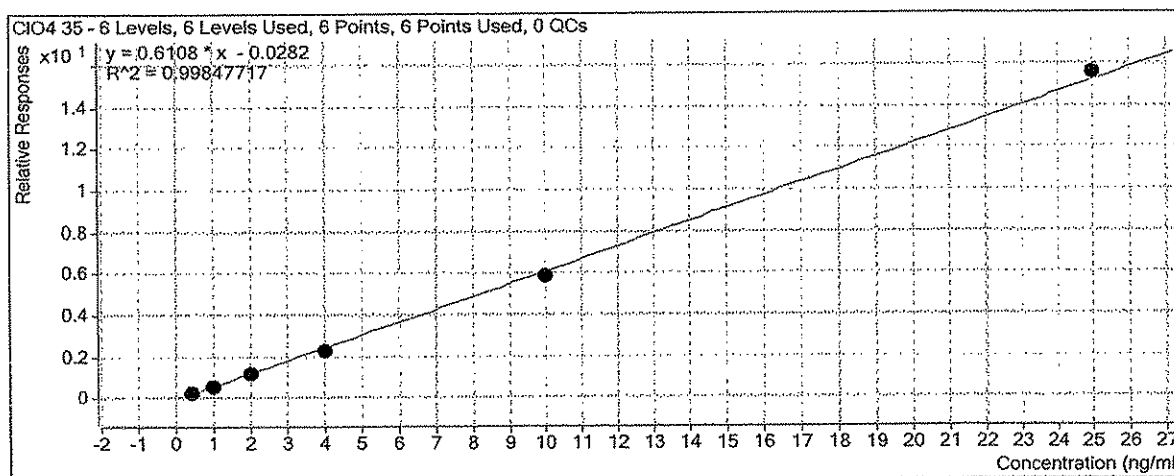
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13415.batch.xml
Analysis Time 2015-05-15 07:54 **Analyst Name** Administrator
Report Time 2015-05-15 07:55 **Reporter Name** Administrator
Last Calib Update 2015-05-15 07:47 **Batch State** ResultsDirty

Calibration Info

ISTD Compound CIO4 18

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p13415004.d	Calibration	L1	<input checked="" type="checkbox"/>	10476	10.0000	1047.6414
ms5p13415005.d	Calibration	L2	<input checked="" type="checkbox"/>	10677	10.0000	1067.6842
ms5p13415006.d	Calibration	L3	<input checked="" type="checkbox"/>	10977	10.0000	1097.6637
ms5p13415007.d	Calibration	L4	<input checked="" type="checkbox"/>	10998	10.0000	1099.8230
ms5p13415008.d	Calibration	L5	<input checked="" type="checkbox"/>	10018	10.0000	1001.7944
ms5p13415009.d	Calibration	L6	<input checked="" type="checkbox"/>	8552	10.0000	855.2489

Target Compound CIO4 35



Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p13415004.d	Calibration	L1	<input checked="" type="checkbox"/>	2457	0.4000	5.8624
ms5p13415005.d	Calibration	L2	<input checked="" type="checkbox"/>	6420	1.0000	6.0131
ms5p13415006.d	Calibration	L3	<input checked="" type="checkbox"/>	12687	2.0000	5.7792
ms5p13415007.d	Calibration	L4	<input checked="" type="checkbox"/>	24919	4.0000	5.6643
ms5p13415008.d	Calibration	L5	<input checked="" type="checkbox"/>	58480	10.0000	5.8375
ms5p13415009.d	Calibration	L6	<input checked="" type="checkbox"/>	133700	25.0000	6.2531

ION RATIO USING LEVELY

2.98

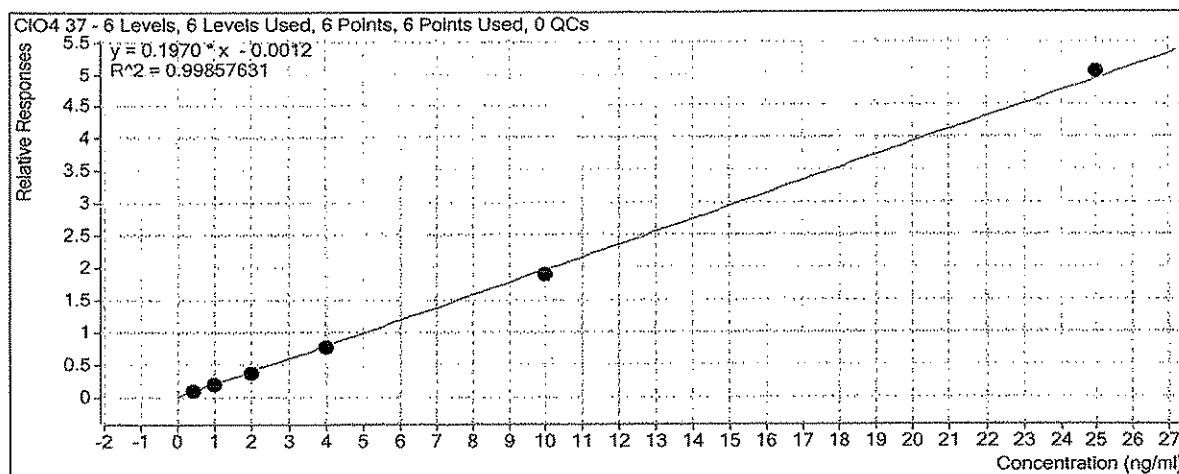
Valerie L. Tomayko
 Principal Specialist

MAY 15 2015

RMSK sls/15

Quant Calibration Report (ISTD)

Target Compound *C104 37*



Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p13415004.d	Calibration	L1	<input checked="" type="checkbox"/>	892	0.4000	2.1288
ms5p13415005.d	Calibration	L2	<input checked="" type="checkbox"/>	2129	1.0000	1.9941
ms5p13415006.d	Calibration	L3	<input checked="" type="checkbox"/>	4044	2.0000	1.8420
ms5p13415007.d	Calibration	L4	<input checked="" type="checkbox"/>	8346	4.0000	1.8970
ms5p13415008.d	Calibration	L5	<input checked="" type="checkbox"/>	18915	10.0000	1.8882
ms5p13415009.d	Calibration	L6	<input checked="" type="checkbox"/>	43152	25.0000	2.0182

QQQ Autotune Report

Instrument Name Instrument 1 **MS Model** G6410A
Tune Date & Time 2015-05-13 10:34
Data Path D:\MassHunter\Tune\QQQ\atunes.TUNE.XML
Ion Source ESI
Ionization Mode ESI

Source Parameters

Parameter	Value
Gas Temp	350
Gas Flow	10
Nebulizer	30
Capillary	4000

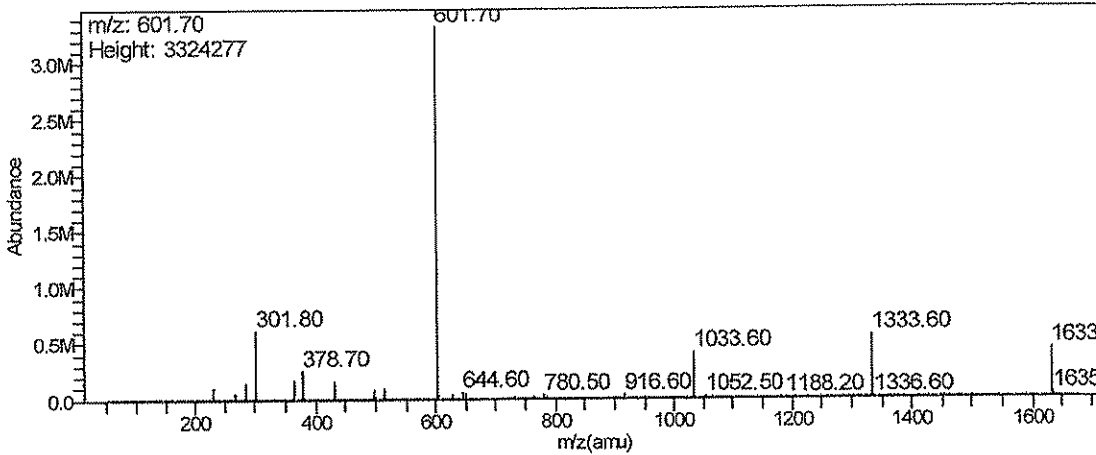
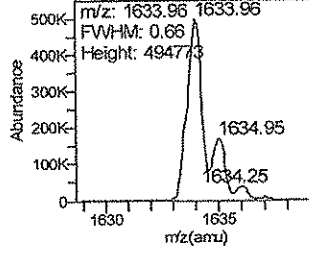
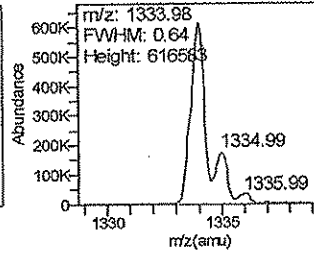
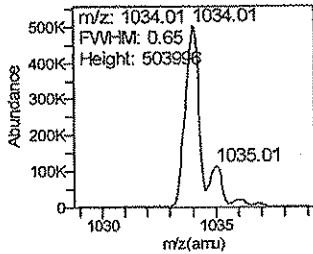
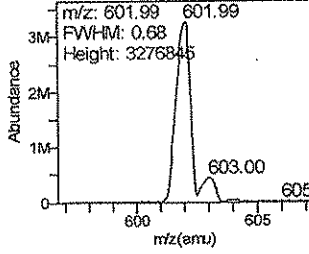
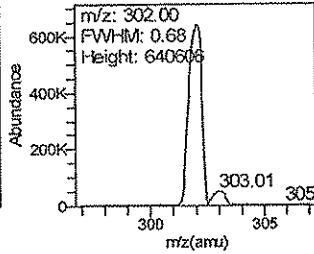
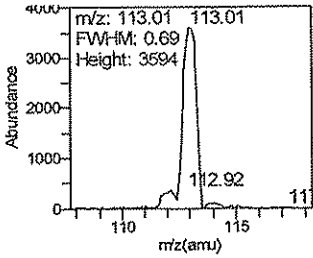
QQQ Autotune Report

Negative Results

Analyzer: MSI

Polarity: Negative

Width: Unit



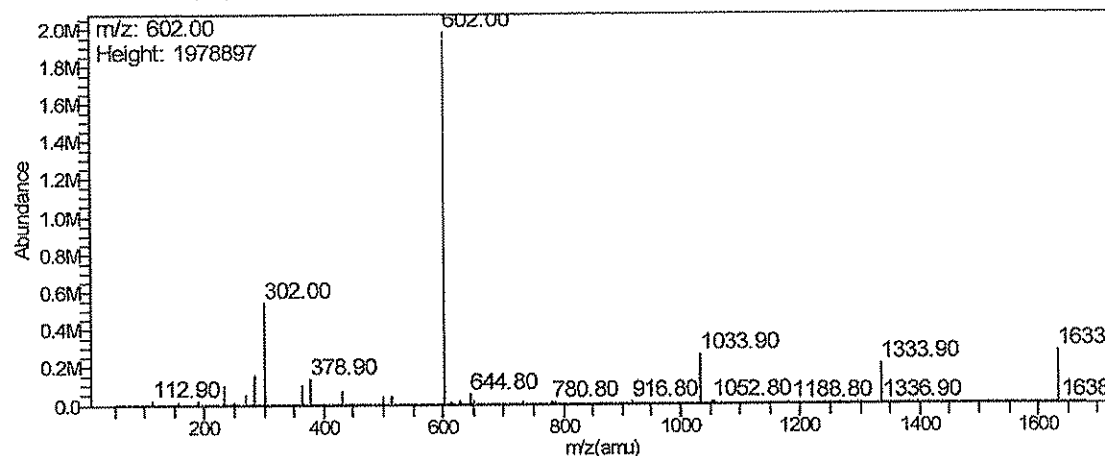
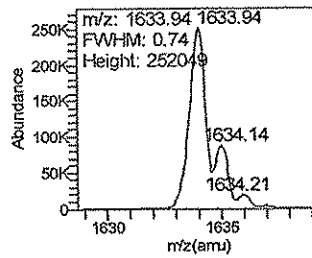
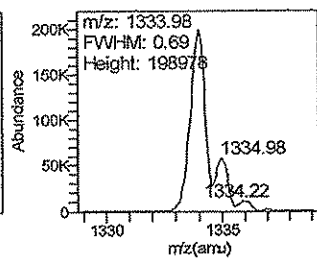
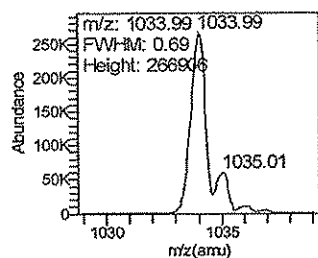
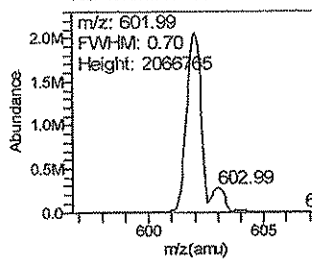
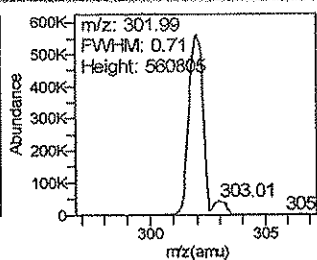
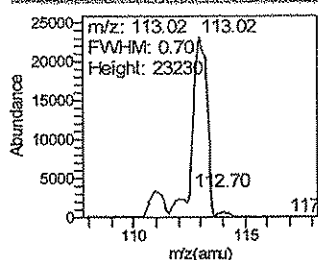
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.01	112.99	0.69	0.70	3594
301.99	302.00	0.68	0.70	640606
601.99	601.98	0.68	0.70	3276845
1034.00	1033.99	0.65	0.70	503996
1333.99	1333.97	0.64	0.70	616583
1633.98	1633.95	0.66	0.70	494773

QQQ Autotune Report

Analyzer: MS2

Polarity: Negative

Width: Unit



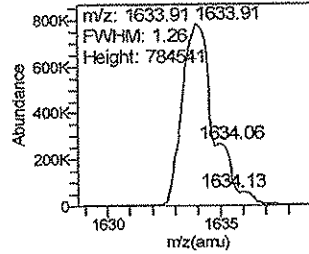
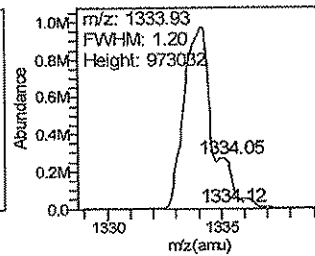
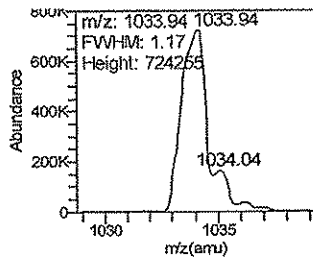
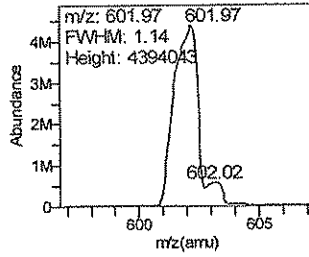
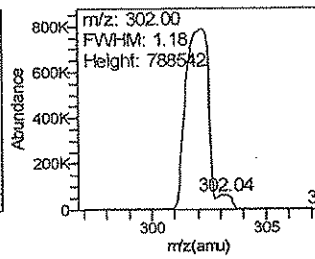
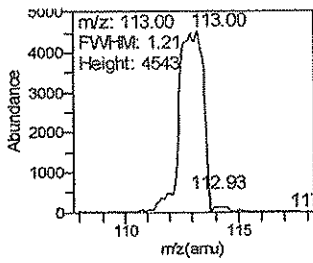
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.02	112.99	0.70	0.70	23230
301.99	302.00	0.71	0.70	560805
601.98	601.98	0.70	0.70	2066765
1033.99	1033.99	0.69	0.70	266906
1334.00	1333.97	0.69	0.70	198978
1633.95	1633.95	0.74	0.70	252049

QQQ Autotune Report

Analyzer: MS1

Polarity: Negative

Width: Wide



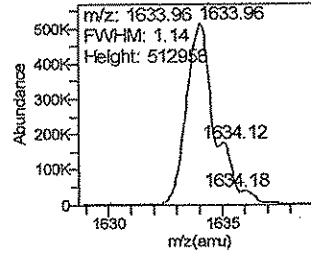
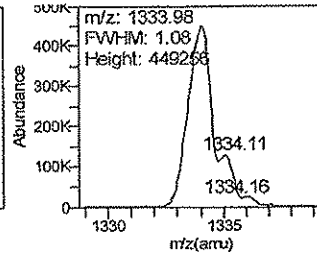
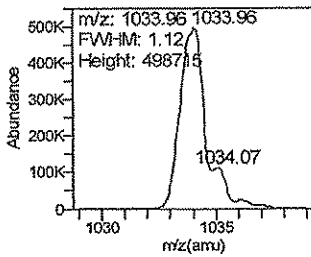
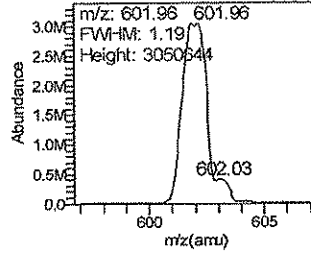
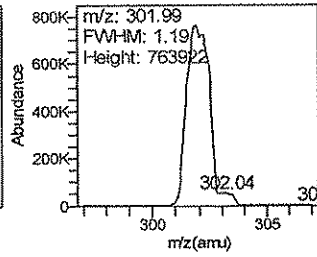
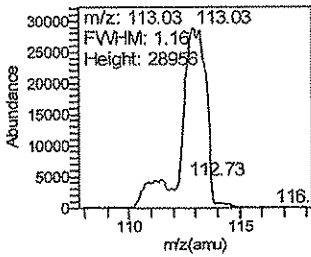
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.00	112.99	1.21	1.20	4543
302.00	302.00	1.18	1.20	788542
601.97	601.98	1.14	1.20	4394043
1033.94	1033.99	1.17	1.20	724255
1333.94	1333.97	1.20	1.20	973033
1633.92	1633.95	1.26	1.20	784541

QQQ Autotune Report

Analyzer: MS2

Polarity: Negative

Width: Wide



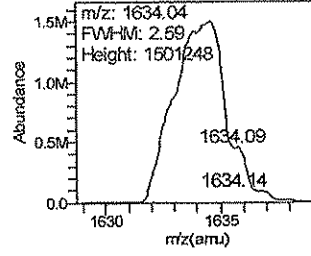
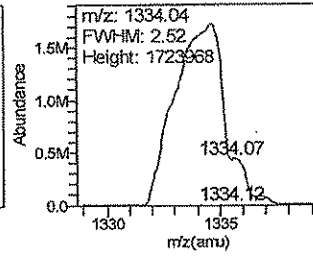
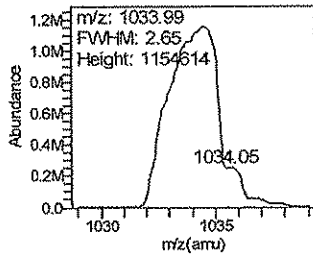
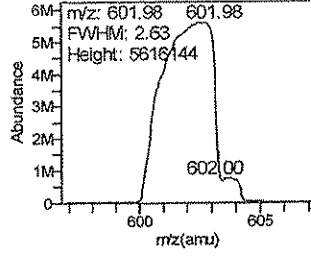
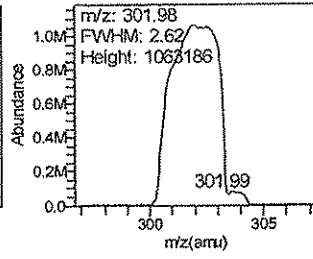
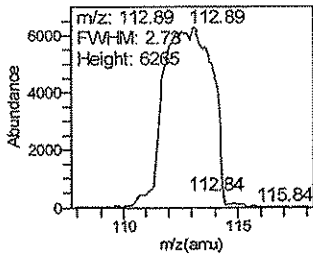
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.03	112.99	1.16	1.20	28956
301.99	302.00	1.19	1.20	763922
601.96	601.98	1.19	1.20	3050644
1033.96	1033.99	1.12	1.20	498715
1334.00	1333.97	1.08	1.20	449256
1633.97	1633.95	1.14	1.20	512958

QQQ Autotune Report

Analyzer: MS1

Polarity: Negative

Width: Widest



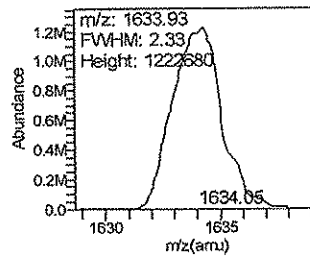
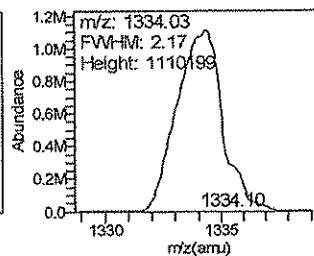
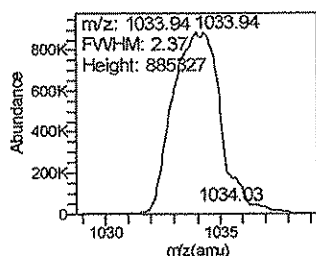
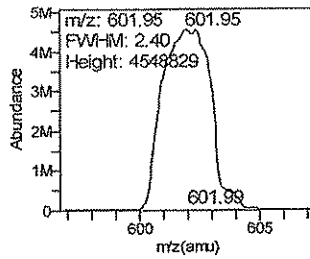
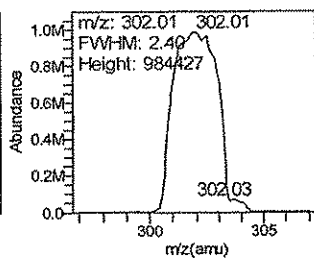
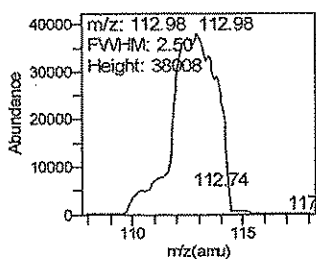
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
112.89	112.99	2.73	2.50	6265
301.98	302.00	2.62	2.50	1063186
601.97	601.98	2.63	2.50	5616144
1033.99	1033.99	2.65	2.50	1154614
1334.05	1333.97	2.52	2.50	1723968
1634.05	1633.95	2.59	2.50	1501248

QQQ Autotune Report

Analyzer: MS2

Polarity: Negative

Width: Widest



m/z	m/z Expected	FWHM	FWHM Expected	Abundance
112.98	112.99	2.50	2.50	38008
302.01	302.00	2.40	2.50	984427
601.95	601.98	2.40	2.50	4548829
1033.93	1033.99	2.37	2.50	885327
1334.04	1333.97	2.17	2.50	1110199
1633.94	1633.95	2.33	2.50	1222679

QQQ Autotune Report

Negative Parameters

Tune Parameters

Parameter	Setting
Fragmentor	135.00
Skimmer	15.00
Octopole DC	5.00
Octopole RF	600.00
Lens1	0.00
Lens2 DC	2.00
Lens2 RF Enable	1.00
Lens2 RF	318.00
Lens2 RF Phase	-108.00
MS1 DC	-3.00
MS1 PostFilter	-2.00
MS1 Axis Offset	0.86
MS1 Axis Gain	-29.10
MS1 Width Offset	0.02
MS1 Width Gain	31.30
MS1 Heater	100.00
MS2 DC	12.00
MS2 PreFilter	27.00
MS2 Axis Offset	0.73
MS2 Axis Gain	15.80
MS2 Width Offset	0.17
MS2 Width Gain	18.60
MS2 Heater	100.00
Cell Entry	0.00
Hexapole DC	0.00
Hexapole RF	400.00
Hexapole Accel	7.00
Cell Exit	8.00
Collision Gas	1.00
Iris	175.00
HED	10.00
EMV	1320.00
Collision Energy	0.00
Lens2 DC RF Off	30.50

Dynamic Ramp Tables

Lens2 DC

m/z	Setting
112.99	0.60
302.00	1.10
601.98	1.90
1033.99	3.10
1333.97	3.90
1633.95	4.70

Lens2 RF

QQQ Autotune Report

m/z	Setting
112.99	87.00
302.00	116.00
601.98	161.00
1033.99	227.00
1333.97	272.00
1633.95	318.00

MS1 Axis Offset

m/z	Setting
112.99	0.86
302.00	0.87
601.98	0.89
1033.99	0.90
1333.97	0.88
1633.95	0.86

MS1 Width Offset

m/z	Setting
112.99	0.02
302.00	0.01
601.98	0.03
1033.99	0.01
1333.97	-0.01
1633.95	0.02

MS2 Axis Offset

m/z	Setting
112.99	0.73
302.00	0.75
601.98	0.77
1033.99	0.78
1333.97	0.76
1633.95	0.73

MS2 Width Offset

m/z	Setting
112.99	0.17
302.00	0.13
601.98	0.12
1033.99	0.11
1333.97	0.11
1633.95	0.17

MS1 Calibrations

Resolution	Mass Gain	Mass Offset	Width Gain	Width Offset
Unit	-29.10	0.86	31.30	0.02
Wide	-29.35	1.03	31.60	0.38
Widest	-29.30	1.44	31.90	1.51

QQQ Autotune Report

MS2 Calibrations

Resolution	Mass Gain	Mass Offset	Width Gain	Width Offset
Unit	15.80	0.73	18.60	0.17
Wide	15.60	0.92	18.80	0.51
Widest	15.25	1.37	19.40	1.42

QQQ Autotune Report

Instrument Name Instrument 1 **MS Model** G6410A
Tune Date & Time 2015-05-14 13:35
Data Path D:\MassHunter\Tune\QQQ\atunes.TUNE.XML
Ion Source ESI
Ionization Mode ESI

Source Parameters

Parameter	Value
Gas Temp	350
Gas Flow	10
Nebulizer	30
Capillary	4000

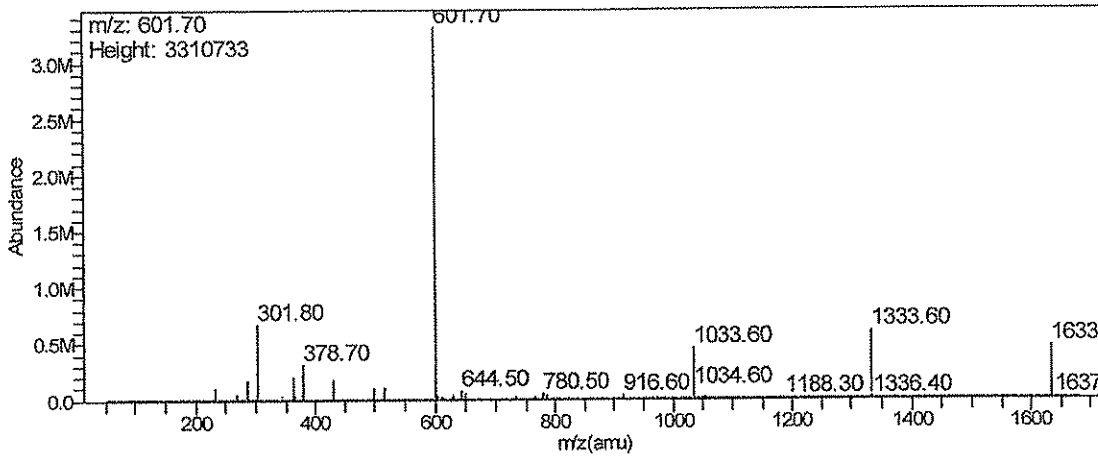
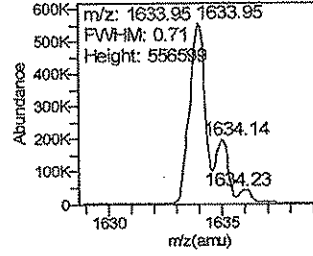
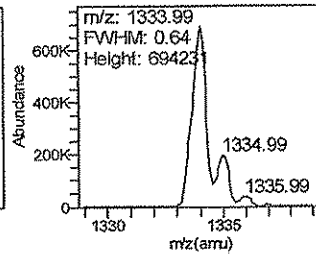
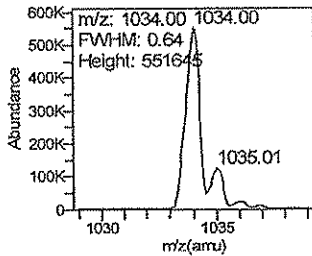
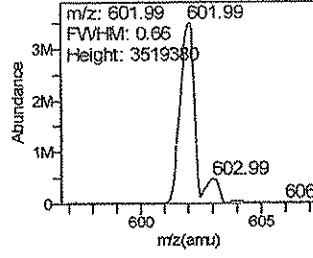
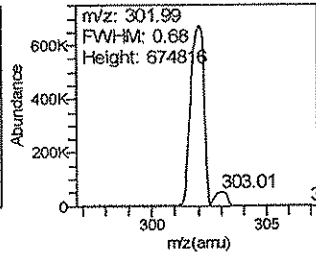
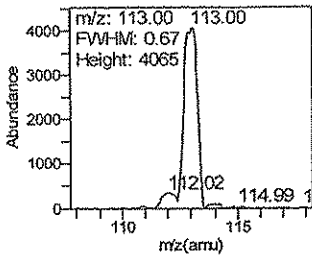
QQQ Autotune Report

Negative Results

Analyzer: MS1

Polarity: Negative

Width: Unit



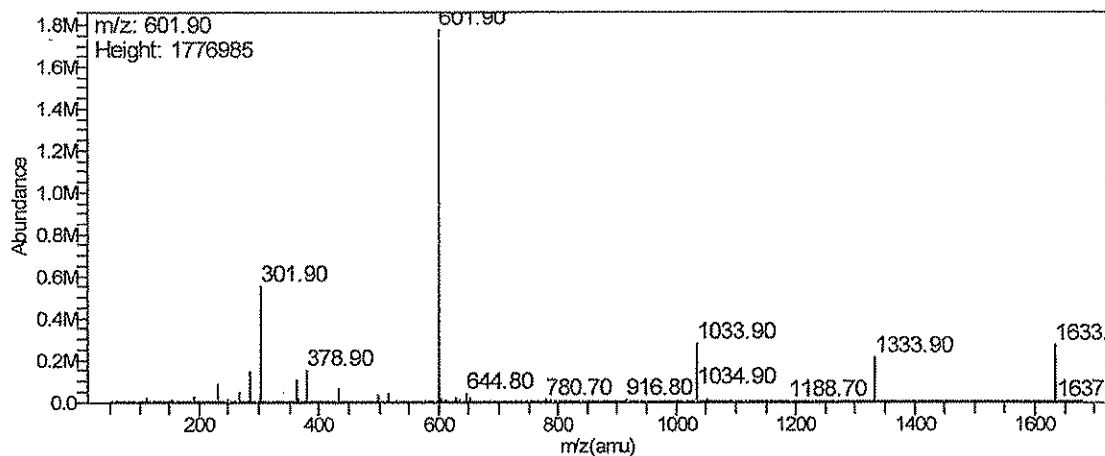
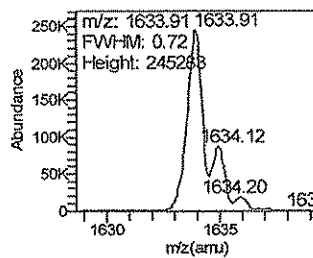
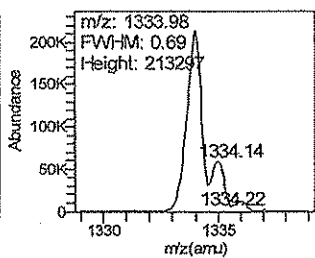
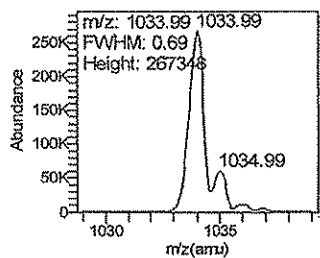
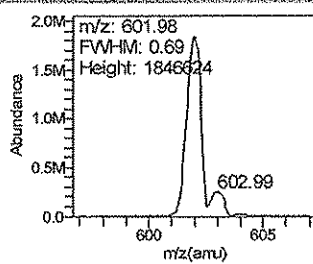
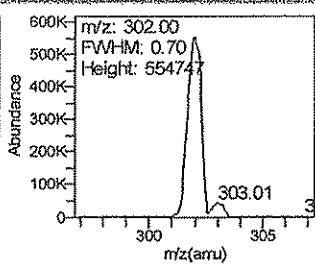
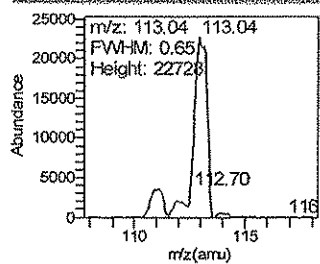
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.00	112.99	0.67	0.70	4065
301.99	302.00	0.68	0.70	674816
601.98	601.98	0.66	0.70	3519380
1034.00	1033.99	0.64	0.70	551645
1334.00	1333.97	0.64	0.70	694231
1633.96	1633.95	0.71	0.70	556599

QQQ Autotune Report

Analyzer: MS2

Polarity: Negative

Width: Unit



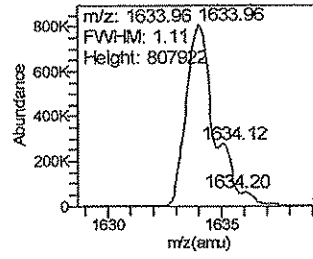
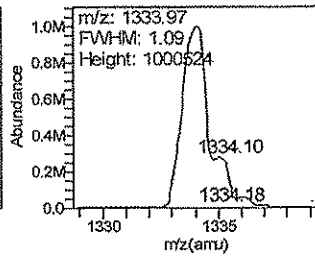
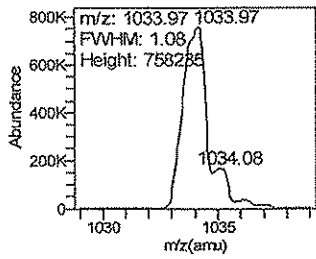
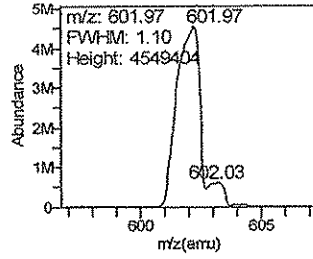
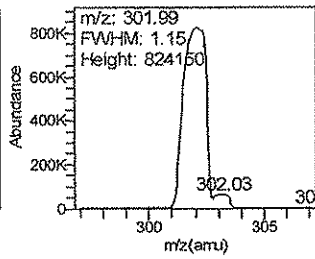
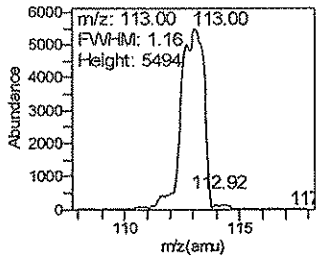
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.04	112.99	0.65	0.70	22728
301.99	302.00	0.70	0.70	554747
601.98	601.98	0.69	0.70	1846624
1033.99	1033.99	0.69	0.70	267348
1333.99	1333.97	0.69	0.70	213297
1633.92	1633.95	0.72	0.70	245283

QQQ Autotune Report

Analyzer: MS1

Polarity: Negative

Width: Wide



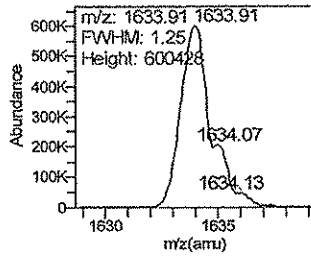
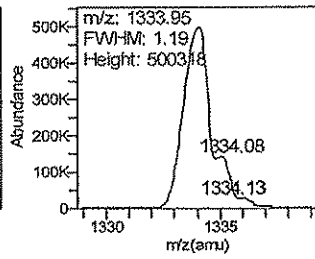
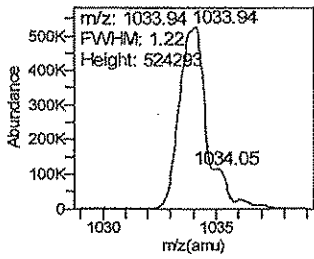
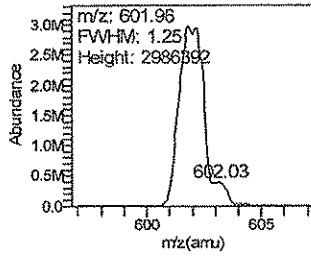
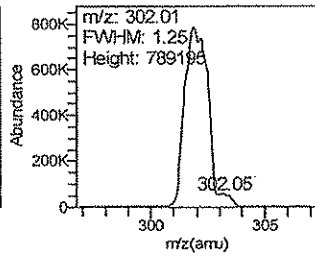
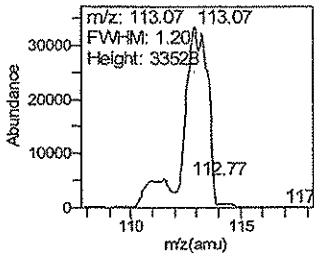
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.00	112.99	1.16	1.20	5494
301.98	302.00	1.15	1.20	824150
601.96	601.98	1.10	1.20	4549404
1033.97	1033.99	1.08	1.20	758235
1333.98	1333.97	1.09	1.20	1000524
1633.97	1633.95	1.11	1.20	807922

QQQ Autotune Report

Analyzer: MS2

Polarity: Negative

Width: Wide



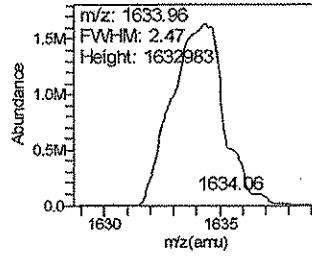
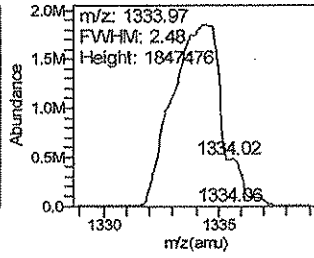
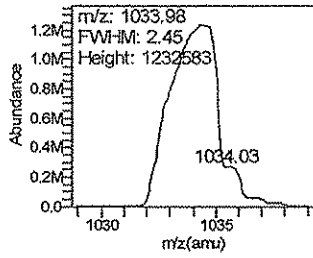
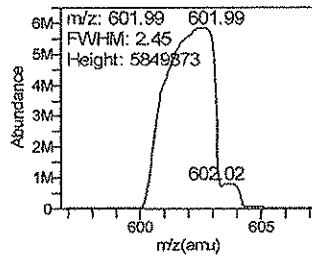
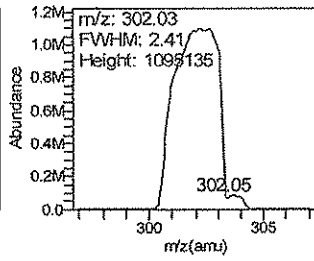
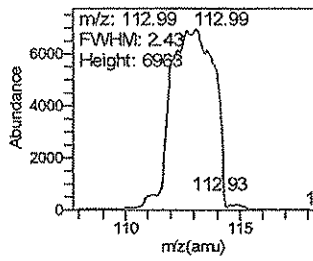
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.07	112.99	1.20	1.20	33528
302.01	302.00	1.25	1.20	789195
601.96	601.98	1.25	1.20	2986392
1033.94	1033.99	1.22	1.20	524293
1333.96	1333.97	1.19	1.20	500318
1633.93	1633.95	1.25	1.20	600428

QQQ Autotune Report

Analyzer: MS1

Polarity: Negative

Width: Widest



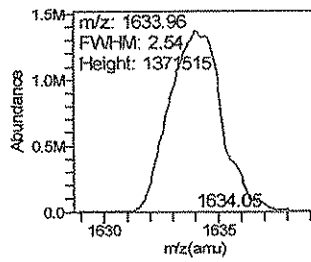
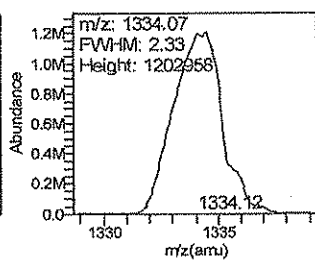
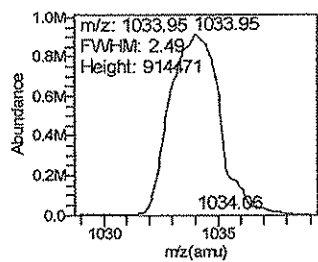
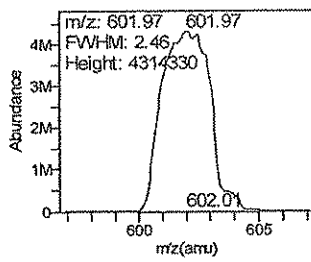
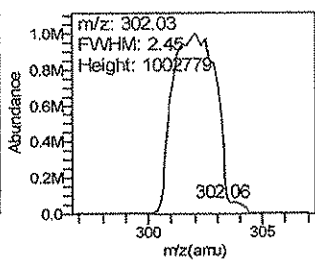
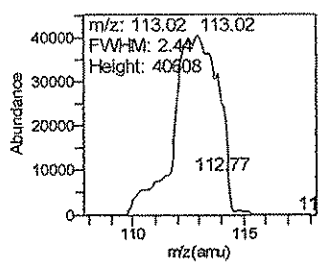
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
112.99	112.99	2.43	2.50	6963
302.03	302.00	2.41	2.50	1095135
601.99	601.98	2.45	2.50	5849873
1033.97	1033.99	2.45	2.50	1232583
1333.98	1333.97	2.48	2.50	1847476
1633.97	1633.95	2.48	2.50	1632983

QQQ Autotune Report

Analyzer: MS2

Polarity: Negative

Width: Widest



m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.02	112.99	2.44	2.50	40608
302.03	302.00	2.45	2.50	1002779
601.97	601.98	2.45	2.50	4314330
1033.95	1033.99	2.49	2.50	914471
1334.08	1333.97	2.33	2.50	1202958
1633.97	1633.95	2.55	2.50	1371516

QQQ Autotune Report

Negative Parameters

Tune Parameters

Parameter	Setting
Fragmentor	135.00
Skimmer	15.00
Octopole DC	5.00
Octopole RF	600.00
Lens1	0.00
Lens2 DC	2.00
Lens2 RF Enable	1.00
Lens2 RF	318.00
Lens2 RF Phase	-108.00
MS1 DC	-3.00
MS1 PostFilter	-2.00
MS1 Axis Offset	0.84
MS1 Axis Gain	-29.05
MS1 Width Offset	0.00
MS1 Width Gain	31.40
MS1 Heater	100.00
MS2 DC	12.00
MS2 PreFilter	27.00
MS2 Axis Offset	0.73
MS2 Axis Gain	15.80
MS2 Width Offset	0.11
MS2 Width Gain	18.70
MS2 Heater	100.00
Cell Entry	0.00
Hexapole DC	0.00
Hexapole RF	400.00
Hexapole Accel	7.00
Cell Exit	8.00
Collision Gas	1.00
Iris	350.00
HED	10.00
EMV	1310.00
Collision Energy	0.00
Lens2 DC RF Off	32.00

Dynamic Ramp Tables

Lens2 DC

m/z	Setting
112.99	0.70
302.00	1.20
601.98	2.00
1033.99	3.20
1333.97	3.90
1633.95	4.70

Lens2 RF

QQQ Autotune Report

m/z	Setting
112.99	87.00
302.00	116.00
601.98	161.00
1033.99	227.00
1333.97	272.00
1633.95	318.00

MS1 Axis Offset

m/z	Setting
112.99	0.84
302.00	0.86
601.98	0.88
1033.99	0.88
1333.97	0.86
1633.95	0.84

MS1 Width Offset

m/z	Setting
112.99	0.00
302.00	0.00
601.98	0.00
1033.99	-0.03
1333.97	-0.04
1633.95	0.00

MS2 Axis Offset

m/z	Setting
112.99	0.73
302.00	0.76
601.98	0.78
1033.99	0.79
1333.97	0.77
1633.95	0.73

MS2 Width Offset

m/z	Setting
112.99	0.11
302.00	0.12
601.98	0.10
1033.99	0.10
1333.97	0.10
1633.95	0.11

MS1 Calibrations

Resolution	Mass Gain	Mass Offset	Width Gain	Width Offset
Unit	-29.05	0.84	31.40	0.00
Wide	-29.20	1.00	31.40	0.37
Widest	-29.50	1.45	32.20	1.31

QQQ Autotune Report

MS2 Calibrations

Resolution	Mass Gain	Mass Offset	Width Gain	Width Offset
Unit	15.80	0.73	18.70	0.11
Wide	15.50	0.98	19.00	0.54
Widest	15.45	1.39	20.00	1.36

Continuing Calibration Method 6850

Run # ms5p13315

MS5P13315010	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.86 perchlorate	3.8	4		-5% ICV

MS5P13315021	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.86 perchlorate	0.4	0.4		0%

MS5P13315030	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.86 perchlorate	3.7	4		-8%

entered by MA 800 5/14/15

verified by NT047 5/15/15

Continuing Calibration Method 6850

Run # ms5p13415

MS5P13415010	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.86 perchlorate	3.8	4		-5% ICV

MS5P13415021	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.86 perchlorate	0.42	0.4		5%

MS5P13415032	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.85 perchlorate	3.8	4		-5%

MS5P13415043	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.85 perchlorate	4.8	0.4		1100%

MS5P13415048	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.85 perchlorate	3.8	4		-5%

entered by MAA 5/15/15

verified by Wray 5/15/15

PFAAs by LC/MS/MS



Lancaster Laboratories
Environmental

**Quality Control Reference List
Specialty Services Group**

**CLIENT: Tetra Tech Inc.
SDG: PIS01**

Fraction: PFAAs by LC/MS/MS

Analysis	Batch Number	Sample Number	Analysis Date
PFAAs in Water by LC/MS/MS	15138004	BLK	05/29/2015 18:44:00
		LCS	05/29/2015 19:15:00
		LCSD	05/29/2015 19:31:00
		7873709	05/29/2015 20:34:00
		7873709	05/29/2015 20:50:00
		7879425	05/29/2015 21:05:00
		7879426 UNSPK	05/29/2015 19:47:00
		7879426 MS	05/29/2015 20:02:00

Fraction: PFAAs by LC/MS/MS

15138004 / BLK Analyte	Analysis Date	Blank Results	Units	DL	LOD	LOQ
Perfluorooctanoic acid	05/29/15	N.D.	ng/l	1	2	2
Perfluoro-octanesulfonate	05/29/15	N.D.	ng/l	5	10	10

Specialty Services Group
Fraction: PFAAs by LC/MS/MS

UNSPK: 7879426 MS: 7879426 Analyte	Batch: 15138004 (Sample number(s): 7873709, 7879425-7879426)								
	Spike Added ng/l	Unspiked Conc ng/l	MS Conc ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	%Rec Limits	%RPD	%RPD Limits
Perfluorooctanoic acid	100	1.03	95.63	NA	95	NA	70-130	NA	NA
Perfluoro-octanesulfonate	100	N.D.	102.25	NA	102	NA	70-130	NA	NA

Comments:

- (2) The unspiked sample result is greater than four times the spike added.
 * = Out of Specification

Results are being reported on an as received basis.

SDG: PIS01
Matrix: LIQUID
Specialty Services Group
 Fraction: PFAAs by LC/MS/MS

LCS LCSD	Batch: 15138004 (Sample number(s): 7873709, 7879425-7879426)							
Analyte	Spike Added ng/l	LCS Conc ng/l	LCSD Conc ng/l	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Perfluorooctanoic acid	100	104.74	112.68	105	113	70-130	7	30
Perfluoro-octanesulfonate	100	106.78	103.84	107	104	70-130	3	30

Sequence Table

File Name	Sample ID	Sample Type	Level	Vial	Inj Vol	Dil Factor	Path	Inst Method	Proc Method
A15138004-01	equi	Unknown	N/A	d:1	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-02	SYS	Unknown	N/A	d:2	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-03	CAL1	Std Bracket	1	d:3	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-04	CAL2	Std Bracket	2	d:4	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-05	CAL3	Std Bracket	3	d:5	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-06	CAL4	Std Bracket	4	d:6	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-07	CAL5	Std Bracket	5	d:7	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-08	CAL6	Std Bracket	6	d:8	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-09	Recon	Unknown	N/A	d:1	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-10	BLK 15138004	Unknown	N/A	d:9	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-11	CCV1	QC	1	d:5	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-12	LCS15138004	QC	VICV	d:10	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-13	LCS15138004	QC	VICV	d:11	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-14	7879426 (BKG)	Unknown	N/A	d:12	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-15	7879426 MS	Unknown	N/A	d:13	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-16	CCV2	QC	2	d:6	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-17	7873709 DF100	Unknown	N/A	d:14	10.0	100.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-18	7873709	Unknown	N/A	d:15	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-19	7879425	Unknown	N/A	d:16	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-20	CCV3	QC	3	d:7	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan

Michelle J. Smith

JUN 01 2015

**Michele J. Smith
Senior Specialist**

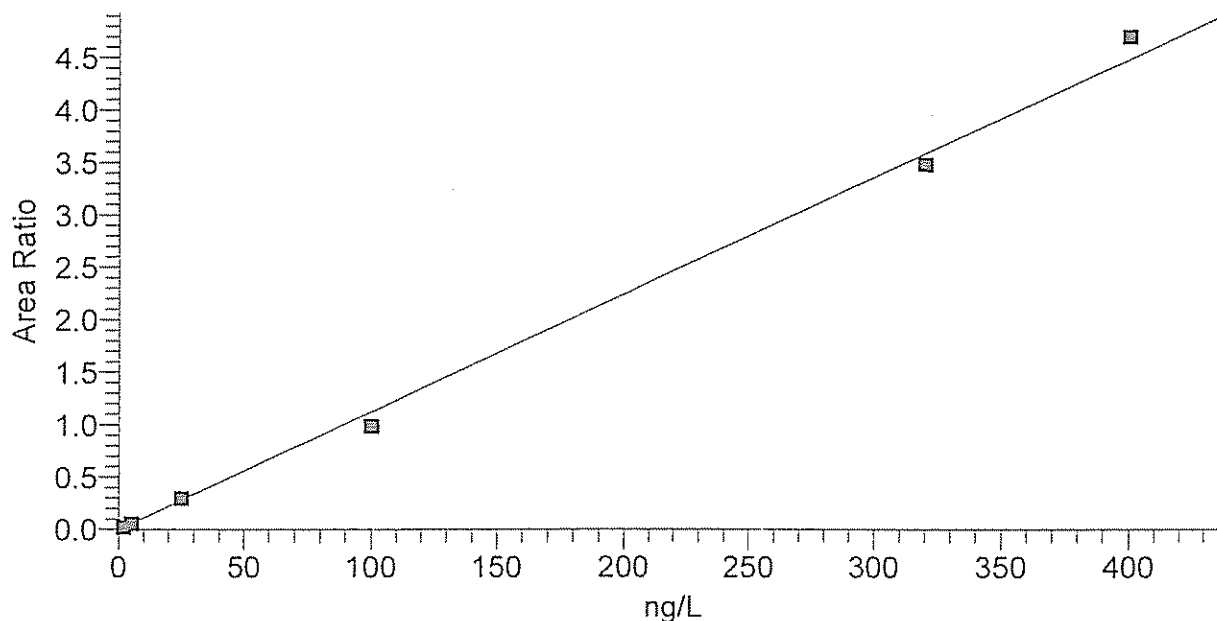
M. Yu
Meng Yu
Principal Chemist

JUN 01 2015

LCMSMS ANALYSIS REPORT

Component Name: PFOA

PFOA
 $Y = -0.00264355 + 0.0112102 * X$ $R^2 = 0.9966$ $W: 1/X$



Identification Filter: - c ESI SRM ms2 412.90
 [168.90-168.91, 368.85-368.86]
 2nd Trace Type: N/A
 Mass Range 2 (m/z): N/A
 Base Peak(BP):
 Retention Time Window (sec): 30.00000
 RT Reference: No
 Adjust Using: N/A
 Detection Options
 ICIS Smoothing Points: 3
 Area Noise Factor: 10
 ICIS Constrain Peak Width: No
 ICIS Tailing Factor: N/A
 ICIS Peak Detection
 ICIS Minimum Peak Height (S/N): 5.0
 ICIS Window %:
 ICIS Forward: 0
 ICIS Match: 0
 ICIS Advanced Parameters
 Minimum Peak Width: 3
 Area Tail Extension: 5
 Component Type: Target Compound
 ISTD Amount: N/A
 ISTD: 13C-PFOA_(IS)
 Origin: IgnoreOrigin
 Calibration Curve: Linear
 Number of Cal. Levels: 6
 Scan Threshold (mAU): N/A
 Limit ScanRange (nm): N/A

Component Name: PFOA
 1st Trace Type: TIC
 Mass Range 1 (m/z):
 Wavelength Range 2 (nm): N/A
 Expected RT (min): 7.60000
 View Width (min): 3.00000
 Adjust Expected RT: No
 Peak Detection Algorithm: ICIS
 ICIS Peak Integration
 Baseline Window: 200
 Peak Noise Factor: 10
 ICIS Peak Height (%): N/A
 ICIS Identify By: Nearest RT
 ICIS Ion Ratio Confirmation: Disabled
 ICIS Qualifier Ion Coelution (min): N/A
 ICIS Spectrum Thresholds
 ICIS Reverse: 0
 Noise Method: Incos
 Multiplet Resolution: 10
 Area Scan Window: 0
 Calibration
 %RSD Calculation Method: Use calculated amounts
 Internal Standard
 ISTD Units: N/A
 Target Compounds
 Weighting: OneOverX
 Response: Area
 Target Units: ng/L
 Number of QC Levels: 5
 Peak Purity Options
 Peak Coverage (%): N/A

Michele J. Smith

JUN 01 2015

Michele J. Smith
 Senior Specialist

Meng Yu
 Meng Yu
 Principal Chemist

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LCMSMS ANALYSIS REPORT

Component Cal Level Table

Cal Level	Amount
1	2.000
2	5.000
3	25.000
4	100.000
5	320.000
6	400.000

Component QC Level Table

QC Level	Amount
ICV	200.000
VICV	100.000
1	25.000
2	100.000
3	320.000

ICV & CCV Result Table

Sample ID	Data File Name	Calculated Amount	Area	ISTD Area	Area Ratio	% Diff
CAL1	A15138004-03	2.077	7022.44	340245.86	0.021	3.85
CAL2	A15138004-04	4.963	16144.41	304681.56	0.053	-0.75
CAL3	A15138004-05	26.728	89963.93	302931.51	0.297	6.91
CAL4	A15138004-06	88.005	306067.84	311073.33	0.984	-12.00
CAL5	A15138004-07	310.871	963216.70	276605.42	3.482	-2.85
CAL6	A15138004-08	419.357	1278652.99	272144.74	4.698	4.84
CCV1	A15138004-11	24.238	80477.52	299101.57	0.269	-3.05
LCS15138004	A15138004-12	104.743	331006.89	282538.91	1.172	4.74
LCSD15138004	A15138004-13	112.685	319651.19	253575.05	1.261	12.69
CCV2	A15138004-16	91.669	278101.07	271321.84	1.025	-8.33
CCV3	A15138004-20	326.190	1090466.04	298430.19	3.654	1.93

Michele J. Smith

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Senior Specialist

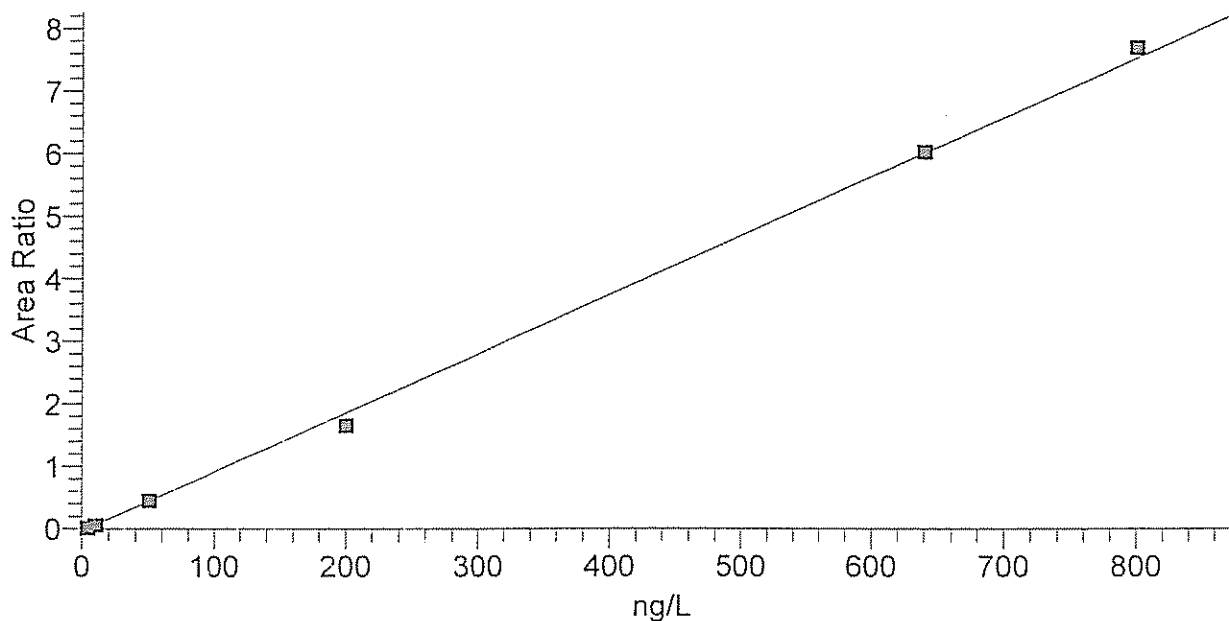
Meng Yu
Meng Yu
Principal Chemist

JUN 01 2015

LCMSMS ANALYSIS REPORT

Component Name: **PFOS**

PFOS
 $Y = -0.0294091 + 0.00942745 * X$ $R^2 = 0.9982$ $W: 1/X$



Identification Filter: - c ES1 SRM ms2 498.86 [80.19-80.20, 99.00-99.00] 2nd Trace Type: N/A Mass Range 2 (m/z): Base Peak(BP): Retention Time Window (sec): 50.00000 RT Reference: No Adjust Using: N/A Detection Options ICIS Smoothing Points: 3 Area Noise Factor: 5 ICIS Constrain Peak Width: No ICIS Tailing Factor: N/A ICIS Peak Detection ICIS Minimum Peak Height (S/N): 5.0 ICIS Window %: ICIS Forward: 0 ICIS Match: 0 ICIS Advanced Parameters Minimum Peak Width: 3 Area Tail Extension: 5 Component Type: Target Compound ISTD Amount: N/A ISTD: 13C-PFOS_(IS) Origin: IgnoreOrigin Calibration Curve: Linear Number of Cal. Levels: 6 Scan Threshold (mAU): N/A Limit ScanRange (nm): N/A	Component Name: PFOS 1st Trace Type: TIC Mass Range 1 (m/z): Wavelength Range 2 (nm): N/A Expected RT (min): 7.80000 View Width (min): 3.00000 Adjust Expected RT: No Peak Detection Algorithm: ICIS ICIS Peak Integration Baseline Window: 75 Peak Noise Factor: 10 ICIS Peak Height (%): N/A ICIS Identify By: Nearest RT ICIS Ion Ratio Confirmation: Disabled ICIS Qualifier Ion Coelution (min): N/A ICIS Spectrum Thresholds ICIS Reverse: 0 Noise Method: Incos Multiplet Resolution: 10 Area Scan Window: 0 Calibration %RSD Calculation Method: Use calculated amounts Internal Standard ISTD Units: N/A Target Compounds Weighting: OneOverX Response: Area Target Units: ng/L Number of QC Levels: 5 Peak Purity Options Peak Coverage (%): N/A	JUN 01 2015 Michele J. Smith Senior Specialist
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Meng Yu
 Meng Yu
 Principal Chemist

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LCMSMS ANALYSIS REPORT

Component Cal Level Table

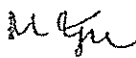
Cal Level	Amount
1	4.000
2	10.000
3	50.000
4	200.000
5	640.000
6	800.000

Component QC Level Table

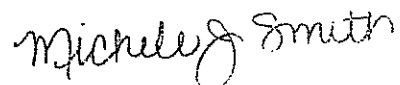
QC Level	Amount
VICV	100.000
ICV	200.000
1	50.000
2	200.000
3	640.000

ICV & CCV Result Table

Sample ID	Data File Name	Calculated Amount	Area	ISTD Area	Area Ratio	% Diff
CAL1	A15138004-03	4.597	560.43	40232.98	0.014	14.93
CAL2	A15138004-04	9.088	2141.36	38054.53	0.056	-9.12
CAL3	A15138004-05	51.105	17586.79	38875.86	0.452	2.21
CAL4	A15138004-06	178.740	60034.25	36260.22	1.656	-10.63
CAL5	A15138004-07	641.610	193583.81	32160.30	6.019	0.25
CAL6	A15138004-08	818.859	244944.43	31850.89	7.690	2.36
CCV1	A15138004-11	50.729	14904.62	33207.16	0.449	1.46
LCS15138004	A15138004-12	106.784	33719.65	34503.22	0.977	6.78
LCSD15138004	A15138004-13	103.835	32089.68	33796.79	0.949	3.83
CCV2	A15138004-16	178.959	53636.11	32355.41	1.658	-10.52
CCV3	A15138004-20	667.812	191653.53	30584.51	6.266	4.35


 Meng Yu
 Principal Chemist

JUN 01 2015



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 Senior Specialist

LCMSMS ANALYSIS REPORT

Sample Name: CCV1	Original Data Path: C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition M\PFOAOS
Sample ID: CCV1	Instrument Method:	
Data File: A15138004-11	Dilution Factor: 1.00	
Acquisition Date: 05/29/15 06:59:50 PM	Instrument Model: TSQ Quantum Access	
Sample Type: QC	Instrument Software Version: 2.3.0.1206 SP1	
Vial: d:5	Instrument Serial Number: TQU01408	
Run Time(min): 15.00	Operator: Quantum	
Injection Volume(µl): 10.00		

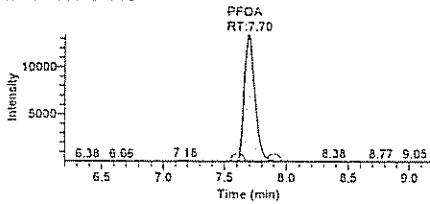
Quan Peak Table

Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.70	299101.57	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	7.95	33207.16	N/A	N/A	N/A
PFOA	24.238	7.70	80477.52	299101.57	0.269	ng/L
PFOS	50.729	7.95	14904.62	33207.16	0.449	ng/L

Extracted Ion Chromatogram

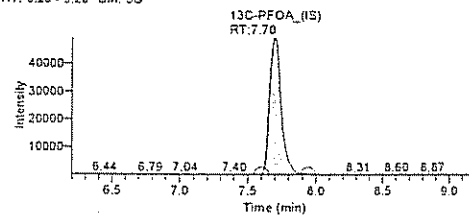
Component Name: PFOA

RT: 6.20 - 9.20 SM: 3G



NL: 1.35E4
TIC F: - c ESI SRM ms2
412.900
[168.895-168.505,
368.845-368.855] MS
ICIS A15138004-11

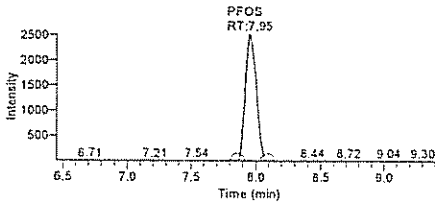
RT: 6.20 - 9.20 SM: 3G



NL: 4.84E4
TIC F: - c ESI
SRM ms2 416.940
[371.885-371.095]
MS ICIS
A15138004-11

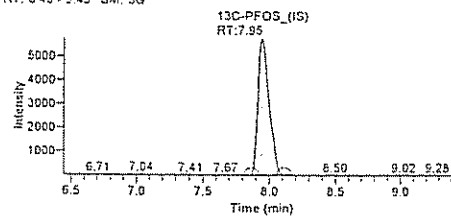
Component Name: PFOS

RT: 6.45 - 9.45 SM: 7G



NL: 2.53E3
TIC F: - c ESI SRM
ms2 498.660
[80.195-80.205,
99.995-99.005] MS
ICIS A15138004-11

RT: 6.45 - 9.45 SM: 3G



NL: 5.78E3
TIC F: - c ESI SRM
ms2 502.950
[80.275-80.285,
98.995-99.005] MS
ICIS A15138004-11

Michele J. Smith

JUN 01 2015

Meng Yu
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Principal Chemist

Michele J. Smith
Senior Specialist

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LCMSMS ANALYSIS REPORT

Sample Name:	LCS15138004	Original Data Path:	C:\XCalibur\PFC\2015May
Sample ID:	LCS15138004	Instrument Method:	C:\XCalibur\PFC\Acquisition MPFOAOS
Data File:	A15138004-12	Dilution Factor:	1.00
Acquisition Date:	05/29/15 07:15:36 PM	Instrument Model:	TSQ Quantum Access
Sample Type:	QC	Instrument Software Version:	2.3.0.1206 SP1
Vial:	d:10	Instrument Serial Number:	TQU01408
Run Time(min):	15.00	Operator:	Quantum
Injection Volume(µl):	10.00		

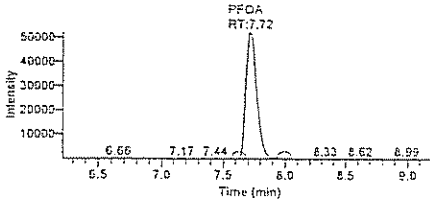
Quan Peak Table

Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.71	282538.91	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	8.01	34503.22	N/A	N/A	N/A
PFOA	104.743	7.72	331006.89	282538.91	1.172	ng/L
PFOS	106.784	8.01	33719.65	34503.22	0.977	ng/L

Extracted Ion Chromatogram

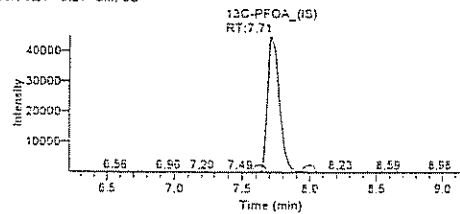
Component Name: PFOA

RT: 6.22 - 9.22 SM: 3G



NL: 5.22E4
TIC F: - e ESI SRM ms2
412.500
[166.895-166.905,
368.845-368.855] MS
ICIS A15138004-12

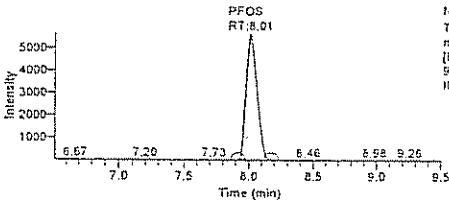
RT: 6.21 - 9.21 SM: 3G



NL: 4.50E4
TIC F: - e ESI
SRM ms2 416.940
[371.885-371.895]
MS ICIS
A15138004-12

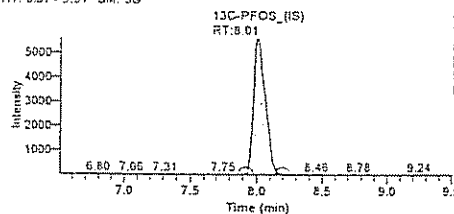
Component Name: PFOS

RT: 6.51 - 9.51 SM: 7G



NL: 5.67E3
TIC F: - e ESI SRM
ms2 498.860
[80.195-80.205,
58.995-59.005] MS
ICIS A15138004-12

RT: 6.51 - 9.51 SM: 3G



NL: 5.62E3
TIC F: - e ESI SRM
ms2 502.960
[80.275-80.285,
58.995-59.005] MS
ICIS A15138004-12

Michele J. Smith

JUN 01 2015

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Senior Specialist

Meng Yu
Meng Yu
Principal Chemist

JUN 01 2015

LCMSMS ANALYSIS REPORT

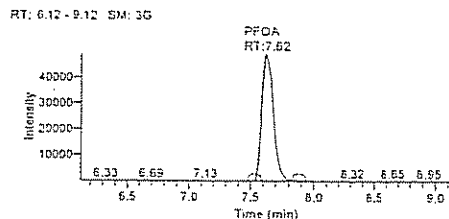
Sample Name:	LCSD15138004	Original Data Path:	C:\XCalibur\PFC\2015May
Sample ID:	LCSD15138004	Instrument Method:	C:\XCalibur\PFC\Acquisition\M\PFOAOS
Data File:	A15138004-13	Dilution Factor:	1.00
Acquisition Date:	05/29/15 07:31:22 PM	Instrument Model:	TSQ Quantum Access
Sample Type:	QC	Instrument Software Version:	2.3.0.1206 SP1
Vial:	d:11	Instrument Serial Number:	TQU01408
Run Time(min):	15.00	Operator:	Quantum
Injection Volume(µl):	10.00		

Quan Peak Table

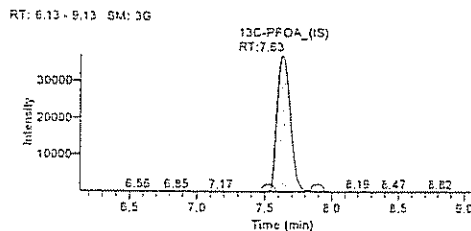
Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.63	253575.05	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	7.90	33796.79	N/A	N/A	N/A
PFOA	112.685	7.62	319651.19	253575.05	1.261	ng/L
PFOS	103.835	7.90	32089.68	33796.79	0.949	ng/L

Extracted Ion Chromatogram

Component Name: PFOA

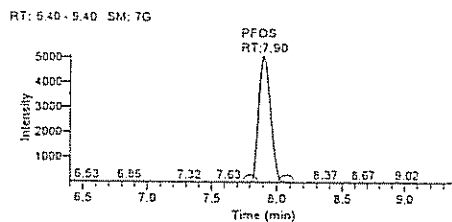


NL: 4.80E4
 TIC F: - c ESI SRM.ms2
 412.900
 [165.895-168.805,
 368.845-368.855] MS
 ICIS A15138004-13

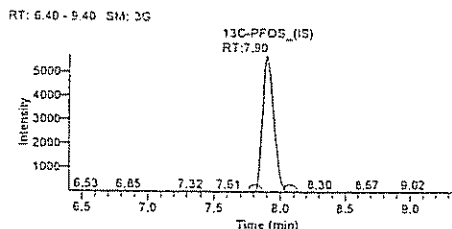


NL: 3.72E4
 TIC F: - c ESI
 SRM.ms2 416.940
 [371.885-371.895]
 MS ICIS
 A15138004-13

Component Name: PFOS



NL: 5.09E3
 TIC F: - c ESI SRM
 ms2 458.650
 [50.195-80.205,
 98.995-99.005] MS
 ICIS A15138004-13



NL: 5.71E3
 TIC F: - c ESI SRM
 ms2 502.950
 [80.275-80.285,
 95.995-99.005] MS
 ICIS A15138004-13

Michele J. Smith

JUN 01 2015

Michele J. Smith
 Senior Specialist

Meng Yu
 Meng Yu
 Principal Chemist

JUN 01 2015

LCMSMS ANALYSIS REPORT

Sample Name: CCV2	Original Data Path: C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\M\PFOAOS
Sample ID: CCV2	Instrument Method: C:\XCalibur\PFC\Acquisition\M\PFOAOS	
Data File: A15138004-16	Dilution Factor: 1.00	
Acquisition Date: 05/29/15 08:18:40 PM	Instrument Model: TSQ Quantum Access	
Sample Type: QC	Instrument Software Version: 2.3.0.1206 SP1	
Vial: d:6	Instrument Serial Number: TQU01408	
Run Time(min): 15.00	Operator: Quantum	
Injection Volume(µl): 10.00		

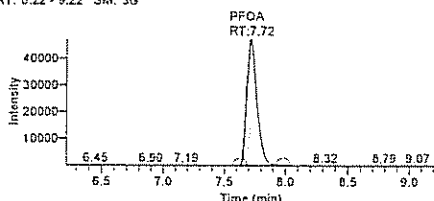
Quan Peak Table

Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.72	271321.84	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	7.96	32355.41	N/A	N/A	N/A
PFOA	91.669	7.72	278101.07	271321.84	1.025	ng/L
PFOS	178.959	7.96	53636.11	32355.41	1.658	ng/L

Extracted Ion Chromatogram

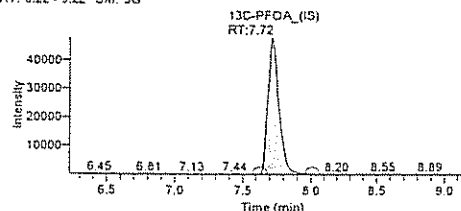
Component Name: PFOA

RT: 6.22 - 9.22 SM: 3G



NL: 4.73E4
TIC F: - c ESI SRM ms2
412.900
[168.895-168.905,
368.845-368.855] MS
ICIS A15138004-16

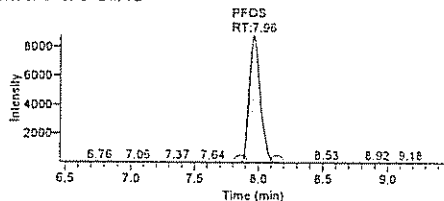
RT: 6.22 - 9.22 SM: 3G



NL: 4.75E4
TIC F: - c ESI
SRM ms2 416.940
[371.825-371.895]
MS ICIS
A15138004-16

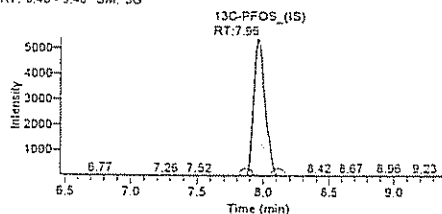
Component Name: PFOS

RT: 6.46 - 9.46 SM: 7G



NL: 8.75E3
TIC F: - c ESI SRM
ms2 498.860
[80.195-80.205,
98.995-99.005] MS
ICIS A15138004-16

RT: 6.46 - 9.46 SM: 3G



NL: 5.41E3
TIC F: - c ESI SRM
ms2 502.950
[80.275-80.285,
98.995-99.005] MS
ICIS A15138004-16

Michelle J. Smith

JUN 01 2015

Michelle J. Smith
Senior Specialist

Meng Yu
Meng Yu
Principal Chemist

JUN 01 2015

LCMSMS ANALYSIS REPORT

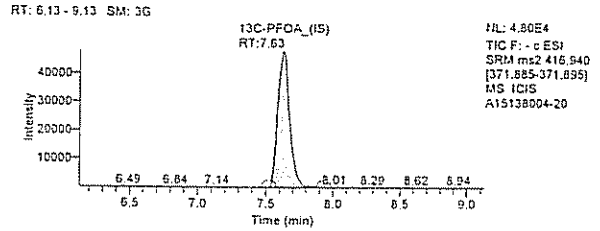
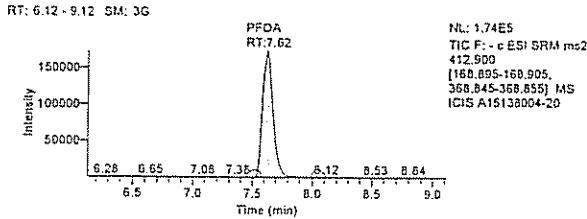
Sample Name:	CCV3	Original Data Path:	C:\XCalibur\PFCA\2015May
Sample ID:	CCV3	Instrument Method:	C:\XCalibur\PFCA\Acquisition\M\PFOAOS
Data File:	A15138004-20	Dilution Factor:	1.00
Acquisition Date:	05/29/15 09:21:43 PM	Instrument Model:	TSQ Quantum Access
Sample Type:	QC	Instrument Software Version:	2.3.0.1206 SP1
Vial:	d:7	Instrument Serial Number:	TQU01408
Run Time(min):	15.00	Operator:	Quantum
Injection Volume(µl):	10.00		

Quan Peak Table

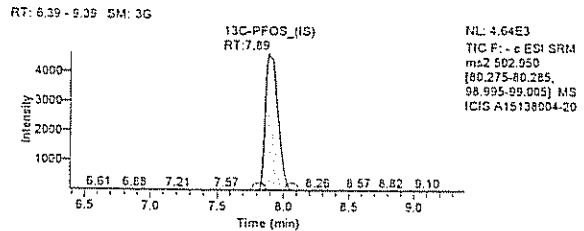
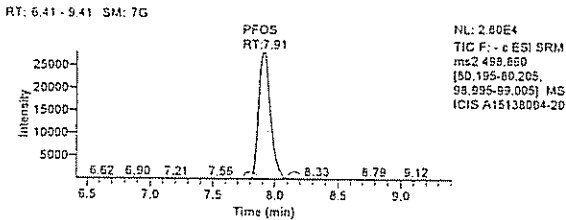
Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.63	298430.19	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	7.89	30584.51	N/A	N/A	N/A
PFOA	326.190	7.62	1090466.04	298430.19	3.654	ng/L
PFOS	667.812	7.91	191653.53	30584.51	6.266	ng/L

Extracted Ion Chromatogram

Component Name: PFOA



Component Name: PFOS



Michele J. Smith

JUN 01 2015

Meng Yu
 Meng Yu
 Principal Chemist

Michele J. Smith
 Senior Specialist

JUN 01 2015

Instrumental Wet Chemistry

**Quality Control Reference List
Instrumental Water Quality**

**CLIENT: Tetra Tech Inc.
SDG: PIS01**

Fraction: Instrumental Wet Chemistry

Analysis	Batch Number	Sample Number	Analysis Date
Hexavalent Chromium	15126987141A	151264BB	05/06/2015 15:19:00
		151264QQ	05/06/2015 14:59:00
		7873710 UNSPK/BKG	05/06/2015 12:06:00
		7873710 DUP	05/06/2015 13:52:00
		7873710 MS	05/06/2015 14:36:00
Hexavalent Chromium	15128987141A	151284BB	05/08/2015 15:38:00
		151284QQ	05/08/2015 15:18:00
		7879426	05/08/2015 12:38:00
Hexavalent Chromium by IC	15126243201A	P12643AB	05/07/2015 13:15:00
		P12643AQ	05/07/2015 11:52:00
		LCSSIS	05/07/2015 12:07:00
		7873707	05/07/2015 09:21:00
		7873708	05/07/2015 09:29:00

Fraction: Instrumental Wet Chemistry

15126987141A / 151264BB Parameter	ME	Analysis Date	Blank Results	Units	DL	LOD	LOQ
Hexavalent Chromium	IC	05/06/15	N.D.	ug/l	0.015	0.050	0.050

15128987141A / 151284BB Parameter	ME	Analysis Date	Blank Results	Units	DL	LOD	LOQ
Hexavalent Chromium	IC	05/08/15	N.D.	ug/l	0.015	0.050	0.050

Fraction: Instrumental Wet Chemistry

15126243201A / P12643AB Parameter	ME	Analysis Date	Blank Results	Units	DL	LOD	LOQ
Hexavalent Chromium by IC	IC	05/07/15	N.D.	mg/kg	0.14	0.40	0.40

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

UNSPK: 7873710 MS: 7873710	Batch: 15126987141A (Sample number(s): 7873710)									
Parameter	ME	Spike Added ug/l	Unspiked Conc ug/l	MS Conc ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	%Rec Limits	%RPD	%RPD Limits
Hexavalent Chromium	IC	0.500	N.D.	0.464	NA	93	NA	90-110	NA	NA

Comments:

(2) The unspiked sample result is greater than four times the spike added.

* = Out of Specification

Results are being reported on an as received basis.

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

BKG: 7873710 DUP: 7873710	Batch: 15126987141A (Sample number(s): 7873710)				
Parameter	ME	Unspiked Conc ug/l	DUP Conc ug/l	%RPD	%RPD Limits
Hexavalent Chromium	IC	N.D.	N.D.	0 (1)	20

Comments:

(1) The sample and/or duplicate result is less than five times the LOQ.

* = Out of Specification

Results are being reported on an as received basis.

SDG: PIS01
Matrix: LIQUID

Instrumental Water Quality
Fraction: Instrumental Wet Chemistry

LCS: 151264QQ		Batch: 15126987141A (Sample number(s): 7873710)							
Parameter	ME	Spike Added ug/l	LCS Conc ug/l	LCSD Conc ug/l	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Hexavalent Chromium	IC	100	96.85	NA	97	NA	90-110	NA	NA

LCS: 151284QQ		Batch: 15128987141A (Sample number(s): 7879426)							
Parameter	ME	Spike Added ug/l	LCS Conc ug/l	LCSD Conc ug/l	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Hexavalent Chromium	IC	100	102.55	NA	103	NA	90-110	NA	NA

SDG: PIS01
Matrix: SOLID

Instrumental Water Quality
Fraction: Instrumental Wet Chemistry

LCS: LCSSIS		Batch: 15126243201A (Sample number(s): 7873707-7873708)							
Parameter	ME	Spike Added mg/kg	LCS Conc mg/kg	LCSD Conc mg/kg	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Hexavalent Chromium by IC(LCSS-IS)	IC	720	714	NA	99	NA	11-17	NA	NA

LCS: P12643AQ		Batch: 15126243201A (Sample number(s): 7873707-7873708)							
Parameter	ME	Spike Added mg/kg	LCS Conc mg/kg	LCSD Conc mg/kg	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Hexavalent Chromium by IC	IC	5.00	4.50	NA	90	NA	80-120	NA	NA

Fraction: Instrumental Wet Chemistry

12868: Hexavalent Chromium	Default	Default	Default	
Analyte Name	DL	LOD	LOQ	Units
Hexavalent Chromium	0.015	0.050	0.050	ug/l

05892: Hexavalent Chromium by IC	Default	Default	Default	
Analyte Name	DL	LOD	LOQ	Units
Hexavalent Chromium by IC	0.14	0.40	0.40	mg/kg

Wet Chemistry

**Quality Control Reference List
Water Quality**

**CLIENT: Tetra Tech Inc.
SDG: PIS01**

Fraction: Wet Chemistry

Analysis	Batch Number	Sample Number	Analysis Date
Oxidation Reduction Potential	15126182101A	P126182Q	05/06/2015 20:30:00
Oxidation Reduction Potential	15126182101B	7873710	05/06/2015 20:30:00
Oxidation Reduction Potential	15126182102A	P126182Q	05/06/2015 21:00:00
Oxidation Reduction Potential	15126182102B	7873707 7873708	05/06/2015 21:00:00 05/06/2015 21:00:00
Oxidation Reduction Potential	15131182101A	P131182Q 7879426	05/11/2015 18:00:00 05/11/2015 18:00:00
pH	15126039401A	P126039Q	05/06/2015 21:00:00
pH	15126039401B	7873707 7873708	05/06/2015 21:00:00 05/06/2015 21:00:00
pH	15126121521A	P126121Q	05/06/2015 20:30:00
pH	15126121521B	7873710	05/06/2015 20:30:00
pH	15131121521A	P131121Q 7879426	05/11/2015 18:00:00 05/11/2015 18:00:00

SDG: PIS01
Matrix: SOLID

Water Quality
Fraction: Wet Chemistry

LCS: P126039Q		Batch: 15126039401B (Sample number(s): 7873707-7873708)							
Parameter	ME	Spike Added Std. Units	LCS Conc Std. Units	LCSD Conc Std. Units	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
pH	MTR	7.00	7.04	NA	101	NA	95-105	NA	NA

LCS: P126182Q		Batch: 15126182102B (Sample number(s): 7873707-7873708)							
Parameter	ME	Spike Added mV	LCS Conc mV	LCSD Conc mV	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Oxidation Reduction Potential	TI	427	432.5	NA	101	NA	98-102	NA	NA

SDG: PIS01
Matrix: LIQUID

Water Quality
Fraction: Wet Chemistry

LCS: P126121Q		Batch: 15126121521B (Sample number(s): 7873710)								
Parameter	ME	Spike Added Std. Units	LCS Conc Std. Units	LCSD Conc Std. Units	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits	
pH	MTR	7.00	7.02	NA	100	NA	95-105	NA	NA	

LCS: P126182Q		Batch: 15126182101B (Sample number(s): 7873710)								
Parameter	ME	Spike Added mV	LCS Conc mV	LCSD Conc mV	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits	
Oxidation Reduction Potential	TI	427	434	NA	102	NA	98-102	NA	NA	

LCS: P131121Q		Batch: 15131121521A (Sample number(s): 7879426)								
Parameter	ME	Spike Added Std. Units	LCS Conc Std. Units	LCSD Conc Std. Units	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits	
pH	MTR	7.00	7.02	NA	100	NA	95-105	NA	NA	

LCS: P131182Q		Batch: 15131182101A (Sample number(s): 7879426)								
Parameter	ME	Spike Added mV	LCS Conc mV	LCSD Conc mV	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits	
Oxidation Reduction Potential	TI	427	433	NA	101	NA	98-102	NA	NA	

DoD Type I Data Package

Prepared for:

Tetra Tech Inc.
Foster Plaza VII
661 Andersen Drive
Pittsburgh PA 15220

Project: Parris Island, SC
Groundwater, Soil and Water Samples
Collected on 05/02/15-05/07/15

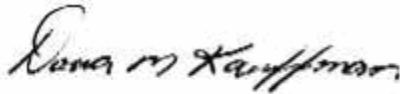
SDG# PIS01

GROUP	SAMPLE NUMBERS
1558459	7873706-7873710
1559656	7879425-7879426

A2LA (DoD) Cert. # 0001.01
PA Cert. # 36-00037
NY Cert. # 10670
NJ Cert. # PA011
NC Cert. # 521
TX Cert. # T104704194-13-10
AZ Cert. # AZ0780

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client.

Authorized by:



Date: 06/04/2015

Dana M. Kauffman
Manager

Any questions or concerns you might have regarding this data package should be directed to your client representative, Angela Miller at (717) 556-7260.

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**Sample Reference List for SDG Number PIS01
with a Data Package Type of I-DOD**

07558 - Tetra Tech Inc.
Project: Parris Island, SC

Lab Sample Number	Lab Sample Code	Client Sample Description
7873706	PIS28	PAI04-SB28-0608 Grab Soil
7873707	PIS08	PAI13C-SS08-0001 Grab Soil
7873708	PISB5	PAI13C-SB05-0204 Grab Soil
7873709	PITW1	PAI04-TW01-20150504 Grab Groundwater
7873710	PITW3	PAI13C-TW03-20150504 Grab Groundwater
7879425	-TW02	PAI04-TW02-20150506 Groundwater
7879426	-RB01	PAI-RB01-050715 Water

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 · 717-656-2300 Fax: 717-656-2681 · www.lancasterlabs.com

06386 Perchlorate in Water LC/MS/MS**06568 Perchlorate Soil Prep**

Water samples are filtered through a 0.45-um syringe filter, followed by direct injection into a LC/MS/MS system followed by multiple reaction monitoring. Quantitation is performed using an isotopic internal standard.

Reference: Test Methods for Evaluating Solid Waste, EPA SW-846, Method 6850, 1/2007.

06557 Perchlorate in Soil LC/MS/MS

Soil samples are extracted with water, then filtered through a 0.45-um syringe filter and analyzed by LC/MS/MS. Quantitation is performed using an isotopic internal standard.

Reference: Test Methods for Evaluating Solid Waste, EPA SW-846, Method 6850, 1/2007.

12868 Hexavalent Chromium

A measured volume of sample is introduced into the ion chromatograph using a well buffered ammonium sulfate, ammonium hydroxide eluent. A guard column removes organics from the sample before hex chrome is separated on an anion exchange separator column. Postcolumn derivatization of the Cr(VI) with diphenylcarbohydrazide is followed by detection of the colored complex at 530 nm.

Reference: Method 218.6, Methods for the Chemical Analysis of Water and Wastes USEPA 600, Rev. May 1994

05892 Hexavalent Chromium by IC

A measured volume of sample is introduced into the ion chromatograph using a well buffered ammonium sulfate, ammonium hydroxide eluent. A guard column removes organics from the sample before hex chrome is separated on an anion exchange separator column. Postcolumn derivatization of the Cr(VI) with diphenylcarbohydrazide is followed by detection of the colored complex at 530 nm.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 7199, December 1996.

12152 pH

The activity of hydrogen ions in the sample is measured using a glass electrode and a reference electrode.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 9040C.

00394 pH

A 1:1 slurry is prepared. The activity of hydrogen ions in the supernatant is measured using a glass electrode and a reference electrode.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 9045C Modified, September 1994.

01821 Oxidation Reduction Potential

The oxidation-reduction potential is measured using a platinum electrode and a reference electrode. The potential reported is the electromotive force between the platinum electrode and the reference electrode, referred to the standard hydrogen scale.

Reference: Annual Book of ASTM Standards, Method D 1498

02432 Hexavalent Cr Extraction - IC

The sample is digested using a 3% sodium carbonate - 2% sodium hydroxide solution and then filtered through a 0.45 micron filter.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 3060A, December 1996

10954 PFAAs in Water by LC/MS/MS

A 100 ml sample of water is extracted using a solid phase extraction (SPE) cartridge. The resulting extract is analyzed by LC/MS/MS in negative electrospray ionization (ESI) mode.

Reference: Determination of Selected Perfluorinated Alkyl Acids (PFAAs) in Aqueous Samples by LC/MS/MS

00111 Moisture

A well-mixed sample is placed in a tared container and dried to a constant weight in an oven at 103-105C. The increase in weight is the total solids.

Reference: Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998, Method 2540 G-1997

Analysis Reports / Field Chain of Custody

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Tetra Tech Inc.
Foster Plaza VII
661 Andersen Drive
Pittsburgh PA 15220

June 01, 2015

Project: Parris Island, SC

Submittal Date: 05/05/2015

Group Number: 1558459

SDG: PIS01

PO Number: 1110299

State of Sample Origin: SC

Client Sample Description

PAI04-SB28-0608 Grab Soil
PAI13C-SS08-0001 Grab Soil
PAI13C-SB05-0204 Grab Soil
PAI04-TW01-20150504 Grab Groundwater
PAI13C-TW03-20150504 Grab Groundwater

Lancaster Labs (LL)

7873706
7873707
7873708
7873709
7873710

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

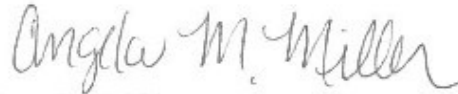
Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>.

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Tetra Tech Inc.
Tetra Tech Inc.
Tetra Tech Inc.
Tetra Tech, Inc.

Attn: Peggy Churchill
Attn: Shannon Hill
Attn: Kelly Carper
Attn: Amy Thomson

Respectfully Submitted,



Angela M. Miller
Specialist

(717) 556-7260

Project Name: Parris Island, SC
LL Group #: 1558459

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:**EPA 218.6, Wet Chemistry**

Sample #s: 7873710

The holding time was not met. The client was notified and the data reported.

SW-846 7199, Wet Chemistry

Batch #: 15126243201A (Sample number(s): 7873707-7873708 UNSPK: P874922 BKG: P874922)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Hexavalent Chromium by IC

SW-846 9045C modified, wet Chemistry

Sample #s: 7873708

The pH was measured in water at 18.9 C.

Sample #s: 7873707

The pH was measured in water at 19 C.

SM 2540 G-1997, Wet Chemistry

Batch #: 15133820001A (Sample number(s): 7873706-7873708 BKG: 7873707)

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Moisture

Sample Description: PAI04-SB28-0608 Grab Soil
Parris Island, SC

LL Sample # SW 7873706
LL Group # 1558459
Account # 07558

Project Name: Parris Island, SC

Collected: 05/02/2015 12:30 by TR

Tetra Tech Inc.

Submitted: 05/05/2015 09:10

Foster Plaza VII

Reported: 06/01/2015 15:12

661 Andersen Drive

Pittsburgh PA 15220

PIS28 SDG#: PIS01-01

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Detection Limit*	Dry Limit of Detection	Dry Limit of Quantitation	DF
Perchlorate							
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007 14797-73-0	ug/kg N.D.	ug/kg 2.7	ug/kg 5.4	ug/kg 6.4	1
Wet Chemistry							
00111	Moisture	SM 2540 G-1997 n.a.	% 21.6	% 0.50	% 0.50	% 0.50	1
Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.							

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	151320023A	05/13/2015 14:02	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	2	151320023A	05/13/2015 07:40	Maria Davenport	1
00111	Moisture	SM 2540 G-1997	1	15133820001A	05/13/2015 18:31	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: PAI13C-SS08-0001 Grab Soil
Parris Island, SC

LL Sample # SW 7873707
LL Group # 1558459
Account # 07558

Project Name: Parris Island, SC

Collected: 05/03/2015 13:15 by TR

Tetra Tech Inc.

Submitted: 05/05/2015 09:10

Foster Plaza VII

Reported: 06/01/2015 15:12

661 Andersen Drive

Pittsburgh PA 15220

PIS08 SDG#: PIS01-02

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Detection Limit*	Dry Limit of Detection	Dry Limit of Quantitation	DF
Perchlorate							
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007 14797-73-0	ug/kg N.D.	ug/kg 3.4	ug/kg 6.9	ug/kg 8.2	1
Wet Chemistry							
05892	Hexavalent Chromium by IC	SW-846 7199 18540-29-9	mg/kg 2.7	mg/kg 0.23	mg/kg 0.64	mg/kg 0.64	1
ASTM D1498							
01821	Oxidation Reduction Potential The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.	n.a.	mV 478	mV 10.0	mV 10.0	mV 10.0	1
SW-846 9045C modified							
00394	pH The pH was measured in water at 19 C.	n.a.	Std. Units 5.97	Std. Units 0.0100	Std. Units 0.0100	Std. Units 0.0100	1
Wet Chemistry							
00111	Moisture Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.	SM 2540 G-1997 n.a.	% 38.7	% 0.50	% 0.50	% 0.50	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	151320023A	05/13/2015 14:40	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	2	151320023A	05/13/2015 07:40	Maria Davenport	1
05892	Hexavalent Chromium by IC	SW-846 7199	1	15126243201A	05/07/2015 09:21	Clinton M Wilson	1
01821	Oxidation Reduction Potential	ASTM D1498	1	15126182102B	05/06/2015 21:00	Michelle L Lalli	1
00394	pH	SW-846 9045C modified	1	15126039401B	05/06/2015 21:00	Michelle L Lalli	1
02432	Hexavalent Cr Extraction - IC	SW-846 3060A	1	15126243201A	05/06/2015 19:10	Daniel S Smith	1
00111	Moisture	SM 2540 G-1997	1	15133820001A	05/13/2015 18:31	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: PAI13C-SB05-0204 Grab Soil
Parris Island, SC

LL Sample # SW 7873708
LL Group # 1558459
Account # 07558

Project Name: Parris Island, SC

Collected: 05/03/2015 13:30 by TR

Tetra Tech Inc.

Submitted: 05/05/2015 09:10

Foster Plaza VII

Reported: 06/01/2015 15:12

661 Andersen Drive

Pittsburgh PA 15220

PISB5 SDG#: PIS01-03

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Detection Limit*	Dry Limit of Detection	Dry Limit of Quantitation	DF
Perchlorate							
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007 14797-73-0	ug/kg N.D.	ug/kg 3.5	ug/kg 6.9	ug/kg 8.2	1
Wet Chemistry							
05892	Hexavalent Chromium by IC	SW-846 7199 18540-29-9	mg/kg 1.2	mg/kg 0.23	mg/kg 0.66	mg/kg 0.66	1
ASTM D1498							
01821	Oxidation Reduction Potential The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.	n.a.	mV 432	mV 10.0	mV 10.0	mV 10.0	1
SW-846 9045C modified							
00394	pH The pH was measured in water at 18.9 C.	n.a.	Std. Units 5.89	Std. Units 0.0100	Std. Units 0.0100	Std. Units 0.0100	1
Wet Chemistry							
00111	Moisture Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.	SM 2540 G-1997 n.a.	% 39.3	% 0.50	% 0.50	% 0.50	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	151320023A	05/13/2015 14:53	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	2	151320023A	05/13/2015 07:40	Maria Davenport	1
05892	Hexavalent Chromium by IC	SW-846 7199	1	15126243201A	05/07/2015 09:29	Clinton M Wilson	1
01821	Oxidation Reduction Potential	ASTM D1498	1	15126182102B	05/06/2015 21:00	Michelle L Lalli	1
00394	pH	SW-846 9045C modified	1	15126039401B	05/06/2015 21:00	Michelle L Lalli	1
02432	Hexavalent Cr Extraction - IC	SW-846 3060A	1	15126243201A	05/06/2015 19:10	Daniel S Smith	1
00111	Moisture	SM 2540 G-1997	1	15133820001A	05/13/2015 18:31	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: PAI04-TW01-20150504 Grab Groundwater
Parris Island, SC

LL Sample # WW 7873709
LL Group # 1558459
Account # 07558

Project Name: Parris Island, SC

Collected: 05/04/2015 08:55 by TR

Tetra Tech Inc.

Submitted: 05/05/2015 09:10

Foster Plaza VII

Reported: 06/01/2015 15:12

661 Andersen Drive

Pittsburgh PA 15220

PITW1 SDG#: PIS01-04

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Perchlorate							
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007 14797-73-0	ug/l N.D.	ug/l 0.20	ug/l 0.40	ug/l 1.0	1
Misc. Organics							
EPA 537 Rev. 1.1 modified							
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	10	10	1
10954	Perfluorooctanoic acid	335-67-1	11,000	100	200	200	100

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007	1	151340030A	05/14/2015 17:35	Richard A Shober	1
10954	PFAAs in Water by LC/MS/MS	EPA 537 Rev. 1.1 modified	1	15138004	05/29/2015 20:34	Meng Yu	100
10954	PFAAs in Water by LC/MS/MS	EPA 537 Rev. 1.1 modified	1	15138004	05/29/2015 20:50	Meng Yu	1

*=This limit was used in the evaluation of the final result

Sample Description: PAI13C-TW03-20150504 Grab Groundwater
Parris Island, SC

LL Sample # WW 7873710
LL Group # 1558459
Account # 07558

Project Name: Parris Island, SC

Collected: 05/04/2015 16:45 by TR

Tetra Tech Inc.

Submitted: 05/05/2015 09:10

Foster Plaza VII

Reported: 06/01/2015 15:12

661 Andersen Drive

Pittsburgh PA 15220

PITW3 SDG#: PIS01-05

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Wet Chemistry							
	EPA 218.6		ug/l	ug/l	ug/l	ug/l	
12868	Hexavalent Chromium The holding time was not met. The client was notified and the data reported.	18540-29-9	N.D.	0.015	0.050	0.050	1
	ASTM D1498		mV	mV	mV	mV	
01821	Oxidation Reduction Potential The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.	n.a.	412	10.0	10.0	10.0	1
	SW-846 9040C		Std. Units	Std. Units	Std. Units	Std. Units	
12152	pH The 40 CFR Part 136 requires that this analysis be performed immediately (within 15 minutes) upon sample collection. Because this was not possible, the result may not be used for reporting purposes.	n.a.	7.4	0.010	0.010	0.010	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12868	Hexavalent Chromium	EPA 218.6	1	15126987141A	05/06/2015 12:06	Clinton M Wilson	1
01821	Oxidation Reduction Potential	ASTM D1498	1	15126182101B	05/06/2015 20:30	Michelle L Lalli	1
12152	pH	SW-846 9040C	1	15126121521B	05/06/2015 20:30	Michelle L Lalli	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Tetra Tech Inc.
Reported: 06/01/2015 15:12

Group Number: 1558459

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank DL**</u>	<u>Blank LOD</u>	<u>Blank LOQ</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Batch number: 151320023A Perchlorate in Soil LC/MS/MS	N.D.	2.1	4.2	5.0	ug/kg	98		84-121		
Batch number: 151340030A Perchlorate in Water LC/MS/MS	N.D.	0.20	0.40	1.0	ug/l	88		84-119		
Batch number: 15138004 Perfluoro-octanesulfonate	N.D.	5	10	10	ng/l	107	104	70-130	3	30
Perfluorooctanoic acid	N.D.	1	2	2	ng/l	105	113	70-130	7	30
Batch number: 15126243201A Hexavalent Chromium by IC	N.D.	0.14	0.40	0.40	mg/kg	90		80-120		
Batch number: 15126987141A Hexavalent Chromium	N.D.	0.015	0.050	0.050	ug/l	97		90-110		
Batch number: 15126039401B pH						101		95-105		
Batch number: 15126121521B pH						100		95-105		
Batch number: 15126182101B Oxidation Reduction Potential						102		98-102		
Batch number: 15126182102B Oxidation Reduction Potential						101		98-102		
Batch number: 15133820001A Moisture						100		99-101		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS %REC</u>	<u>MSD %REC</u>	<u>MS/MSD Limits</u>	<u>RPD</u>	<u>RPD MAX</u>	<u>BKG Conc</u>	<u>DUP Conc</u>	<u>DUP RPD</u>	<u>Dup RPD Max</u>
Batch number: 151320023A									
	Sample number(s): 7873706-7873708 UNSPK: 7873706								

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.
- (3) The surrogate spike amount was less than the LOD.

Quality Control Summary

Client Name: Tetra Tech Inc.
Reported: 06/01/2015 15:12

Group Number: 1558459

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS</u> <u>%REC</u>	<u>MSD</u> <u>%REC</u>	<u>MS/MSD</u> <u>Limits</u>	<u>RPD</u> <u>RPD</u>	<u>BKG</u> <u>MAX</u> <u>Conc</u>	<u>DUP</u> <u>Conc</u>	<u>DUP</u> <u>RPD</u>	<u>Dup RPD</u> <u>Max</u>
Perchlorate in Soil LC/MS/MS	98	102	84-121	4	15			
Batch number: 151340030A	Sample number(s): 7873709 UNSPK: 7873709							
Perchlorate in Water LC/MS/MS	111	101	84-119	9	15			
Batch number: 15138004	Sample number(s): 7873709 UNSPK: 7879426							
Perfluoro-octanesulfonate	102		70-130					
Perfluorooctanoic acid	95		70-130					
Batch number: 15126243201A	Sample number(s): 7873707-7873708 UNSPK: P874922 BKG: P874922							
Hexavalent Chromium by IC	0*		75-125		N.D.	N.D.	0 (1)	20
Batch number: 15126987141A	Sample number(s): 7873710 UNSPK: 7873710 BKG: 7873710							
Hexavalent Chromium	93		90-110		N.D.	N.D.	0 (1)	20
Batch number: 15126039401B	Sample number(s): 7873707-7873708 BKG: P874922							
pH					8.81	8.80	0	3
Batch number: 15126121521B	Sample number(s): 7873710 BKG: P874716							
pH					8.2	8.2	0	3
Batch number: 15126182101B	Sample number(s): 7873710 BKG: P874716							
Oxidation Reduction Potential					340	339	0	5
Batch number: 15126182102B	Sample number(s): 7873707-7873708 BKG: P874922							
Oxidation Reduction Potential					314	313	0	5
Batch number: 15133820001A	Sample number(s): 7873706-7873708 BKG: 7873707							
Moisture					38.7	34.4	12*	5

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.
- (3) The surrogate spike amount was less than the LOD.



TETRA TECH NUS, INC.

7558 | 1558459 | 7873706-10

CHAIN OF CUSTODY

NUMBER **Nº 1603**

PAGE **1** OF **1**

PROJECT NO: 112G01509	FACILITY: PARRIS ISLAND	PROJECT MANAGER P. CHURCHILL	PHONE NUMBER (321) 636-6470	LABORATORY NAME AND CONTACT: LANCASTER LABORATORIES
SAMPLERS (SIGNATURE) <i>Taylor</i>		FIELD OPERATIONS LEADER S. HILL	PHONE NUMBER (973) 607-7988	ADDRESS 2425 NEW HOLLAND PIKE
CARRIER/WAYBILL NUMBER FED Ex AB # 8631 3888 2244			CITY, STATE LANCASTER PA 17601	

DATE YEAR	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS										COMMENTS						
									PERCHLORATE (SOIL)	402 JAS	Hex CHROM (Cr6+)	ORP & moisture	PERCHLORATE / PH (Soil)	4041 Vial	PFAA	PFAA	Hex CHROM (Cr6+)	PH		PH	PH				
5/2	1230	PAI04-SB28-0608	SB28	6	8	SO	G	1	1																
5/3	1315	PAI13C-SS08-0001	SS08	0	1	SO	G	2	-	1	1														
5/3	1330	PAI13C-SB05-0204	SB05	2	4	SO	G	2	-	1	1														
5/4	0855	PAI04-TW01-20150504	TW01	-	-	GW	G	3	-	-	-	1	1	1											
5/4	1645	PAI13C-TW03-20150504	TW03	-	-	GW	G	2	-	-	-	-	-	-	1	1									

1. RELINQUISHED BY <i>Taylor</i>	DATE 5-04-15	TIME 2000	1. RECEIVED BY FED EX	DATE 5-04-15	TIME 2000
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY <i>Brennly Buckley</i>	DATE 5:15	TIME 910

Angela Miller

From: Angela Miller
Sent: Tuesday, May 05, 2015 4:52 PM
To: Christine Jampo; Coffman, Michelle Hill, Shannon
Cc:
Subject: RE: Final Redline SAP and response to EPA feedback on the redline

Good afternoon,

We received the first sample submission today for this project and unfortunately, we were not able to meet the 24 hour hold time for the hexavalent chromium analysis for the groundwater sample we received.

Please let me know when we can expect to receive the second hexavalent chromium water sample and equipment blank sample so that our technical center can be prepared for the next submittal.

Kind regards,
Angela

Angela Miller
Specialist

DISC01 Page 12 of 13
Eurofins Lancaster Laboratories Environmental, LLC
2425 New Holland Pike
Lancaster, PA 17601
USA
Phone: +1 717-556-7260
www.LancasterLabsEnv.com

286

Look for Eurofins Lancaster Laboratories Environmental at these [upcoming conferences and industry events](#).

From: Christine Jampo
Sent: Tuesday, April 28, 2015 1:33 PM
To: Coffman, Michelle; Angela Miller
Cc: Hill, Shannon
Subject: RE: Final Redline SAP and response to EPA feedback on the redline

Directly to Vista if you can.

Christine Jampo
Senior Account Manager

Eurofins Lancaster Laboratories Environmental, LLC
2425 New Holland Pike
Lancaster, PA. 17601
Mobile: 717-327-7726

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	BMQL	Below Minimum Quantitation Level
N.D.	none detected	MPN	Most Probable Number
TNTC	Too Numerous To Count	CP Units	cobalt-chloroplatinate units
IU	International Units	NTU	nephelometric turbidity units
umhos/cm	micromhos/cm	ng	nanogram(s)
C	degrees Celsius	F	degrees Fahrenheit
meq	milliequivalents	lb.	pound(s)
g	gram(s)	kg	kilogram(s)
µg	microgram(s)	mg	milligram(s)
mL	milliliter(s)	L	liter(s)
m³	cubic meter(s)	µL	microliter(s)
		pg/L	picogram/liter
<	less than		
>	greater than		
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
ppb	parts per billion		
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

Laboratory Data Qualifiers:

- B - Analyte detected in the blank
- C - Result confirmed by reanalysis
- E - Concentration exceeds the calibration range
- J (or G, I, X) - estimated value \geq the Method Detection Limit (MDL or DL) and the $<$ Limit of Quantitation (LOQ or RL)
- P - Concentration difference between the primary and confirmation column $>40\%$. The lower result is reported.
- U - Analyte was not detected at the value indicated
- V - Concentration difference between the primary and confirmation column $>100\%$. The reporting limit is raised due to this disparity and evident interference...

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, ISO17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Tetra Tech Inc.
Foster Plaza VII
661 Andersen Drive
Pittsburgh PA 15220

June 01, 2015

Project: Parris Island, SC

Submittal Date: 05/08/2015
Group Number: 1559656
SDG: PIS01
PO Number: 1110299
State of Sample Origin: SC

Client Sample Description

PAI04-TW02-20150506 Groundwater
PAI-RB01-050715 Water

Lancaster Labs (LL) #

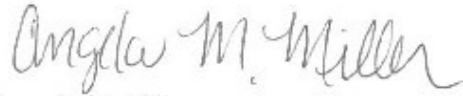
7879425
7879426

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our scopes of accreditation can be viewed at <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>.

ELECTRONIC COPY TO	Tetra Tech Inc.	Attn: Peggy Churchill
ELECTRONIC COPY TO	Tetra Tech Inc.	Attn: Shannon Hill
ELECTRONIC COPY TO	Tetra Tech Inc.	Attn: Kelly Carper
ELECTRONIC COPY TO	Tetra Tech, Inc.	Attn: Amy Thomson

Respectfully Submitted,



Angela M. Miller
Specialist

(717) 556-7260

Project Name: Parris Island, SC
LL Group #: 1559656

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:

No additional comments are necessary.

Sample Description: PAI04-TW02-20150506 Groundwater
PARRIS ISLAND

LL Sample # WW 7879425
LL Group # 1559656
Account # 07558

Project Name: Parris Island, SC

Collected: 05/06/2015 09:55 by TR

Tetra Tech Inc.

Submitted: 05/08/2015 09:25

Foster Plaza VII

Reported: 06/01/2015 15:13

661 Andersen Drive

Pittsburgh PA 15220

-TW02 SDG#: PIS01-06

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Perchlorate							
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007 14797-73-0	ug/l N.D.	ug/l 0.20	ug/l 0.40	ug/l 1.0	1
Misc. Organics							
EPA 537 Rev. 1.1 modified							
10954	Perfluoro-octanesulfonate	1763-23-1	78	5	10	10	1
10954	Perfluorooctanoic acid	335-67-1	12	1	2	2	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007	1	151340030A	05/14/2015 18:38	Richard A Shober	1
10954	PFAAs in Water by LC/MS/MS	EPA 537 Rev. 1.1 modified	1	15138004	05/29/2015 21:05	Meng Yu	1

*=This limit was used in the evaluation of the final result

Sample Description: PAI-RB01-050715 Water
PARRIS ISLAND

LL Sample # WW 7879426
LL Group # 1559656
Account # 07558

Project Name: Parris Island, SC

Collected: 05/07/2015 14:00 by TR

Tetra Tech Inc.

Submitted: 05/08/2015 09:25

Foster Plaza VII

Reported: 06/01/2015 15:13

661 Andersen Drive

Pittsburgh PA 15220

-RB01 SDG#: PIS01-07RB

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Perchlorate							
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007 14797-73-0	ug/l N.D.	ug/l 0.20	ug/l 0.40	ug/l 1.0	1
Misc. Organics							
EPA 537 Rev. 1.1 modified							
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	10	10	1
10954	Perfluorooctanoic acid	335-67-1	1 J	1	2	2	1
Wet Chemistry							
EPA 218.6							
12868	Hexavalent Chromium	18540-29-9	N.D.	0.015	0.050	0.050	1
ASTM D1498							
01821	Oxidation Reduction Potential	n.a.	255	10.0	10.0	10.0	1
The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.							
SW-846 9040C							
12152	pH	n.a.	9.3	0.010	0.010	0.010	1
The 40 CFR Part 136 requires that this analysis be performed immediately (within 15 minutes) upon sample collection. Because this was not possible, the result may not be used for reporting purposes.							

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007	1	151340030A	05/14/2015 18:51	Richard A Shober	1
10954	PFAAs in Water by LC/MS/MS	EPA 537 Rev. 1.1 modified	1	15138004	05/29/2015 19:47	Meng Yu	1
12868	Hexavalent Chromium	EPA 218.6	1	15128987141A	05/08/2015 12:38	Clinton M Wilson	1
01821	Oxidation Reduction Potential	ASTM D1498	1	15131182101A	05/11/2015 18:00	Michelle L Lalli	1
12152	pH	SW-846 9040C	1	15131121521A	05/11/2015 18:00	Michelle L Lalli	1

*=This limit was used in the evaluation of the final result

Quality Control Summary

Client Name: Tetra Tech Inc.
Reported: 06/01/2015 15:13

Group Number: 1559656

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Laboratory Compliance Quality Control

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank DL**</u>	<u>Blank LOD</u>	<u>Blank LOQ</u>	<u>Report Units</u>	<u>LCS %REC</u>	<u>LCSD %REC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD Max</u>
Batch number: 151340030A Perchlorate in Water LC/MS/MS	N.D.	0.20	0.40	1.0	ug/l	88		84-119		
Batch number: 15138004 Perfluoro-octanesulfonate	N.D.	5	10	10	ng/l	107	104	70-130	3	30
Perfluorooctanoic acid	N.D.	1	2	2	ng/l	105	113	70-130	7	30
Batch number: 15128987141A Hexavalent Chromium	N.D.	0.015	0.050	0.050	ug/l	103		90-110		
Batch number: 15131121521A pH						100		95-105		
Batch number: 15131182101A Oxidation Reduction Potential						101		98-102		

Sample Matrix Quality Control

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike
Background (BKG) = the sample used in conjunction with the duplicate

<u>Analysis Name</u>	<u>MS %REC</u>	<u>MSD %REC</u>	<u>MS/MSD Limits</u>	<u>RPD</u>	<u>RPD MAX</u>	<u>BKG Conc</u>	<u>DUP Conc</u>	<u>DUP RPD</u>	<u>Dup RPD Max</u>
Batch number: 151340030A Perchlorate in Water LC/MS/MS	111	101	84-119	9	15				
Batch number: 15138004 Perfluoro-octanesulfonate	102		70-130						
Perfluorooctanoic acid	95		70-130						
Batch number: 15128987141A Hexavalent Chromium	95	97	90-110	2	2	0.089	0.081	9 (1)	20
Batch number: 15131121521A pH						11.9	11.9	0	3
Batch number: 15131182101A Oxidation Reduction Potential						349	345	1	5

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.
- (3) The surrogate spike amount was less than the LOD.

Quality Control Summary

Client Name: Tetra Tech Inc.
Reported: 06/01/2015 15:13

Group Number: 1559656

*- Outside of specification

** - This limit was used in the evaluation of the final result for the blank

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.
- (3) The surrogate spike amount was less than the LOD.



PROJECT NO: 112601509	FACILITY: PARRIS ISLAND	PROJECT MANAGER P. CHURCHILL	PHONE NUMBER (321)636-6470	LABORATORY NAME AND CONTACT: LANCASTER LABS / A. Miller
SAMPLERS (SIGNATURE) <i>Troy Royal</i>		FIELD OPERATIONS LEADER S. Hill	PHONE NUMBER (973)607-7988	ADDRESS 2425 NEW HOLLAND PIKE
CARRIER/WAYBILL NUMBER FED EX AB# 8065 1898 1677			CITY, STATE LANCASTER PA 17601	

DATE YEAR	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS				PRESERVATIVE USED	COMMENTS
									Perchlorate	Asym Vial	PFAAS	PFAAS		
5/06	0955	PAI04-TW02-20150506	TW 02	-	-	GW	G	3	1	1	1	1	40C	
5/07	1400	PAI-RB01-050715	QC	-	-	QC	G	5	1	1	1	1	40C	*"SHORT HOLD"

1. RELINQUISHED BY <i>Troy Royal</i>	DATE 5-07-15	TIME 1800	1. RECEIVED BY FED EX	DATE 5-07-15	TIME 1800
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY <i>ELIE</i>	DATE 5/8/15	TIME 0925
COMMENTS					

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	BMQL	Below Minimum Quantitation Level
N.D.	none detected	MPN	Most Probable Number
TNTC	Too Numerous To Count	CP Units	cobalt-chloroplatinate units
IU	International Units	NTU	nephelometric turbidity units
umhos/cm	micromhos/cm	ng	nanogram(s)
C	degrees Celsius	F	degrees Fahrenheit
meq	milliequivalents	lb.	pound(s)
g	gram(s)	kg	kilogram(s)
µg	microgram(s)	mg	milligram(s)
mL	milliliter(s)	L	liter(s)
m³	cubic meter(s)	µL	microliter(s)
		pg/L	picogram/liter
<	less than		
>	greater than		
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
ppb	parts per billion		
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

Laboratory Data Qualifiers:

- B - Analyte detected in the blank
- C - Result confirmed by reanalysis
- E - Concentration exceeds the calibration range
- J (or G, I, X) - estimated value \geq the Method Detection Limit (MDL or DL) and the $<$ Limit of Quantitation (LOQ or RL)
- P - Concentration difference between the primary and confirmation column $>40\%$. The lower result is reported.
- U - Analyte was not detected at the value indicated
- V - Concentration difference between the primary and confirmation column $>100\%$. The reporting limit is raised due to this disparity and evident interference...

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, ISO17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Client: Tetra Tech

Delivery and Receipt Information

Delivery Method:	<u>Fed Ex</u>	Arrival Timestamp:	<u>05/05/2015 9:10</u>
Number of Packages:	<u>1</u>	Number of Projects:	<u>1</u>

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	Yes	VOA Vial Headspace \geq 6mm:	No
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	0
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Brandy Barclay (2299) at 09:31 on 05/05/2015

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

<u>Cooler #</u>	<u>Thermometer ID</u>	<u>Corrected Temp</u>	<u>Therm. Type</u>	<u>Ice Type</u>	<u>Ice Present?</u>	<u>Ice Container</u>	<u>Elevated Temp?</u>
1	8013596-IR	0.1	IR	Wet	Y	Loose	N

Client: TETRA TECH NUS

112G01509 PARRIS ISLAND

Delivery and Receipt Information

Delivery Method:	<u>Fed Ex</u>	Arrival Timestamp:	<u>05/08/2015 9:25</u>
Number of Packages:	<u>1</u>	Number of Projects:	<u>1</u>

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace \geq 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	0
Paperwork Enclosed:	Yes	Air Quality Samples Present:	No
Samples Intact:	Yes		
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Corey Eshleman (3647) at 09:53 on 05/08/2015

Samples Chilled Details: 112G01509 PARRIS ISLAND

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

<u>Cooler #</u>	<u>Thermometer ID</u>	<u>Corrected Temp</u>	<u>Therm. Type</u>	<u>Ice Type</u>	<u>Ice Present?</u>	<u>Ice Container</u>	<u>Elevated Temp?</u>
1	DT121	0.7	DT	Wet	Y	Loose	N

Perchlorate Data

Case Narrative/Conformance Summary

Perchlorate

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Pesticide Residue Analysis

Fraction: Perchlorate

Perchlorate in Soil LC/MS/MS

Sample #	Client ID	Matrix		DF	Comments
		Liquid	Solid		
7873706	PAI04-SB28-0608		X	1	
7873707	PAI13C-SS08-0001		X	1	
7873708	PAI13C-SB05-0204		X	1	
7873709	PAI04-TW01-20150504	X		1	
7879425	PAI04-TW02-20150506	X		1	
7879426	PAI-RB01-050715	X		1	Material Rinse Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

All QC is within specification.

SAMPLE ANALYSIS:

No problems were encountered with the analysis of the samples.

Abbreviation Key

UNSPK = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
MS = Matrix Spike	MDL = Method Detection Limit

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Pesticide Residue Analysis

Fraction: Perchlorate

MSD = Matrix Spike Duplicate	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value
D = Duplicate (DUP)	E= out of calibration range
LCS = Lab Control Sample	RE = Repreparation/Reanalysis
LCSD = Lab Control Sample Duplicate	* = Out of Specification

Quality Control and Calibration Summary Forms

Perchlorate



Lancaster Laboratories
Environmental

**Quality Control Reference List
Pesticide Residue Analysis**

**CLIENT: Tetra Tech Inc.
SDG: PIS01**

Fraction: Perchlorate

Analysis	Batch Number	Sample Number	Analysis Date
Perchlorate in Soil LC/MS/MS	151320023A	PBLK23132	05/13/2015 13:36:00
		LCS23132	05/13/2015 13:49:00
		7873706 UNSPK	05/13/2015 14:02:00
		7873706 MS	05/13/2015 14:15:00
		7873706 MSD	05/13/2015 14:27:00
		7873707	05/13/2015 14:40:00
		7873708	05/13/2015 14:53:00
		Perchlorate in Water LC/MS/MS	151340030A
LCS30134	05/14/2015 17:09:00		
7873709 UNSPK	05/14/2015 17:35:00		
7873709 MS	05/14/2015 17:48:00		
7873709 MSD	05/14/2015 18:00:00		
7879425	05/14/2015 18:38:00		
7879426	05/14/2015 18:51:00		



Lancaster Laboratories
Environmental

Quality Control Summary
Method Blank
Pesticide Residue Analysis
SDG: PIS01
Matrix: LIQUID

Fraction: Perchlorate

151340030A / PBLK30134 Analyte	Analysis Date	Blank Results	Units	DL	LOD	LOQ
Perchlorate in Water LC/MS/MS	05/14/15	N.D.	ug/l	0.20	0.40	1.0



Lancaster Laboratories
Environmental

Quality Control Summary
Method Blank
Pesticide Residue Analysis
SDG: PIS01
Matrix: SOLID

Fraction: Perchlorate

151320023A / PBLK23132 Analyte	Analysis Date	Blank Results	Units	DL	LOD	LOQ
Perchlorate in Soil LC/MS/MS	05/13/15	N.D.	ug/kg	2.1	4.2	5.0



Lancaster Laboratories
Environmental

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: PIS01
Matrix: LIQUID

Pesticide Residue Analysis
Fraction: Perchlorate

LCS: LCS30134	Batch: 151340030A (Sample number(s): 7873709, 7879425-7879426)							
	Spike Added ug/l	LCS Conc ug/l	LCSD Conc ug/l	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Analyte								
Perchlorate in Water LC/MS/MS	1.00	0.879	NA	88	NA	84-119	NA	NA



Lancaster Laboratories
Environmental

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: PIS01
Matrix: SOLID

Pesticide Residue Analysis
Fraction: Perchlorate

LCS: LCS23132	Batch: 151320023A (Sample number(s): 7873706-7873708)							
	Spike Added ug/kg	LCS Conc ug/kg	LCSD Conc ug/kg	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Analyte								
Perchlorate in Soil LC/MS/MS	100	98.1	NA	98	NA	84-121	NA	NA

Pesticide Residue Analysis

Fraction: Perchlorate

UNSPK: 7873709 MS: 7873709 MSD: 7873709 Analyte	Batch: 151340030A (Sample number(s): 7873709, 7879425-7879426)								
	Spike Added ug/l	Unspiked Conc ug/l	MS Conc ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	%Rec Limits	%RPD	%RPD Limits
Perchlorate in Water LC/MS/MS	1.00	N.D.	1.11	1.01	111	101	84-119	9	15

Comments:

(2) The unspiked sample result is greater than four times the spike added.

* = Out of Specification

Results are being reported on an as received basis.

Pesticide Residue Analysis
Fraction: Perchlorate

UNSPK: 7873706 MS: 7873706 MSD: 7873706 Analyte	Batch: 151320023A (Sample number(s): 7873706-7873708)								
	Spike Added ug/kg	Unspiked Conc ug/kg	MS Conc ug/kg	MSD Conc ug/kg	MS %Rec	MSD %Rec	%Rec Limits	%RPD	%RPD Limits
Perchlorate in Soil LC/MS/MS	100	N.D.	98.1	102.2	98	102	84-121	4	15

Comments:

(2) The unspiked sample result is greater than four times the spike added.
* = Out of Specification

Results are being reported on an as received basis.

Quant Calibration Report (ISTD)

Batch Info

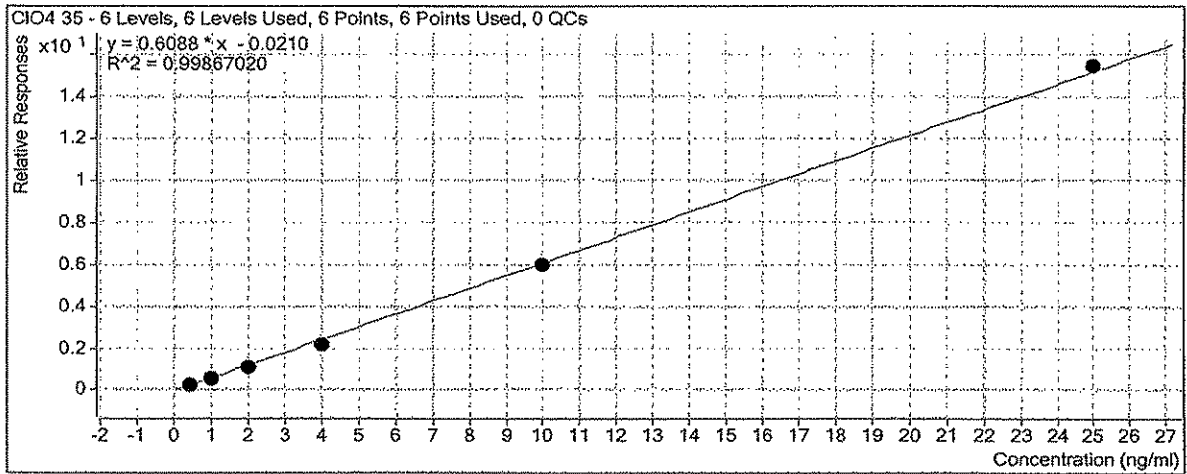
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13315.batch.xml
Analysis Time 2015-05-14 07:55 **Analyst Name** Administrator
Report Time 2015-05-14 07:56 **Reporter Name** Administrator
Last Calib Update 2015-05-14 07:51 **Batch State** ResultsDirty

Calibration Info

ISTD Compound CIO4 18 13269

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p13315004.d	Calibration	L1	<input checked="" type="checkbox"/>	13982	10.0000	1398.1985
ms5p13315005.d	Calibration	L2	<input checked="" type="checkbox"/>	13752	10.0000	1375.1688
ms5p13315006.d	Calibration	L3	<input checked="" type="checkbox"/>	13641	10.0000	1364.1199
ms5p13315007.d	Calibration	L4	<input checked="" type="checkbox"/>	14301	10.0000	1430.1211
ms5p13315008.d	Calibration	L5	<input checked="" type="checkbox"/>	12728	10.0000	1272.8137
ms5p13315009.d	Calibration	L6	<input checked="" type="checkbox"/>	11213	10.0000	1121.3033

Target Compound CIO4 35



Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p13315004.d	Calibration	L1	<input checked="" type="checkbox"/>	3422	0.4000	6.1184
ms5p13315005.d	Calibration	L2	<input checked="" type="checkbox"/>	8306	1.0000	6.0402
ms5p13315006.d	Calibration	L3	<input checked="" type="checkbox"/>	15608	2.0000	5.7209
ms5p13315007.d	Calibration	L4	<input checked="" type="checkbox"/>	31856	4.0000	5.5687
ms5p13315008.d	Calibration	L5	<input checked="" type="checkbox"/>	75765	10.0000	5.9525
ms5p13315009.d	Calibration	L6	<input checked="" type="checkbox"/>	173965	25.0000	6.2058

100% RATIO USING LEVEL 4
2.93

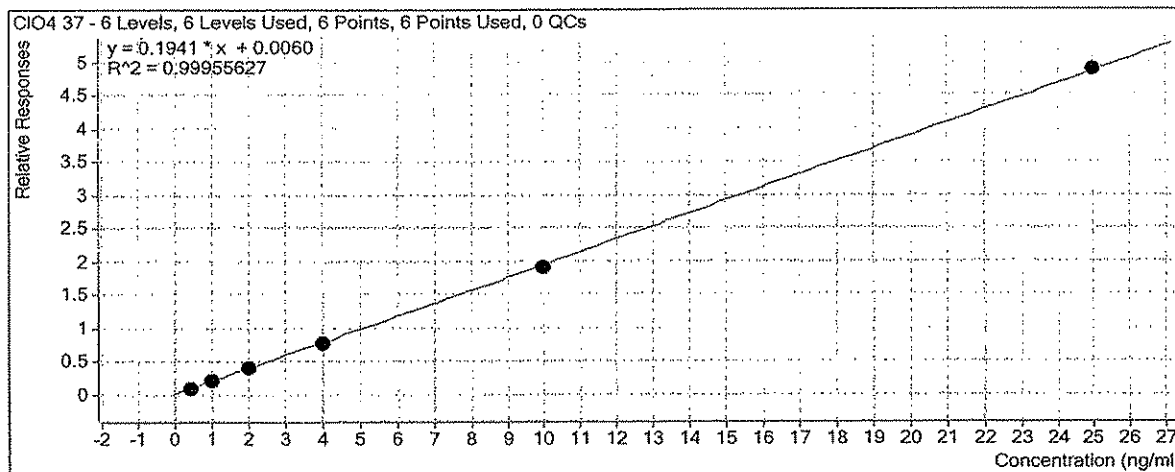
Valerie L. Tomayko
Valerie L. Tomayko
Principal Specialist

MAY 15 2015

JUA 84 5/14/15

Quant Calibration Report (ISTD)

Target Compound *ClO4 37*



Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p13315004.d	Calibration	L1	<input checked="" type="checkbox"/>	1115	0.4000	1.9938
ms5p13315005.d	Calibration	L2	<input checked="" type="checkbox"/>	2900	1.0000	2.1091
ms5p13315006.d	Calibration	L3	<input checked="" type="checkbox"/>	5567	2.0000	2.0404
ms5p13315007.d	Calibration	L4	<input checked="" type="checkbox"/>	10849	4.0000	1.8965
ms5p13315008.d	Calibration	L5	<input checked="" type="checkbox"/>	24337	10.0000	1.9121
ms5p13315009.d	Calibration	L6	<input checked="" type="checkbox"/>	54904	25.0000	1.9586

Quant Calibration Report (ISTD)

Batch Info

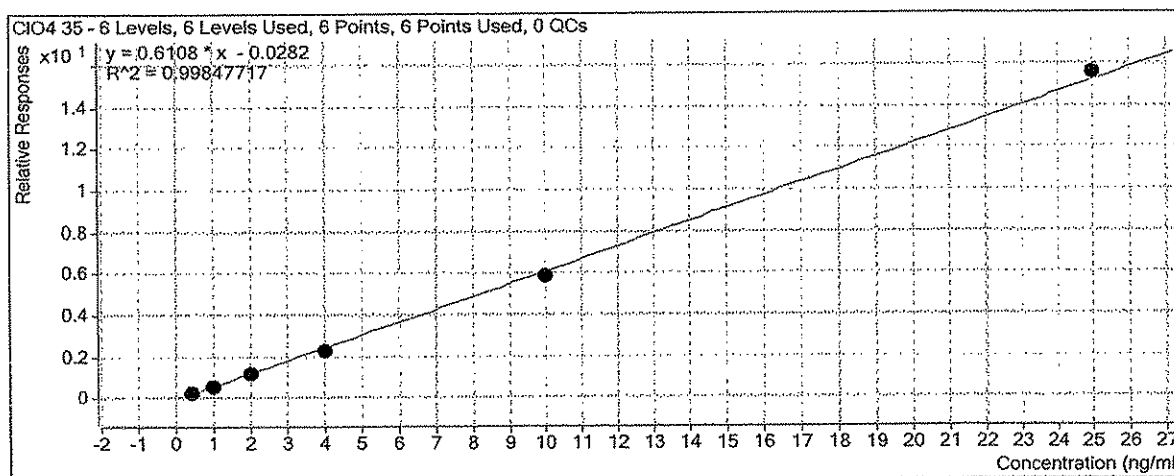
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13415.batch.xml
Analysis Time 2015-05-15 07:54 **Analyst Name** Administrator
Report Time 2015-05-15 07:55 **Reporter Name** Administrator
Last Calib Update 2015-05-15 07:47 **Batch State** ResultsDirty

Calibration Info

ISTD Compound CIO4 18

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p13415004.d	Calibration	L1	<input checked="" type="checkbox"/>	10476	10.0000	1047.6414
ms5p13415005.d	Calibration	L2	<input checked="" type="checkbox"/>	10677	10.0000	1067.6842
ms5p13415006.d	Calibration	L3	<input checked="" type="checkbox"/>	10977	10.0000	1097.6637
ms5p13415007.d	Calibration	L4	<input checked="" type="checkbox"/>	10998	10.0000	1099.8230
ms5p13415008.d	Calibration	L5	<input checked="" type="checkbox"/>	10018	10.0000	1001.7944
ms5p13415009.d	Calibration	L6	<input checked="" type="checkbox"/>	8552	10.0000	855.2489

Target Compound CIO4 35



Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p13415004.d	Calibration	L1	<input checked="" type="checkbox"/>	2457	0.4000	5.8624
ms5p13415005.d	Calibration	L2	<input checked="" type="checkbox"/>	6420	1.0000	6.0131
ms5p13415006.d	Calibration	L3	<input checked="" type="checkbox"/>	12687	2.0000	5.7792
ms5p13415007.d	Calibration	L4	<input checked="" type="checkbox"/>	24919	4.0000	5.6643
ms5p13415008.d	Calibration	L5	<input checked="" type="checkbox"/>	58480	10.0000	5.8375
ms5p13415009.d	Calibration	L6	<input checked="" type="checkbox"/>	133700	25.0000	6.2531

ION RATIO USING LEVELY

2.98

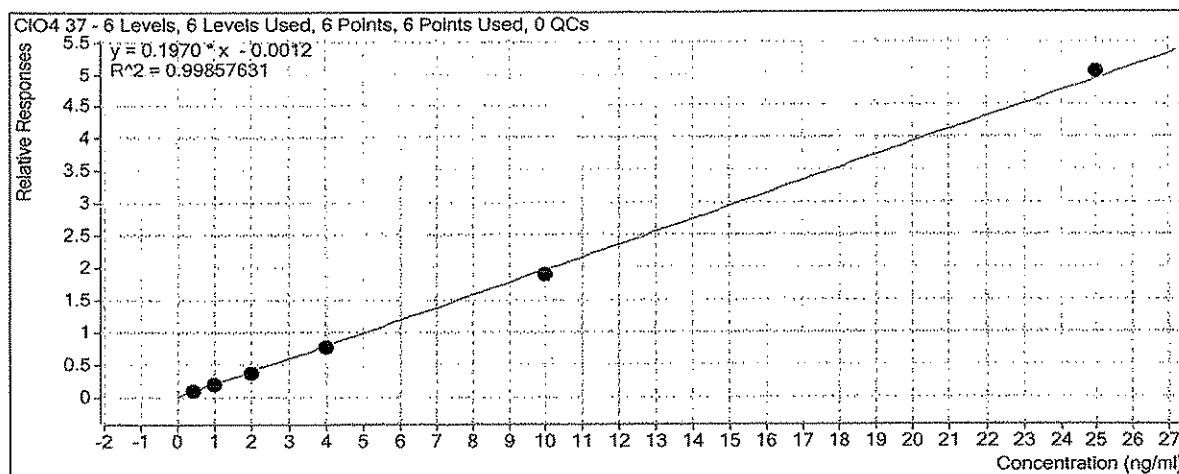
Valerie L. Tomayko
 Principal Specialist

MAY 15 2015

RMSK sls/15

Quant Calibration Report (ISTD)

Target Compound *C104 37*



Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p13415004.d	Calibration	L1	<input checked="" type="checkbox"/>	892	0.4000	2.1288
ms5p13415005.d	Calibration	L2	<input checked="" type="checkbox"/>	2129	1.0000	1.9941
ms5p13415006.d	Calibration	L3	<input checked="" type="checkbox"/>	4044	2.0000	1.8420
ms5p13415007.d	Calibration	L4	<input checked="" type="checkbox"/>	8346	4.0000	1.8970
ms5p13415008.d	Calibration	L5	<input checked="" type="checkbox"/>	18915	10.0000	1.8882
ms5p13415009.d	Calibration	L6	<input checked="" type="checkbox"/>	43152	25.0000	2.0182

QQQ Autotune Report

Instrument Name Instrument 1 **MS Model** G6410A
Tune Date & Time 2015-05-13 10:34
Data Path D:\MassHunter\Tune\QQQ\atunes.TUNE.XML
Ion Source ESI
Ionization Mode ESI

Source Parameters

Parameter	Value
Gas Temp	350
Gas Flow	10
Nebulizer	30
Capillary	4000

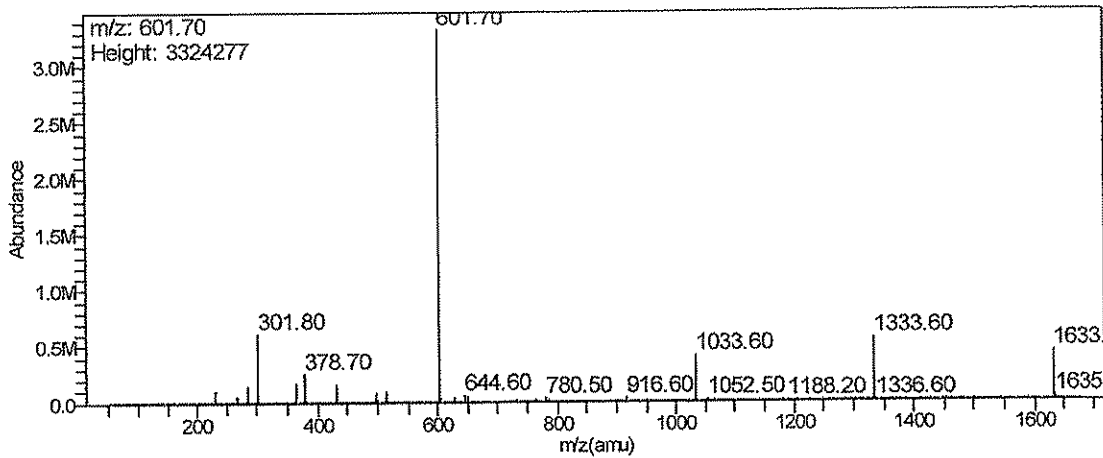
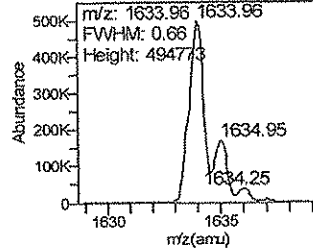
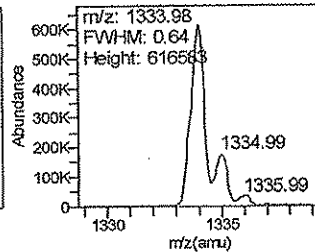
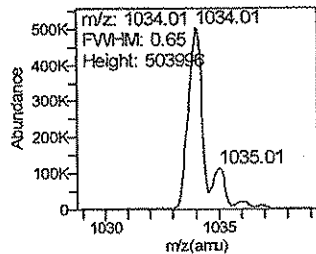
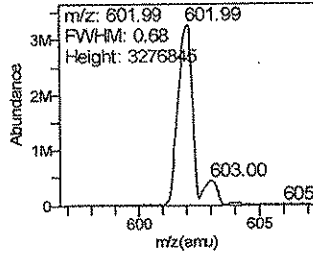
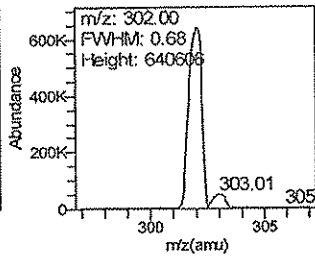
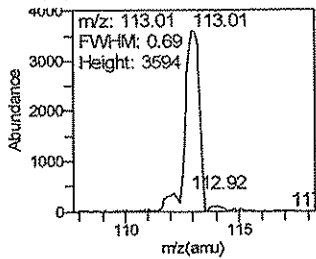
QQQ Autotune Report

Negative Results

Analyzer: MSI

Polarity: Negative

Width: Unit



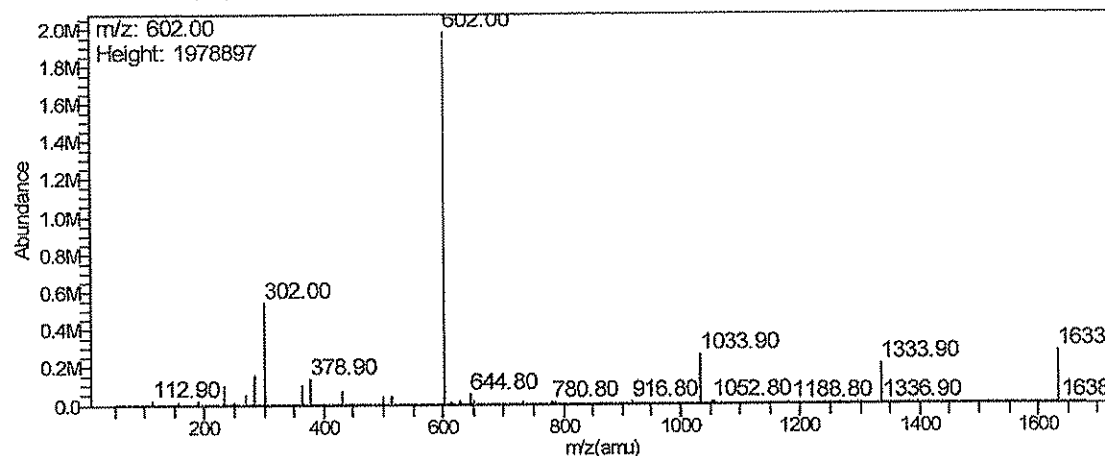
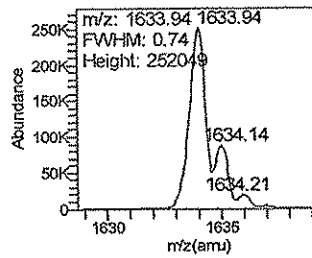
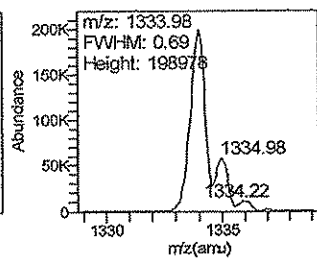
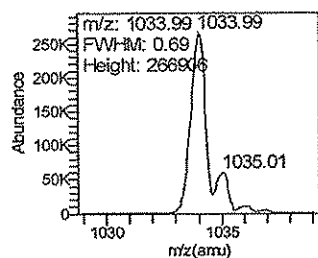
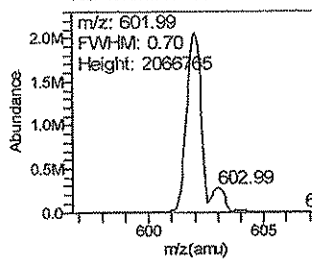
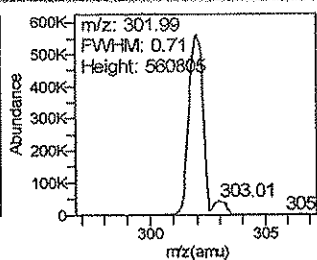
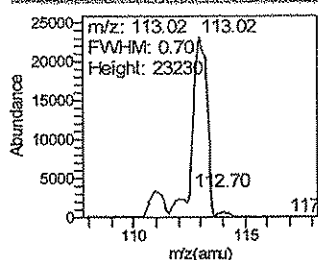
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.01	112.99	0.69	0.70	3594
301.99	302.00	0.68	0.70	640606
601.99	601.98	0.68	0.70	3276845
1034.00	1033.99	0.65	0.70	503996
1333.99	1333.97	0.64	0.70	616583
1633.98	1633.95	0.66	0.70	494773

QQQ Autotune Report

Analyzer: MS2

Polarity: Negative

Width: Unit



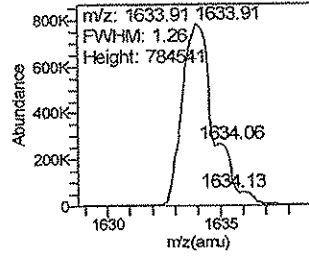
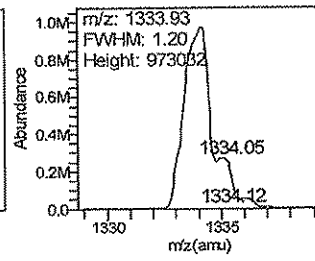
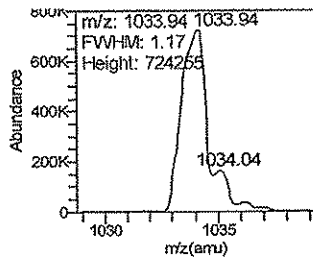
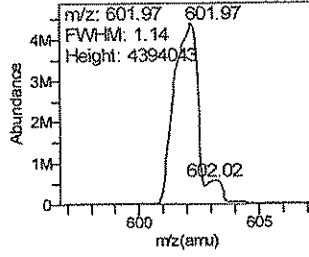
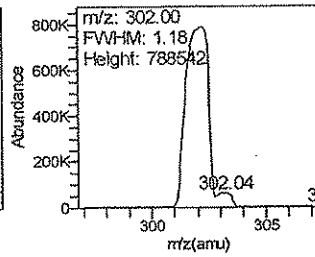
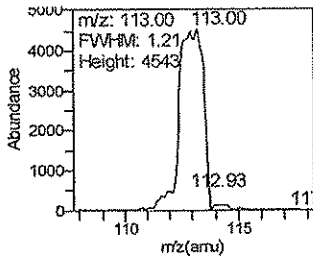
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.02	112.99	0.70	0.70	23230
301.99	302.00	0.71	0.70	560805
601.98	601.98	0.70	0.70	2066765
1033.99	1033.99	0.69	0.70	266906
1334.00	1333.97	0.69	0.70	198978
1633.95	1633.95	0.74	0.70	252049

QQQ Autotune Report

Analyzer: MS1

Polarity: Negative

Width: Wide



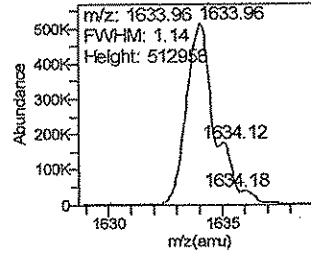
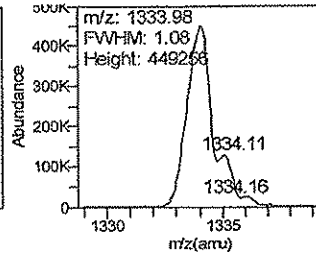
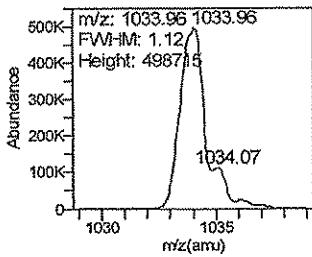
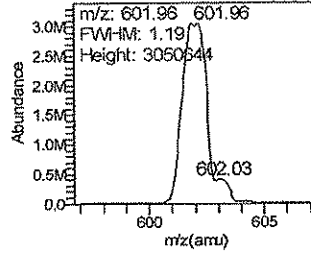
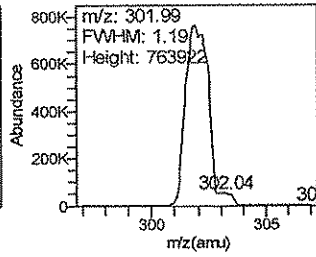
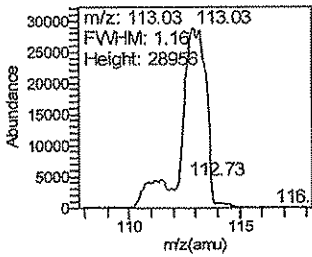
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.00	112.99	1.21	1.20	4543
302.00	302.00	1.18	1.20	788542
601.97	601.98	1.14	1.20	4394043
1033.94	1033.99	1.17	1.20	724255
1333.94	1333.97	1.20	1.20	973033
1633.92	1633.95	1.26	1.20	784541

QQQ Autotune Report

Analyzer: MS2

Polarity: Negative

Width: Wide



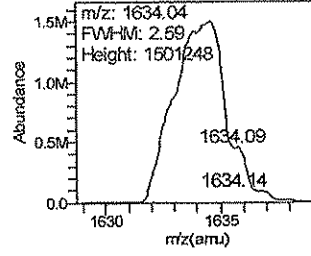
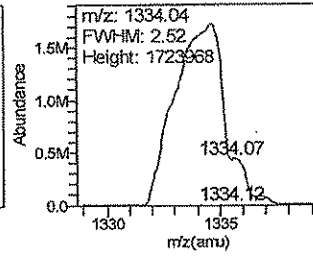
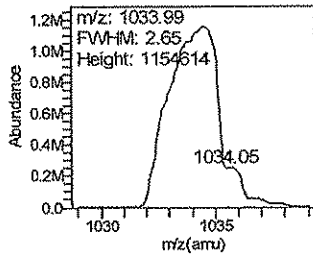
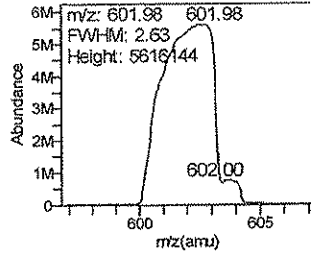
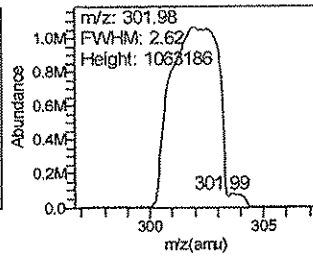
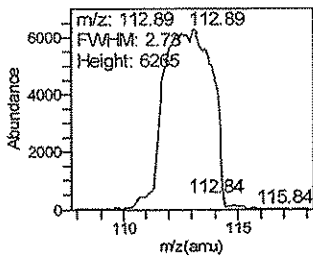
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.03	112.99	1.16	1.20	28956
301.99	302.00	1.19	1.20	763922
601.96	601.98	1.19	1.20	3050644
1033.96	1033.99	1.12	1.20	498715
1334.00	1333.97	1.08	1.20	449256
1633.97	1633.95	1.14	1.20	512958

QQQ Autotune Report

Analyzer: MS1

Polarity: Negative

Width: Widest



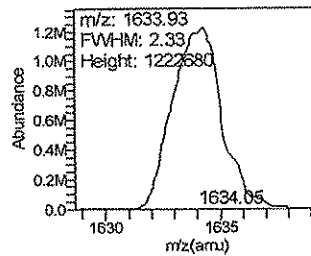
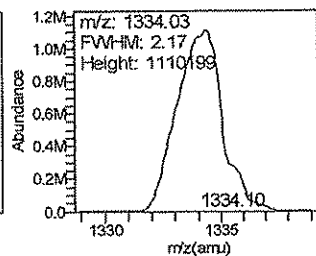
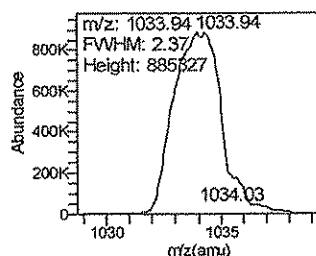
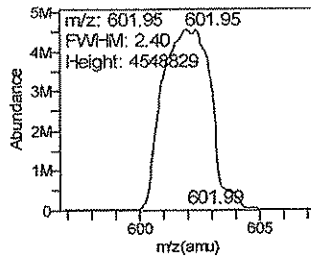
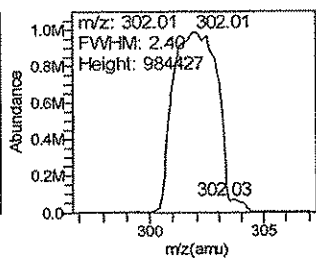
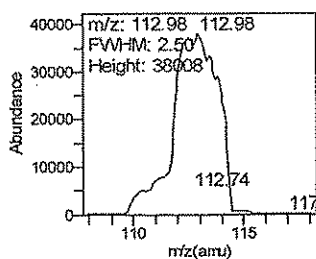
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
112.89	112.99	2.73	2.50	6265
301.98	302.00	2.62	2.50	1063186
601.97	601.98	2.63	2.50	5616144
1033.99	1033.99	2.65	2.50	1154614
1334.05	1333.97	2.52	2.50	1723968
1634.05	1633.95	2.59	2.50	1501248

QQQ Autotune Report

Analyzer: MS2

Polarity: Negative

Width: Widest



m/z	m/z Expected	FWHM	FWHM Expected	Abundance
112.98	112.99	2.50	2.50	38008
302.01	302.00	2.40	2.50	984427
601.95	601.98	2.40	2.50	4548829
1033.93	1033.99	2.37	2.50	885327
1334.04	1333.97	2.17	2.50	1110199
1633.94	1633.95	2.33	2.50	1222679

QQQ Autotune Report

Negative Parameters

Tune Parameters

Parameter	Setting
Fragmentor	135.00
Skimmer	15.00
Octopole DC	5.00
Octopole RF	600.00
Lens1	0.00
Lens2 DC	2.00
Lens2 RF Enable	1.00
Lens2 RF	318.00
Lens2 RF Phase	-108.00
MS1 DC	-3.00
MS1 PostFilter	-2.00
MS1 Axis Offset	0.86
MS1 Axis Gain	-29.10
MS1 Width Offset	0.02
MS1 Width Gain	31.30
MS1 Heater	100.00
MS2 DC	12.00
MS2 PreFilter	27.00
MS2 Axis Offset	0.73
MS2 Axis Gain	15.80
MS2 Width Offset	0.17
MS2 Width Gain	18.60
MS2 Heater	100.00
Cell Entry	0.00
Hexapole DC	0.00
Hexapole RF	400.00
Hexapole Accel	7.00
Cell Exit	8.00
Collision Gas	1.00
Iris	175.00
HED	10.00
EMV	1320.00
Collision Energy	0.00
Lens2 DC RF Off	30.50

Dynamic Ramp Tables

Lens2 DC

m/z	Setting
112.99	0.60
302.00	1.10
601.98	1.90
1033.99	3.10
1333.97	3.90
1633.95	4.70

Lens2 RF

QQQ Autotune Report

m/z	Setting
112.99	87.00
302.00	116.00
601.98	161.00
1033.99	227.00
1333.97	272.00
1633.95	318.00

MS1 Axis Offset

m/z	Setting
112.99	0.86
302.00	0.87
601.98	0.89
1033.99	0.90
1333.97	0.88
1633.95	0.86

MS1 Width Offset

m/z	Setting
112.99	0.02
302.00	0.01
601.98	0.03
1033.99	0.01
1333.97	-0.01
1633.95	0.02

MS2 Axis Offset

m/z	Setting
112.99	0.73
302.00	0.75
601.98	0.77
1033.99	0.78
1333.97	0.76
1633.95	0.73

MS2 Width Offset

m/z	Setting
112.99	0.17
302.00	0.13
601.98	0.12
1033.99	0.11
1333.97	0.11
1633.95	0.17

MS1 Calibrations

Resolution	Mass Gain	Mass Offset	Width Gain	Width Offset
Unit	-29.10	0.86	31.30	0.02
Wide	-29.35	1.03	31.60	0.38
Widest	-29.30	1.44	31.90	1.51

QQQ Autotune Report

MS2 Calibrations

Resolution	Mass Gain	Mass Offset	Width Gain	Width Offset
Unit	15.80	0.73	18.60	0.17
Wide	15.60	0.92	18.80	0.51
Widest	15.25	1.37	19.40	1.42

QQQ Autotune Report

Instrument Name Instrument 1 **MS Model** G6410A
Tune Date & Time 2015-05-14 13:35
Data Path D:\MassHunter\Tune\QQQ\atunes.TUNE.XML
Ion Source ESI
Ionization Mode ESI

Source Parameters

Parameter	Value
Gas Temp	350
Gas Flow	10
Nebulizer	30
Capillary	4000

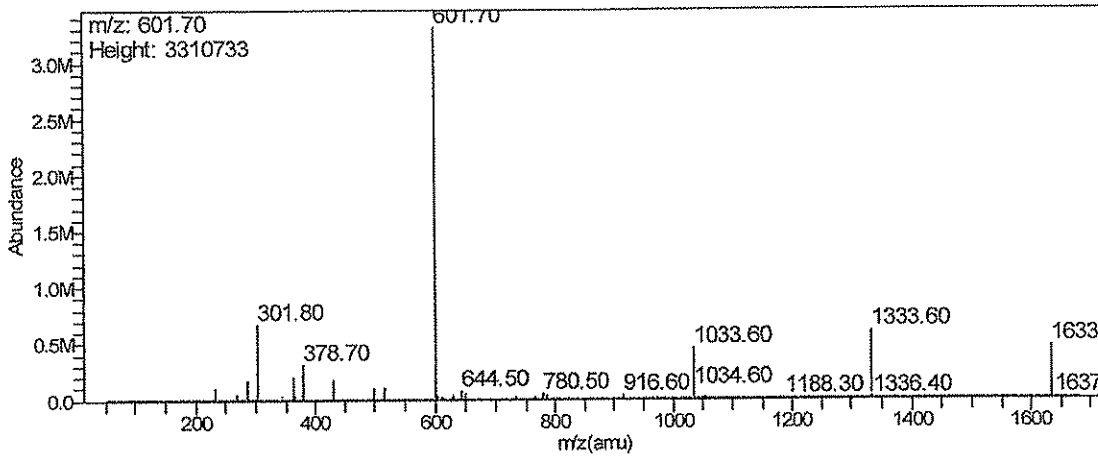
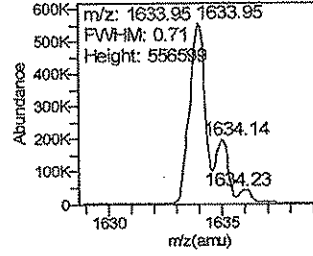
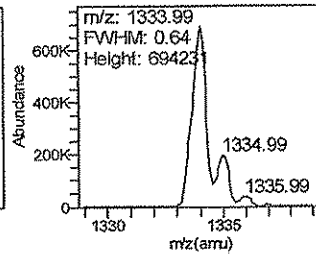
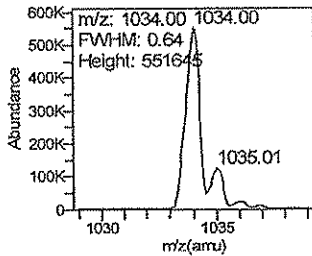
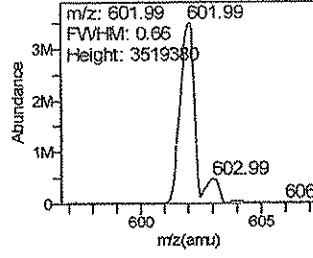
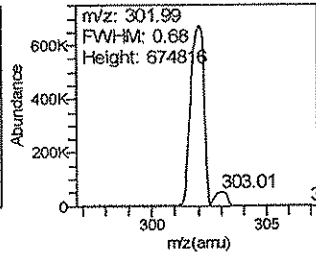
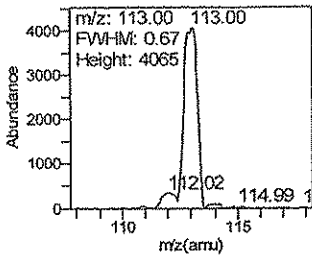
QQQ Autotune Report

Negative Results

Analyzer: MS1

Polarity: Negative

Width: Unit



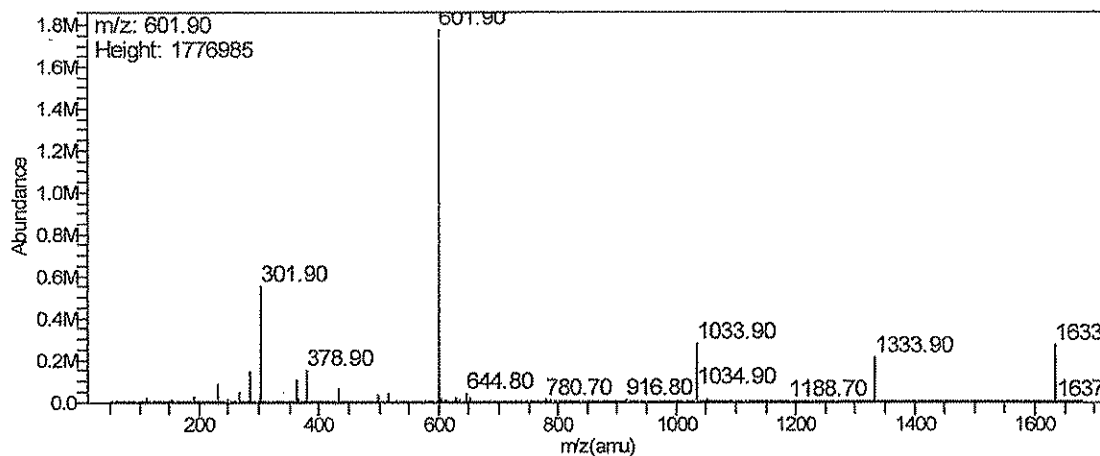
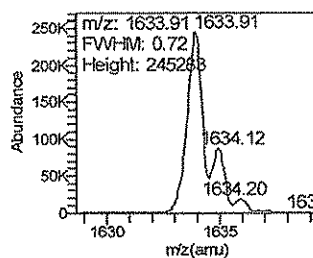
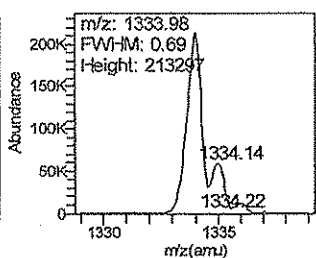
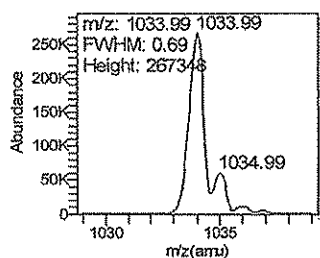
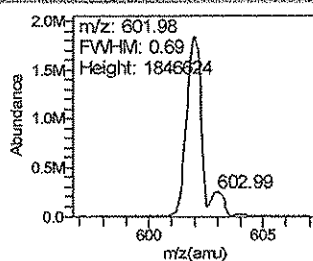
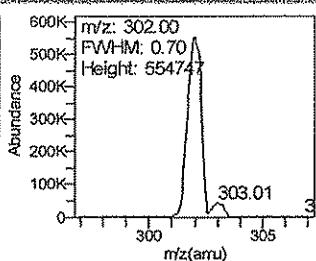
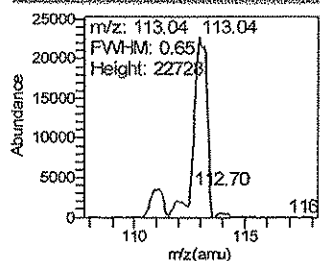
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.00	112.99	0.67	0.70	4065
301.99	302.00	0.68	0.70	674816
601.98	601.98	0.66	0.70	3519380
1034.00	1033.99	0.64	0.70	551645
1334.00	1333.97	0.64	0.70	694231
1633.96	1633.95	0.71	0.70	556599

QQQ Autotune Report

Analyzer: MS2

Polarity: Negative

Width: Unit



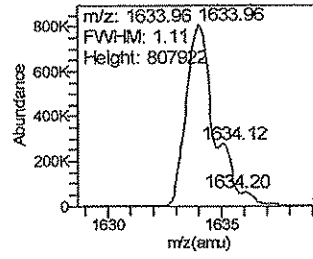
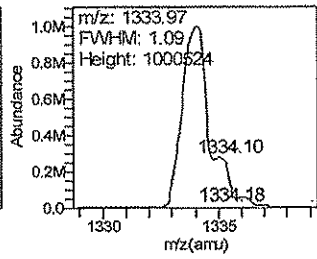
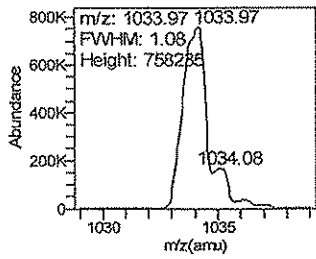
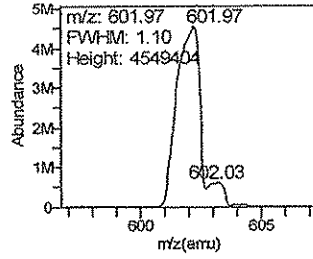
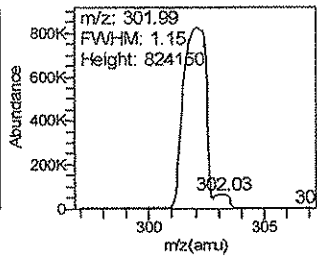
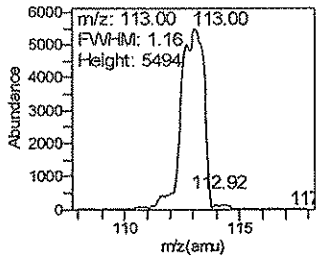
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.04	112.99	0.65	0.70	22728
301.99	302.00	0.70	0.70	554747
601.98	601.98	0.69	0.70	1846624
1033.99	1033.99	0.69	0.70	267348
1333.99	1333.97	0.69	0.70	213297
1633.92	1633.95	0.72	0.70	245283

QQQ Autotune Report

Analyzer: MS1

Polarity: Negative

Width: Wide



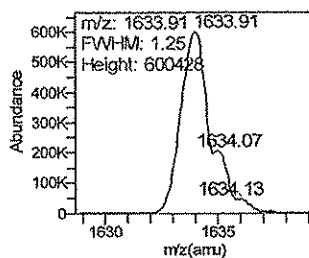
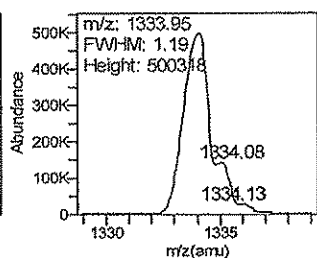
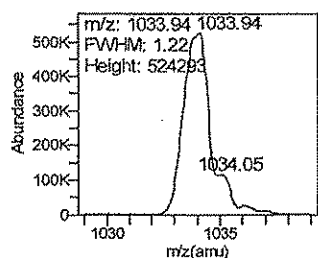
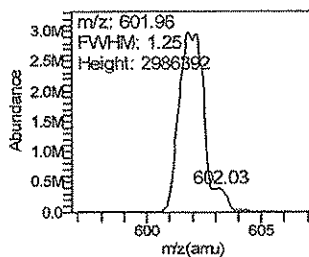
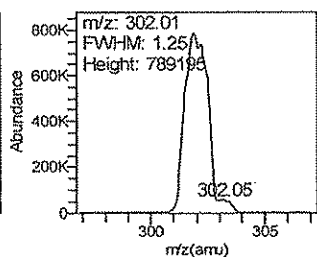
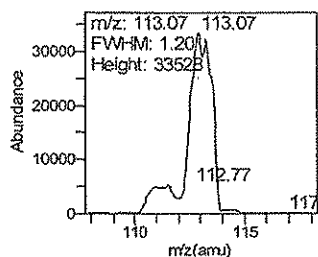
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.00	112.99	1.16	1.20	5494
301.98	302.00	1.15	1.20	824150
601.96	601.98	1.10	1.20	4549404
1033.97	1033.99	1.08	1.20	758235
1333.98	1333.97	1.09	1.20	1000524
1633.97	1633.95	1.11	1.20	807922

QQQ Autotune Report

Analyzer: MS2

Polarity: Negative

Width: Wide



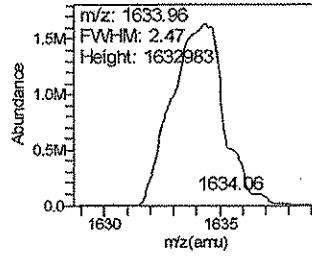
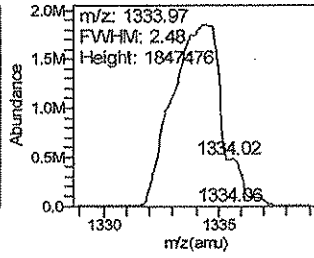
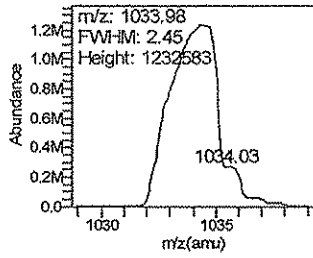
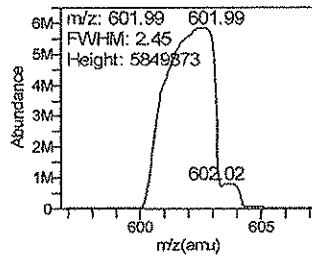
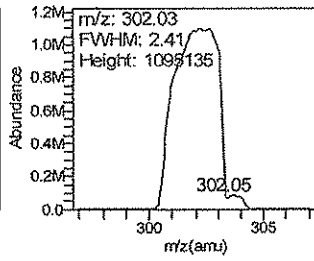
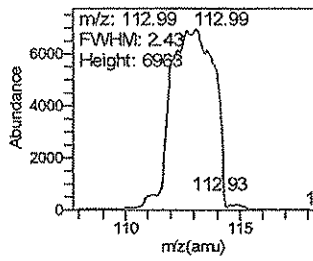
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.07	112.99	1.20	1.20	33528
302.01	302.00	1.25	1.20	789195
601.96	601.98	1.25	1.20	2986392
1033.94	1033.99	1.22	1.20	524293
1333.96	1333.97	1.19	1.20	500318
1633.93	1633.95	1.25	1.20	600428

QQQ Autotune Report

Analyzer: MS1

Polarity: Negative

Width: Widest



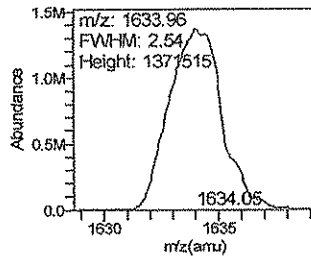
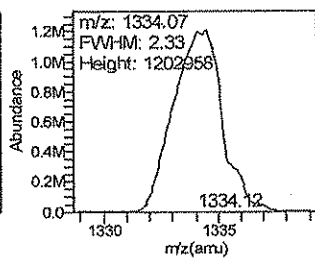
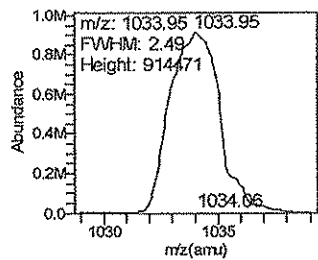
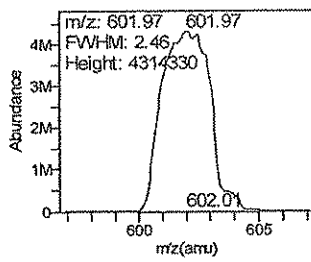
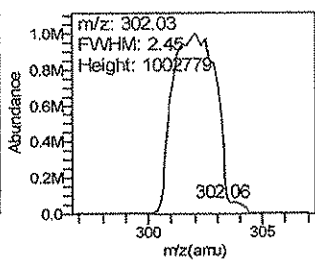
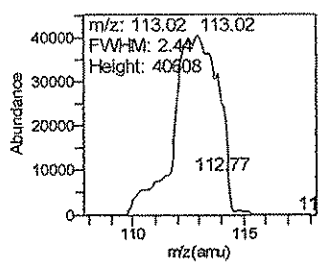
m/z	m/z Expected	FWHM	FWHM Expected	Abundance
112.99	112.99	2.43	2.50	6963
302.03	302.00	2.41	2.50	1095135
601.99	601.98	2.45	2.50	5849873
1033.97	1033.99	2.45	2.50	1232583
1333.98	1333.97	2.48	2.50	1847476
1633.97	1633.95	2.48	2.50	1632983

QQQ Autotune Report

Analyzer: MS2

Polarity: Negative

Width: Widest



m/z	m/z Expected	FWHM	FWHM Expected	Abundance
113.02	112.99	2.44	2.50	40608
302.03	302.00	2.45	2.50	1002779
601.97	601.98	2.45	2.50	4314330
1033.95	1033.99	2.49	2.50	914471
1334.08	1333.97	2.33	2.50	1202958
1633.97	1633.95	2.55	2.50	1371516

QQQ Autotune Report

Negative Parameters

Tune Parameters

Parameter	Setting
Fragmentor	135.00
Skimmer	15.00
Octopole DC	5.00
Octopole RF	600.00
Lens1	0.00
Lens2 DC	2.00
Lens2 RF Enable	1.00
Lens2 RF	318.00
Lens2 RF Phase	-108.00
MS1 DC	-3.00
MS1 PostFilter	-2.00
MS1 Axis Offset	0.84
MS1 Axis Gain	-29.05
MS1 Width Offset	0.00
MS1 Width Gain	31.40
MS1 Heater	100.00
MS2 DC	12.00
MS2 PreFilter	27.00
MS2 Axis Offset	0.73
MS2 Axis Gain	15.80
MS2 Width Offset	0.11
MS2 Width Gain	18.70
MS2 Heater	100.00
Cell Entry	0.00
Hexapole DC	0.00
Hexapole RF	400.00
Hexapole Accel	7.00
Cell Exit	8.00
Collision Gas	1.00
Iris	350.00
HED	10.00
EMV	1310.00
Collision Energy	0.00
Lens2 DC RF Off	32.00

Dynamic Ramp Tables

Lens2 DC

m/z	Setting
112.99	0.70
302.00	1.20
601.98	2.00
1033.99	3.20
1333.97	3.90
1633.95	4.70

Lens2 RF

QQQ Autotune Report

m/z	Setting
112.99	87.00
302.00	116.00
601.98	161.00
1033.99	227.00
1333.97	272.00
1633.95	318.00

MS1 Axis Offset

m/z	Setting
112.99	0.84
302.00	0.86
601.98	0.88
1033.99	0.88
1333.97	0.86
1633.95	0.84

MS1 Width Offset

m/z	Setting
112.99	0.00
302.00	0.00
601.98	0.00
1033.99	-0.03
1333.97	-0.04
1633.95	0.00

MS2 Axis Offset

m/z	Setting
112.99	0.73
302.00	0.76
601.98	0.78
1033.99	0.79
1333.97	0.77
1633.95	0.73

MS2 Width Offset

m/z	Setting
112.99	0.11
302.00	0.12
601.98	0.10
1033.99	0.10
1333.97	0.10
1633.95	0.11

MS1 Calibrations

Resolution	Mass Gain	Mass Offset	Width Gain	Width Offset
Unit	-29.05	0.84	31.40	0.00
Wide	-29.20	1.00	31.40	0.37
Widest	-29.50	1.45	32.20	1.31

QQQ Autotune Report

MS2 Calibrations

Resolution	Mass Gain	Mass Offset	Width Gain	Width Offset
Unit	15.80	0.73	18.70	0.11
Wide	15.50	0.98	19.00	0.54
Widest	15.45	1.39	20.00	1.36

Continuing Calibration Method 6850

Run # ms5p13315

MS5P13315010	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.86 perchlorate	3.8	4		-5% ICV

MS5P13315021	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.86 perchlorate	0.4	0.4		0%

MS5P13315030	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.86 perchlorate	3.7	4		-8%

entered by MA 800 5/14/15

verified by NT047 5/15/15

Continuing Calibration Method 6850

Run # ms5p13415

MS5P13415010	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.86 perchlorate	3.8	4		-5% ICV

MS5P13415021	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.86 perchlorate	0.42	0.4		5%

MS5P13415032	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.85 perchlorate	3.8	4		-5%

MS5P13415043	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.85 perchlorate	4.8	0.4		1100%

MS5P13415048	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.85 perchlorate	3.8	4		-5%

entered by MAA 5/15/15

verified by Wray 5/15/15

Sample Data

Perchlorate

Fraction: Perchlorate

06557: Perchlorate in Soil LC/MS/MS Analyte Name	Default DL	Default LOD	Default LOQ	Units
Perchlorate in Soil LC/MS/MS	2.1	4.2	5.0	ug/kg

06386: Perchlorate in Water LC/MS/MS Analyte Name	Default DL	Default LOD	Default LOQ	Units
Perchlorate in Water LC/MS/MS	0.20	0.40	1.0	ug/l

Quant Sample Report (ISTD)

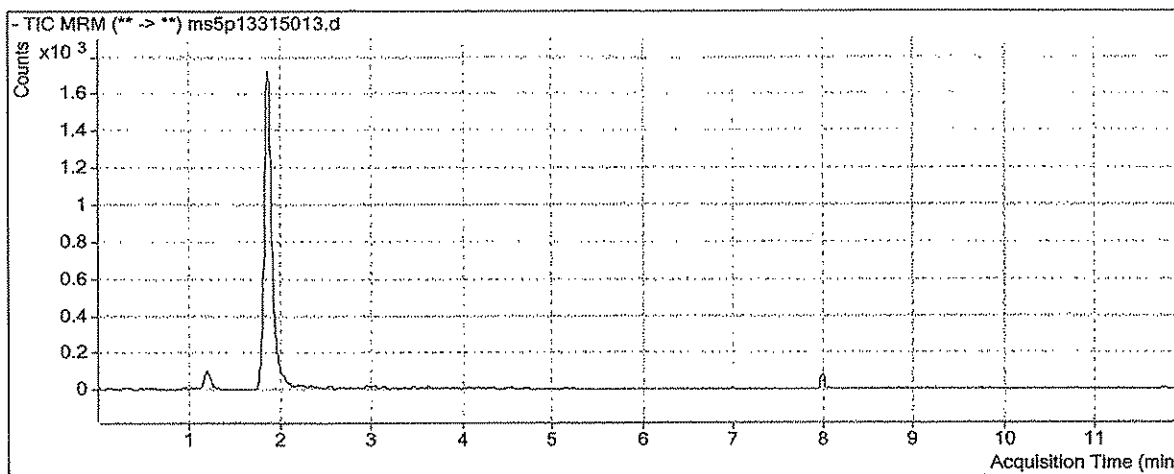
Batch Info

Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13315.batch.xml
Analysis Time 2015-05-14 07:55 **Analyst Name** Administrator
Report Time 2015-05-14 07:56 **Reporter Name** Administrator
Last Calib Update 2015-05-14 07:51 **Batch State** ResultsDirty

Analysis Info

Acq Time 2015-05-13 14:02
Data File ms5p13315013.d
Acq Method File clo4_Obeli_01.m
Sample Name 7873706
Sample Info 151320023A
Sample Type Sample
Level
Sample Pos P1-B4

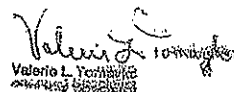
Sample Chromatogram



Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.878	209	10094	0.0	0.6851	
ClO4 37	ClO4 18	1.877	108	10094	0.0	0.2406	

76


 Valerio L. Yon...
Analyst

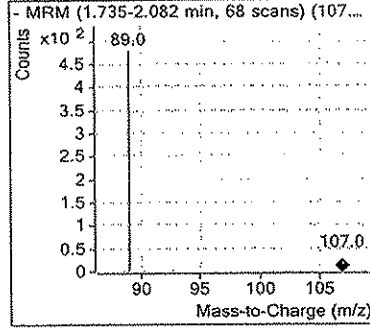
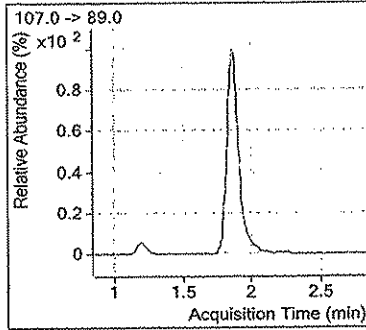
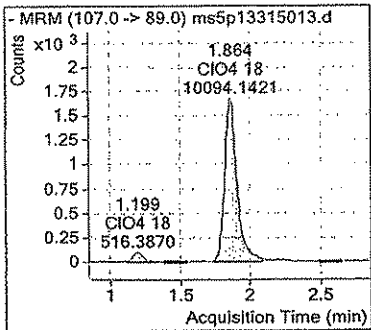
MAY 15 2015

Handwritten initials and date: ANA 5/14/15

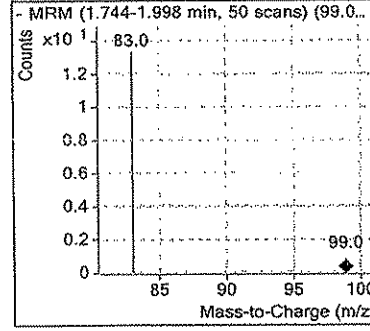
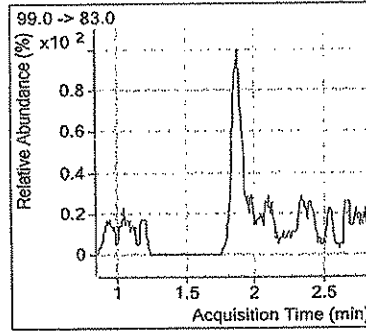
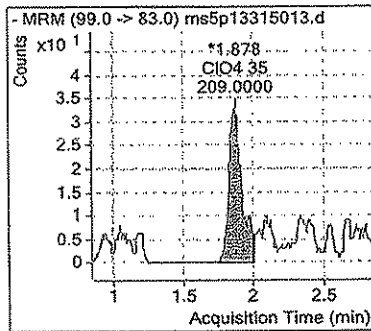
Quant Sample Report (ISTD)

Compound Graphics

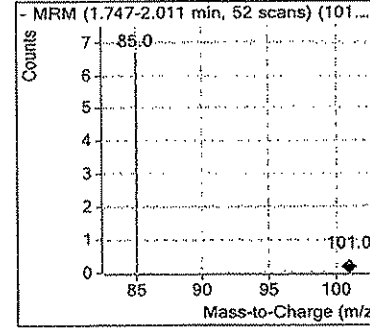
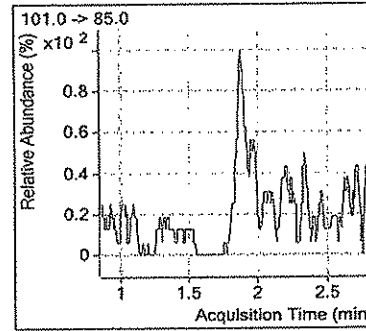
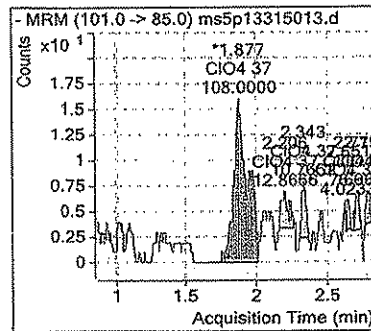
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

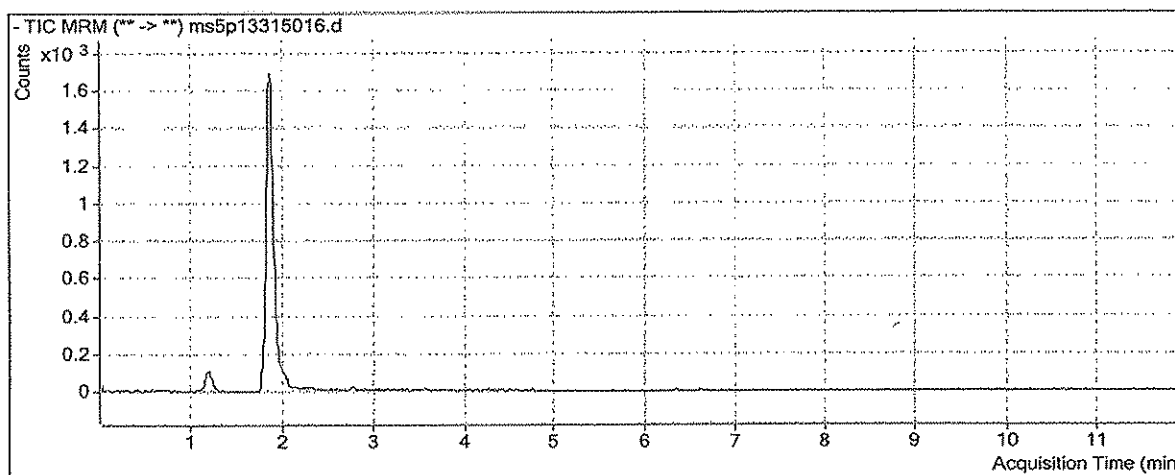
Batch Info

Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13315.batch.xml
Analysis Time 2015-05-14 07:55 **Analyst Name** Administrator
Report Time 2015-05-14 07:56 **Reporter Name** Administrator
Last Calib Update 2015-05-14 07:51 **Batch State** ResultsDirty

Analysis Info

Acq Time 2015-05-13 14:40
Data File ms5p13315016.d
Acq Method File clo4_Obeli_01.m
Sample Name 7873707
Sample Info 151320023A
Sample Type Sample
Level
Sample Pos P1-B7

Sample Chromatogram



Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.889	187	9627	0.0	0.6640	
ClO4 37	ClO4 18	1.866	120	9627	0.0	0.3316	

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Valerie L. Tomayko
 Principal Scientist

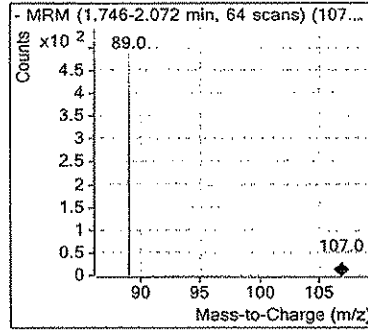
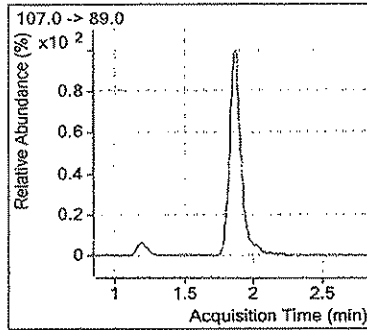
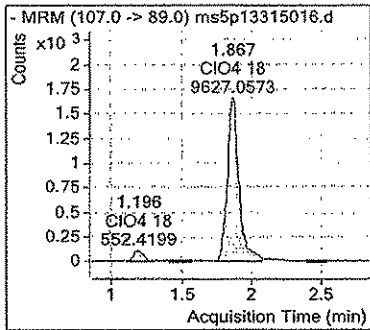
MAY 15 2015

QUASL 5/14/15

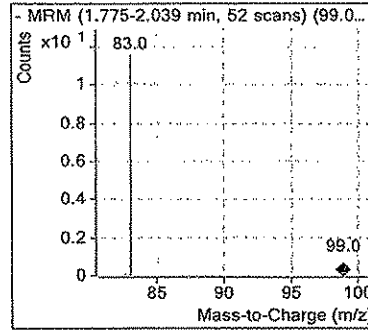
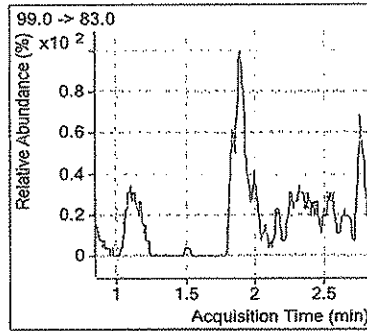
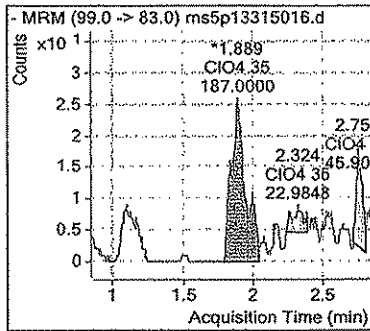
Quant Sample Report (ISTD)

Compound Graphics

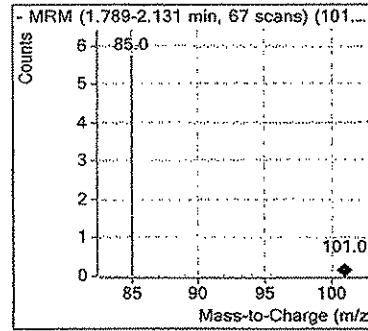
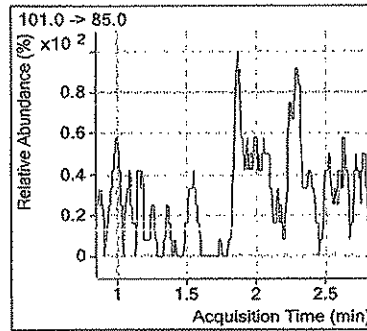
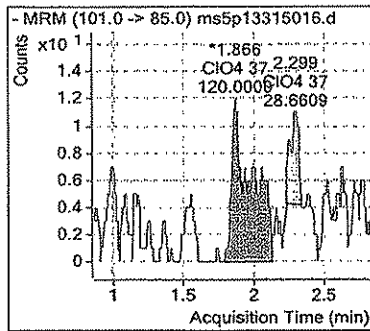
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

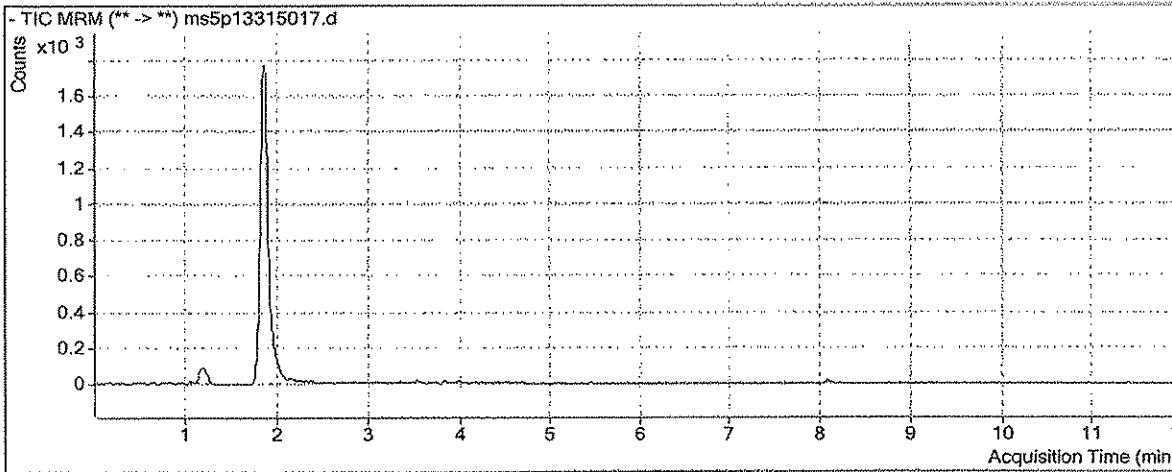
Batch Info

Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13315.batch.xml
Analysis Time 2015-05-14 07:55 **Analyst Name** Administrator
Report Time 2015-05-14 07:56 **Reporter Name** Administrator
Last Calib Update 2015-05-14 07:51 **Batch State** ResultsDirty

Analysis Info

Acq Time 2015-05-13 14:53
Data File ms5p13315017.d
Acq Method File clo4_Obeli_01.m
Sample Name 7873708
Sample Info 151320023A
Sample Type Sample
Level
Sample Pos P1-B8

Sample Chromatogram



Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.863	193	10666	0.0	0.6422	
ClO4 37	ClO4 18	1.882	111	10666	0.0	0.2256	

80

Valeria L. Remigio
Analyst

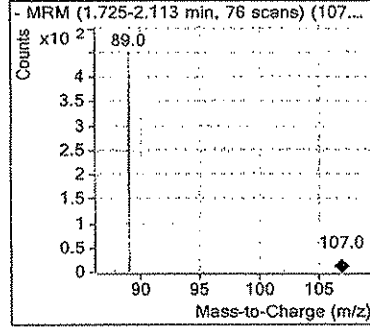
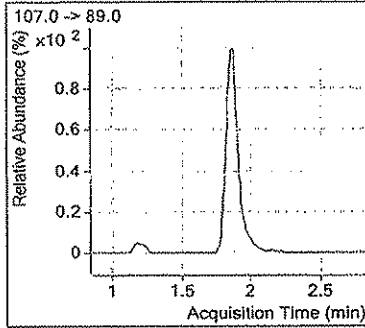
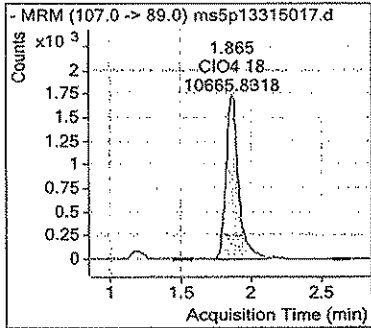
MAY 15 2015

Russell 5/14/15

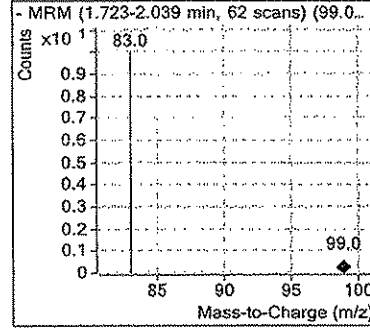
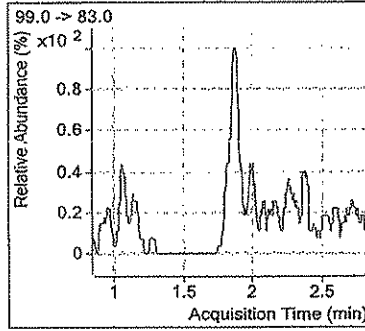
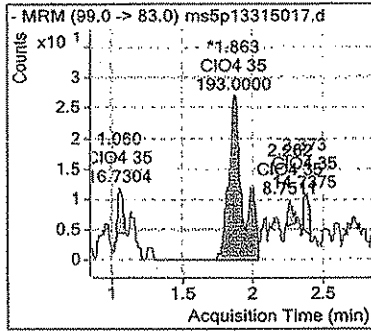
Quant Sample Report (ISTD)

Compound Graphics

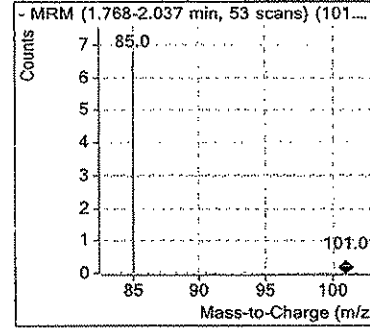
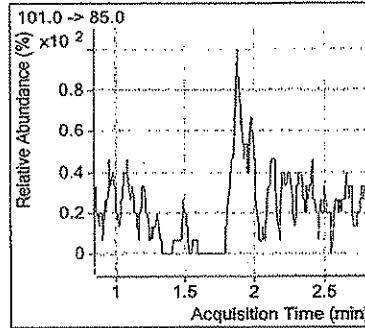
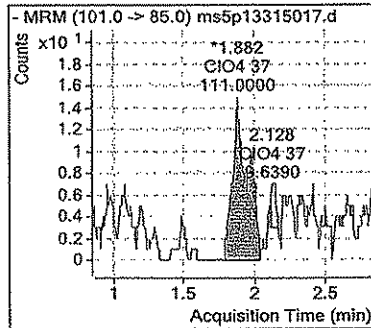
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

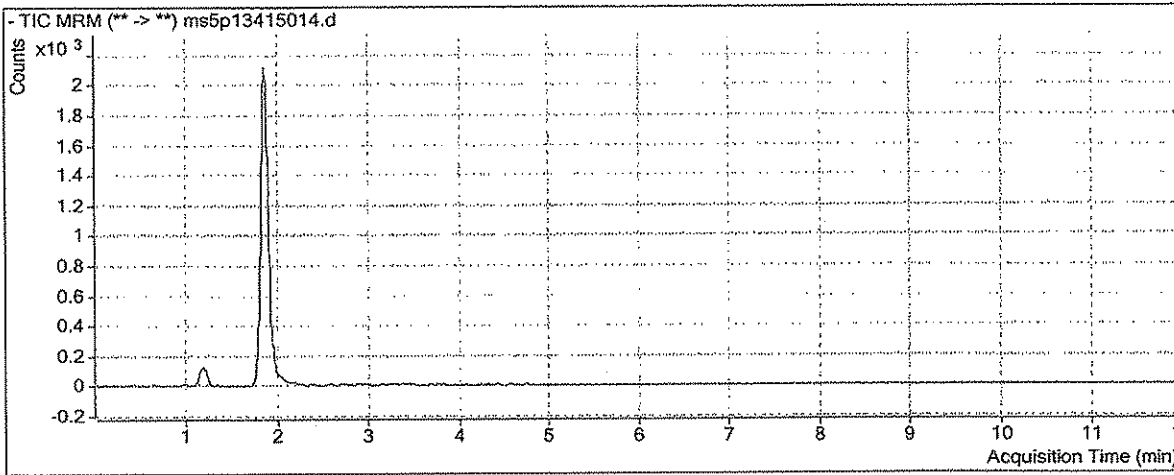
Batch Info

Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13415.batch.xml
Analysis Time 2015-05-15 07:54 **Analyst Name** Administrator
Report Time 2015-05-15 07:55 **Reporter Name** Administrator
Last Calib Update 2015-05-15 07:47 **Batch State** ResultsDirty

Analysis Info

Acq Time 2015-05-14 17:35
Data File ms5p13415014.d
Acq Method File clo4_Obeli_01.m
Sample Name 7873709
Sample Info 151340030A
Sample Type Sample
Level
Sample Pos P1-B5

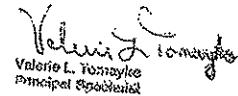
Sample Chromatogram



Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
CIO4 35	CIO4 18	1.868	469	11797	0.0	0.1112	
CIO4 37	CIO4 18	1.851	195	11797	0.0	0.0898	

//S


 Valerie L. Tomayke
 Principal Specialist

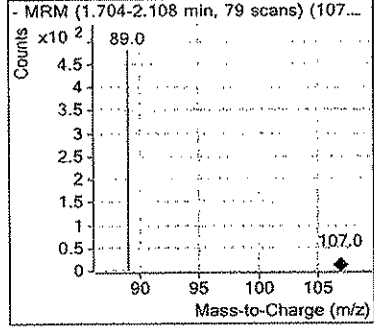
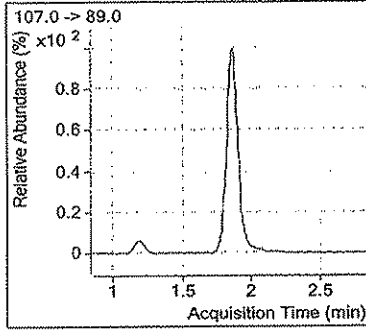
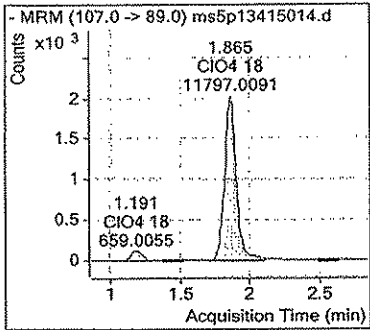
MAY 15 2015

RMS 5/15/15

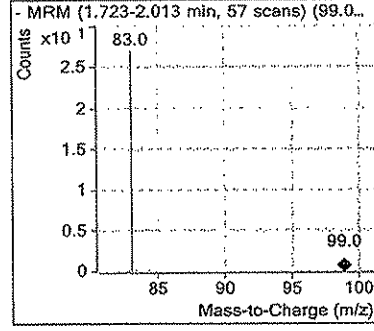
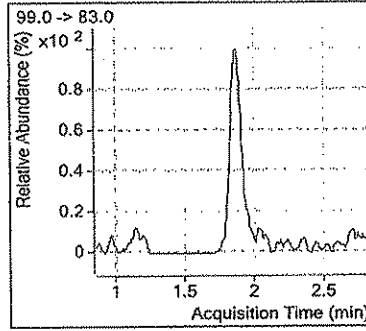
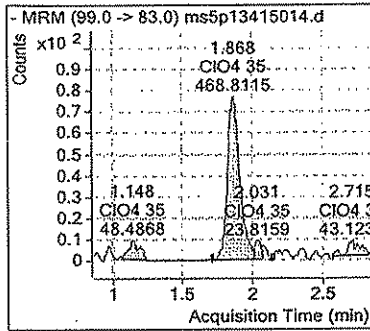
Quant Sample Report (ISTD)

Compound Graphics

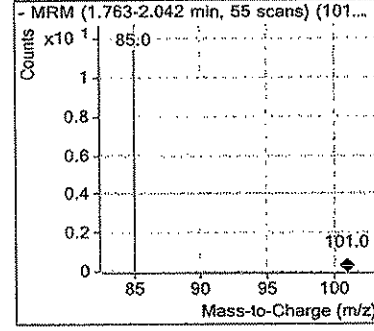
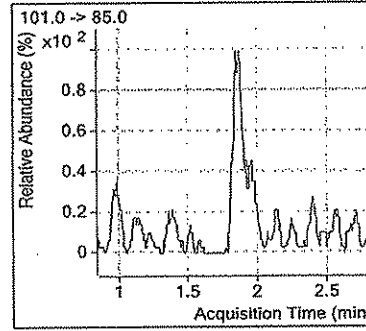
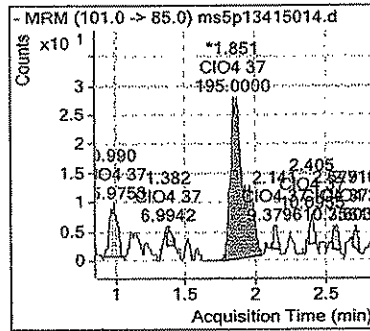
ISTD Compound *CIO4 18*



Target Compound *CIO4 35*



Target Compound *CIO4 37*



Quant Sample Report (ISTD)

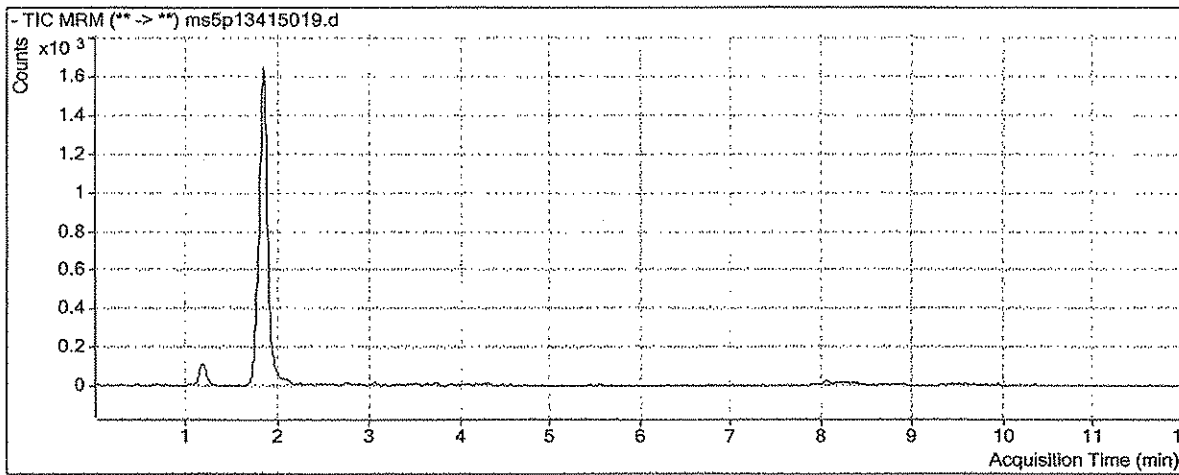
Batch Info

Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13415.batch.xml
Analysis Time 2015-05-15 07:54 **Analyst Name** Administrator
Report Time 2015-05-15 07:55 **Reporter Name** Administrator
Last Calib Update 2015-05-15 07:47 **Batch State** ResultsDirty

Analysis Info

Acq Time 2015-05-14 18:38
Data File ms5p13415019.d
Acq Method File clo4_Obeli_01.m
Sample Name 7879425
Sample Info 151340030A
Sample Type Sample
Level
Sample Pos P1-C1

Sample Chromatogram



Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.873	53	10601	0.0	0.0542	
ClO4 37	ClO4 18	1.960	72	10601	0.0	0.0404	

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Valerio L. Tommaso
Manager, Spectroscopy

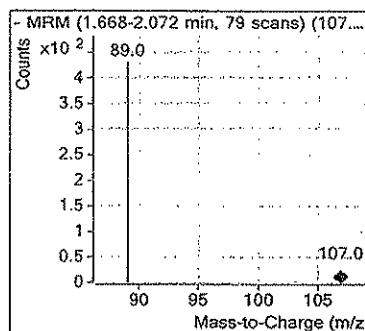
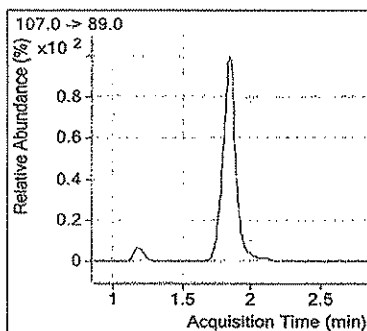
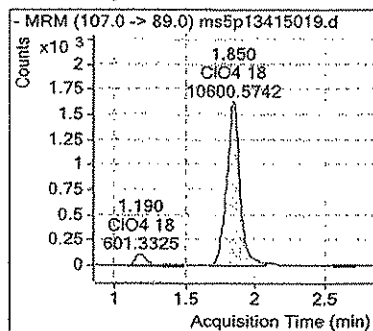
MAY 15 2015

Handwritten initials/signature

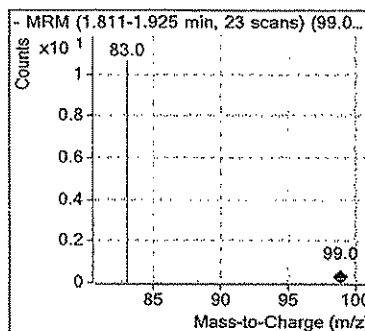
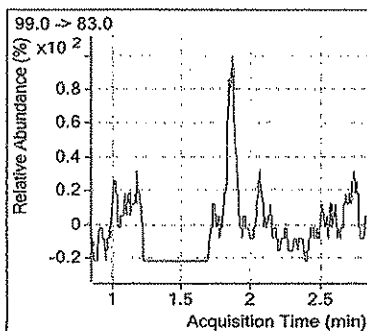
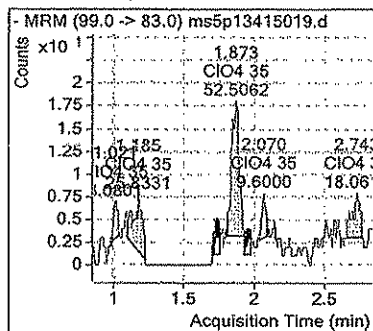
Quant Sample Report (ISTD)

Compound Graphics

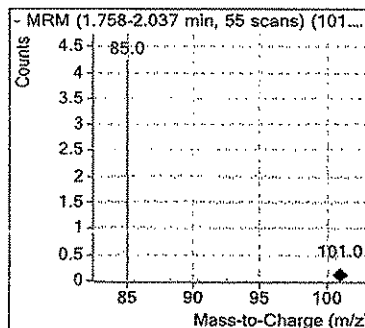
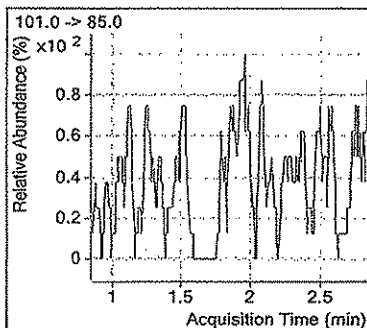
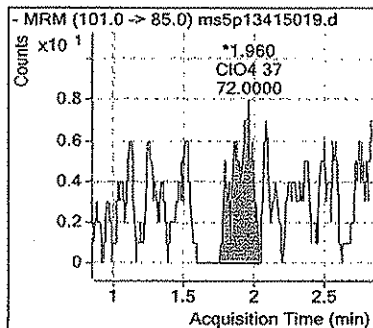
ISTD Compound *CIO4 18*



Target Compound *CIO4 35*



Target Compound *CIO4 37*



Quant Sample Report (ISTD)

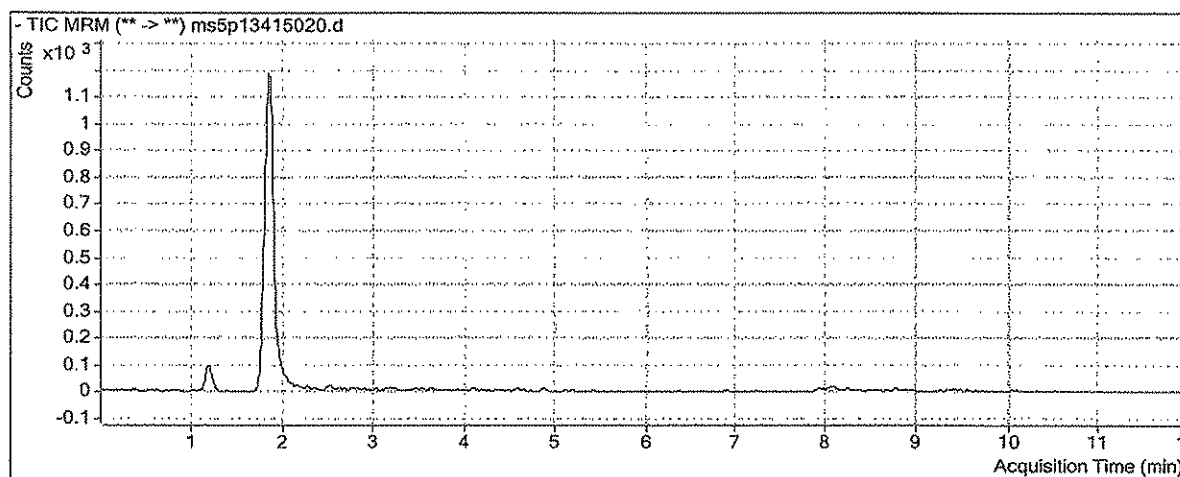
Batch Info

Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13415.batch.xml
Analysis Time 2015-05-15 07:54 **Analyst Name** Administrator
Report Time 2015-05-15 07:55 **Reporter Name** Administrator
Last Calib Update 2015-05-15 07:47 **Batch State** ResultsDirty

Analysis Info

Acq Time 2015-05-14 18:51
Data File ms5p13415020.d
Acq Method File clo4_Obeli_01.m
Sample Name 7879426
Sample Info 151340030A
Sample Type Sample
Level
Sample Pos P1-C2

Sample Chromatogram



Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.884	69	8473	0.0	0.0595	
ClO4 37	ClO4 18	1.897	39	8473	0.0	0.0293	

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Valeriy G. Tomayko
Analyst

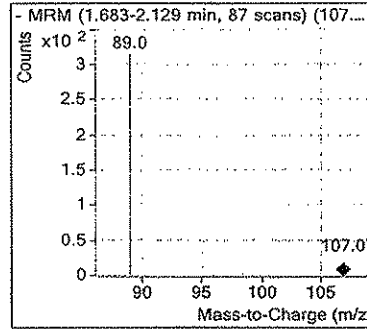
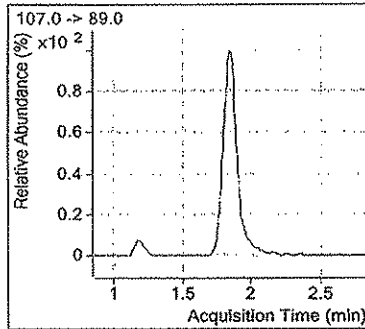
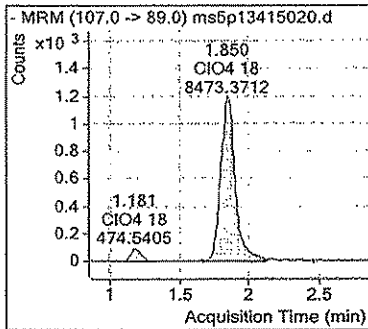
MAY 15 2015

QuASR sp11/15

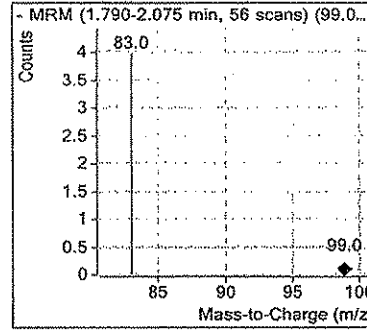
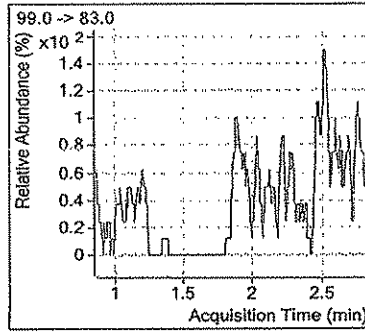
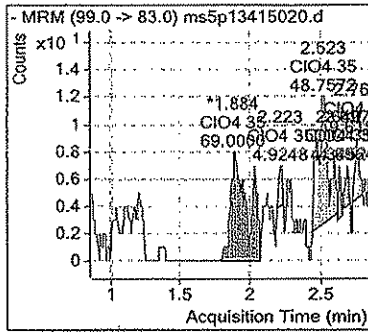
Quant Sample Report (ISTD)

Compound Graphics

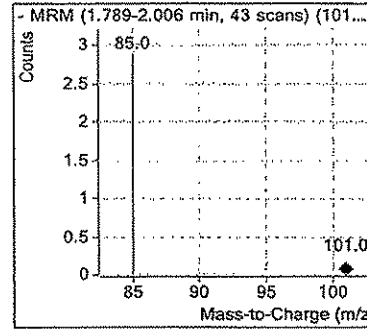
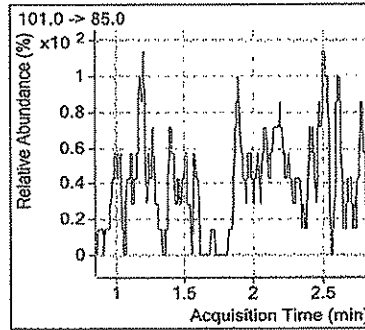
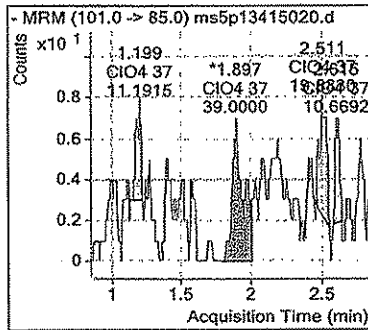
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Standards Data

Perchlorate

Worklist Report

Worklist Path: D:\MassHunter\Worklists\ms5p13315.wkl

Worklist Run Parameters

```

Operator Name: ---
Run Type: Standard Start
Part of Method to Run: Acquisition Only
Execution for Acquisition-DA: Synchronous
Acquisition Method Path: D:\MassHunter\methods
DA Method Path: D:\MassHunter\methods
Data File Path: D:\MassHunter\data
Pre-Worklist Script: ---
Post-Worklist Script: ---
Acquisition Clean Up Script: ---
Overlapped Injection: Yes
Clear sample selection after run: Yes
Wait Time for Ready(Min): 10
Threshold Disk Value(MB): 10240
Comment: ---
    
```

Worklist Table

Sample Name	Sample Position	Method	Data File	Sample Type	Level Name	Dilution	Comment
Conditioner	P1-A1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315001.d	Sample		1	
Conditioner	P1-A1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315002.d	Sample		1	
Conditioner	P1-A2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315002a.d	Sample		1	
Conditioner	P1-A2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315002b.d	Sample		1	
Perc1 1524a	P1-A3	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315003.d	Sample		1	
Perc2 1524a	P1-A4	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315004.d	Calibration	L1	1	

Perc31524a	P1-A5	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315005.d	Calibration	L2	1
Perc41524a	P1-A6	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315006.d	Calibration	L3	1
Perc51524a	P1-A7	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315007.d	Calibration	L4	1
Perc61524a	P1-A8	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315008.d	Calibration	L5	1
Perc71524a	P1-A9	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315009.d	Calibration	L6	1
lpcerc51424b	P1-B1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315010.d	Sample		1
BLANKA	P1-B2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315011.d	Sample		10
LCSA	P1-B3	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315012.d	Sample		10
7873706	P1-B4	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315013.d	Sample		10
7873706MS	P1-B5	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315014.d	Sample		10
7873706MSD	P1-B6	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315015.d	Sample		10
7873707	P1-B7	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315016.d	Sample		10
7873708	P1-B8	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315017.d	Sample		10
7877383 df10	P1-B9	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315018.d	Sample		10
BLANKA	P1-C1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315019.d	Sample		1
LCSA	P1-C2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315020.d	Sample		1
lpcerc21424d	P1-C3	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315021.d	Sample		1
ICS	P1-C4	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315022.d	Sample		1
7873709	P1-C5	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315023.d	Sample		1
7873709MS	P1-C6	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315024.d	Sample		1
7873709MSD	P1-C7	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315025.d	Sample		1
7877123 df10	P1-C8	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315026.d	Sample		10
7877125	P1-C9	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315027.d	Sample		1
7879425	P1-D1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315028.d	Sample		1
7879426	P1-D2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315029.d	Sample		1
lpcerc51424b	P1-B1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13315030.d	Sample		1
SCP_InstrumentStandby()\Acquisition : AcqEngSystem : SCP_System}						

Quant Sample Report (ISTD)

Batch Info

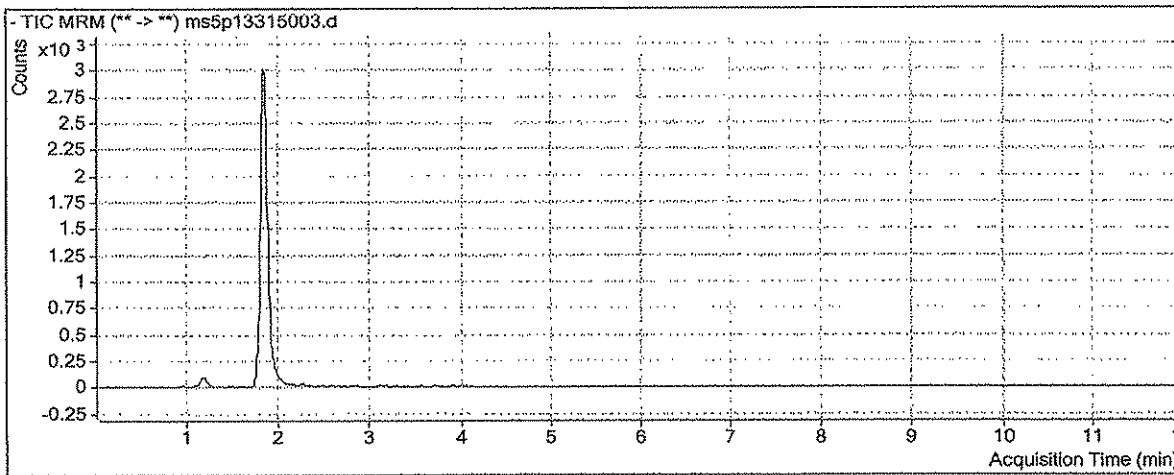
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13315.batch.xml

Analysis Time 2015-05-14 07:55 Analyst Name Administrator
Report Time 2015-05-14 07:56 Reporter Name Administrator
Last Calib Update 2015-05-14 07:51 Batch State ResultsDirty

Analysis Info

Acq Time 2015-05-13 11:55
Data File ms5p13315003.d
Acq Method File clo4_Obeli_01.m
Sample Name Perc11524a
Sample Info
Sample Type Sample
Level
Sample Pos P1-A3

Sample Chromatogram



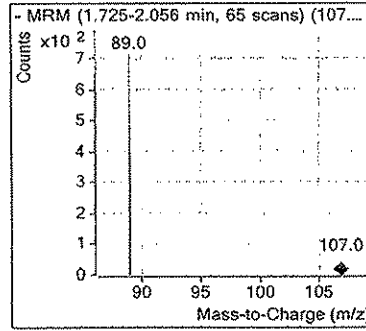
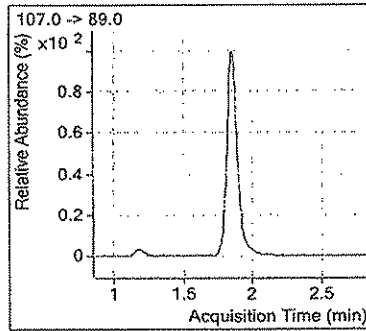
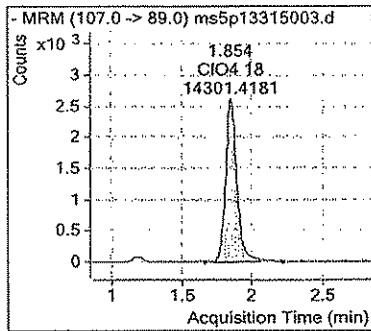
Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.853	1680	14301	0.1	0.2275	
ClO4 37	ClO4 18	1.852	596	14301	0.0	0.1836	

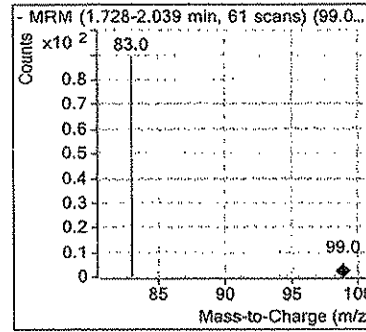
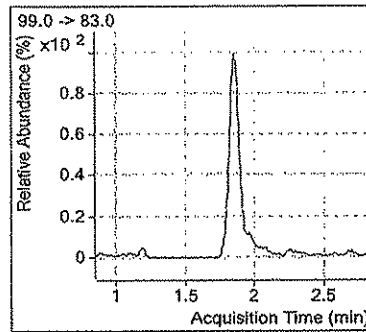
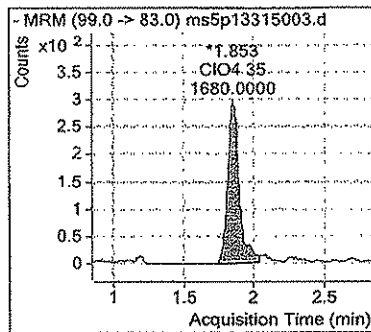
Quant Sample Report (ISTD)

Compound Graphics

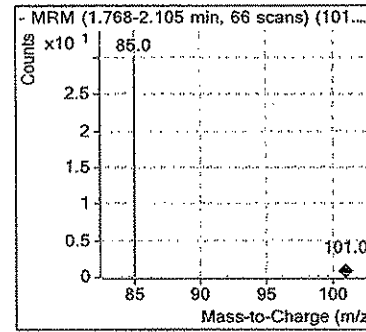
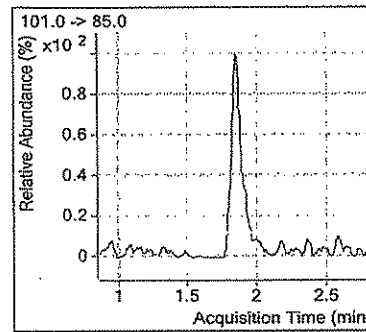
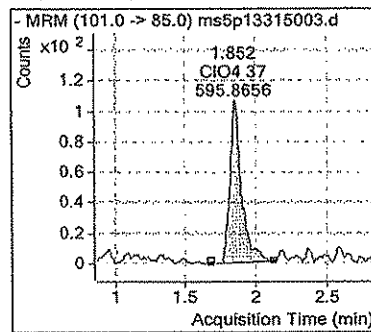
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

Batch Info

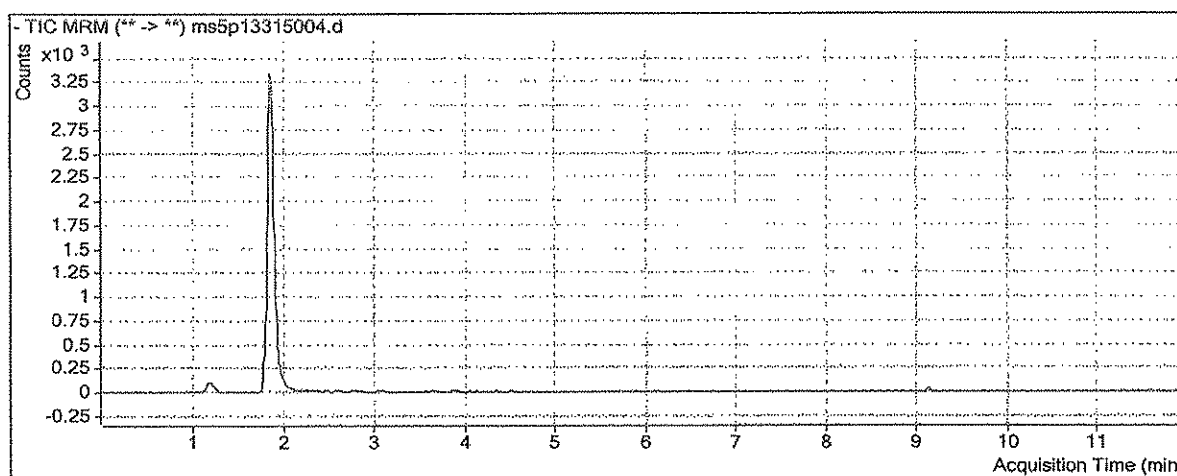
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13315.batch.xml

Analysis Time 2015-05-14 07:55 Analyst Name Administrator
Report Time 2015-05-14 07:56 Reporter Name Administrator
Last Calib Update 2015-05-14 07:51 Batch State ResultsDirty

Analysis Info

Acq Time 2015-05-13 12:07
Data File ms5p13315004.d
Acq Method File clo4_Obeli_01.m
Sample Name Perc21524a
Sample Info
Sample Type Calibration
Level L1
Sample Pos P1-A4

Sample Chromatogram



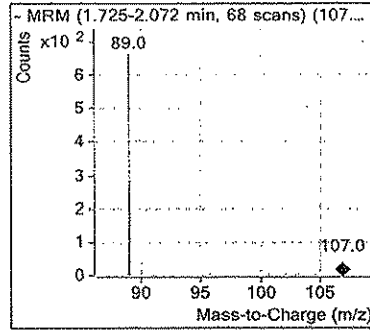
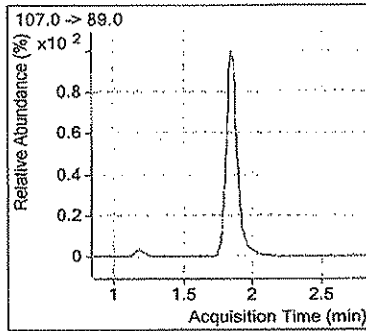
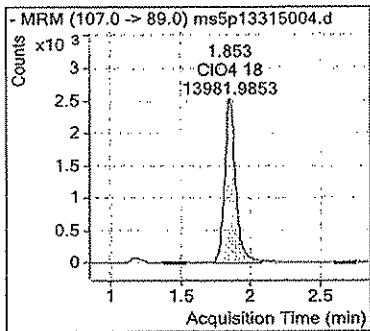
Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.855	3422	13982	0.2	0.4365	109.1
ClO4 37	ClO4 18	1.852	1115	13982	0.1	0.3798	95.0

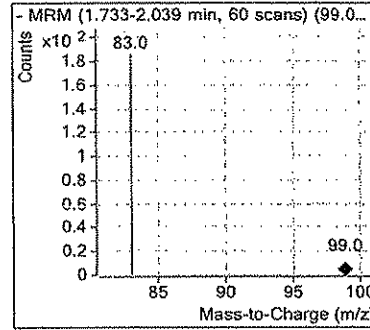
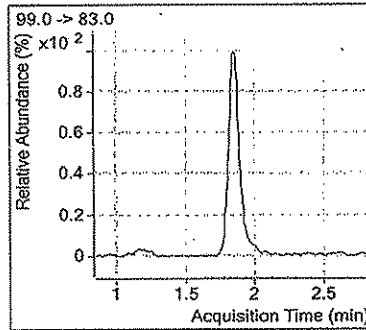
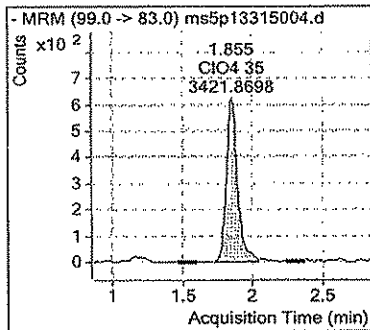
Quant Sample Report (ISTD)

Compound Graphics

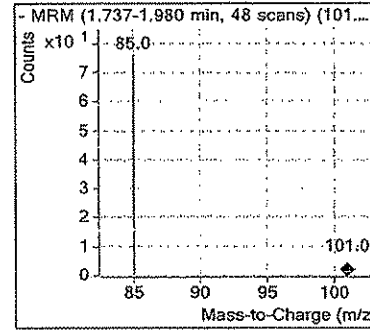
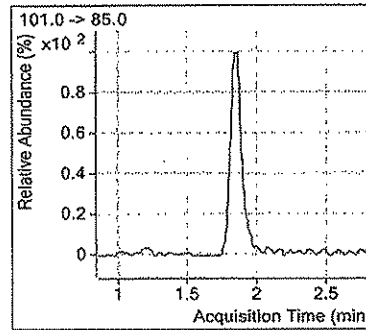
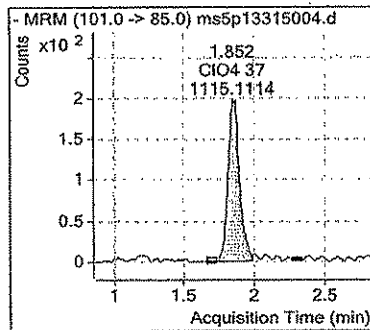
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

Batch Info

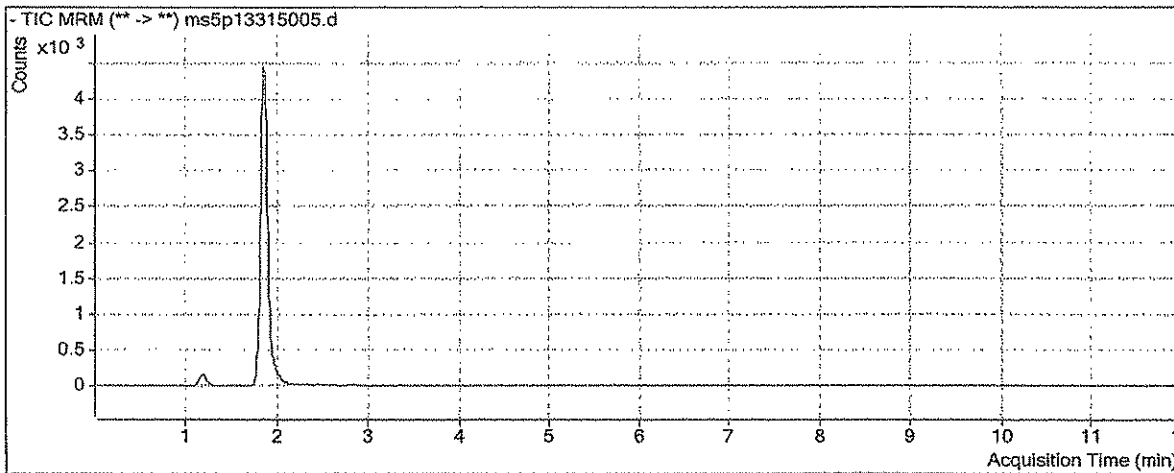
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13315.batch.xml

Analysis Time 2015-05-14 07:55 Analyst Name Administrator
Report Time 2015-05-14 07:56 Reporter Name Administrator
Last Calib Update 2015-05-14 07:51 Batch State ResultsDirty

Analysis Info

Acq Time 2015-05-13 12:20
Data File ms5p13315005.d
Acq Method File clo4_Obell_01.m
Sample Name Perc31524a
Sample Info
Sample Type Calibration
Level L2
Sample Pos P1-A5

Sample Chromatogram



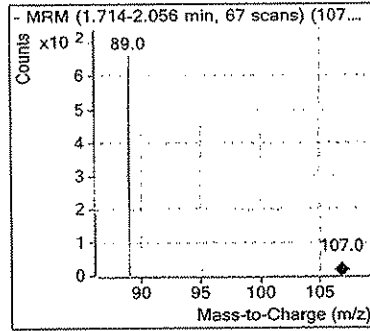
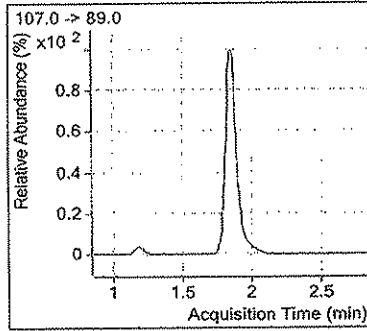
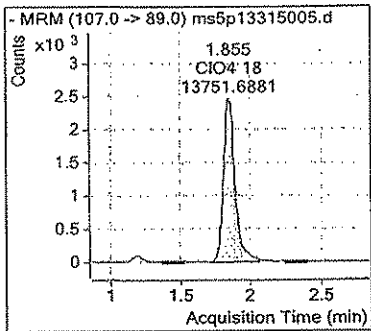
Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.855	8306	13752	0.6	1.0266	102.7
ClO4 37	ClO4 18	1.853	2900	13752	0.2	1.0556	105.6

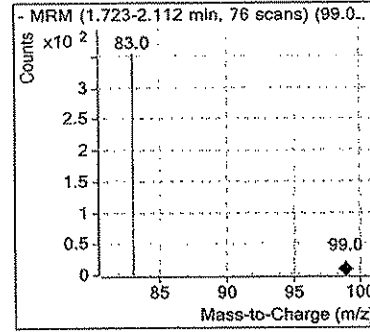
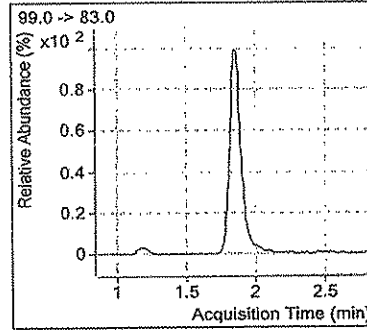
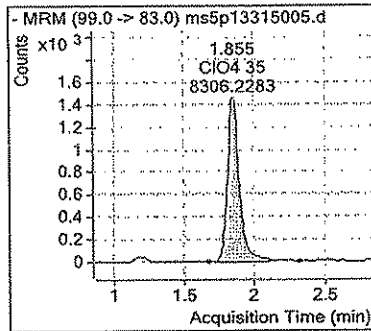
Quant Sample Report (ISTD)

Compound Graphics

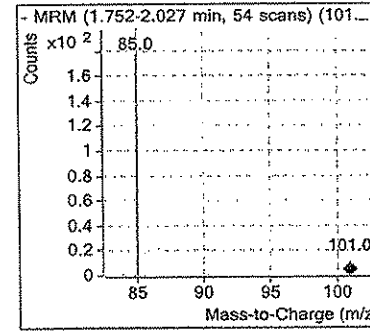
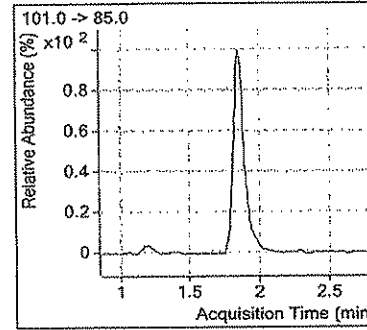
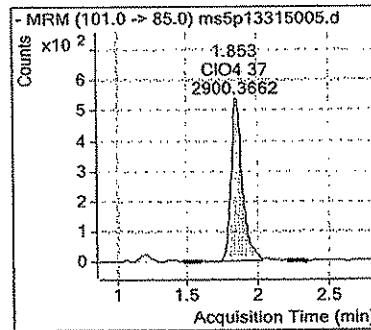
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

Batch Info

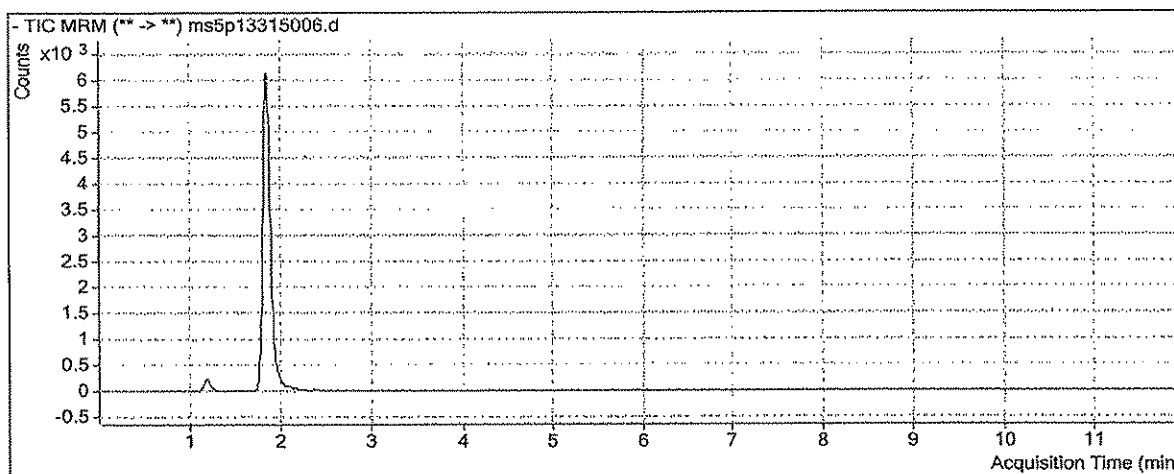
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13315.batch.xml

Analysis Time 2015-05-14 07:55 Analyst Name Administrator
Report Time 2015-05-14 07:56 Reporter Name Administrator
Last Calib Update 2015-05-14 07:51 Batch State ResultsDirty

Analysis Info

Acq Time 2015-05-13 12:33
Data File ms5p13315006.d
Acq Method File clo4_Obeli_01.m
Sample Name Perc41524a
Sample Info
Sample Type Calibration
Level L3
Sample Pos P1-A6

Sample Chromatogram



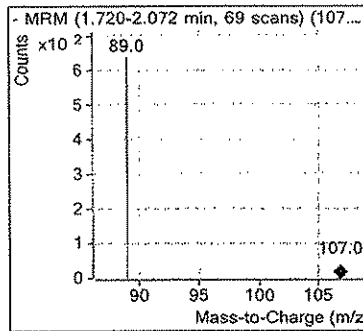
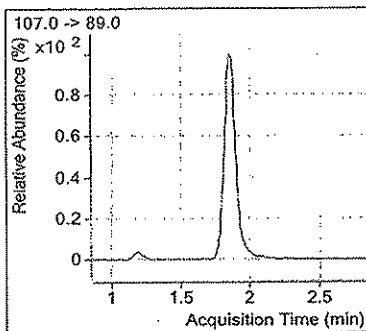
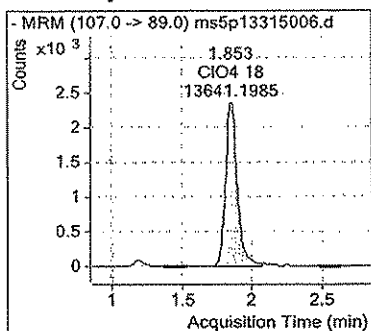
Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.854	15608	13641	1.1	1.9139	95.7
ClO4 37	ClO4 18	1.852	5567	13641	0.4	2.0714	103.6

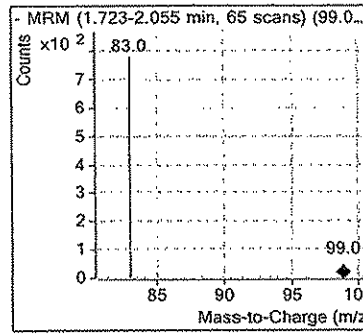
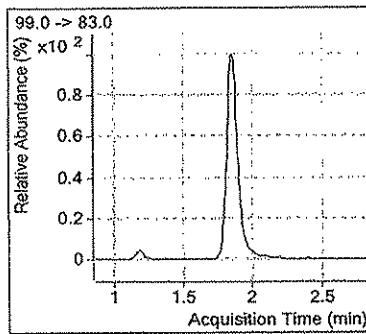
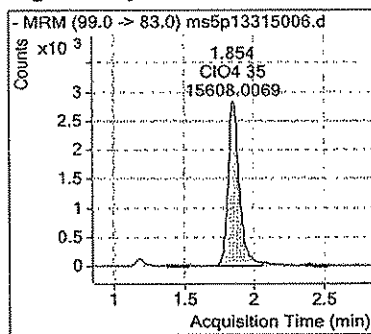
Quant Sample Report (ISTD)

Compound Graphics

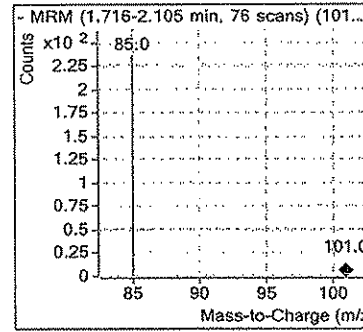
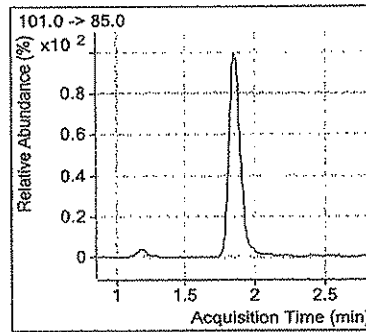
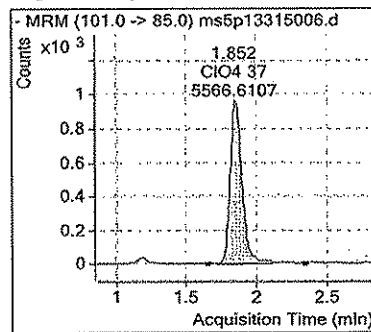
ISTD Compound C104 18



Target Compound C104 35



Target Compound C104 37



Quant Sample Report (ISTD)

Batch Info

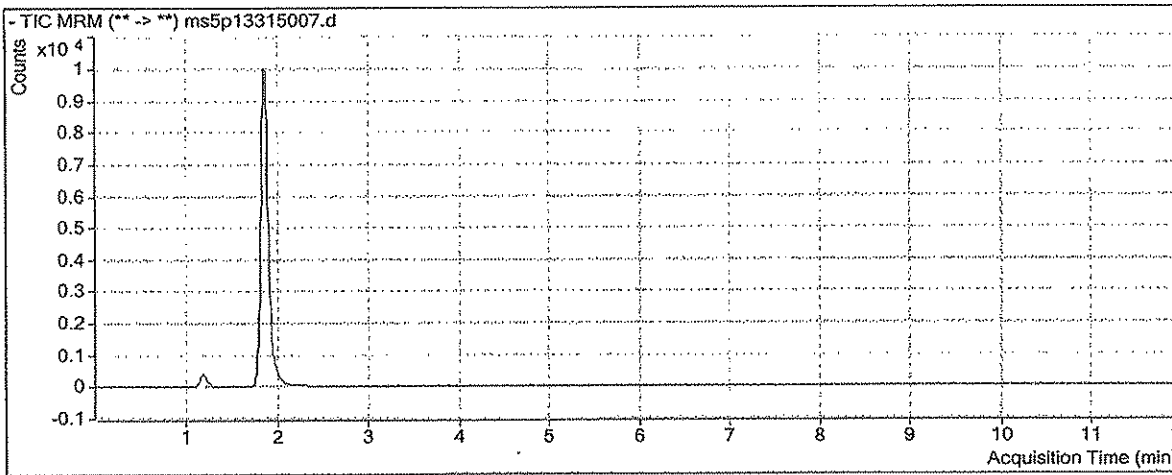
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13315.batch.xml

Analysis Time 2015-05-14 07:55 Analyst Name Administrator
Report Time 2015-05-14 07:56 Reporter Name Administrator
Last Calib Update 2015-05-14 07:51 Batch State ResultsDirty

Analysis Info

Acq Time 2015-05-13 12:46
Data File ms5p13315007.d
Acq Method File clo4_Obeli_01.m
Sample Name Perc51524a
Sample Info
Sample Type Calibration
Level L4
Sample Pos P1-A7

Sample Chromatogram



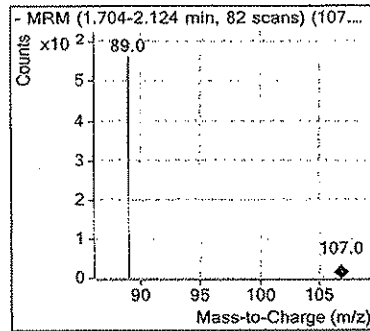
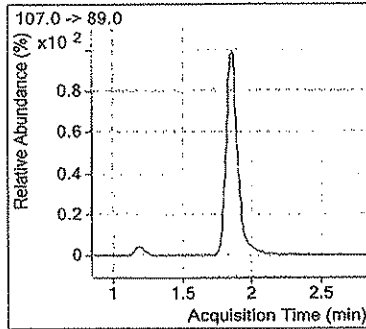
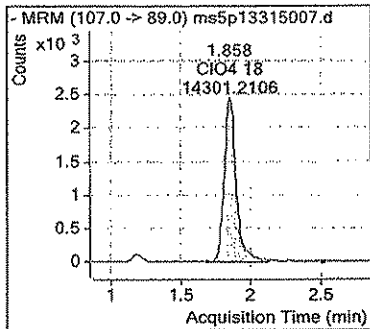
Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.854	31856	14301	2.2	3.6933	92.3
ClO4 37	ClO4 18	1.858	10849	14301	0.8	3.8772	96.9

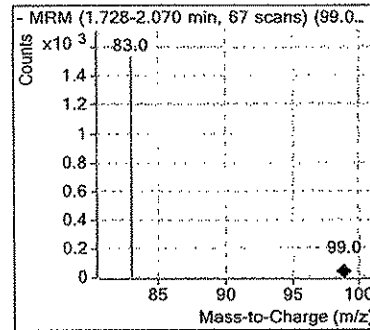
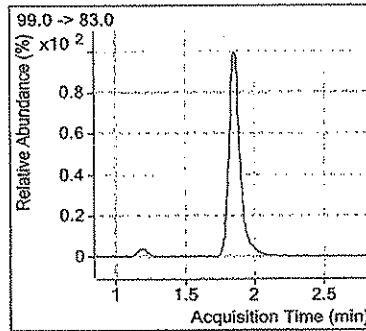
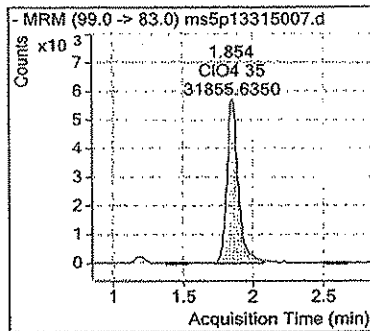
Quant Sample Report (ISTD)

Compound Graphics

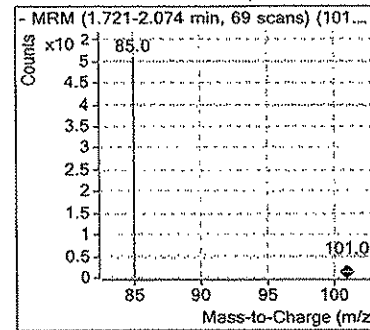
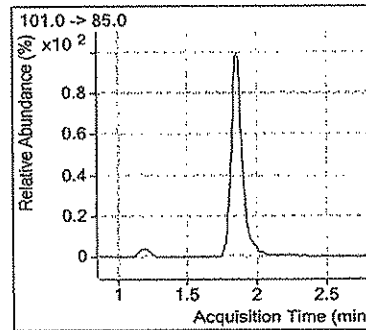
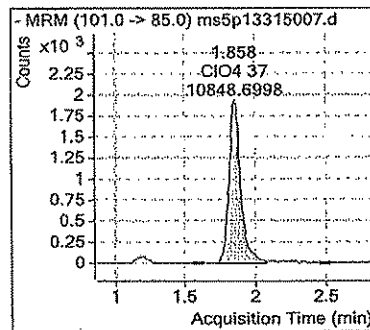
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

Batch Info

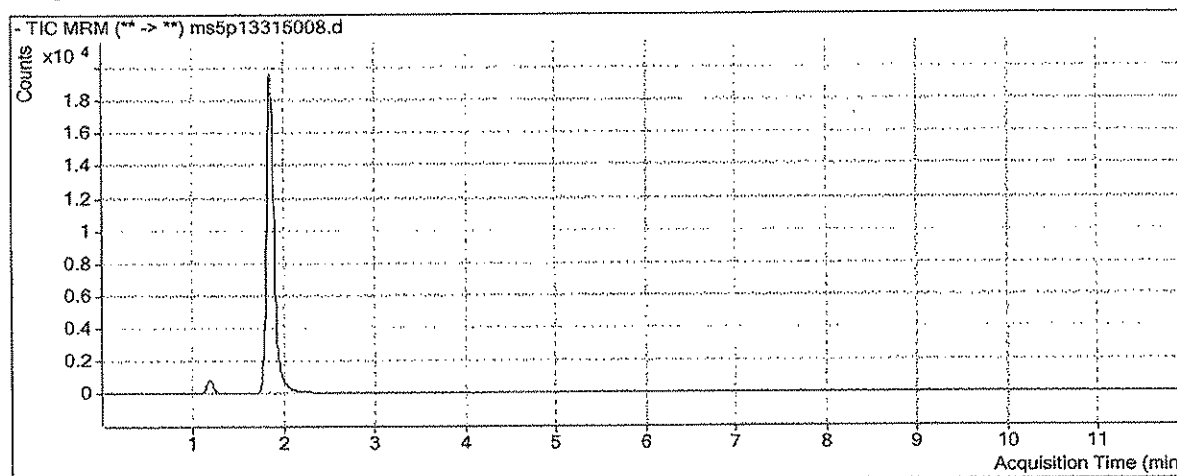
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13315.batch.xml

Analysis Time 2015-05-14 07:55 Analyst Name Administrator
Report Time 2015-05-14 07:56 Reporter Name Administrator
Last Calib Update 2015-05-14 07:51 Batch State ResultsDirty

Analysis Info

Acq Time 2015-05-13 12:58
Data File ms5p13315008.d
Acq Method File clo4_Obeli_01.m
Sample Name Perc61524a
Sample Info
Sample Type Calibration
Level L5
Sample Pos P1-A8

Sample Chromatogram



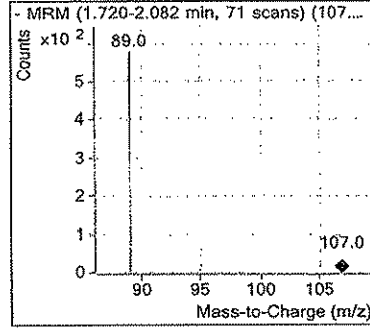
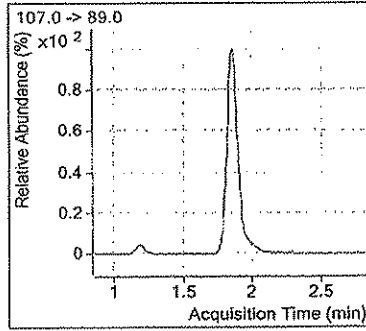
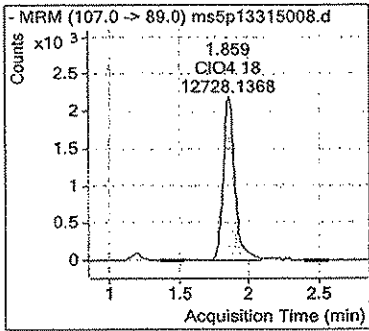
Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.860	75765	12728	6.0	9.8118	98.1
ClO4 37	ClO4 18	1.858	24337	12728	1.9	9.8202	98.2

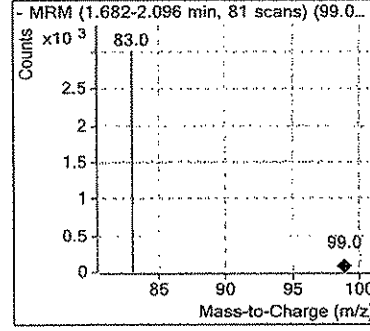
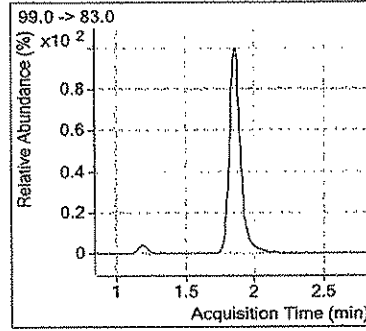
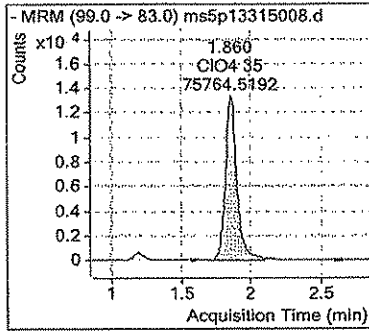
Quant Sample Report (ISTD)

Compound Graphics

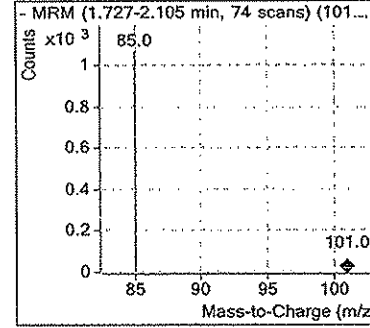
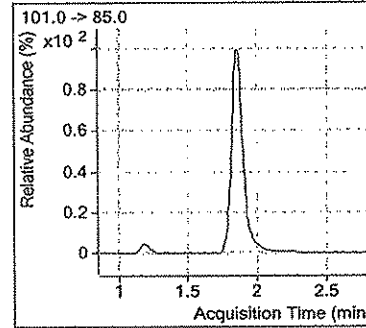
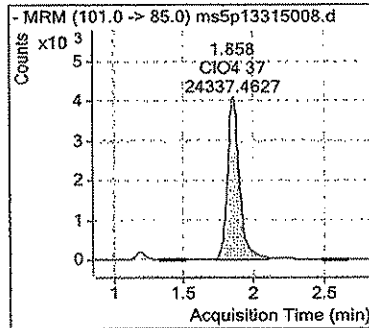
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

Batch Info

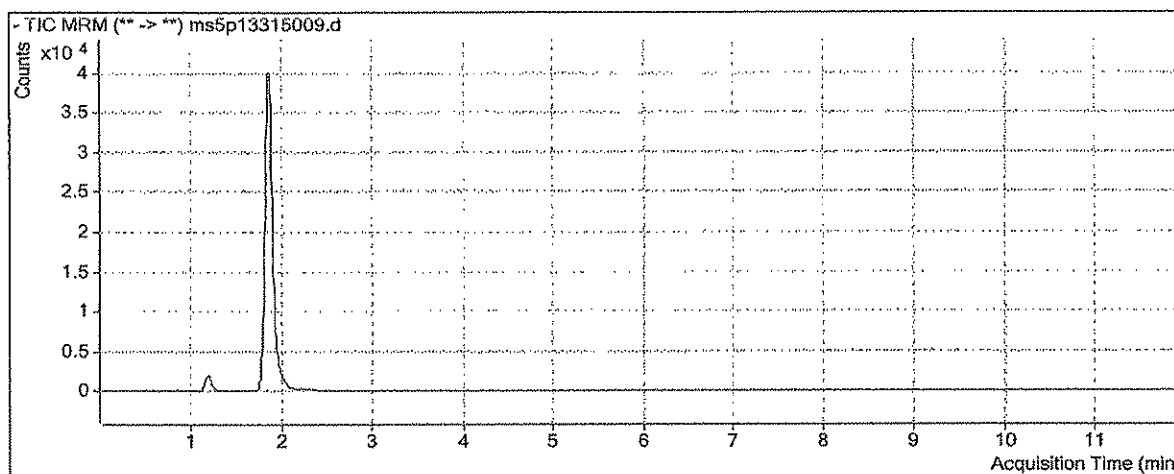
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13315.batch.xml

Analysis Time 2015-05-14 07:55 Analyst Name Administrator
Report Time 2015-05-14 07:56 Reporter Name Administrator
Last Calib Update 2015-05-14 07:51 Batch State ResultsDirty

Analysis Info

Acq Time 2015-05-13 13:11
Data File ms5p13315009.d
Acq Method File clo4_Obell_01.m
Sample Name Perc71524a
Sample Info
Sample Type Calibration
Level L6
Sample Pos P1-A9

Sample Chromatogram



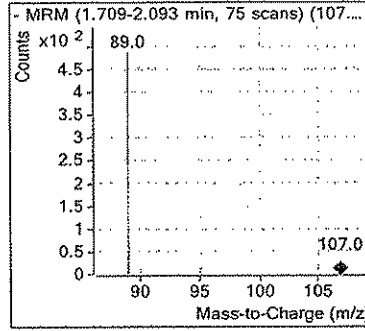
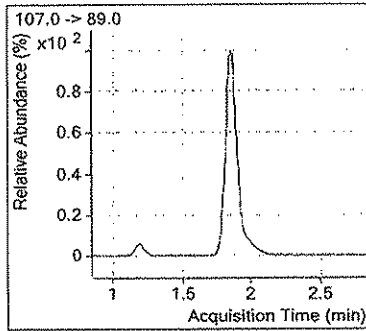
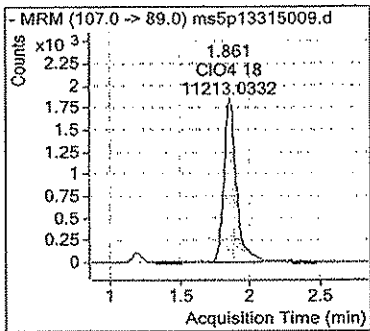
Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.862	173965	11213	15.5	25.5179	102.1
ClO4 37	ClO4 18	1.861	54904	11213	4.9	25.1957	100.8

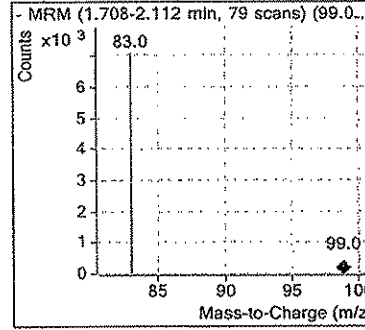
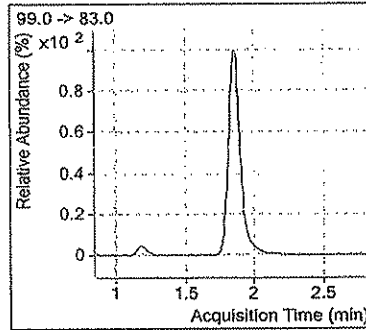
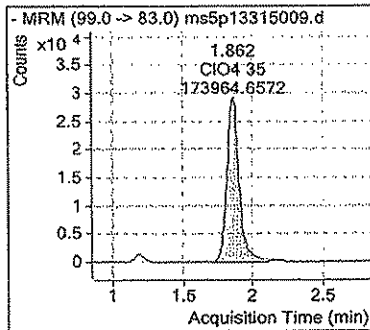
Quant Sample Report (ISTD)

Compound Graphics

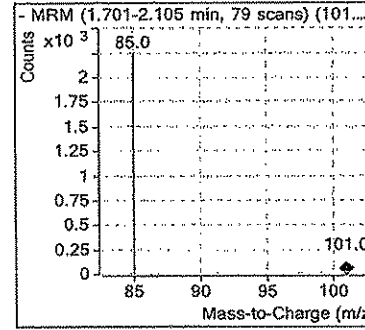
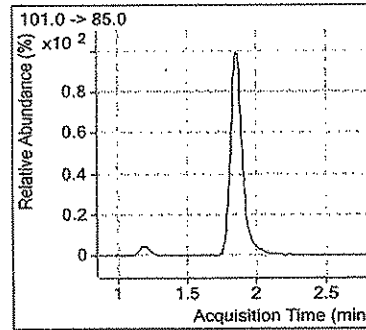
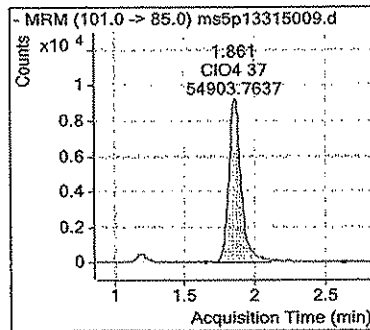
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

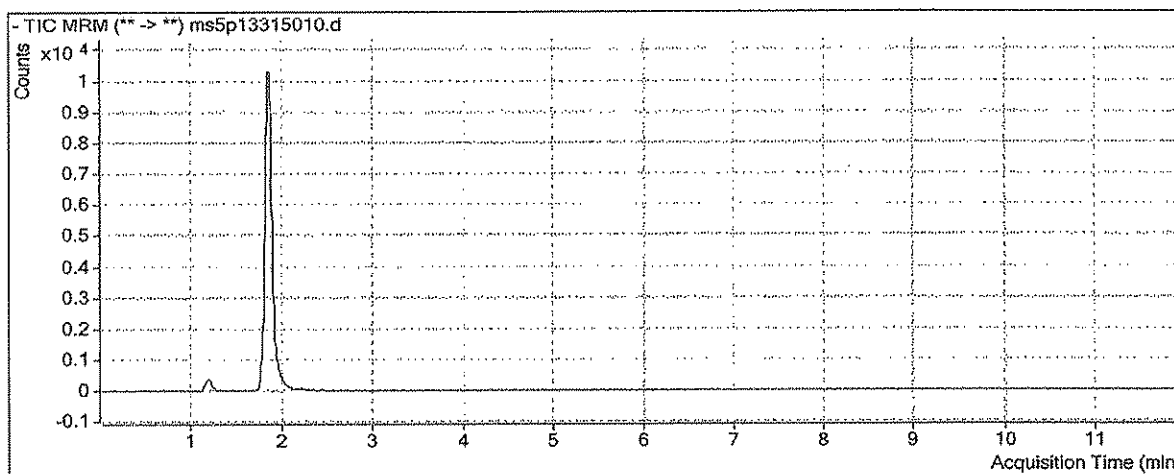
Batch Info

Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13315.batch.xml
Analysis Time 2015-05-14 07:55 **Analyst Name** Administrator
Report Time 2015-05-14 07:56 **Reporter Name** Administrator
Last Calib Update 2015-05-14 07:51 **Batch State** ResultsDirty

Analysis Info

Acq Time 2015-05-13 13:24
Data File ms5p13315010.d
Acq Method File clo4_Obeli_01.m
Sample Name lcperc51424b
Sample Info
Sample Type Sample
Level
Sample Pos P1-B1

Sample Chromatogram



Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.859	32817	14150	2.3	3.8440	
ClO4 37	ClO4 18	1.858	10683	14150	0.8	3.8586	
			3,07	107			


 Valerio L. Fontana
 Principal Specialist

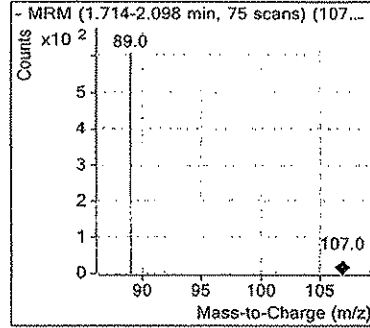
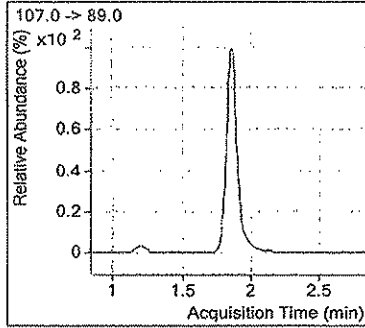
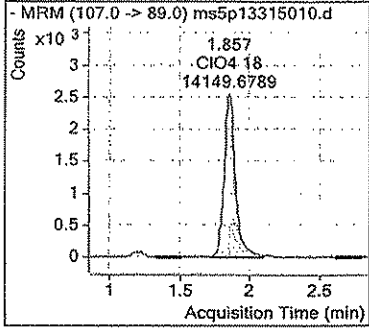
MAY 15 2015

Handwritten initials/signature

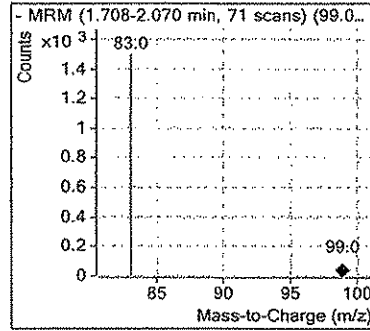
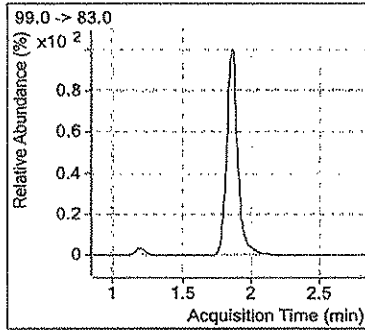
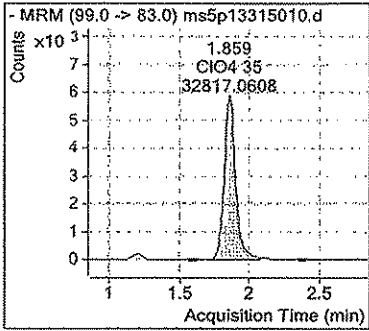
Quant Sample Report (ISTD)

Compound Graphics

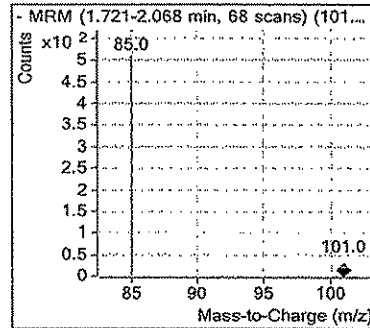
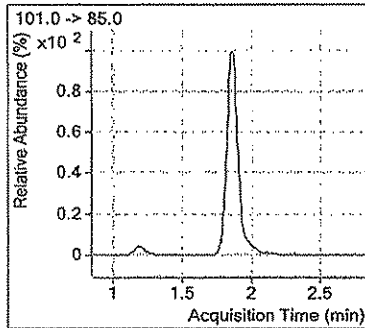
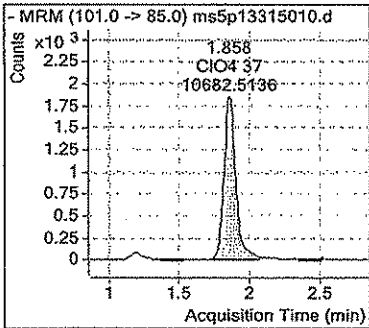
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

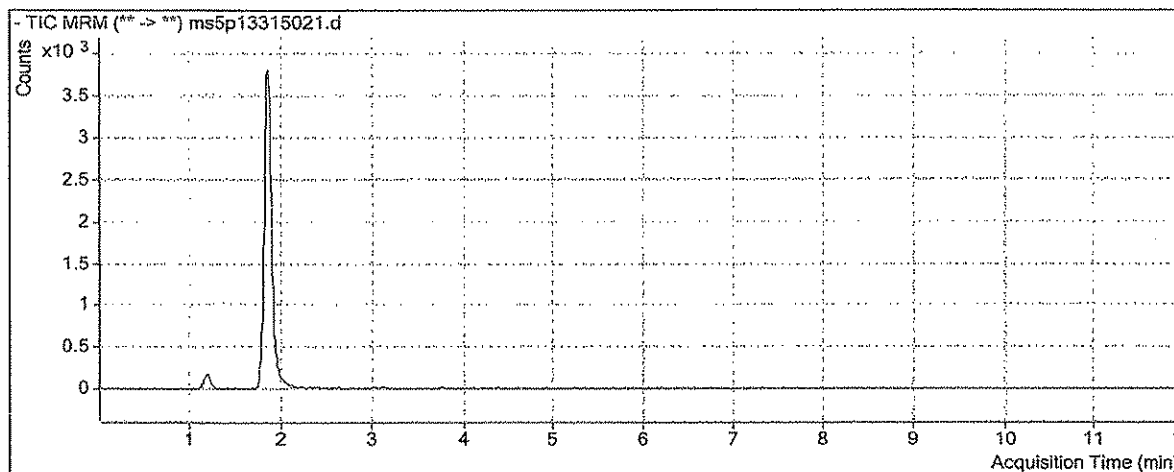
Batch Info

Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13315.batch.xml
Analysis Time 2015-05-14 07:55 **Analyst Name** Administrator
Report Time 2015-05-14 07:56 **Reporter Name** Administrator
Last Calib Update 2015-05-14 07:51 **Batch State** ResultsDirty

Analysis Info

Acq Time 2015-05-13 15:43
Data File ms5p13315021.d
Acq Method File clo4_Obeli_01.m
Sample Name lcperc21424d
Sample Info 151320017A
Sample Type Sample
Level
Sample Pos P1-C3

Sample Chromatogram



Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.857	3735	16657	0.2	0.4028	
ClO4 37	ClO4 18	1.862	1183	16657	0.1	0.3348	
			3.16	126			


 Valerie L. Tomayko
 Principal Specialist

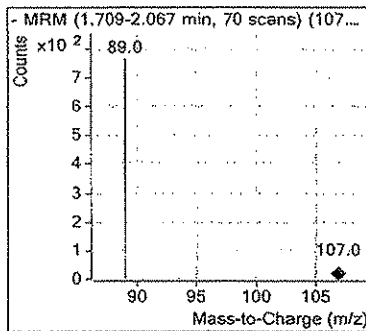
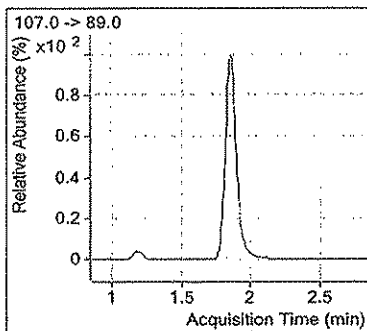
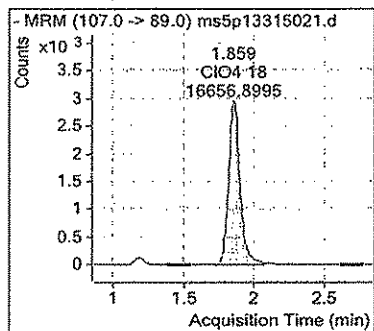
MAY 15 2015

Handwritten signature

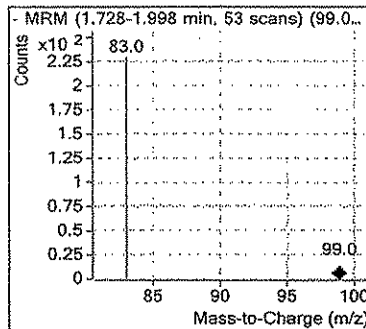
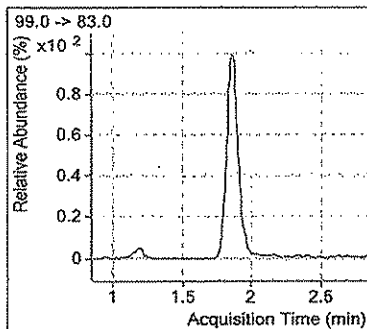
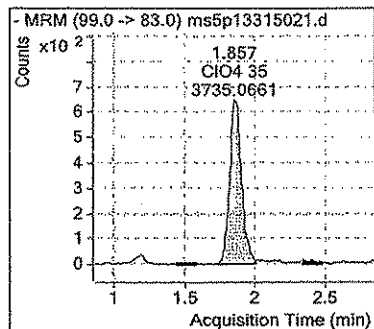
Quant Sample Report (ISTD)

Compound Graphics

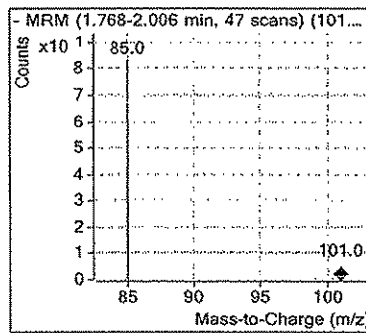
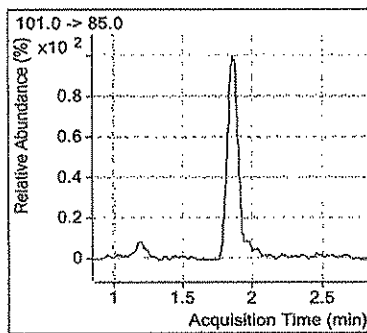
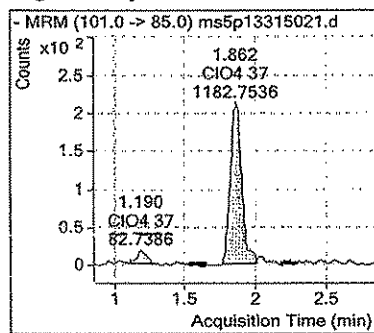
ISTD Compound C104 18



Target Compound C104 35



Target Compound C104 37



Worklist Report

Worklist Path: D:\MassHunter\Worklists\ms5p13415.wkl

Worklist Run Parameters

```

Operator Name:
Run Type: Standard Start
Part of Method to Run: Acquisition Only
Execution for Acquisition-DA: Synchronous
Acquisition Method Path: D:\MassHunter\methods
DA Method Path: D:\MassHunter\methods
Data File Path: D:\MassHunter\data
Pre-Worklist Script:
Post-Worklist Script:
Acquisition Clean Up Script:
Overlapped Injection: Yes
Clear sample selection after run: Yes
Wait Time for Ready(Min): 10
Threshold Disk Value(MB): 10240
Comment:
    
```

Worklist Table

Sample Name	Sample Position	Method	Data File	Sample Type	Level Name	Dilution	Comment
Conditioner	P1-A1	cl04_Obell_01.m	D:\MassHunter\data\perchlorate\ms5p13415001.d	Sample		1	
Conditioner	P1-A1	cl04_Obell_01.m	D:\MassHunter\data\perchlorate\ms5p13415002.d	Sample		1	
Conditioner	P1-A2	cl04_Obell_01.m	D:\MassHunter\data\perchlorate\ms5p13415002a.d	Sample		1	
Conditioner	P1-A2	cl04_Obell_01.m	D:\MassHunter\data\perchlorate\ms5p13415002b.d	Sample		1	
Perc11524a	P1-A3	cl04_Obell_01.m	D:\MassHunter\data\perchlorate\ms5p13415003.d	Sample		1	
Perc21524a	P1-A4	cl04_Obell_01.m	D:\MassHunter\data\perchlorate\ms5p13415004.d	Calibration	L1	1	

Perc31524a	P1-A5	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415005.d	Calibration	L2	1	
Perc41524a	P1-A6	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415006.d	Calibration	L3	1	
Perc51524a	P1-A7	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415007.d	Calibration	L4	1	
Perc61524a	P1-A8	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415008.d	Calibration	L5	1	
Perc71524a	P1-A9	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415009.d	Calibration	L6	1	
lperc51424b	P1-B1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415010.d	Sample		1	
BLANKA	P1-B2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415011.d	Sample		1	151340030A
LCSA	P1-B3	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415012.d	Sample		1	151340030A
ICS	P1-B4	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415013.d	Sample		1	151340030A
7873709	P1-B5	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415014.d	Sample		1	151340030A
7873709MS	P1-B6	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415015.d	Sample		1	151340030A
7873709MSD	P1-B7	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415016.d	Sample		1	151340030A
7877123 df10	P1-B8	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415017.d	Sample		10	151340030A
7877125	P1-B9	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415018.d	Sample		1	151340030A
7879425	P1-C1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415019.d	Sample		1	151340030A
7879426	P1-C2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415020.d	Sample		1	151340030A
lperc21424d	P1-C3	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415021.d	Sample		1	
BLANKA	P1-C4	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415022.d	Sample		1	151340031A
LCSA	P1-C5	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415023.d	Sample		1	151340031A
7883274	P1-C6	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415024.d	Sample		1	151340031A
7883275	P1-C7	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415025.d	Sample		1	151340031A
7883276	P1-C8	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415026.d	Sample		1	151340031A
7883277	P1-C9	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415027.d	Sample		1	151340031A
7883278	P1-D1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415028.d	Sample		1	151340031A
7883279	P1-D2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415029.d	Sample		1	151340031A
7883280	P1-D3	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415030.d	Sample		1	151340031A
7883281	P1-D4	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415031.d	Sample		1	151340031A
lperc51424b	P1-B1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415032.d	Sample		1	
7883282	P1-D6	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415033.d	Sample		1	151340031A
7883283	P1-D7	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415034.d	Sample		1	151340031A
7883284	P1-D8	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415035.d	Sample		1	151340031A
7883285	P1-D9	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415036.d	Sample		1	151340031A

7883286	P1-E1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415037.d	Sample	1	151340031A
7883287MS	P1-E2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415038.d	Sample	1	151340031A
7883288MSD	P1-E3	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415039.d	Sample	1	151340031A
7883289	P1-E4	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415040.d	Sample	1	151340031A
7883290	P1-E5	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415041.d	Sample	1	151340031A
7883291	P1-E6	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415042.d	Sample	1	151340031A
lcpirc21424d	P1-C3	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415043.d	Sample	1	
7883292	P1-E8	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415044.d	Sample	1	151340031A
7883293	P1-E9	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415045.d	Sample	1	151340031A
7883294	P1-F1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415046.d	Sample	1	151340031A
7883295	P1-F2	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415047.d	Sample	1	151340031A
lcpirc51424b	P1-B1	clo4_Obeli_01.m	D:\MassHunter\data\perchlorate\ms5p13415048.d	Sample	1	
SCP_InstrumentStandby()\Acquisition : AcqEngSystem : SCP_System}						

Quant Sample Report (ISTD)

Batch Info

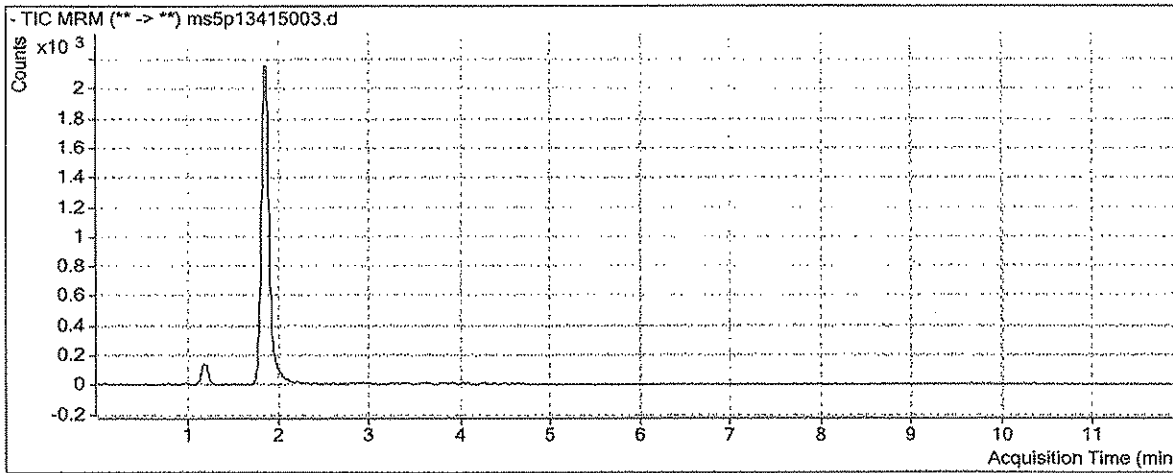
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13415.batch.xml

Analysis Time 2015-05-15 07:54 **Analyst Name** Administrator
Report Time 2015-05-15 07:55 **Reporter Name** Administrator
Last Calib Update 2015-05-15 07:47 **Batch State** ResultsDirty

Analysis Info

Acq Time 2015-05-14 15:15
Data File ms5p13415003.d
Acq Method File do4_Obeli_01.m
Sample Name Perc11524a
Sample Info
Sample Type Sample
Level
Sample Pos P1-A3

Sample Chromatogram



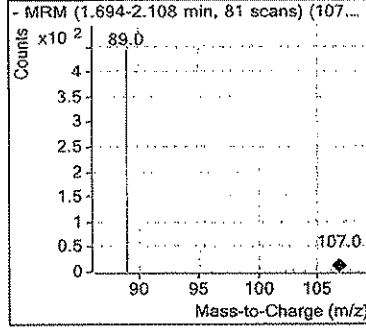
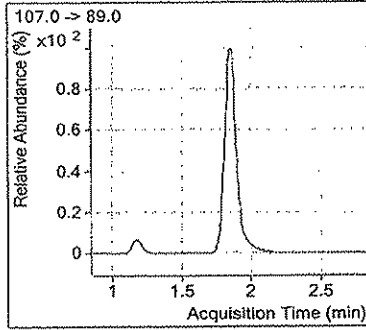
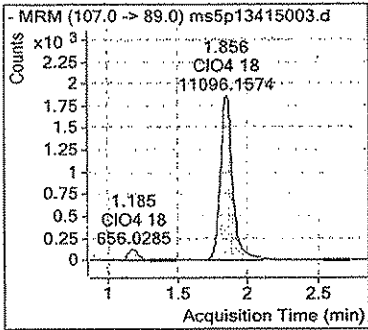
Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.855	1399	11096	0.1	0.2525	
ClO4 37	ClO4 18	1.847	408	11096	0.0	0.1925	

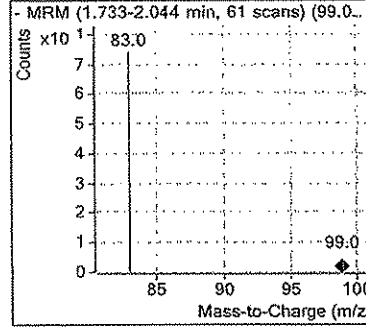
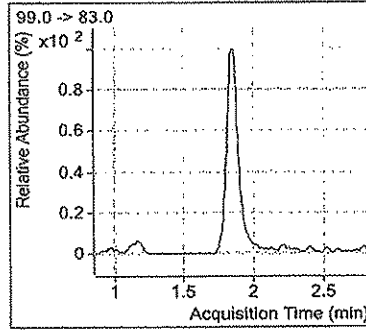
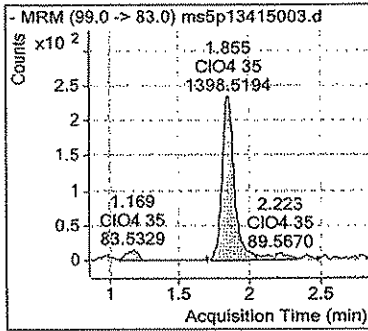
Quant Sample Report (ISTD)

Compound Graphics

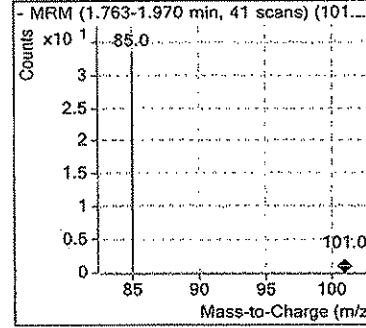
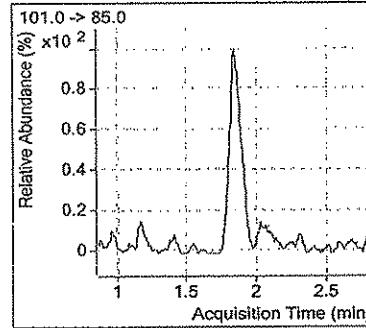
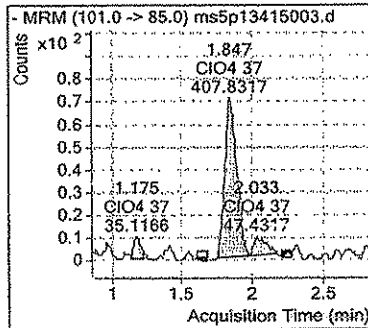
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

Batch Info

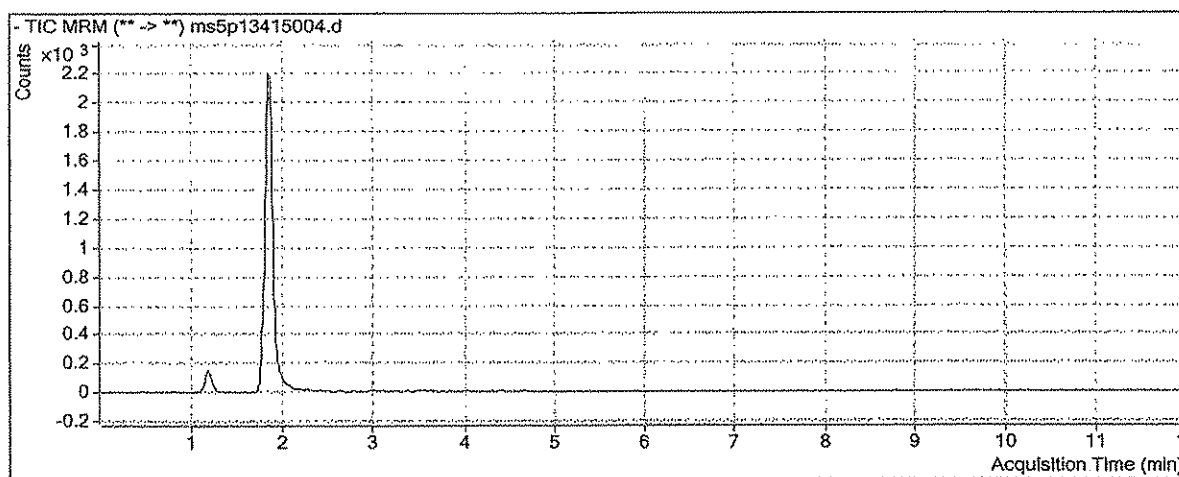
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13415.batch.xml

Analysis Time 2015-05-15 07:54 Analyst Name Administrator
Report Time 2015-05-15 07:55 Reporter Name Administrator
Last Calib Update 2015-05-15 07:47 Batch State ResultsDirty

Analysis Info

Acq Time 2015-05-14 15:28
Data File ms5p13415004.d
Acq Method File clo4_Obeli_01.m
Sample Name Perc21524a
Sample Info
Sample Type Calibration
Level L1
Sample Pos P1-A4

Sample Chromatogram



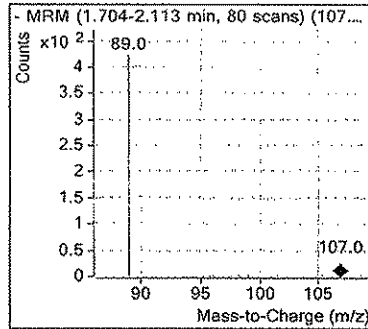
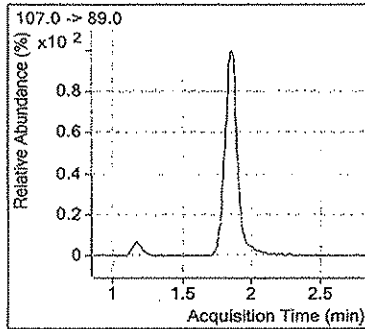
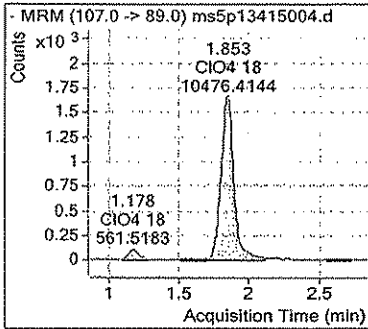
Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.863	2457	10476	0.2	0.4301	107.5
ClO4 37	ClO4 18	1.850	892	10476	0.1	0.4382	109.5

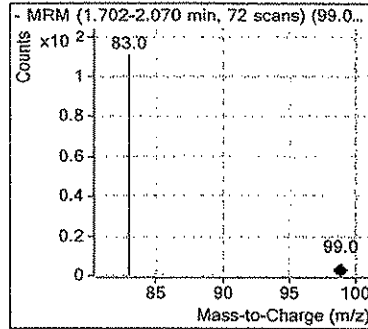
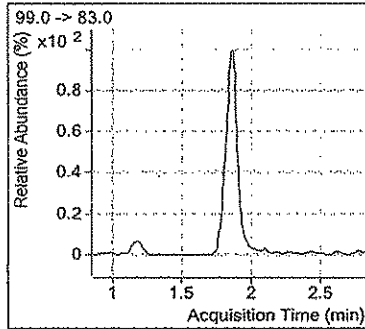
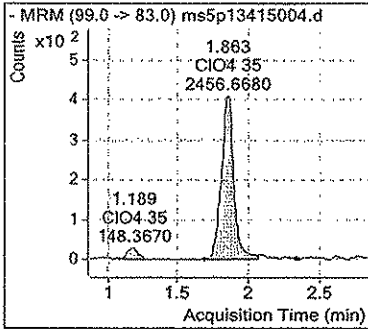
Quant Sample Report (ISTD)

Compound Graphics

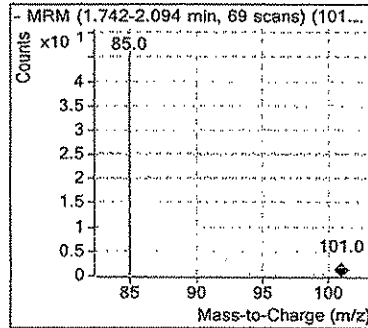
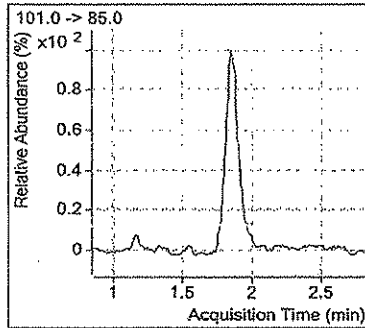
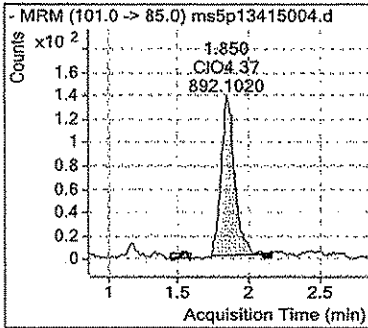
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

Batch Info

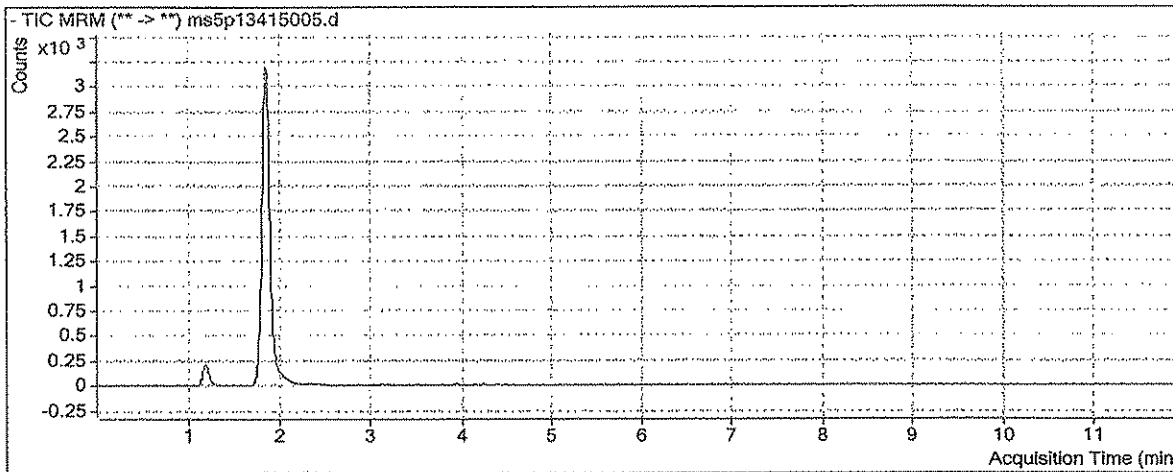
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13415.batch.xml

Analysis Time 2015-05-15 07:54 Analyst Name Administrator
Report Time 2015-05-15 07:55 Reporter Name Administrator
Last Calib Update 2015-05-15 07:47 Batch State ResultsDirty

Analysis Info

Acq Time 2015-05-14 15:40
Data File ms5p13415005.d
Acq Method File clo4_Obeli_01.m
Sample Name Perc31524a
Sample Info
Sample Type Calibration
Level L2
Sample Pos P1-A5

Sample Chromatogram



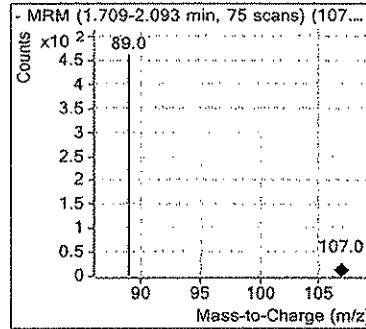
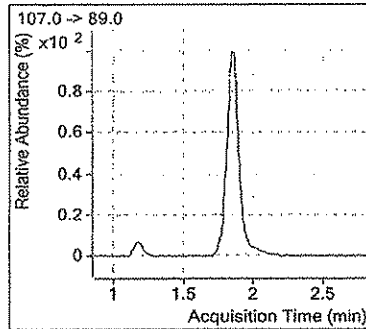
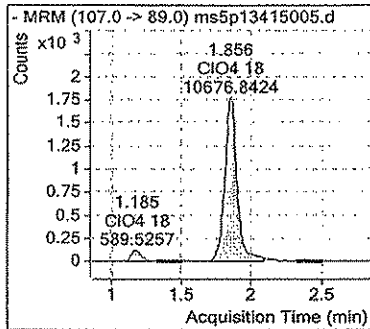
Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.854	6420	10677	0.6	1.0306	103.1
ClO4 37	ClO4 18	1.842	2129	10677	0.2	1.0182	101.8

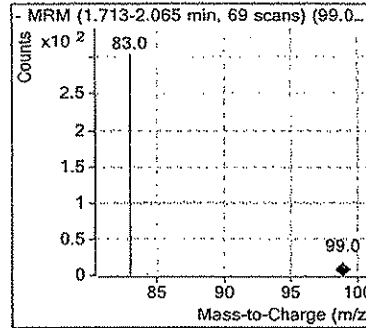
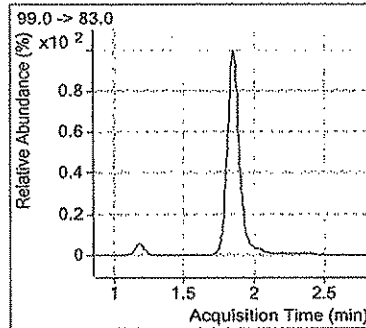
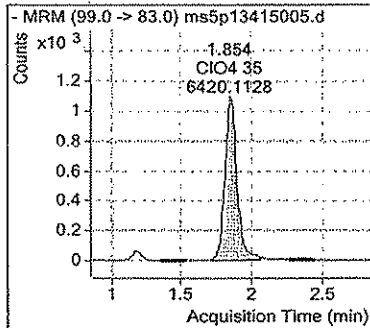
Quant Sample Report (ISTD)

Compound Graphics

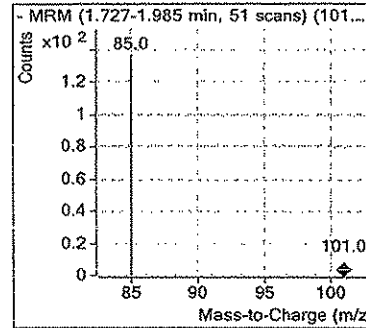
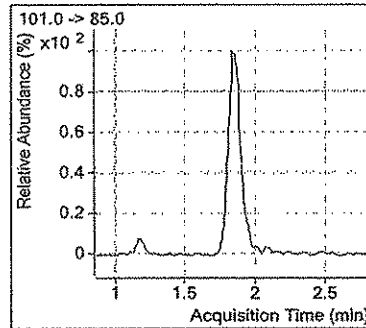
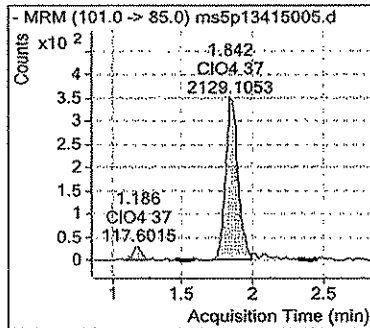
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

Batch Info

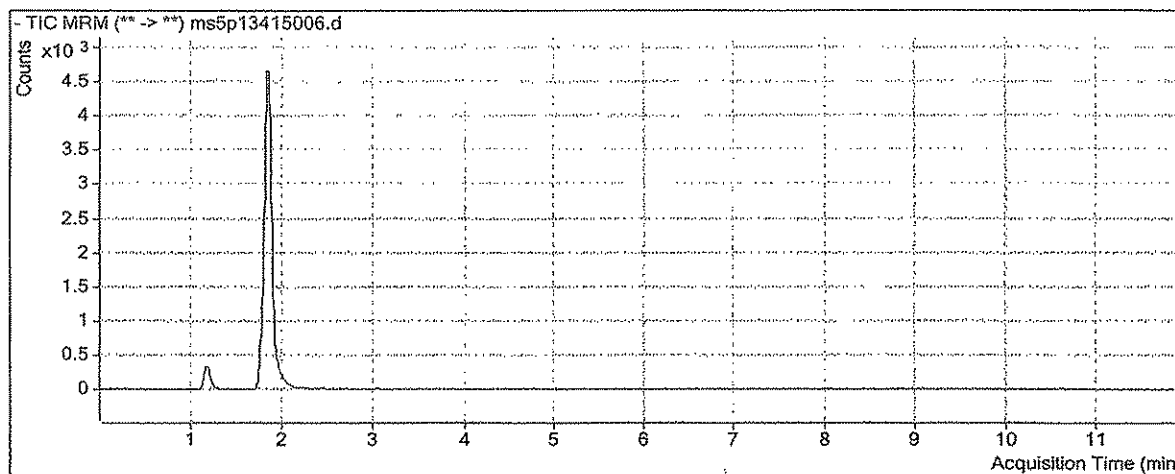
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13415.batch.xml

Analysis Time 2015-05-15 07:54 Analyst Name Administrator
Report Time 2015-05-15 07:55 Reporter Name Administrator
Last Calib Update 2015-05-15 07:47 Batch State ResultsDirty

Analysis Info

Acq Time 2015-05-14 15:53
Data File ms5p13415006.d
Acq Method File clo4_Obeli_01.m
Sample Name Perc41524a
Sample Info
Sample Type Calibration
Level L3
Sample Pos P1-A6

Sample Chromatogram



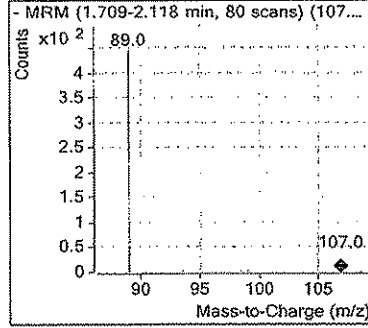
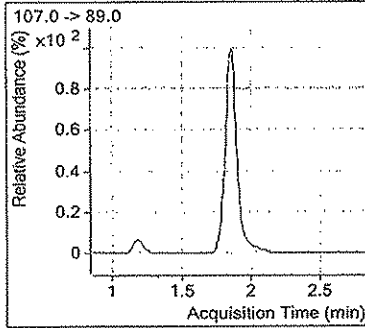
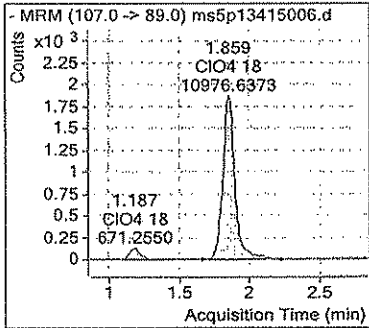
Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.857	12687	10977	1.2	1.9385	96.9
ClO4 37	ClO4 18	1.857	4044	10977	0.4	1.8760	93.8

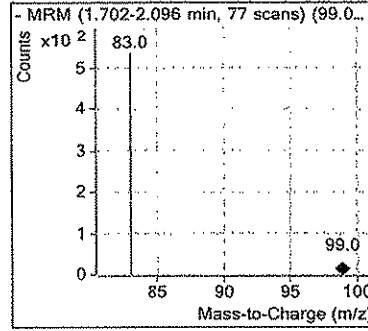
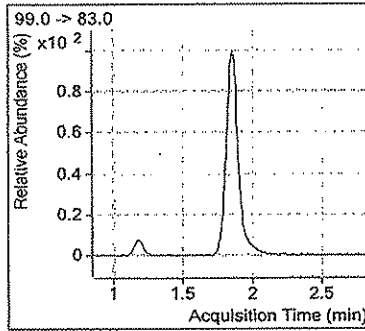
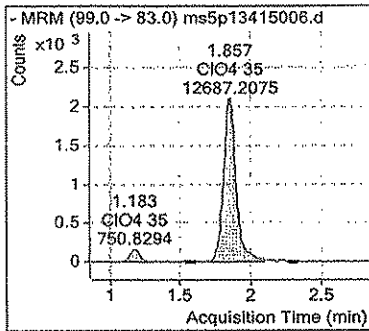
Quant Sample Report (ISTD)

Compound Graphics

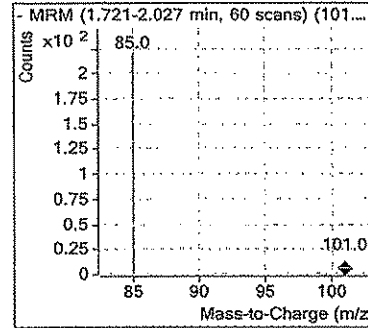
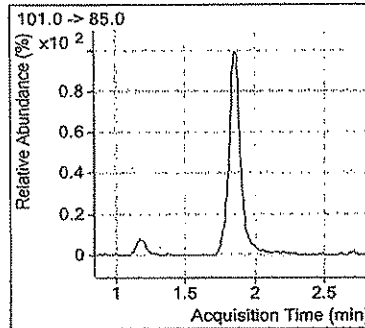
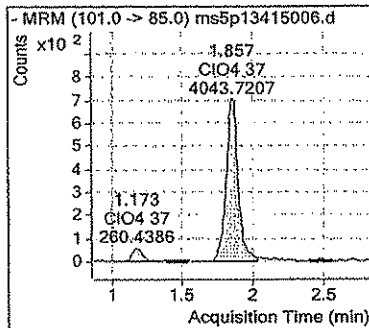
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

Batch Info

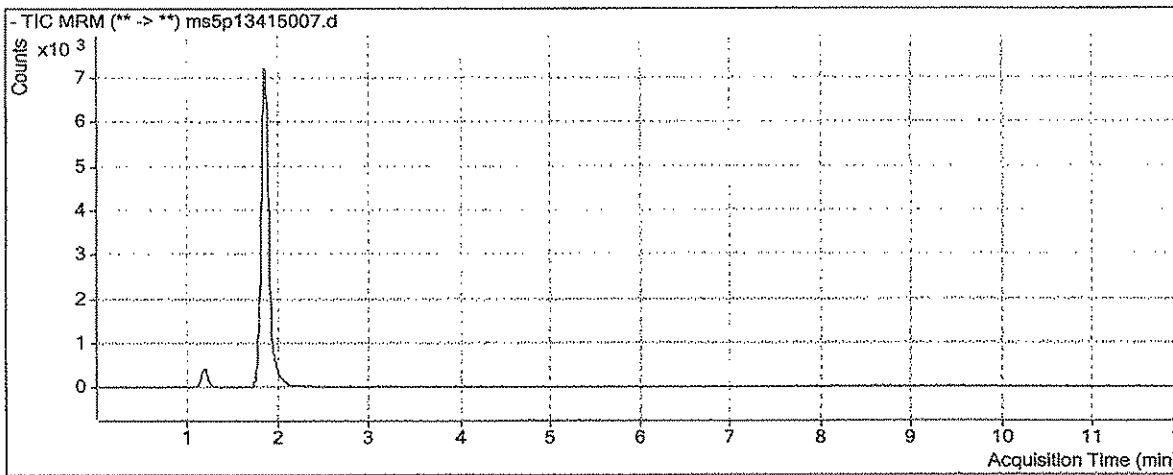
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13415.batch.xml

Analysis Time 2015-05-15 07:54 **Analyst Name** Administrator
Report Time 2015-05-15 07:55 **Reporter Name** Administrator
Last Calib Update 2015-05-15 07:47 **Batch State** ResultsDirty

Analysis Info

Acq Time 2015-05-14 16:06
Data File ms5p13415007.d
Acq Method File clo4_Obeli_01.m
Sample Name Perc51524a
Sample Info
Sample Type Calibration
Level L4
Sample Pos P1-A7

Sample Chromatogram



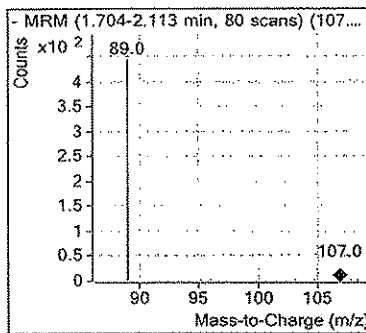
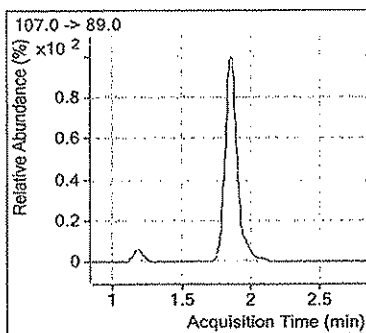
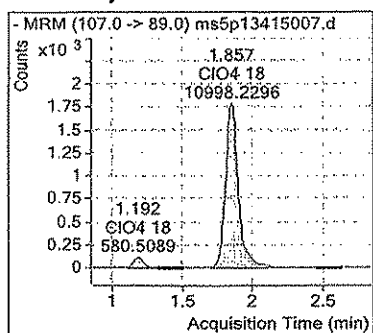
Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.858	24919	10998	2.3	3.7557	93.9
ClO4 37	ClO4 18	1.858	8346	10998	0.8	3.8580	96.4

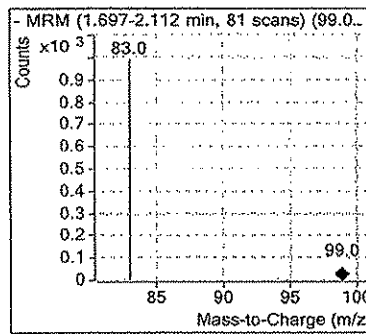
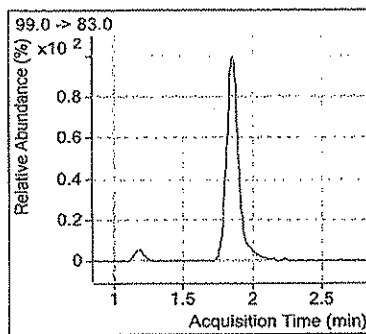
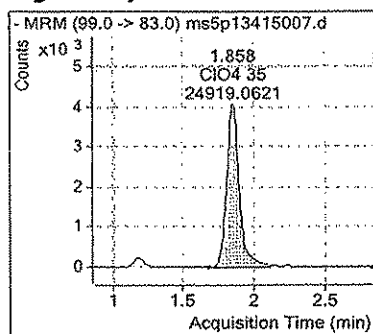
Quant Sample Report (ISTD)

Compound Graphics

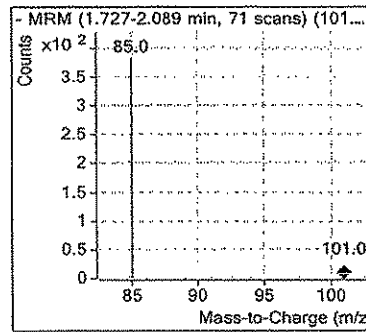
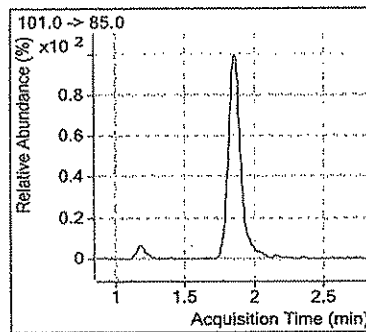
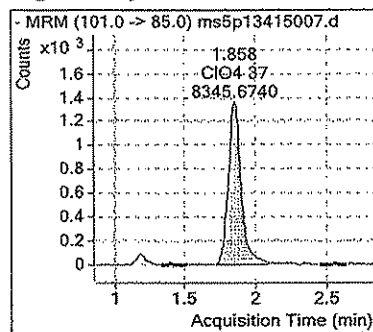
ISTD Compound C104 18



Target Compound C104 35



Target Compound C104 37



Quant Sample Report (ISTD)

Batch Info

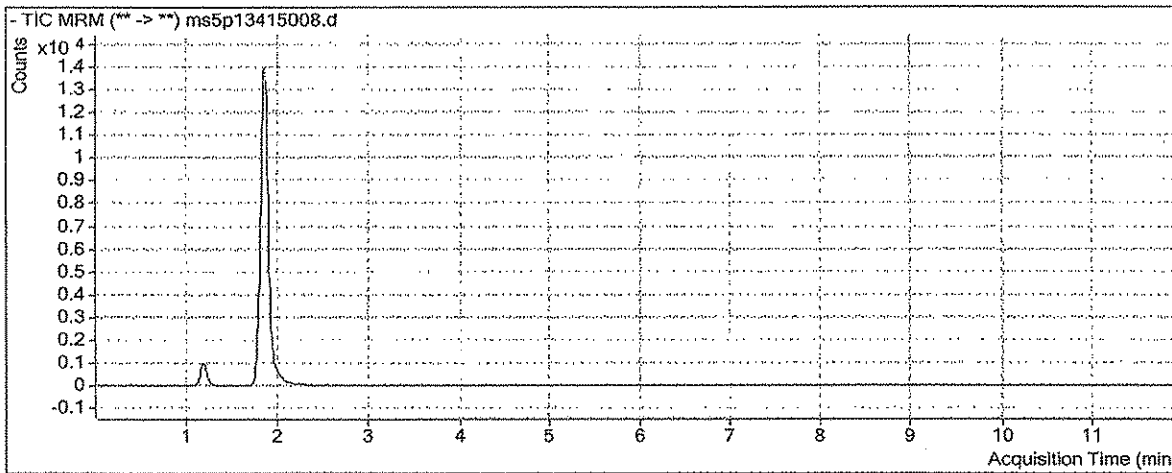
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13415.batch.xml

Analysis Time 2015-05-15 07:54 Analyst Name Administrator
Report Time 2015-05-15 07:55 Reporter Name Administrator
Last Calib Update 2015-05-15 07:47 Batch State ResultsDirty

Analysis Info

Acq Time 2015-05-14 16:19
Data File ms5p13415008.d
Acq Method File do4_Obeli_01.m
Sample Name Perc61524a
Sample Info
Sample Type Calibration
Level L5
Sample Pos P1-A8

Sample Chromatogram



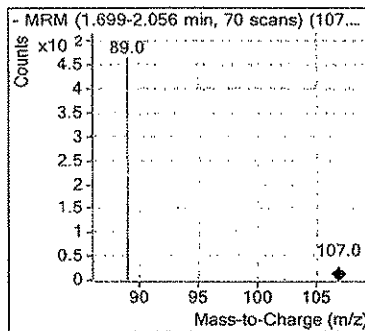
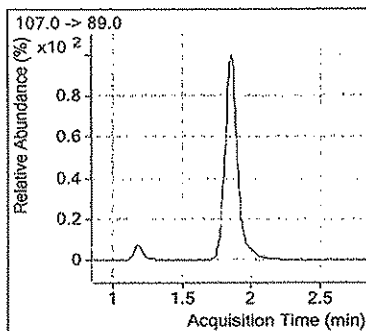
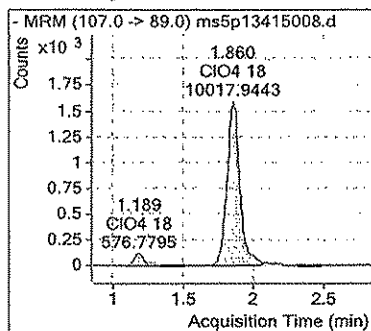
Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.862	58480	10018	5.8	9.6037	96.0
ClO4 37	ClO4 18	1.862	18915	10018	1.9	9.5909	95.9

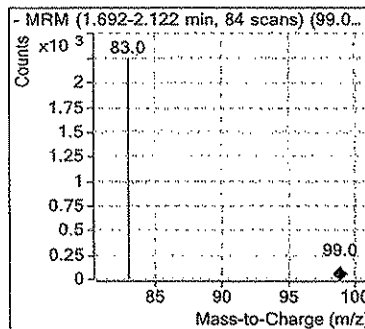
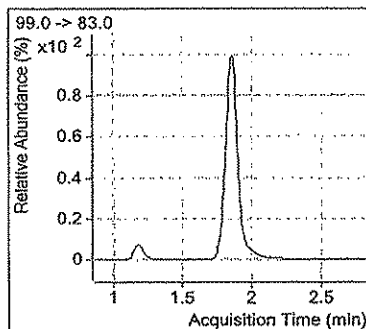
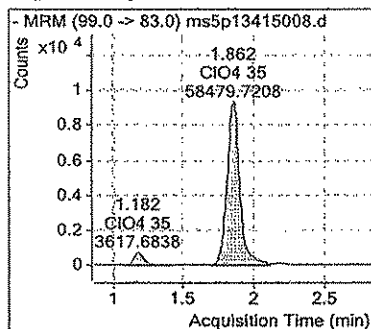
Quant Sample Report (ISTD)

Compound Graphics

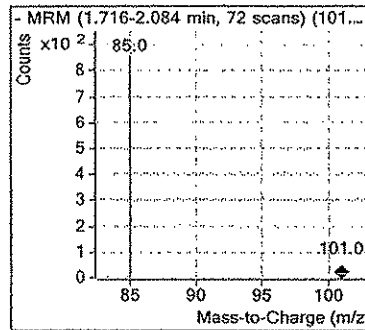
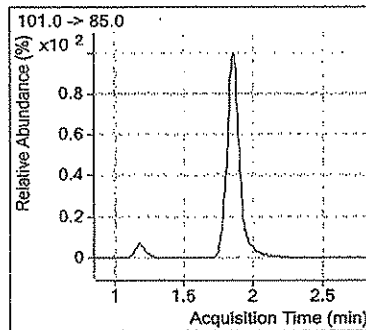
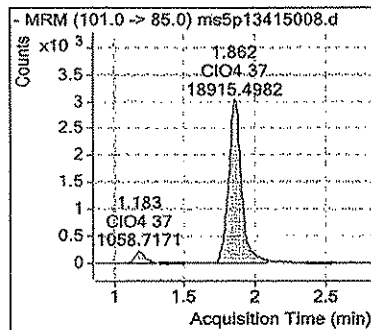
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

Batch Info

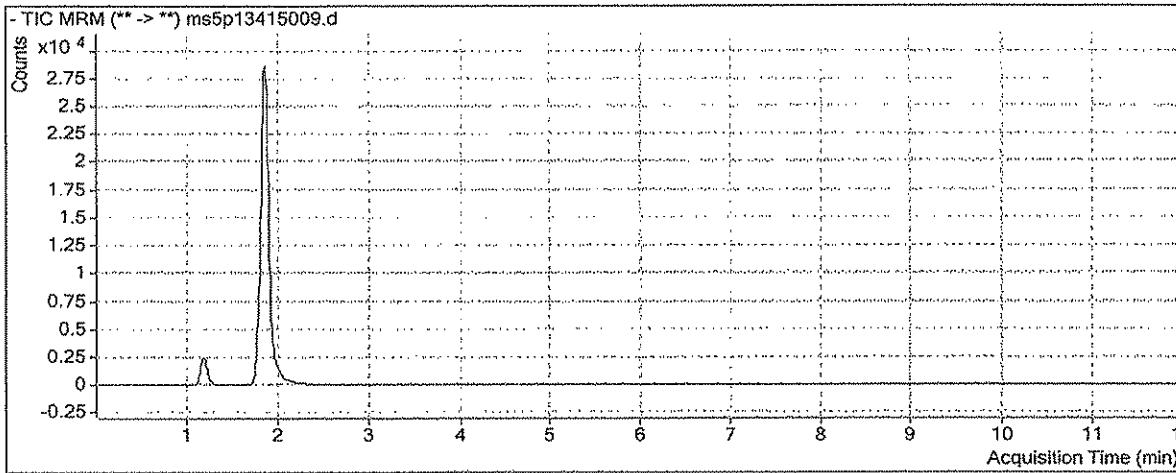
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13415.batch.xml

Analysis Time 2015-05-15 07:54 Analyst Name Administrator
Report Time 2015-05-15 07:55 Reporter Name Administrator
Last Calib Update 2015-05-15 07:47 Batch State ResultsDirty

Analysis Info

Acq Time 2015-05-14 16:31
Data File ms5p13415009.d
Acq Method File clo4_Obell_01.m
Sample Name Perc71524a
Sample Info
Sample Type Calibration
Level L6
Sample Pos P1-A9

Sample Chromatogram



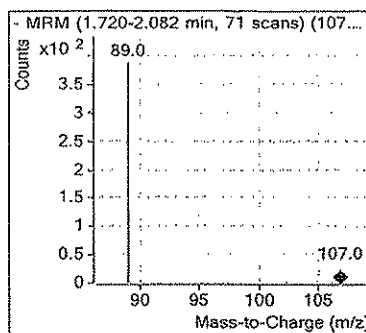
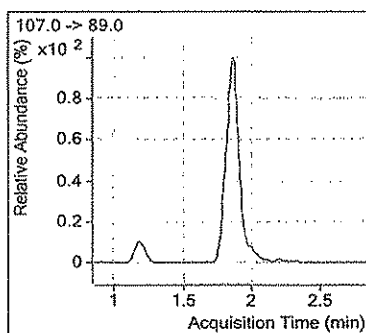
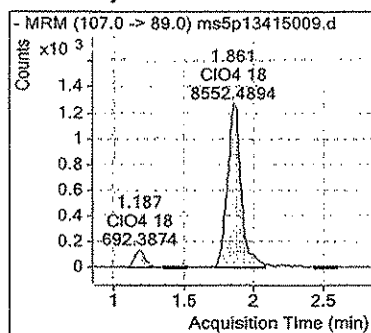
Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.863	133700	8552	15.6	25.6413	102.6
ClO4 37	ClO4 18	1.862	43152	8552	5.0	25.6188	102.5

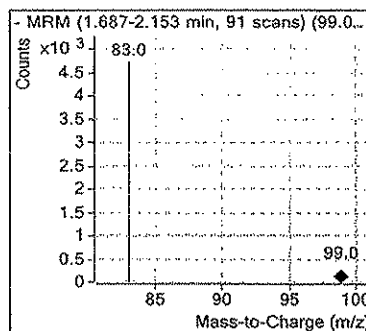
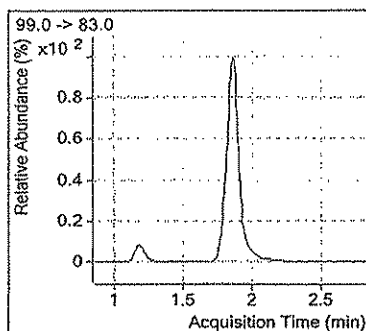
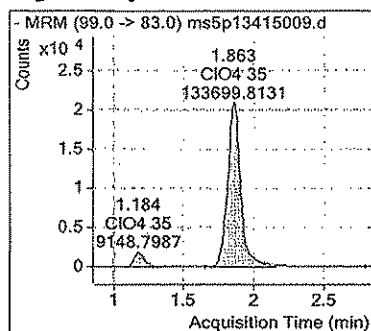
Quant Sample Report (ISTD)

Compound Graphics

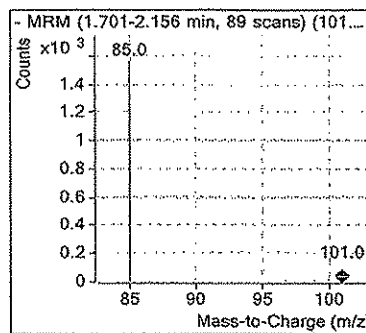
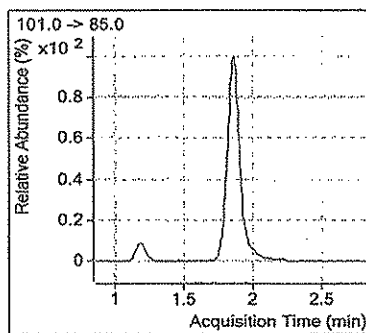
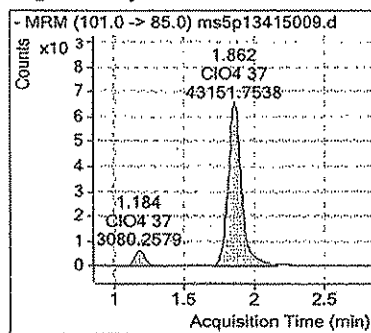
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

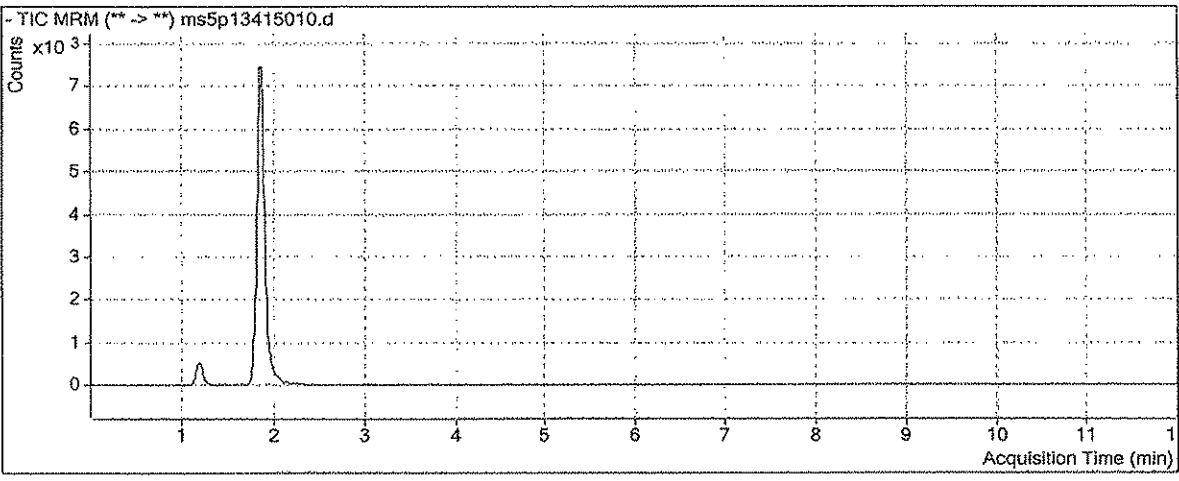
Batch Info

Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13415.batch.xml
Analysis Time 2015-05-15 07:54 **Analyst Name** Administrator
Report Time 2015-05-15 07:55 **Reporter Name** Administrator
Last Calib Update 2015-05-15 07:47 **Batch State** ResultsDirty

Analysis Info

Acq Time 2015-05-14 16:44
Data File ms5p13415010.d
Acq Method File clo4_Obeli_01.m
Sample Name lcperc51424b
Sample Info
Sample Type Sample
Level
Sample Pos P1-B1

Sample Chromatogram



Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.859	25576	11200	2.3	3.7848	
ClO4 37	ClO4 18	1.865	8742	11200	0.8	3.9679	
			2.92	109			


 Valerio L. Tomayko
 Principal Specialist

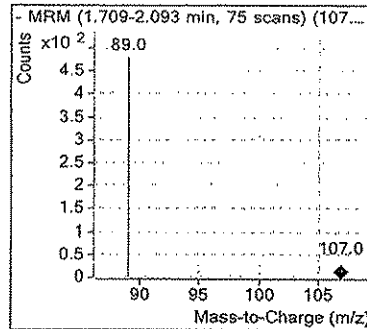
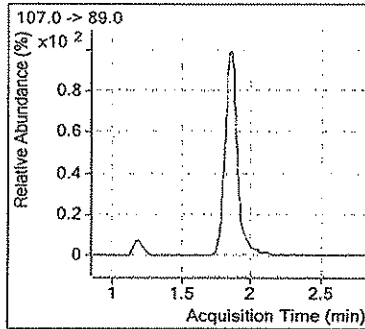
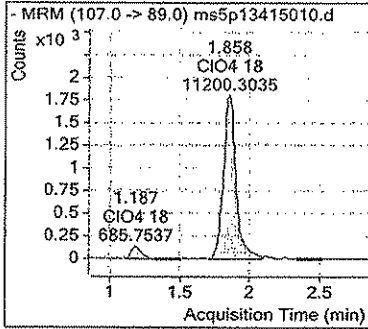
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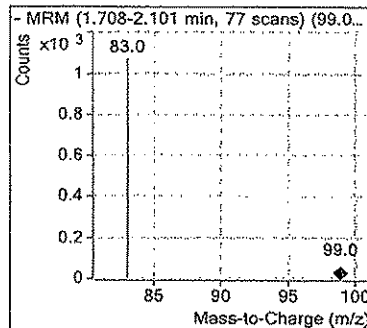
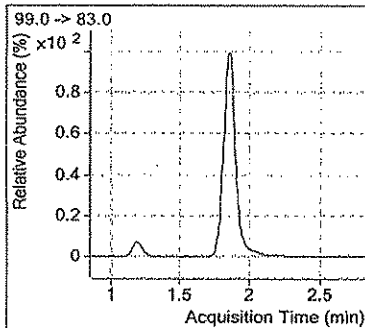
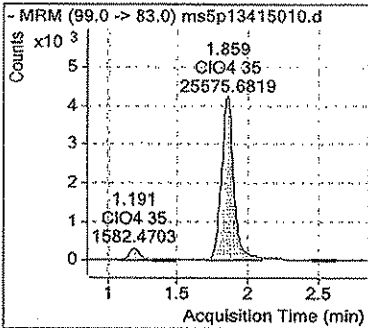
Quant Sample Report (ISTD)

Compound Graphics

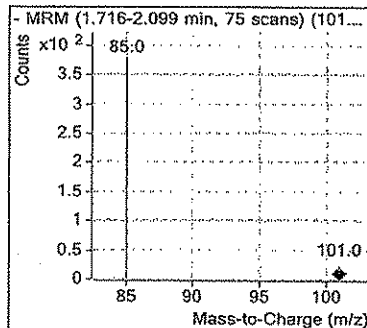
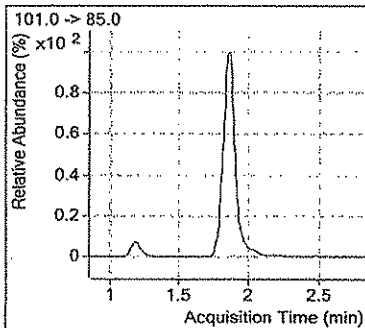
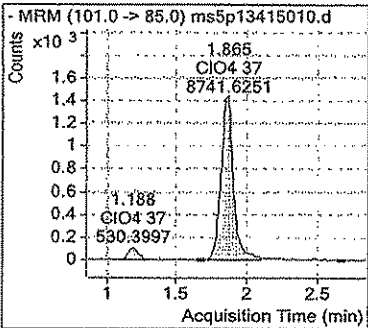
ISTD Compound C104 18



Target Compound C104 35



Target Compound C104 37



Quant Sample Report (ISTD)

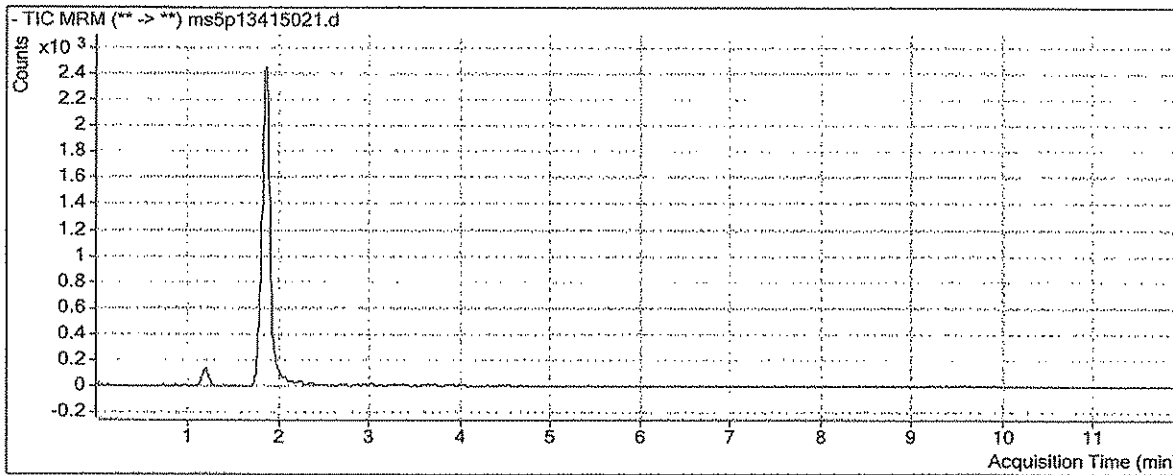
Batch Info

Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13415.batch.xml
Analysis Time 2015-05-15 07:54 **Analyst Name** Administrator
Report Time 2015-05-15 07:55 **Reporter Name** Administrator
Last Calib Update 2015-05-15 07:47 **Batch State** ResultsDirty

Analysis Info

Acq Time 2015-05-14 19:04
Data File ms5p13415021.d
Acq Method File clo4_Obeli_01.m
Sample Name lcperc21424d
Sample Info
Sample Type Sample
Level
Sample Pos P1-C3

Sample Chromatogram



Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.863	2653	11560	0.2	0.4218	
ClO4 37	ClO4 18	1.853	880	11560	0.1	0.3926	
			3.01	112			


 Valerie L. Tomaszko
 Principal Specialist

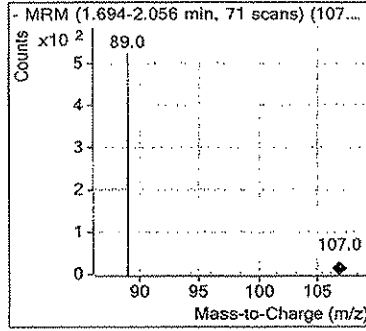
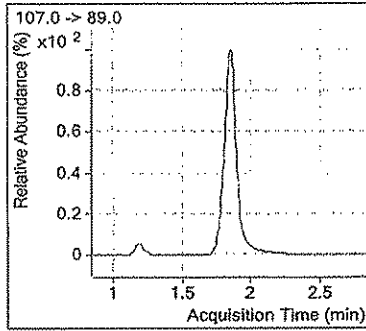
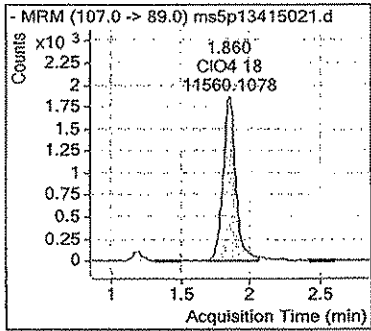
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RMAR 5/15/15

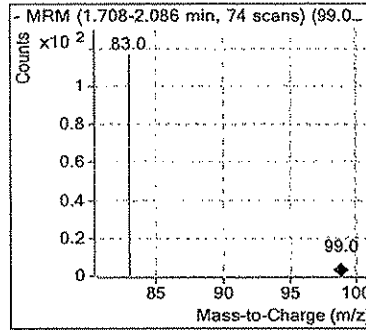
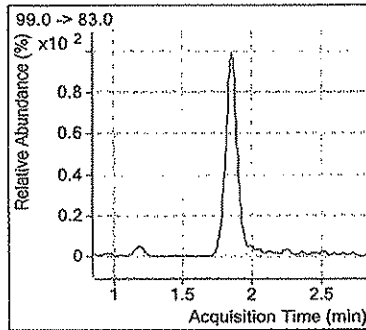
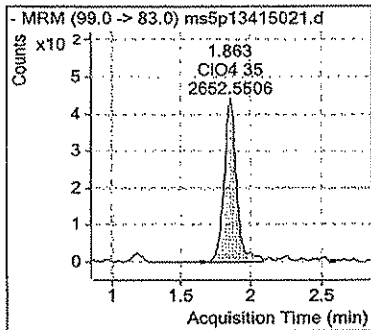
Quant Sample Report (ISTD)

Compound Graphics

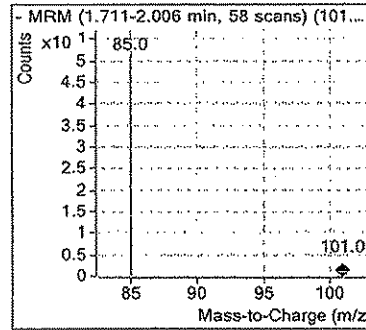
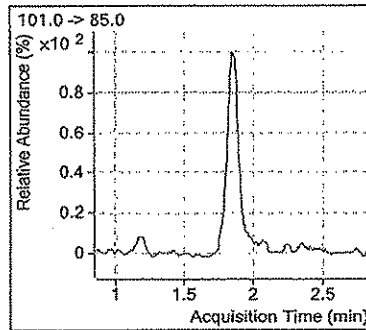
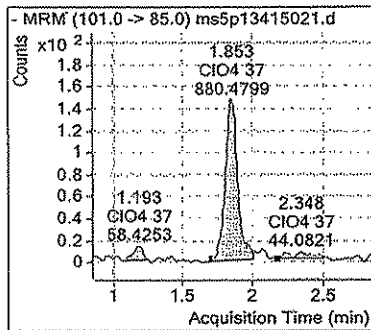
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Raw QC Data

Perchlorate

Quant Sample Report (ISTD)

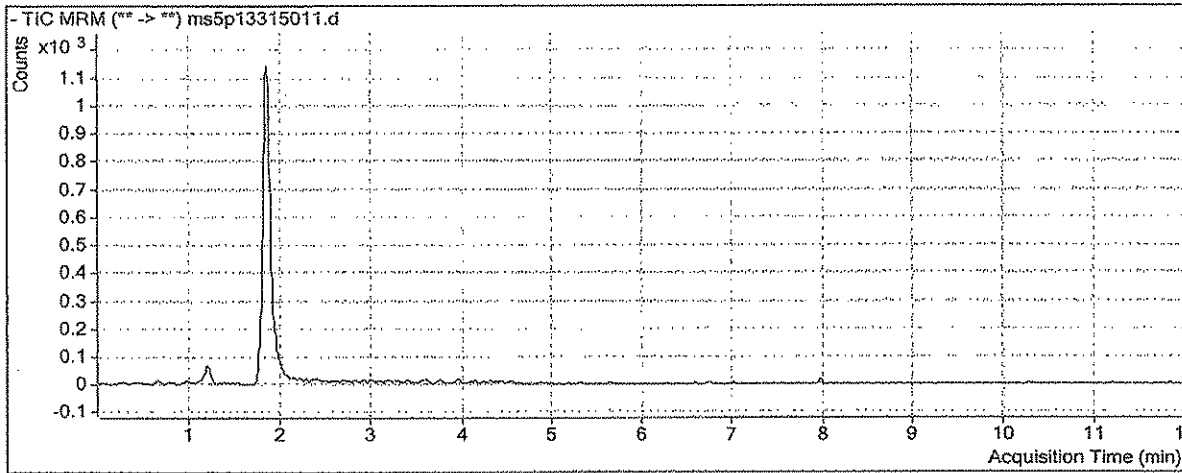
Batch Info

Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13315.batch.xml
Analysis Time 2015-05-14 07:55 **Analyst Name** Administrator
Report Time 2015-05-14 07:56 **Reporter Name** Administrator
Last Calib Update 2015-05-14 07:51 **Batch State** ResultsDirty

Analysis Info

Acq Time 2015-05-13 13:36
Data File ms5p13315011.d
Acq Method File clo4_Obeli_01.m
Sample Name BLANKA
Sample Info 151320023A
Sample Type Sample
Level
Sample Pos P1-B2

Sample Chromatogram



Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.880	167	6609	0.0	0.7598	
ClO4 37	ClO4 18	1.851	75	6609	0.0	0.2741	

50

Vitorio L. Fontana
Analista de Laboratorio

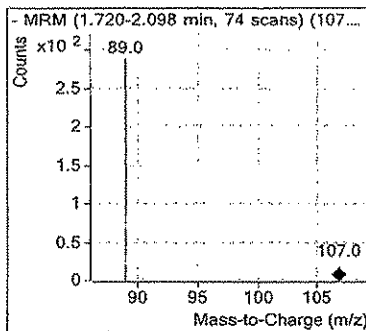
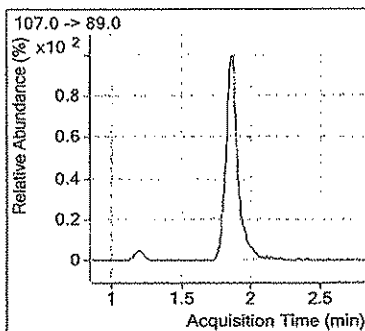
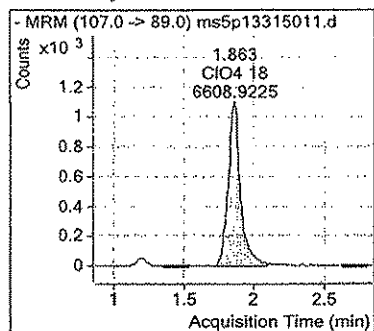
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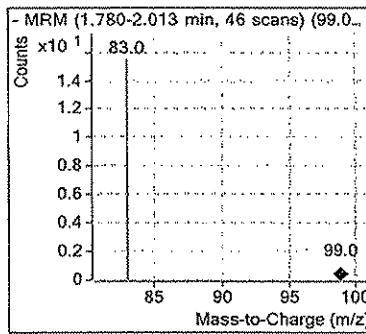
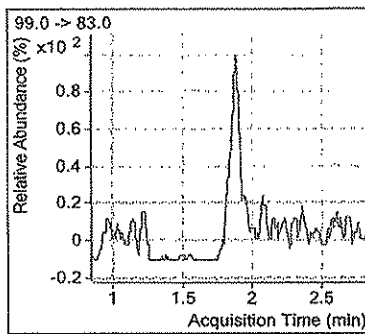
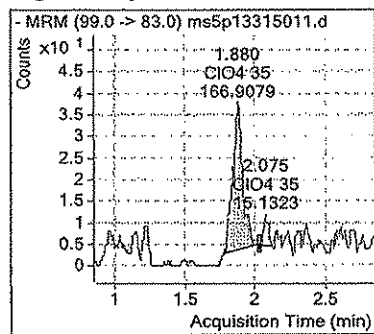
Quant Sample Report (ISTD)

Compound Graphics

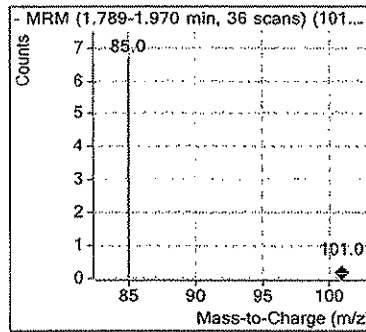
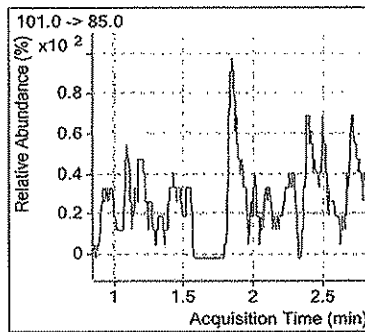
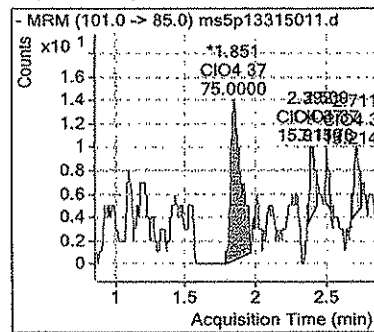
ISTD Compound C104 18



Target Compound C104 35



Target Compound C104 37



Quant Sample Report (ISTD)

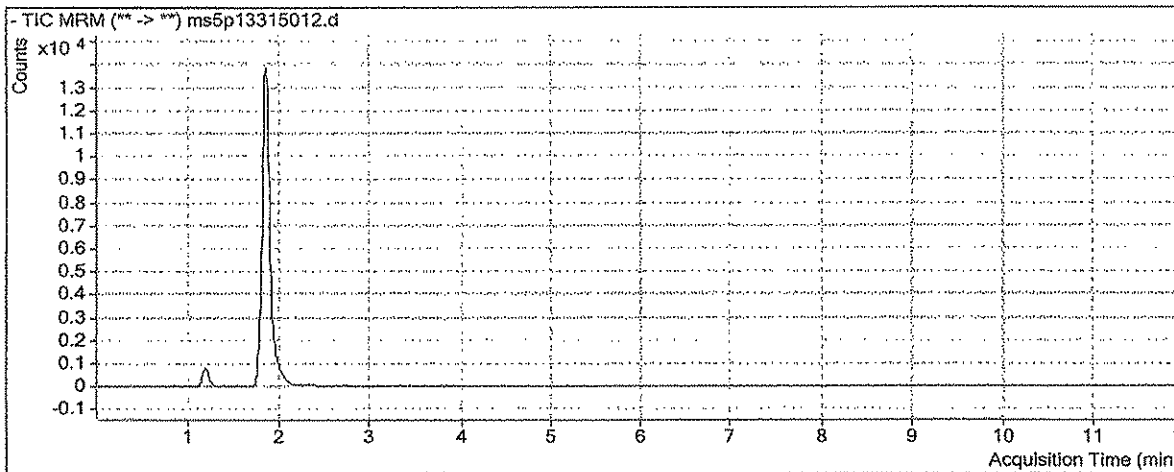
Batch Info

Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13315.batch.xml
Analysis Time 2015-05-14 07:55 **Analyst Name** Administrator
Report Time 2015-05-14 07:56 **Reporter Name** Administrator
Last Calib Update 2015-05-14 07:51 **Batch State** ResultsDirty

Analysis Info

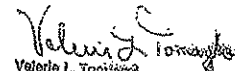
Acq Time 2015-05-13 13:49
Data File ms5p13315012.d
Acq Method File clo4_Obeli_01.m
Sample Name LCSA
Sample Info 151320023A
Sample Type Sample
Level
Sample Pos P1-B3

Sample Chromatogram



Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.865	56446	9477	6.0	98.1790	
ClO4 37	ClO4 18	1.865	18235	9477	1.9	98.8221	
			3.49	71			


 Valerie L. Tomlin
MassHunter Specialist

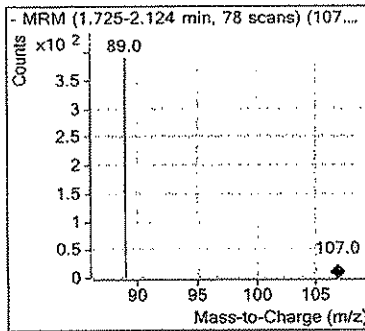
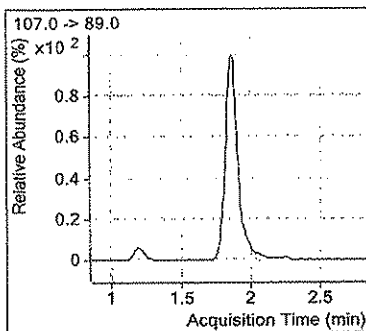
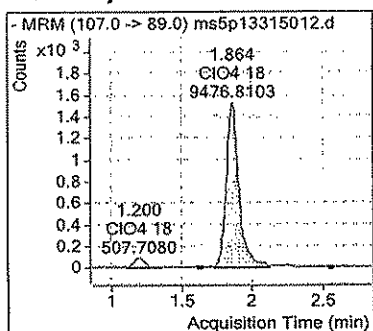
MAY 15 2015

RUASL 5/14/15

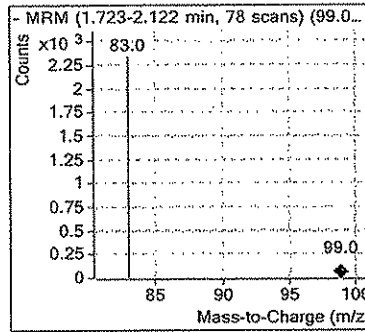
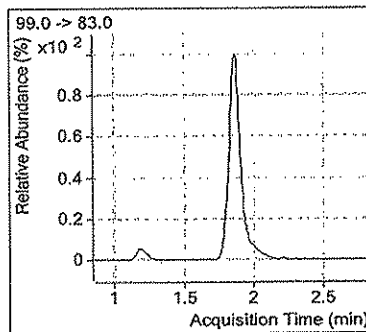
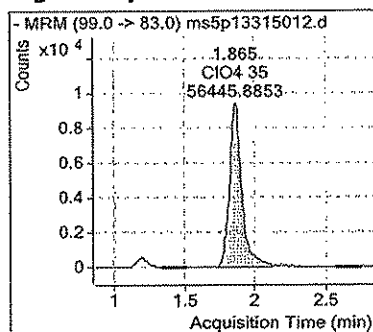
Quant Sample Report (ISTD)

Compound Graphics

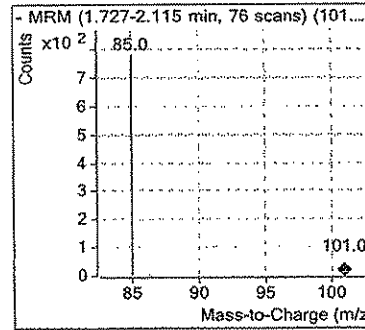
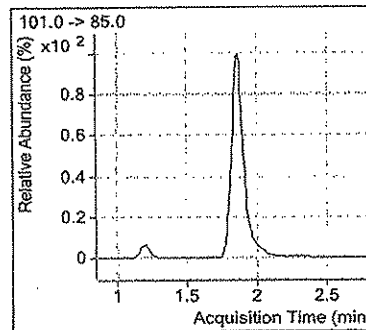
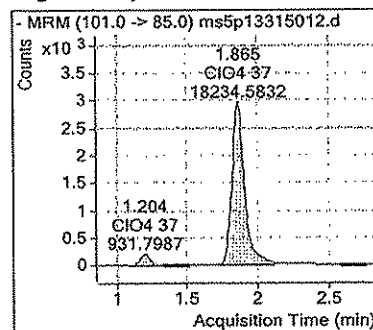
ISTD Compound C104 18



Target Compound C104 35



Target Compound C104 37



Quant Sample Report (ISTD)

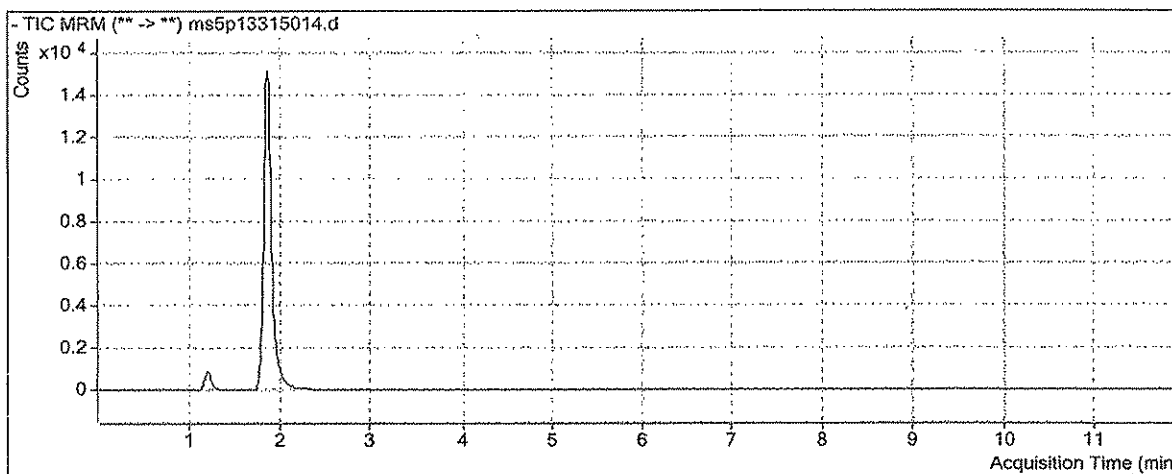
Batch Info

Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13315.batch.xml
Analysis Time 2015-05-14 07:55 **Analyst Name** Administrator
Report Time 2015-05-14 07:56 **Reporter Name** Administrator
Last Calib Update 2015-05-14 07:51 **Batch State** ResultsDirty

Analysis Info

Acq Time 2015-05-13 14:15
Data File ms5p13315014.d
Acq Method File clo4_Obeli_01.m
Sample Name 7873706MS
Sample Info 151320023A
Sample Type Sample
Level
Sample Pos P1-B5

Sample Chromatogram



Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
CIO4 35	CIO4 18	1.867	61220	10281	6.0	98.1559	
CIO4 37	CIO4 18	1.869	20368	10281	2.0	101.7591	
			3,00	77			

Valeria L. Fortin
ANALYST

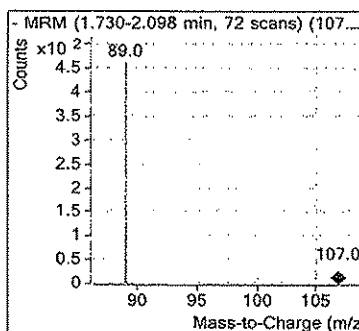
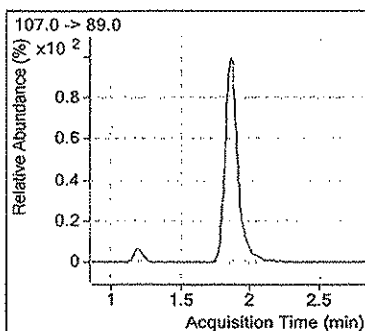
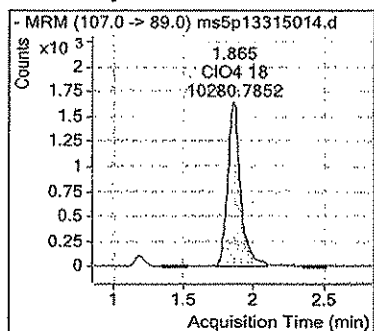
MAY 15 2015

RW188 - st-115

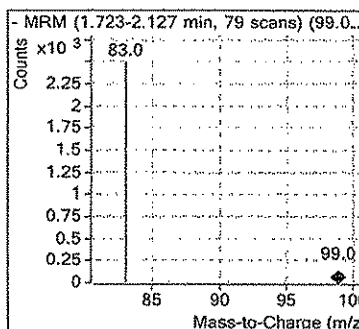
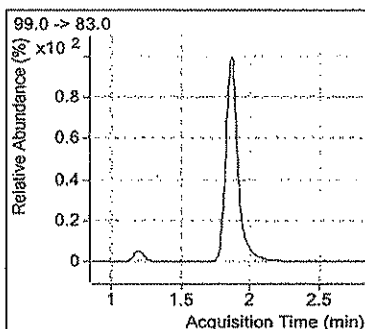
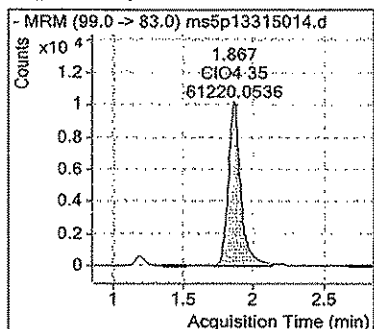
Quant Sample Report (ISTD)

Compound Graphics

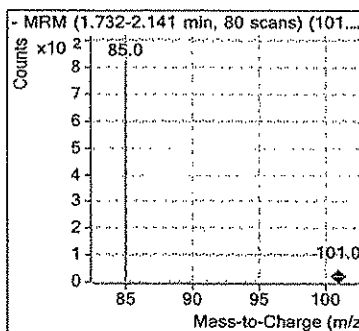
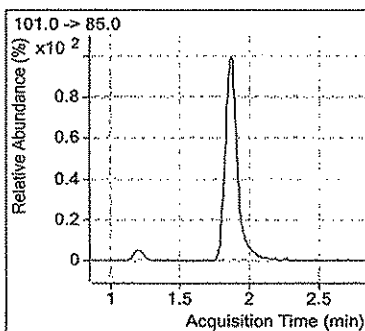
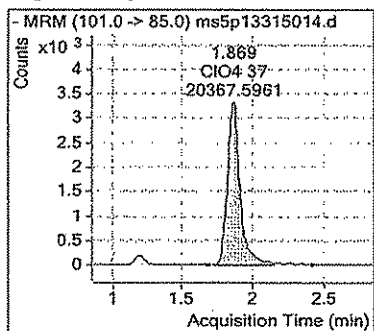
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

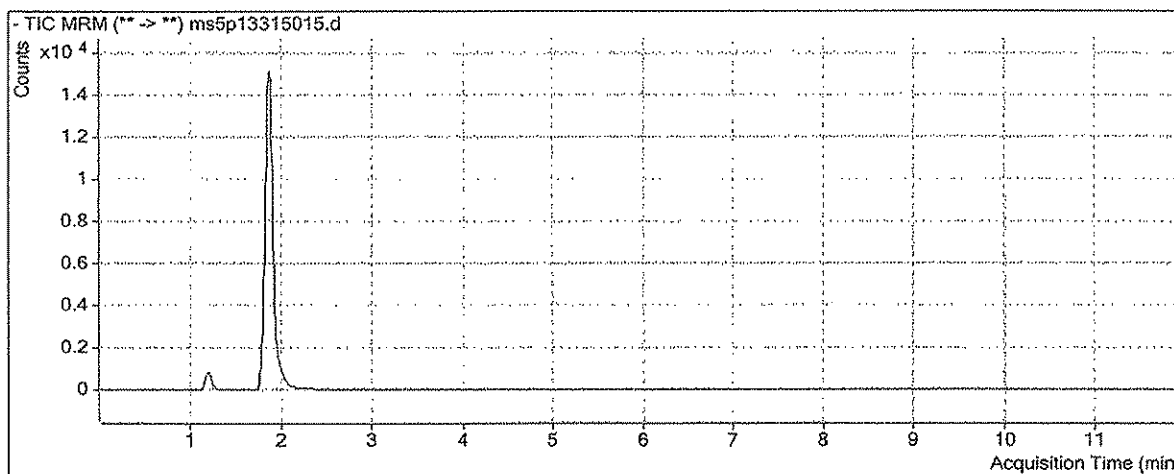
Batch Info

Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13315.batch.xml
Analysis Time 2015-05-14 07:55 **Analyst Name** Administrator
Report Time 2015-05-14 07:56 **Reporter Name** Administrator
Last Calib Update 2015-05-14 07:51 **Batch State** ResultsDirty

Analysis Info

Acq Time 2015-05-13 14:27
Data File ms5p13315015.d
Acq Method File clo4_Obeli_01.m
Sample Name 7873706MSD
Sample Info 151320023A
Sample Type Sample
Level
Sample Pos P1-B6

Sample Chromatogram



Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.869	60651	9780	6.2	102.2105	
ClO4 37	ClO4 18	1.867	19669	9780	2.0	103.3069	
			3.08	77			

Valerio L. Tomaglia
 Method Specialist

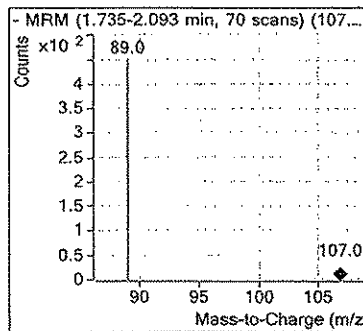
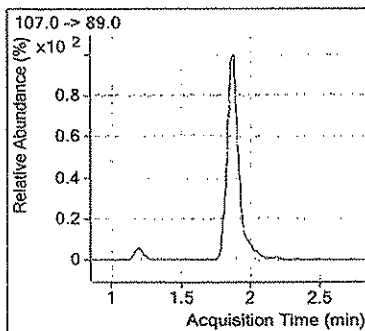
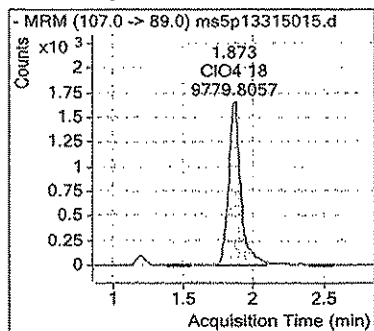
MAY 15 2015

MAS 5/14/15

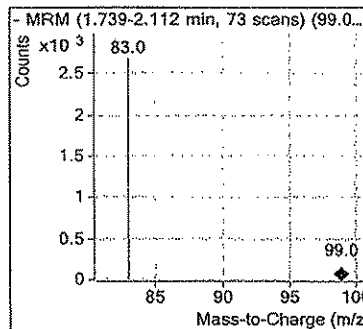
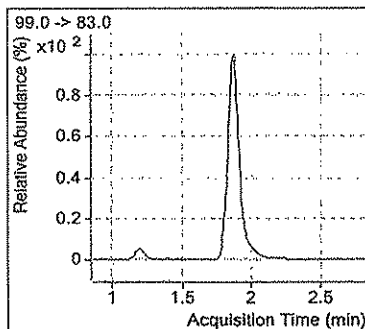
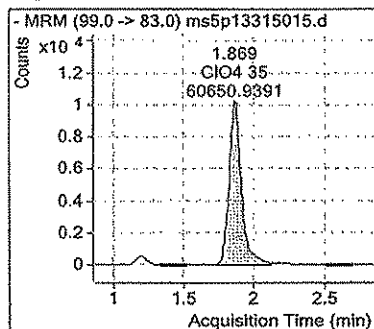
Quant Sample Report (ISTD)

Compound Graphics

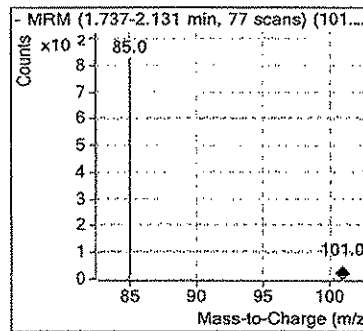
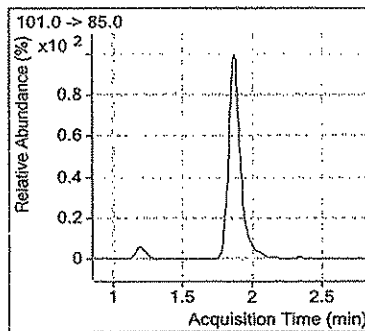
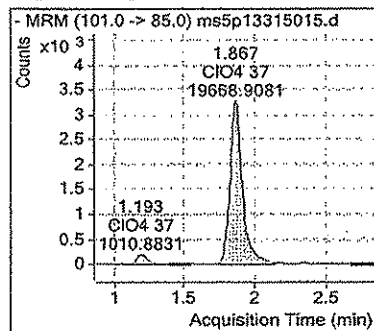
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

Batch Info

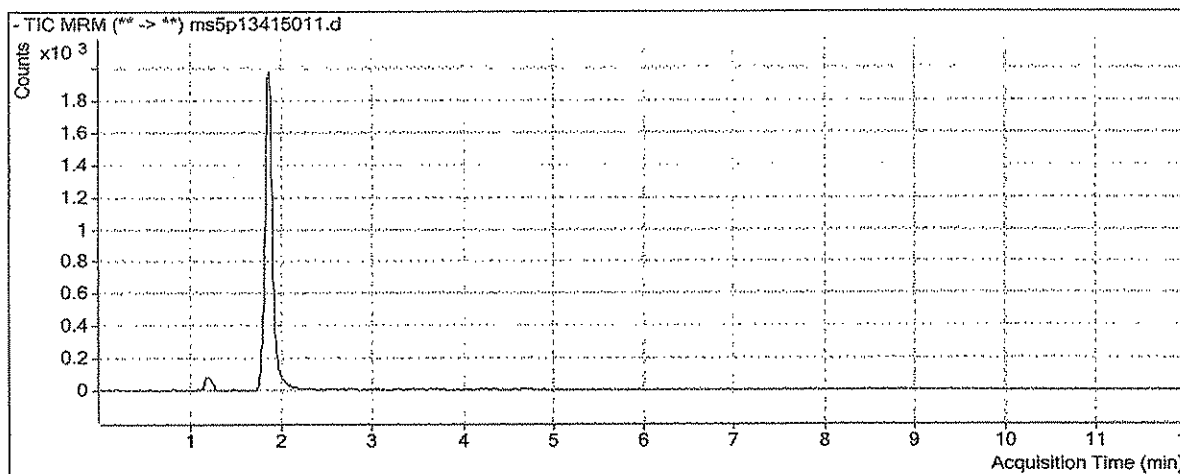
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13415.batch.xml

Analysis Time 2015-05-15 07:54 Analyst Name Administrator
Report Time 2015-05-15 07:55 Reporter Name Administrator
Last Calib Update 2015-05-15 07:47 Batch State ResultsDirty

Analysis Info

Acq Time 2015-05-14 16:57
Data File ms5p13415011.d
Acq Method File clo4_Obeli_01.m
Sample Name BLANKA
Sample Info 151340030A
Sample Type Sample
Level
Sample Pos P1-B2

Sample Chromatogram



Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.873	133	11653	0.0	0.0648	
ClO4 37	ClO4 18	1.866	38	11653	0.0	0.0224	

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Valerie L. Tomé
Valerie L. Tomé
ANALYST

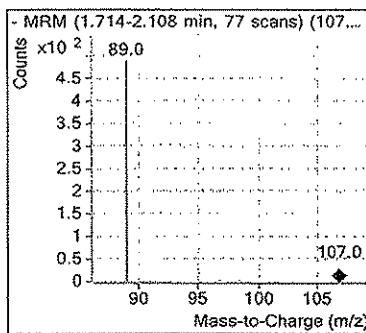
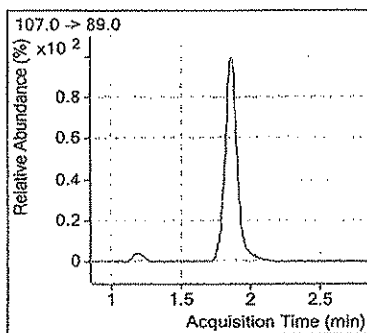
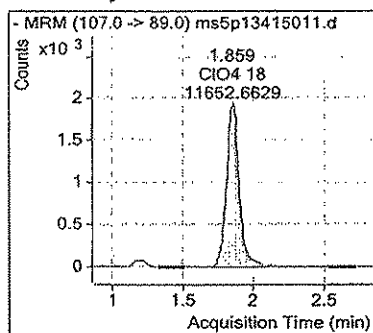
MAY 15 2015

MASU 5/15/15

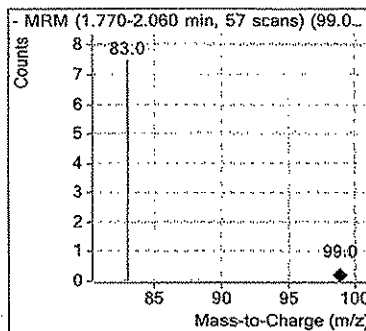
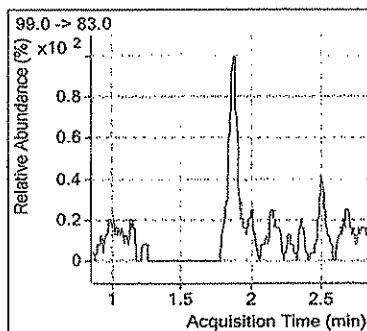
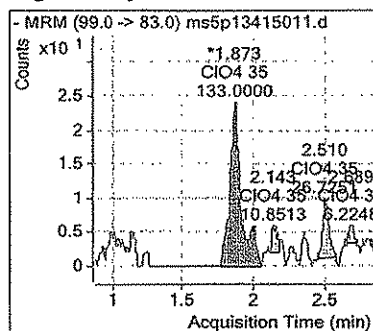
Quant Sample Report (ISTD)

Compound Graphics

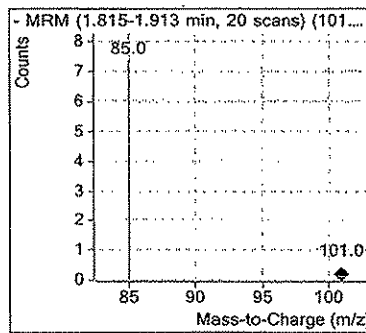
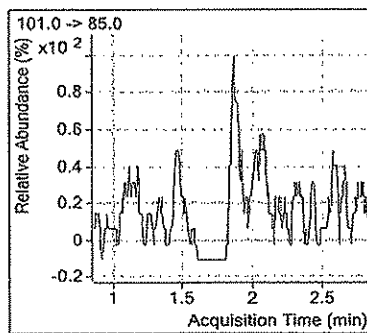
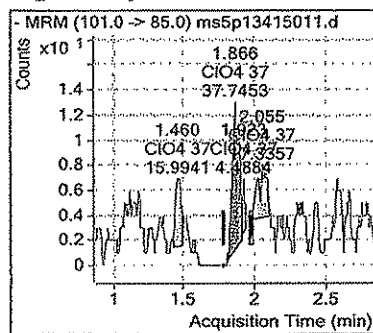
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

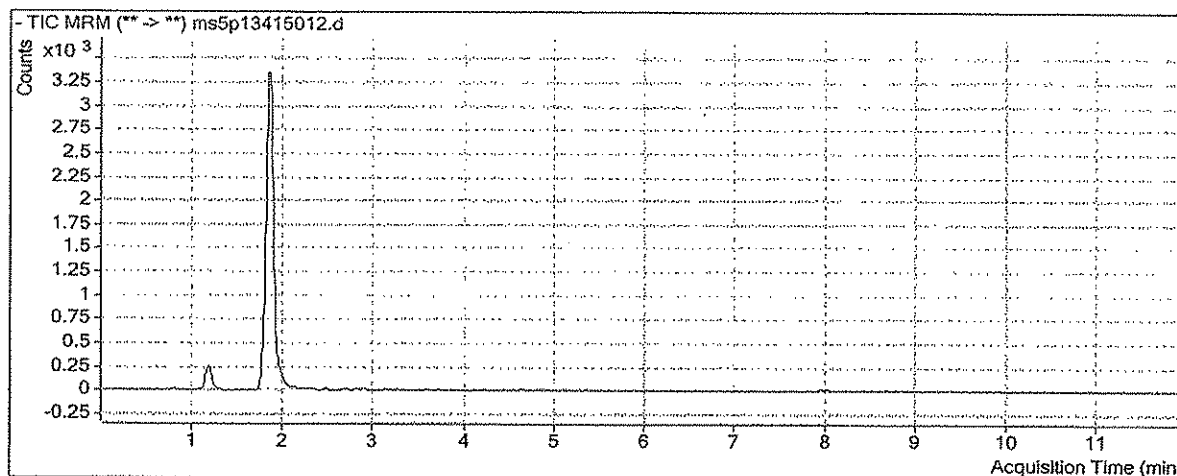
Batch Info

Batch Data Path	D:\MassHunter\Data\perchlorate\QuantResults\ms5p13415.batch.xml		
Analysis Time	2015-05-15 07:54	Analyst Name	Administrator
Report Time	2015-05-15 07:55	Reporter Name	Administrator
Last Calib Update	2015-05-15 07:47	Batch State	ResultsDirty

Analysis Info

Acq Time	2015-05-14 17:09
Data File	ms5p13415012.d
Acq Method File	cl04_Obeli_01.m
Sample Name	LCSA
Sample Info	151340030A
Sample Type	Sample
Level	
Sample Pos	P1-B3

Sample Chromatogram



Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.866	6149	12076	0.5	0.8798	
ClO4 37	ClO4 18	1.853	2097	12076	0.2	0.8872	
			293	117			


 Valerio L. Tomayko
 Principal Specialist

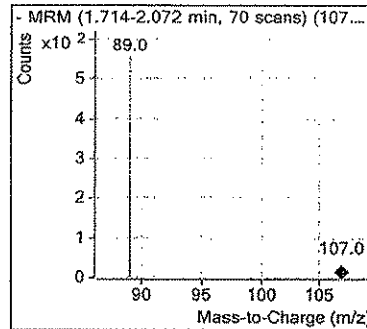
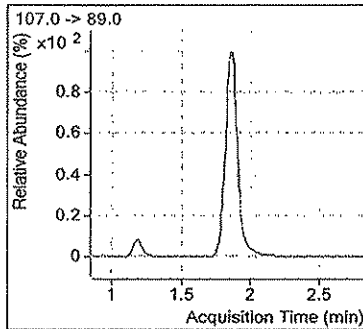
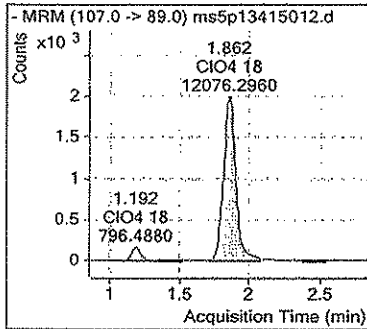
MAY 15 2015

MAJKA - sls/ljs

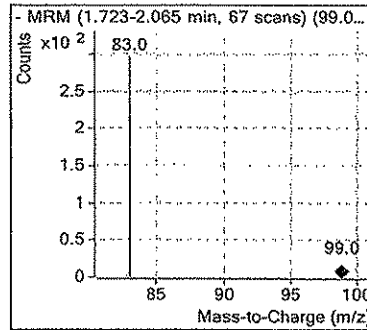
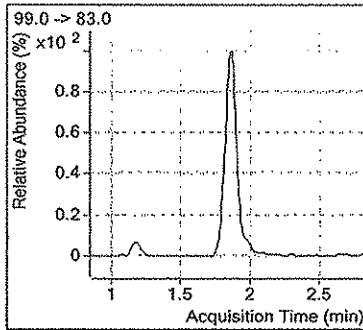
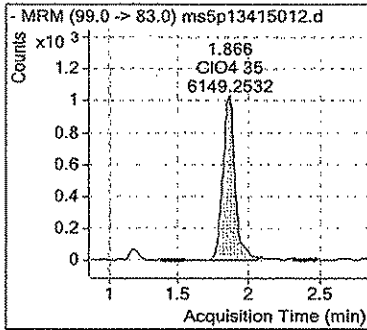
Quant Sample Report (ISTD)

Compound Graphics

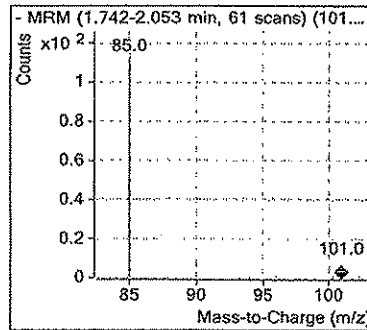
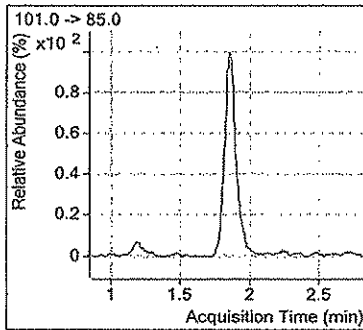
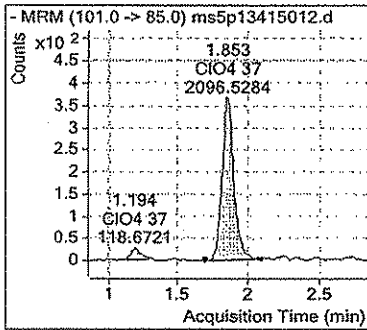
ISTD Compound C104 18



Target Compound C104 35



Target Compound C104 37



Quant Sample Report (ISTD)

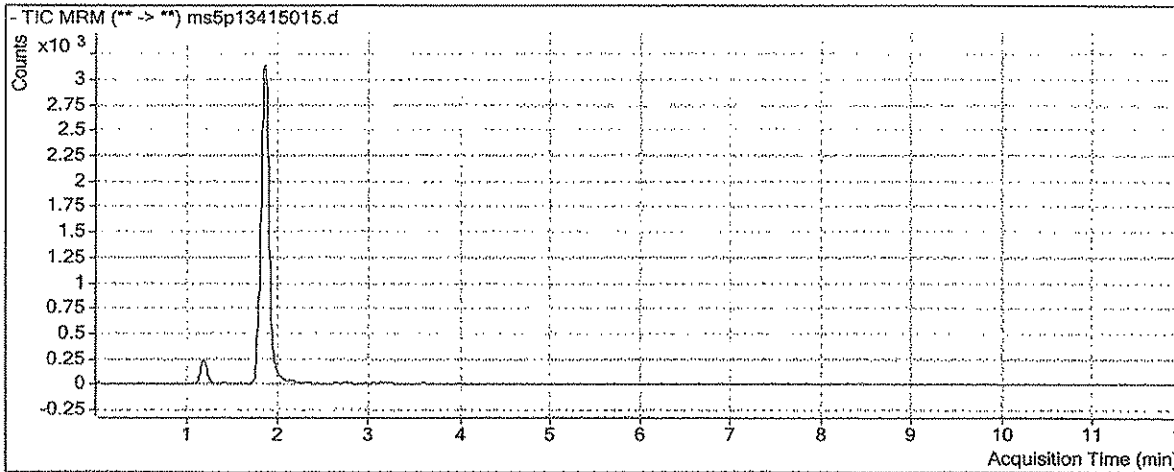
Batch Info

Batch Data Path	D:\MassHunter\Data\perchlorate\QuantResults\ms5p13415.batch.xml		
Analysis Time	2015-05-15 07:54	Analyst Name	Administrator
Report Time	2015-05-15 07:55	Reporter Name	Administrator
Last Calib Update	2015-05-15 07:47	Batch State	ResultsDirty

Analysis Info

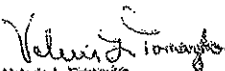
Acq Time	2015-05-14 17:48
Data File	ms5p13415015.d
Acq Method File	clo4_Obeli_01.m
Sample Name	7873709MS
Sample Info	151340030A
Sample Type	Sample
Level	
Sample Pos	P1-B6

Sample Chromatogram



Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.861	6909	10668	0.6	1.1065	
ClO4 37	ClO4 18	1.857	2214	10668	0.2	1.0597	
			3.12	104			


 Valerio L. Fomayko
 Principal Specialist

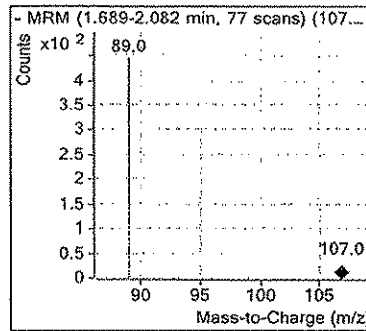
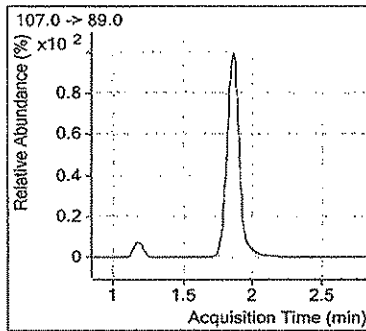
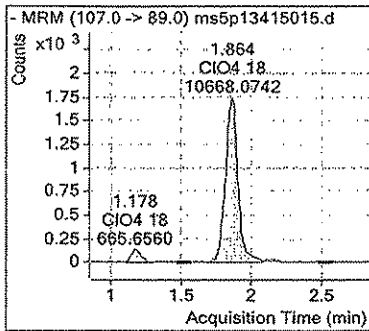
MAY 15 2015

Handwritten initials/signature

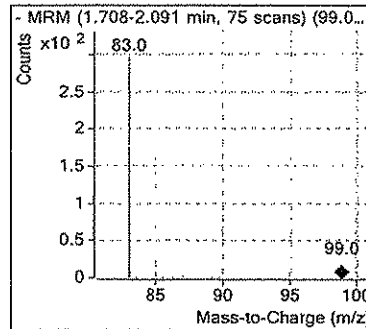
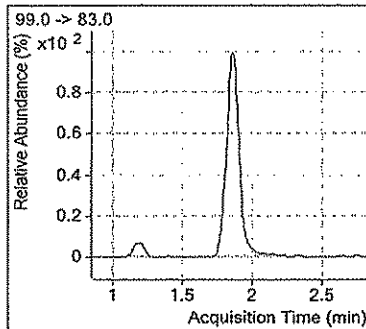
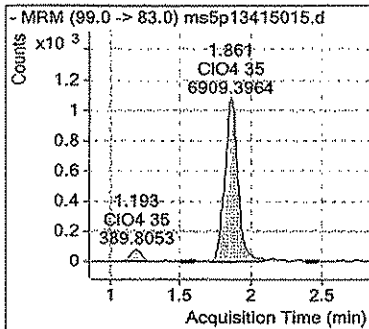
Quant Sample Report (ISTD)

Compound Graphics

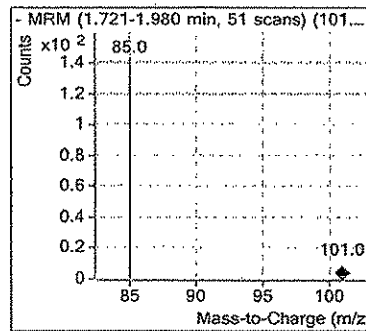
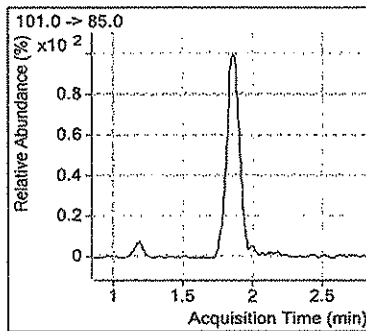
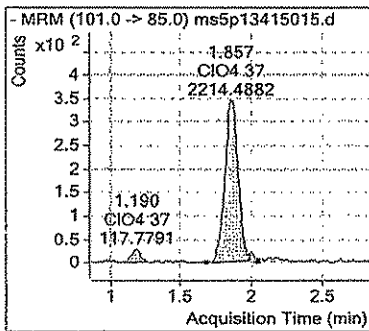
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Quant Sample Report (ISTD)

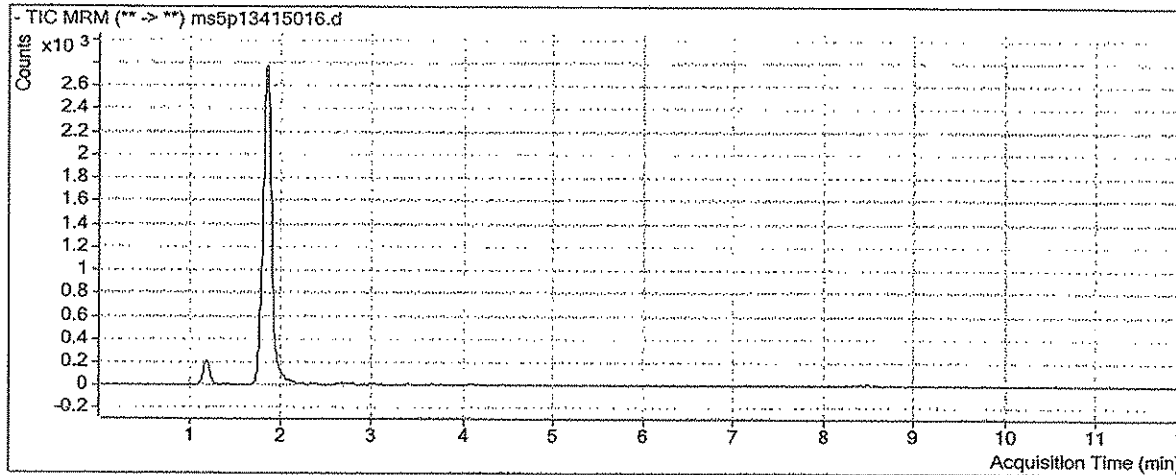
Batch Info

Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13415.batch.xml
Analysis Time 2015-05-15 07:54 **Analyst Name** Administrator
Report Time 2015-05-15 07:55 **Reporter Name** Administrator
Last Calib Update 2015-05-15 07:47 **Batch State** ResultsDirty

Analysis Info

Acq Time 2015-05-14 18:00
Data File ms5p13415016.d
Acq Method File clo4_Obeli_01.m
Sample Name 7873709MSD
Sample Info 151340030A
Sample Type Sample
Level
Sample Pos P1-B7

Sample Chromatogram



Quantitation Results

Compound	ISTD	RT	Response	ISTD Resp	Resp Ratio	Final Conc	Accuracy
ClO4 35	ClO4 18	1.856	5946	10107	0.6	1.0093	
ClO4 37	ClO4 18	1.860	2040	10107	0.2	1.0306	
			2.91	98			

Valeria L. Tomczyk
 Principal Specialist

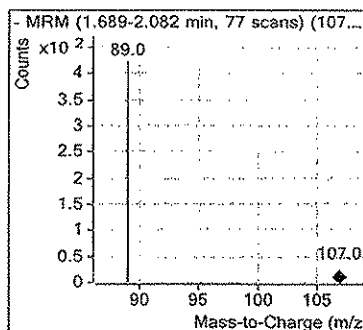
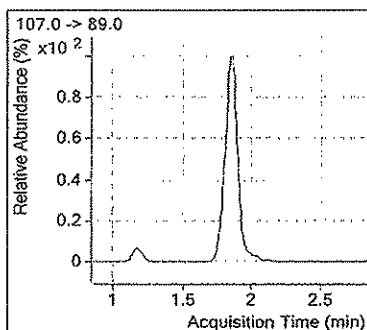
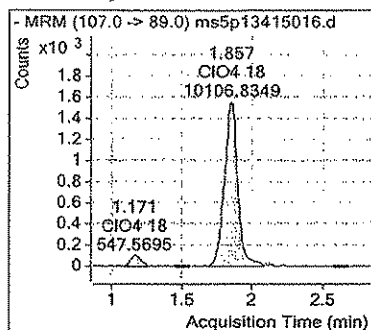
MAY 15 2015

RHASL sps/15

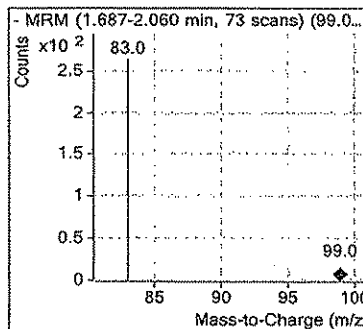
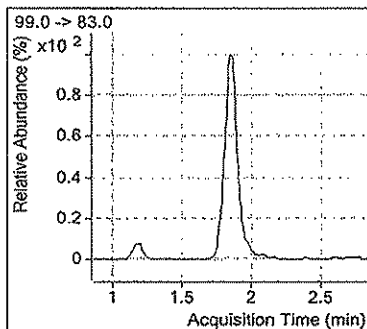
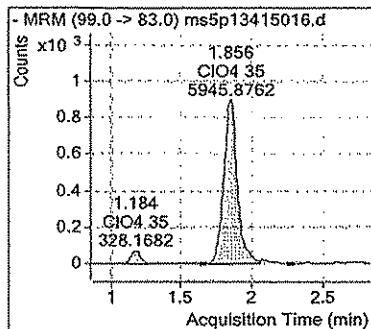
Quant Sample Report (ISTD)

Compound Graphics

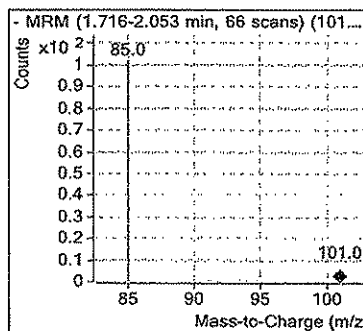
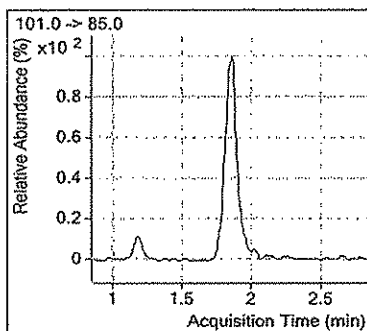
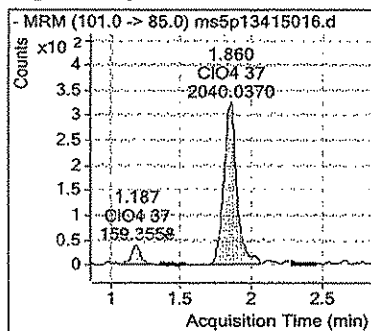
ISTD Compound CIO4 18



Target Compound CIO4 35



Target Compound CIO4 37



Extraction/Distillation/Digestion Logs

Perchlorate

Organic Extraction Batchlog Assigned to: 300 Maria Davenport Reviewed by: MS Start Date: 5-13-15 Start time: 07:40
 151320023A Tech 1: MD300 Tech 2: _____

Solvent Used	Lot No.
Ottawa Sand	213240-AG
Syringe Filter	9538220
IS1436424A	Perchlorate Int. Std.
IS1414224B	Perchlorate Intern.

Perchlorate in Soil LC/MS/MS										
QC	Sample Code	Amt (g)	SS/S Sol.	Amt (mL)	MS Sol.	Amt (mL)	FV (mL)	pH	BC	Comments
7873706MSD	PIS28MSD	1.01	IS1414224B	0.1		10	10	Z	34A	
7873706MS	PIS28MS	1.00	IS1436424A	0.02		10	10	Z	34A	
BLANKA	PBLK23132	1.00	IS1436424A	0.02		10	10	Z	N/A	
LCSA	LCS23132	1.00	IS1436424A	0.02		10	10	Z	N/A	

Note: 1.02mls Int-Std. is added to 2mls of extract

Sample #	Sample Code	Amt (g)	SS/S Sol.	Amt (mL)	FV (mL)	pH	BC	Comments	Analyses	List	Due Date	Prio
17873706	R PIS28	1.00	IS1436424A	0.02	10	Z	34A		06557	16419	05/15/2015	Q
27873707	R PIS08	1.01	IS1436424A	0.02	10	Z	34A		06557	16419	05/15/2015	Q
37873708	R PISB5	1.02	IS1436424A	0.02	10	Z	34A		06557	16419	05/15/2015	Q

MD300
5/13/15
H/A

Sonic bath 17489

Rack ID:	Work Station	Micro Temp
Internal Standard	Balance # 11985	100?

S-bath ID	C	S-bath ID	C	N-Evap	C	M-Yap	C	151320023A
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Documented temps are NIST corrected.
centrifuge # 8

151340030A

Solvent Used	Lot No.
SYRINGE	9091616
SYRINGE FILTER	9608356

Perchlorate in Water LC/MS/MS										
QC	Sample Code	Amt (µl)	SS/IS Sol.	MS Sol.	Amt (mL)	FV (mL)	pH	pH	BC	Comments
7873709MSD	PITW1MSD	1	151436424A	151436424B	0.01	1	17.8A		17.8A	
7873709MS	PITW1MS	1		151436424B	0.01	1			17.8A	
BLANKA	PBLK30134	1			0.01	1				
LCSA	LCS30134	1		151436424B	0.01	1				
	ICS	1		151436424B	0.01	1				

Sample #	Sample Code	Amt (µl)	SS/IS Sol.	FV (mL)	pH	BC	Comments	Analyses	List	Due Date	Prio
17873709	R PITW1	1	151436424A	0.01	17.8A			06386	16418	05/15/2015	Q
27877123	R ASPT1	1		0.01				06386	15521	05/15/2015	S
37877125	R ASP5B	1		0.01				06386	15521	05/15/2015	S
47879425	R -TW02	1		0.01				06386	16418	05/20/2015	Q
57879426	R -RB01	1		0.01				06386	16418	05/20/2015	Q

Rack ID:	Work Station	Micro Temp
Internal Standard	Balance #	1007
S-bath ID	S-bath ID	N-Evap
C	C	C
M-vap	C	C
151340030A		

Documented temps are NIST corrected.

PFAAs by LC/MS/MS Data

Case Narrative/Conformance Summary

PFAAs by LC/MS/MS

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Specialty Services Group
Fraction: PFAAs by LC/MS/MS

Sample #	Client ID	Matrix		DF	Comments
		Liquid	Solid		
7873709	PAI04-TW01-20150504	X		1; 100	
7879425	PAI04-TW02-20150506	X		1	
7879426	PAI-RB01-050715	X		1	Material Rinse Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

All QC is within specification.

The LCS serves as the ICV second source check.

SAMPLE ANALYSIS:

No problems were encountered with the analysis of the samples.

Abbreviation Key

UNSPK = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
MS = Matrix Spike	MDL = Method Detection Limit
MSD = Matrix Spike Duplicate	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Specialty Services Group
Fraction: PFAAs by LC/MS/MS

D = Duplicate (DUP)	E= out of calibration range
LCS = Lab Control Sample	RE = Repreparation/Reanalysis
LCSD = Lab Control Sample Duplicate	* = Out of Specification
NC = Not Calculated	NF = Not Found

QC Summary

PFAAs by LC/MS/MS



Lancaster Laboratories
Environmental

**Quality Control Reference List
Specialty Services Group**

**CLIENT: Tetra Tech Inc.
SDG: PIS01**

Fraction: PFAAs by LC/MS/MS

Analysis	Batch Number	Sample Number	Analysis Date
PFAAs in Water by LC/MS/MS	15138004	BLK	05/29/2015 18:44:00
		LCS	05/29/2015 19:15:00
		LCSD	05/29/2015 19:31:00
		7873709	05/29/2015 20:34:00
		7873709	05/29/2015 20:50:00
		7879425	05/29/2015 21:05:00
		7879426 UNSPK	05/29/2015 19:47:00
		7879426 MS	05/29/2015 20:02:00

Fraction: PFAAs by LC/MS/MS

15138004 / BLK Analyte	Analysis Date	Blank Results	Units	DL	LOD	LOQ
Perfluorooctanoic acid	05/29/15	N.D.	ng/l	1	2	2
Perfluoro-octanesulfonate	05/29/15	N.D.	ng/l	5	10	10

Specialty Services Group
Fraction: PFAAs by LC/MS/MS

UNSPK: 7879426 MS: 7879426 Analyte	Batch: 15138004 (Sample number(s): 7873709, 7879425-7879426)								
	Spike Added ng/l	Unspiked Conc ng/l	MS Conc ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	%Rec Limits	%RPD	%RPD Limits
Perfluorooctanoic acid	100	1.03	95.63	NA	95	NA	70-130	NA	NA
Perfluoro-octanesulfonate	100	N.D.	102.25	NA	102	NA	70-130	NA	NA

Comments:

(2) The unspiked sample result is greater than four times the spike added.

* = Out of Specification

Results are being reported on an as received basis.



Lancaster Laboratories
Environmental

Quality Control Summary
Laboratory Control Standard (LCS)
Laboratory Control Standard Duplicate(LCSD)

SDG: PIS01
Matrix: LIQUID

Specialty Services Group
Fraction: PFAAs by LC/MS/MS

LCS LCSD Analyte	Batch: 15138004 (Sample number(s): 7873709, 7879425-7879426)							
	Spike Added ng/l	LCS Conc ng/l	LCSD Conc ng/l	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Perfluorooctanoic acid	100	104.74	112.68	105	113	70-130	7	30
Perfluoro-octanesulfonate	100	106.78	103.84	107	104	70-130	3	30

Sample Data

PFAAs by LC/MS/MS

Fraction: PFAAs by LC/MS/MS

10954: PFAAs in Water by LC/MS/MS Analyte Name	Default DL	Default LOD	Default LOQ	Units
Perfluorooctanoic acid	1	2	2	ng/l
Perfluoro-octanesulfonate	5	10	10	ng/l

LCMSMS ANALYSIS REPORT

Summary of Quan Results

Compound Name	Sample ID	Data File Name	Response	ISTD Response	Response Ratio	Specified Amount	Calculated Amount	Units	% Diff
13C-PFOA_(IS)	equi	A15138004-01	41.60	N/A	N/A	N/A	N/A	N/A	N/A
13C-PFOA_(IS)	SYS	A15138004-02	279006.30	N/A	N/A	N/A	N/A	N/A	N/A
13C-PFOA_(IS)	CAL1	A15138004-03	340245.86	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOA_(IS)	CAL2	A15138004-04	304681.56	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOA_(IS)	CAL3	A15138004-05	302931.51	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOA_(IS)	CAL4	A15138004-06	311073.33	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOA_(IS)	CAL5	A15138004-07	276605.42	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOA_(IS)	CAL6	A15138004-08	272144.74	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOA_(IS)	Recon	A15138004-09	N/A	N/A	N/A	N/A	N/A	N/A	N/A
13C-PFOA_(IS)	BLK 15138004	A15138004-10	290983.79	N/A	N/A	N/A	N/A	N/A	N/A
13C-PFOA_(IS)	CCV1	A15138004-11	299101.57	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOA_(IS)	LCS15138004	A15138004-12	282538.91	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOA_(IS)	LCSD15138004	A15138004-13	253575.05	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOA_(IS)	7879426 (BKG)	A15138004-14	400578.82	N/A	N/A	N/A	N/A	N/A	N/A
13C-PFOA_(IS)	7879426 MS	A15138004-15	381250.54	N/A	N/A	N/A	N/A	N/A	N/A
13C-PFOA_(IS)	CCV2	A15138004-16	271321.84	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOA_(IS)	7873709 DF100	A15138004-17	311262.53	N/A	N/A	N/A	N/A	N/A	N/A
13C-PFOA_(IS)	7873709	A15138004-18	97740.36	N/A	N/A	N/A	N/A	N/A	N/A
13C-PFOA_(IS)	7879425	A15138004-19	157833.29	N/A	N/A	N/A	N/A	N/A	N/A
13C-PFOA_(IS)	CCV3	A15138004-20	298430.19	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOS_(IS)	equi	A15138004-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
13C-PFOS_(IS)	SYS	A15138004-02	39316.68	N/A	N/A	N/A	N/A	N/A	N/A
13C-PFOS_(IS)	CAL1	A15138004-03	40232.98	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOS_(IS)	CAL2	A15138004-04	38054.53	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOS_(IS)	CAL3	A15138004-05	38875.86	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOS_(IS)	CAL4	A15138004-06	36260.22	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOS_(IS)	CAL5	A15138004-07	32160.30	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOS_(IS)	CAL6	A15138004-08	31850.89	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOS_(IS)	Recon	A15138004-09	N/A	N/A	N/A	N/A	N/A	N/A	N/A
13C-PFOS_(IS)	BLK 15138004	A15138004-10	33506.49	N/A	N/A	N/A	N/A	N/A	N/A
13C-PFOS_(IS)	CCV1	A15138004-11	33207.16	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOS_(IS)	LCS15138004	A15138004-12	34503.22	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOS_(IS)	LCSD15138004	A15138004-13	33796.79	N/A	N/A	1.000	N/A	N/A	N/A
13C-PFOS_(IS)	7879426 (BKG)	A15138004-14	45084.00	N/A	N/A	N/A	N/A	N/A	N/A
13C-PFOS_(IS)	7879426 MS	A15138004-15	39737.75	N/A	N/A	N/A	N/A	N/A	N/A
13C-PFOS_(IS)	CCV2	A15138004-16	32355.41	N/A	N/A	N/A	N/A	N/A	N/A

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LCMSMS ANALYSIS REPORT

Compound Name	Sample ID	Data File Name	Response	ISTD Response	Response Ratio	Specified Amount	Calculated Amount	Units	% Diff
13C-PFOS (IS)	7873709 DF100	A15138004-17	34231.36	N/A	N/A	N/A	N/A	N/A	N/A
13C-PFOS (IS)	7873709	A15138004-18	46984.55	N/A	N/A	N/A	N/A	N/A	N/A
13C-PFOS (IS)	7879425	A15138004-19	46036.85	N/A	N/A	N/A	N/A	N/A	N/A
13C-PFOS (IS)	CCV3	A15138004-20	30584.51	N/A	N/A	1.000	N/A	N/A	N/A
PFOA	equi	A15138004-01	N/A	N/A	N/A	N/A	N/A	ng/L	N/A
PFOA	SYS	A15138004-02	4769.80	279006.30	0.017	N/A	1.761	ng/L	N/A
PFOA	CAL1	A15138004-03	7022.44	340245.86	0.021	2.000	2.077	ng/L	3.85
PFOA	CAL2	A15138004-04	16144.41	304681.56	0.053	5.000	4.963	ng/L	-0.75
PFOA	CAL3	A15138004-05	89963.93	302931.51	0.297	25.000	26.728	ng/L	6.91
PFOA	CAL4	A15138004-06	306067.84	311073.33	0.984	100.000	88.005	ng/L	-12.00
PFOA	CAL5	A15138004-07	963216.70	276605.42	3.482	320.000	310.871	ng/L	-2.85
PFOA	CAL6	A15138004-08	1278652.99	272144.74	4.698	400.000	419.357	ng/L	4.84
PFOA	Recon	A15138004-09	N/A	N/A	N/A	N/A	N/A	ng/L	N/A
PFOA	BLK 15138004	A15138004-10	498.79	290983.79	0.002	N/A	0.389	ng/L	N/A
PFOA	CCV1	A15138004-11	80477.52	299101.57	0.269	25.000	24.238	ng/L	-3.05
PFOA	LCS15138004	A15138004-12	331006.89	282538.91	1.172	100.000	104.743	ng/L	4.74
PFOA	LCSD15138004	A15138004-13	319651.19	253575.05	1.261	100.000	112.685	ng/L	12.69
PFOA	7879426 (BKG)	A15138004-14	3548.02	400578.82	0.009	N/A	1.026	ng/L	N/A
PFOA	7879426 MS	A15138004-15	407722.73	381250.54	1.069	N/A	95.634	ng/L	N/A
PFOA	CCV2	A15138004-16	278101.07	271321.84	1.025	100.000	91.669	ng/L	-8.33
PFOA	7873709 DF100	A15138004-17	385664.56	311262.53	1.239	N/A	11076.321	ng/L	N/A
PFOA	7873709	A15138004-18	13118660.65	97740.36	134.219	N/A	11973.225	ng/L	N/A
PFOA	7879425	A15138004-19	20857.66	157833.29	0.132	N/A	12.024	ng/L	N/A
PFOA	CCV3	A15138004-20	1090466.04	298430.19	3.654	320.000	326.190	ng/L	1.93
PFOS	equi	A15138004-01	N/A	N/A	N/A	N/A	N/A	ng/L	N/A
PFOS	SYS	A15138004-02	57.73	39316.68	0.001	N/A	3.275	ng/L	N/A
PFOS	CAL1	A15138004-03	560.43	40232.98	0.014	4.000	4.597	ng/L	14.93
PFOS	CAL2	A15138004-04	2141.36	38054.53	0.056	10.000	9.088	ng/L	-9.12
PFOS	CAL3	A15138004-05	17586.79	38875.86	0.452	50.000	51.105	ng/L	2.21
PFOS	CAL4	A15138004-06	60034.25	36260.22	1.656	200.000	178.740	ng/L	-10.63
PFOS	CAL5	A15138004-07	193583.81	32160.30	6.019	640.000	641.610	ng/L	0.25
PFOS	CAL6	A15138004-08	244944.43	31850.89	7.690	800.000	818.859	ng/L	2.36
PFOS	Recon	A15138004-09	N/A	N/A	N/A	N/A	N/A	ng/L	N/A
PFOS	BLK 15138004	A15138004-10	N/A	N/A	N/A	N/A	N/A	ng/L	N/A
PFOS	CCV1	A15138004-11	14904.62	33207.16	0.449	50.000	50.729	ng/L	1.46
PFOS	LCS15138004	A15138004-12	33719.65	34503.22	0.977	100.000	106.784	ng/L	6.78
PFOS	LCSD15138004	A15138004-13	32089.68	33796.79	0.949	100.000	103.835	ng/L	3.83
PFOS	7879426 (BKG)	A15138004-14	N/A	N/A	N/A	N/A	N/A	ng/L	N/A
PFOS	7879426 MS	A15138004-15	37135.42	39737.75	0.935	N/A	102.246	ng/L	N/A
PFOS	7879426 MS	A15138004-16	53636.11	32355.41	1.658	200.000	178.959	ng/L	-10.52

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LCMSMS ANALYSIS REPORT

Compound Name	Sample ID	Data File Name	Response	ISTD Response	Response Ratio	Specified Amount	Calculated Amount	Units	% Diff
PFOS	7873709 DF100	A15138004-17	N/A	N/A	N/A	N/A	N/A	ng/L	N/A
PFOS	7873709	A15138004-18	N/A	N/A	N/A	N/A	N/A	ng/L	N/A
PFOS	7879425	A15138004-19	32398.84	46036.85	0.704	N/A	77.769	ng/L	N/A
PFOS	CCV3	A15138004-20	191653.53	30584.51	6.266	640.000	667.812	ng/L	4.35

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LCMSMS ANALYSIS REPORT

Sample Name:	7873709 DF100	Original Data Path:	C:\XCalibur\PFC\2015May
Sample ID:	7873709 DF100	Instrument Method:	C:\XCalibur\PFC\Acquisition MPFOAOS
Data File:	A15138004-17	Dilution Factor:	100.00
Acquisition Date:	05/29/15 08:34:22 PM	Instrument Model:	TSQ Quantum Access
Sample Type:	Unknown	Instrument Software Version:	2.3.0.1206 SP1
Vial:	d:14	Instrument Serial Number:	TQU01408
Run Time(min):	15.00	Operator:	Quantum
Injection Volume(μl):	10.00		

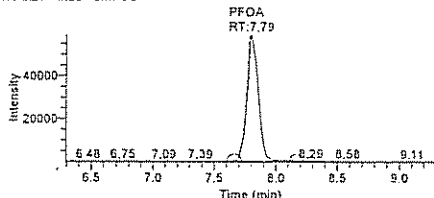
Quan Peak Table

Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.80	311262.53	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	8.03	34231.36	N/A	N/A	N/A
PFOA	11076.321	7.79	385664.56	311262.53	1.239	ng/L
PFOS	N/A	N/A	N/A	N/A	N/A	ng/L

Extracted Ion Chromatogram

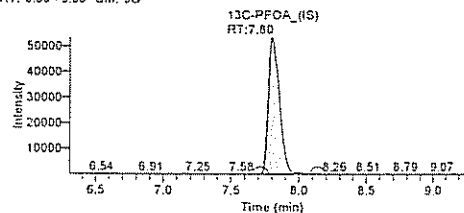
Component Name: PFOA

RT: 6.29 - 9.29 SM: 3G



NL: 5.93E4
TIC F: - e ESI SRM ms2
412.900
[168.895-168.905,
368.845-368.858] MS
ICIS A15138004-17

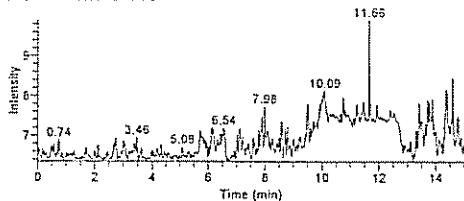
RT: 6.30 - 9.30 SM: 3G



NL: 5.36E4
TIC F: - e ESI
SRM ms2 416.940
[371.895-371.895]
MS ICIS
A15138004-17

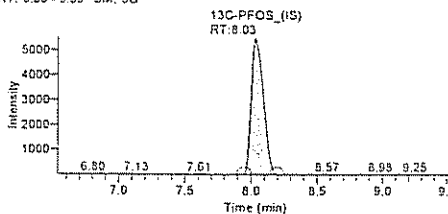
Component Name: PFOS

RT: 0.00 - 15.00 SM: 3G



NL: 9.90
TIC F: - e ESI SRM
ms2 408.850
[80.195-80.205,
98.995-99.005] MS
A15138004-17

RT: 6.53 - 9.53 SM: 3G



NL: 5.51E3
TIC F: - e ESI SRM
ms2 502.950
[80.275-80.285,
98.995-99.005] MS
ICIS A15138004-17

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LCMSMS ANALYSIS REPORT

Sample Name:	7873709	Original Data Path:	C:\XCalibur\PFC\2015May
Sample ID:	7873709	Instrument Method:	C:\XCalibur\PFC\Acquisition MPFOAOS
Data File:	A15138004-18	Dilution Factor:	1.00
Acquisition Date:	05/29/15 08:50:10 PM	Instrument Model:	TSQ Quantum Access
Sample Type:	Unknown	Instrument Software Version:	2.3.0.1206 SP1
Vial:	d:15	Instrument Serial Number:	TQU01408
Run Time(min):	14.99	Operator:	Quantum
Injection Volume(µl):	10.00		

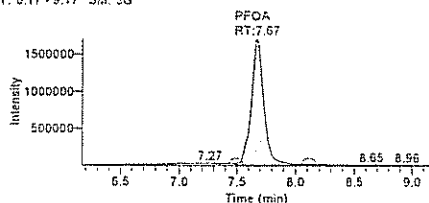
Quan Peak Table

Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.67	97740.36	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	7.96	46984.55	N/A	N/A	N/A
PFOA	11973.225	7.67	13118660.65	97740.36	134.219	ng/L
PFOS	N/A	N/A	N/A	N/A	N/A	ng/L

Extracted Ion Chromatogram

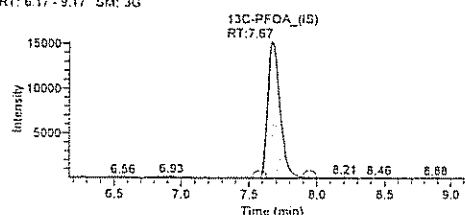
Component Name: PFOA

RT: 6.17 - 9.17 SM: 3G



NL: 1.71E5
TIC F: - c ESI SRM ms2
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[168.895-188.905,
368.845-368.855] MS
ICIS A15138004-18

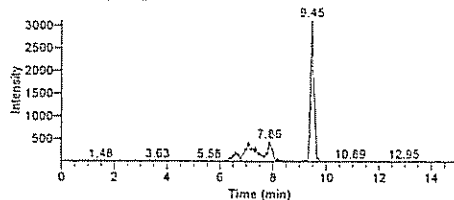
RT: 6.17 - 9.17 SM: 3G



NL: 1.53E4
TIC F: - c ESI
SRM ms2 416.940
[371.885-371.895]
MS ICIS
A15138004-18

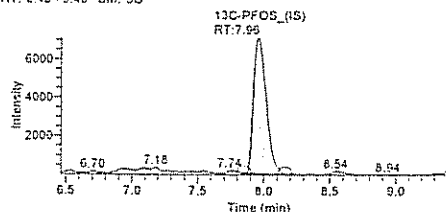
Component Name: PFOS

RT: 0.00 - 15.00 SM: 7G



NL: 3.12E3
TIC F: - c ESI SRM
ms2 458.860
[80.195-80.205,
98.995-99.005] MS
A15138004-18

RT: 6.46 - 9.46 SM: 3G



NL: 7.12E3
TIC F: - c ESI SRM
ms2 502.950
[80.275-80.285,
98.995-99.005] MS
ICIS A15138004-18

* > uia use data 7873709 DF100

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LCMSMS ANALYSIS REPORT

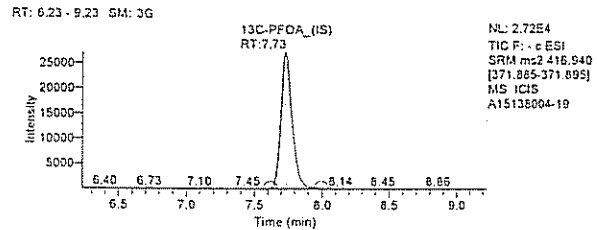
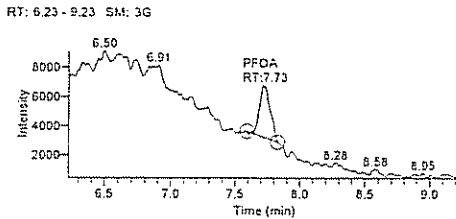
Sample Name:	7879425	Original Data Path:	C:\XCalibur\APFC\2015May
Sample ID:	7879425	Instrument Method:	C:\XCalibur\APFC\Acquisition MPFOAOS
Data File:	A15138004-19	Dilution Factor:	1.00
Acquisition Date:	05/29/15 09:05:56 PM	Instrument Model:	TSQ Quantum Access
Sample Type:	Unknown	Instrument Software Version:	2.3.0.1206 SP1
Vial:	d:16	Instrument Serial Number:	TQU01408
Run Time(min):	15.00	Operator:	Quantum
Injection Volume(µl):	10.00		

Quan Peak Table

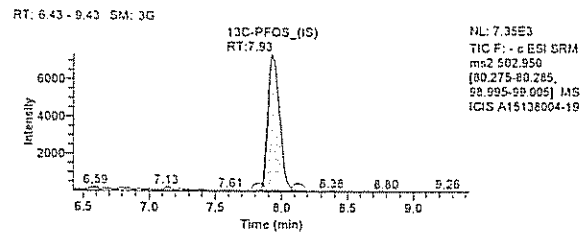
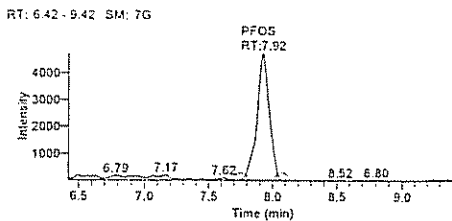
Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.73	157833.29	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	7.93	46036.85	N/A	N/A	N/A
PFOA	12.024	7.73	20857.66	157833.29	0.132	ng/L
PFOS	77.769	7.92	32398.84	46036.85	0.704	ng/L

Extracted Ion Chromatogram

Component Name: PFOA



Component Name: PFOS



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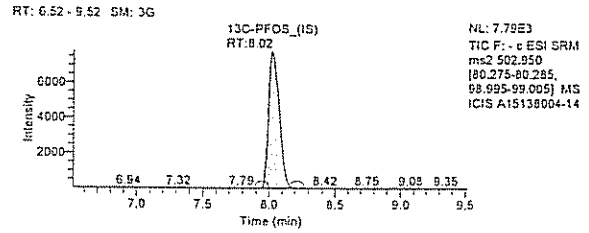
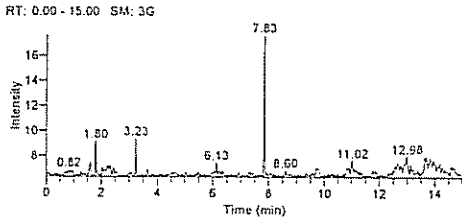
Sample Name:	7879426 (BKG)	Original Data Path:	C:\XCalibur\PFC\2015May
Sample ID:	7879426 (BKG)	Instrument Method:	C:\XCalibur\PFC\Acquisition MPFOAOS
Data File:	A15138004-14	Dilution Factor:	1.00
Acquisition Date:	05/29/15 07:47:09 PM	Instrument Model:	TSQ Quantum Access
Sample Type:	Unknown	Instrument Software Version:	2.3.0.1206 SP1
Vial:	d:12	Instrument Serial Number:	TQU01408
Run Time(min):	15.00	Operator:	Quantum
Injection Volume(μl):	10.00		

Quan Peak Table

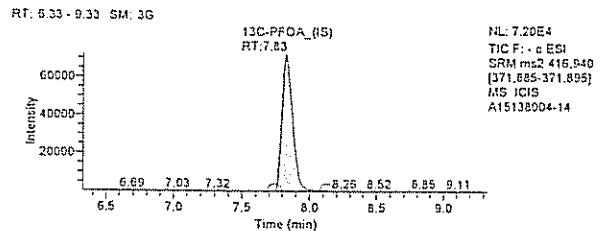
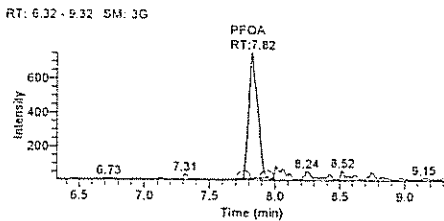
Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.83	400578.82	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	8.02	45084.00	N/A	N/A	N/A
PFOA	1.026	7.82	3548.02	400578.82	0.009	ng/L
PFOS	N/A	N/A	N/A	N/A	N/A	ng/L

Extracted Ion Chromatogram

Component Name: PFOS



Component Name: PFOA



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Standards Data

PFAAs by LC/MS/MS

Sequence Table

File Name	Sample ID	Sample Type	Level	Vial	Inj Vol	Dil Factor	Path	Inst Method	Proc Method
A15138004-01	equi	Unknown	N/A	d:1	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition	C:\XCalibur\PFC\Quan
A15138004-02	SYS	Unknown	N/A	d:2	10.0	1.000	C:\XCalibur\PFC\2015May	MPPFOAOS	MPPFOAOS
A15138004-03	CAL1	Std Bracket	1	d:3	10.0	1.000	C:\XCalibur\PFC\2015May	MPPFOAOS	MPPFOAOS
A15138004-04	CAL2	Std Bracket	2	d:4	10.0	1.000	C:\XCalibur\PFC\2015May	MPPFOAOS	MPPFOAOS
A15138004-05	CAL3	Std Bracket	3	d:5	10.0	1.000	C:\XCalibur\PFC\2015May	MPPFOAOS	MPPFOAOS
A15138004-06	CAL4	Std Bracket	4	d:6	10.0	1.000	C:\XCalibur\PFC\2015May	MPPFOAOS	MPPFOAOS
A15138004-07	CAL5	Std Bracket	5	d:7	10.0	1.000	C:\XCalibur\PFC\2015May	MPPFOAOS	MPPFOAOS
A15138004-08	CAL6	Std Bracket	6	d:8	10.0	1.000	C:\XCalibur\PFC\2015May	MPPFOAOS	MPPFOAOS
A15138004-09	Recon	Unknown	N/A	d:1	10.0	1.000	C:\XCalibur\PFC\2015May	MPPFOAOS	MPPFOAOS
A15138004-10	BLK 15138004	Unknown	N/A	d:9	10.0	1.000	C:\XCalibur\PFC\2015May	MPPFOAOS	MPPFOAOS
A15138004-11	CCV1	QC	1	d:5	10.0	1.000	C:\XCalibur\PFC\2015May	MPPFOAOS	MPPFOAOS
A15138004-12	LCS15138004	QC	VICV	d:10	10.0	1.000	C:\XCalibur\PFC\2015May	MPPFOAOS	MPPFOAOS
A15138004-13	LCSD15138004	QC	VICV	d:11	10.0	1.000	C:\XCalibur\PFC\2015May	MPPFOAOS	MPPFOAOS
A15138004-14	7879426 (BKG)	Unknown	N/A	d:12	10.0	1.000	C:\XCalibur\PFC\2015May	MPPFOAOS	MPPFOAOS
A15138004-15	7879426 MS	Unknown	N/A	d:13	10.0	1.000	C:\XCalibur\PFC\2015May	MPPFOAOS	MPPFOAOS
A15138004-16	CCV2	QC	2	d:6	10.0	1.000	C:\XCalibur\PFC\2015May	MPPFOAOS	MPPFOAOS
A15138004-17	7873709 DFI00	Unknown	N/A	d:14	10.0	100.000	C:\XCalibur\PFC\2015May	MPPFOAOS	MPPFOAOS
A15138004-18	7873709	Unknown	N/A	d:15	10.0	1.000	C:\XCalibur\PFC\2015May	MPPFOAOS	MPPFOAOS
A15138004-19	7879425	Unknown	N/A	d:16	10.0	1.000	C:\XCalibur\PFC\2015May	MPPFOAOS	MPPFOAOS
A15138004-20	CCV3	QC	3	d:7	10.0	1.000	C:\XCalibur\PFC\2015May	MPPFOAOS	MPPFOAOS

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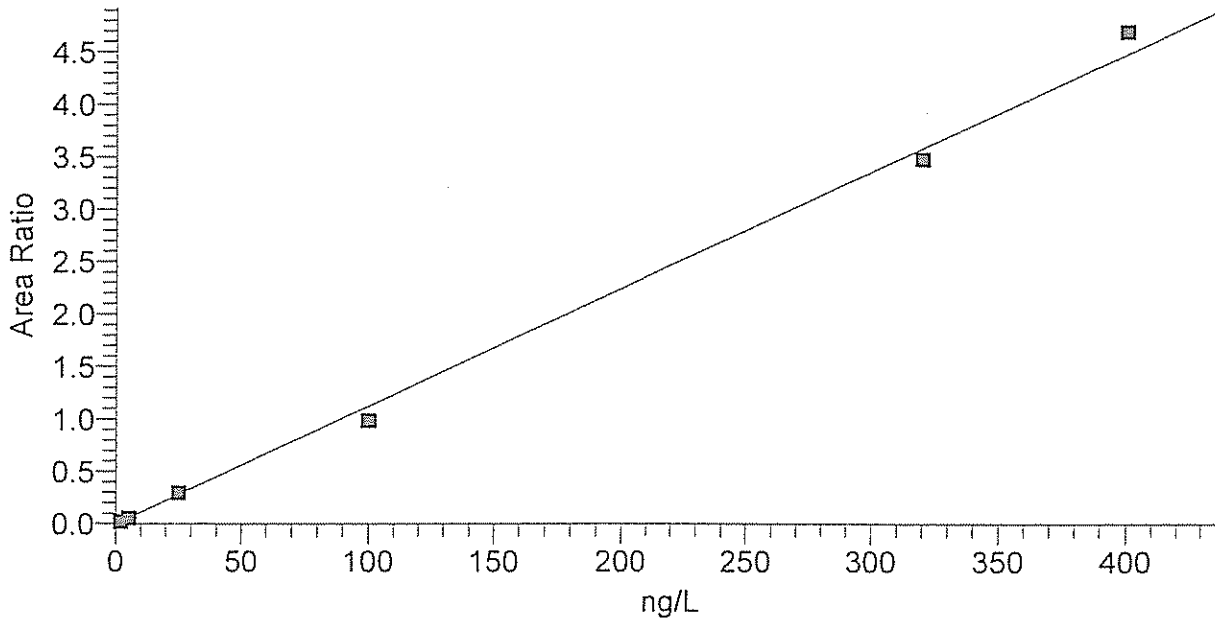
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Senior Specialist

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LCMSMS ANALYSIS REPORT

Component Name: PFOA

PFOA
 $Y = -0.00264355 + 0.0112102 * X \quad R^2 = 0.9966 \quad W: 1/X$



Identification Filter:	- c ESI SRM ms2 412.90 [168.90-168.91, 368.85-368.86]	Component Name:	PFOA
2nd Trace Type:	N/A	1st Trace Type:	TIC
Mass Range 2 (m/z):		Mass Range 1 (m/z):	
Base Peak(BP):		Wavelength Range 2 (nm):	N/A
Retention Time Window (sec):	30.00000	Expected RT (min):	7.60000
RT Reference:	No	View Width (min):	3.00000
Adjust Using:	N/A	Adjust Expected RT:	No
Detection Options		Peak Detection Algorithm:	ICIS
ICIS Smoothing Points:	3	ICIS Peak Integration	
Area Noise Factor:	10	Baseline Window:	200
ICIS Constrain Peak Width:	No	Peak Noise Factor:	10
ICIS Tailing Factor:	N/A	ICIS Peak Height (%):	N/A
ICIS Peak Detection		ICIS Identify By:	Nearest RT
ICIS Minimum Peak Height (S/N):	5.0	ICIS Ion Ratio Confirmation:	Disabled
ICIS Window %:		ICIS Qualifier Ion Coelution (min):	N/A
ICIS Forward:	0	ICIS Spectrum Thresholds	
ICIS Match:	0	ICIS Reverse:	0
ICIS Advanced Parameters		Noise Method:	Incos
Minimum Peak Width:	3	Multiplet Resolution:	10
Area Tail Extension:	5	Area Scan Window:	0
Component Type:	Target Compound	Calibration	
ISTD Amount:	N/A	%RSD Calculation Method:	Use calculated amounts
ISTD:	13C-PFOA_(IS)	Internal Standard	
Origin:	IgnoreOrigin	ISTD Units:	N/A
Calibration Curve:	Linear	Target Compounds	<i>Michele J. Smith</i>
Number of Cal. Levels:	6	Weighting:	OneOverX
Scan Threshold (mAU):	N/A	Response:	Area
Limit ScanRange (nm):	N/A	Target Units:	ng/L
		Number of QC Levels:	5
		Peak Purity Options	
		Peak Coverage (%):	N/A

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LCMSMS ANALYSIS REPORT

Component Cal Level Table

Cal Level	Amount
1	2.000
2	5.000
3	25.000
4	100.000
5	320.000
6	400.000

Component QC Level Table

QC Level	Amount
ICV	200.000
VICV	100.000
1	25.000
2	100.000
3	320.000

ICV & CCV Result Table

Sample ID	Data File Name	Calculated Amount	Area	ISTD Area	Area Ratio	% Diff
CAL1	A15138004-03	2.077	7022.44	340245.86	0.021	3.85
CAL2	A15138004-04	4.963	16144.41	304681.56	0.053	-0.75
CAL3	A15138004-05	26.728	89963.93	302931.51	0.297	6.91
CAL4	A15138004-06	88.005	306067.84	311073.33	0.984	-12.00
CAL5	A15138004-07	310.871	963216.70	276605.42	3.482	-2.85
CAL6	A15138004-08	419.357	1278652.99	272144.74	4.698	4.84
CCV1	A15138004-11	24.238	80477.52	299101.57	0.269	-3.05
LCS15138004	A15138004-12	104.743	331006.89	282538.91	1.172	4.74
LCSD15138004	A15138004-13	112.685	319651.19	253575.05	1.261	12.69
CCV2	A15138004-16	91.669	278101.07	271321.84	1.025	-8.33
CCV3	A15138004-20	326.190	1090466.04	298430.19	3.654	1.93

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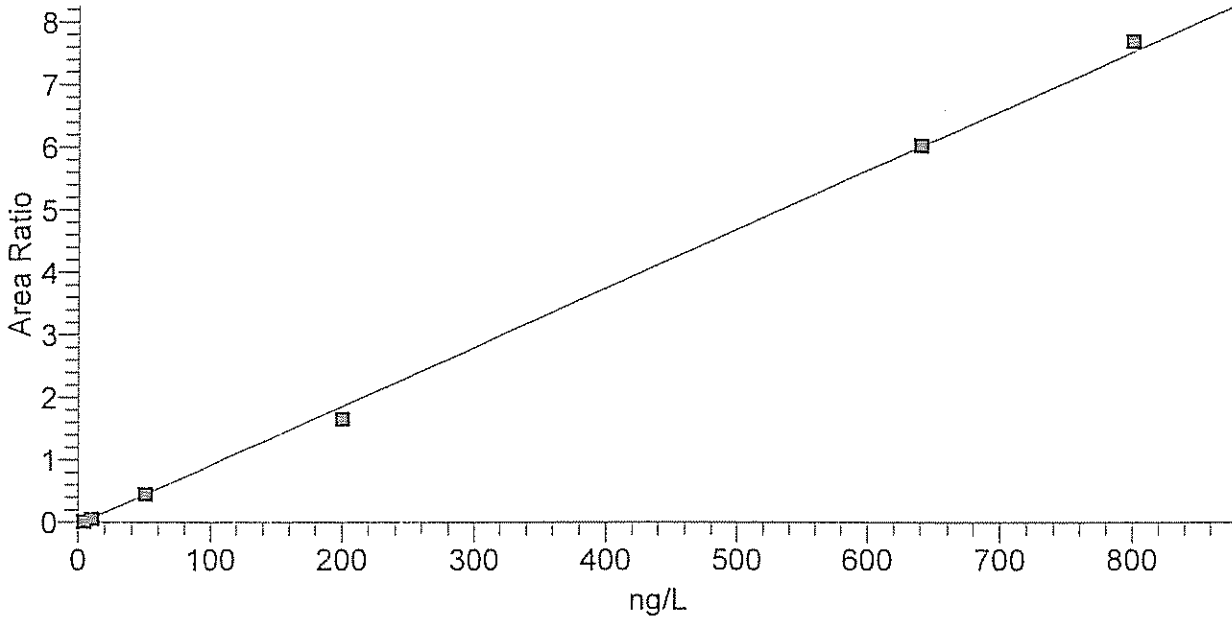
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LCMSMS ANALYSIS REPORT

Component Name: PFOS

PFOS

$$Y = -0.0294091 + 0.00942745 * X \quad R^2 = 0.9982 \quad W: 1/X$$



Identification		Component Name:	PFOS
Filter:	- c ESI SRM ms2 498.86 [80.19-80.20, 99.00-99.00]	1st Trace Type:	TIC
2nd Trace Type:	N/A	Mass Range 1 (m/z):	
Mass Range 2 (m/z):		Wavelength Range 2 (nm):	N/A
Base Peak(BP):		Expected RT (min):	7.80000
Retention Time		View Width (min):	3.00000
Window (sec):	50.00000	Adjust Expected RT:	No
RT Reference:	No		
Adjust Using:	N/A	Peak Detection Algorithm:	ICIS
Detection Options		ICIS Peak Integration	
ICIS Smoothing Points:	3	Baseline Window:	75
Area Noise Factor:	5	Peak Noise Factor:	10
ICIS Constrain Peak Width:	No	ICIS Peak Height (%):	N/A
ICIS Tailing Factor:	N/A	ICIS Identify By:	Nearest RT
ICIS Peak Detection		ICIS Ion Ratio Confirmation:	Disabled
ICIS Minimum Peak Height (S/N):	5.0	ICIS Qualifier Ion Coelution (min):	N/A
ICIS Window %:		ICIS Spectrum Thresholds	
ICIS Forward:	0	ICIS Reverse:	0
ICIS Match:	0	Noise Method:	IncOS
ICIS Advanced Parameters		Multiplet Resolution:	10
Minimum Peak Width:	3	Area Scan Window:	0
Area Tail Extension:	5	Calibration	
Component Type:	Target Compound	%RSD Calculation Method:	Use calculated amounts
ISTD Amount:	N/A	Internal Standard	
ISTD:		ISTD Units:	N/A
Origin:	13C-PFOS_(IS)	Target Compounds	
Calibration Curve:	IgnoreOrigin	Weighting:	OneOverX
Number of Cal. Levels:	Linear	Response:	Area
Scan Threshold (mAU):	6	Target Units:	ng/L
Limit ScanRange (nm):	N/A	Number of QC Levels:	5
		Peak Purity Options	
		Peak Coverage (%):	N/A

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LCMSMS ANALYSIS REPORT

Component Cal Level Table

Cal Level	Amount
1	4.000
2	10.000
3	50.000
4	200.000
5	640.000
6	800.000

Component QC Level Table

QC Level	Amount
VICV	100.000
ICV	200.000
1	50.000
2	200.000
3	640.000

ICV & CCV Result Table

Sample ID	Data File Name	Calculated Amount	Area	ISTD Area	Area Ratio	% Diff
CAL1	A15138004-03	4.597	560.43	40232.98	0.014	14.93
CAL2	A15138004-04	9.088	2141.36	38054.53	0.056	-9.12
CAL3	A15138004-05	51.105	17586.79	38875.86	0.452	2.21
CAL4	A15138004-06	178.740	60034.25	36260.22	1.656	-10.63
CAL5	A15138004-07	641.610	193583.81	32160.30	6.019	0.25
CAL6	A15138004-08	818.859	244944.43	31850.89	7.690	2.36
CCV1	A15138004-11	50.729	14904.62	33207.16	0.449	1.46
LCS15138004	A15138004-12	106.784	33719.65	34503.22	0.977	6.78
LCSD15138004	A15138004-13	103.835	32089.68	33796.79	0.949	3.83
CCV2	A15138004-16	178.959	53636.11	32355.41	1.658	-10.52
CCV3	A15138004-20	667.812	191653.53	30584.51	6.266	4.35

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LCMSMS ANALYSIS REPORT

Sample Name:	SYS	Original Data Path:	C:\XCalibur\PFC\2015May
Sample ID:	SYS	Instrument Method:	C:\XCalibur\PFC\Acquisition MPFOAOS
Data File:	A15138004-02	Dilution Factor:	1.00
Acquisition Date:	05/29/15 04:38:05 PM	Instrument Model:	TSQ Quantum Access
Sample Type:	Unknown	Instrument Software Version:	2.3.0.1206 SP1
Vial:	d:2	Instrument Serial Number:	TQU01408
Run Time(min):	15.00	Operator:	Quantum
Injection Volume(μl):	10.00		

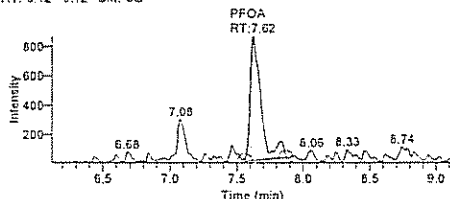
Quan Peak Table

Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.63	279006.30	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	7.89	39316.68	N/A	N/A	N/A
PFOA	1.761	7.62	4769.80	279006.30	0.017	ng/L
PFOS	3.275	7.90	57.73	39316.68	0.001	ng/L

Extracted Ion Chromatogram

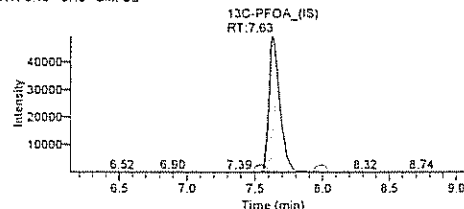
Component Name: PFOA

RT: 6.12 - 9.12 SM: 3G



NL: 8.71E2
TIC F: - c ESI SRM
m/z 412.900
[168.895-168.905,
368.845-368.855] MS
A15138004-02

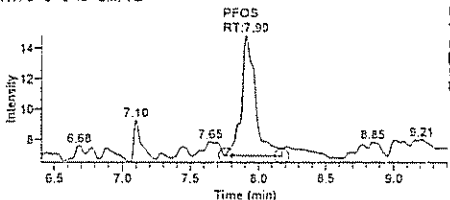
RT: 6.13 - 9.13 SM: 3G



NL: 4.97E4
TIC F: - c ESI
SRM m/z 416.940
[371.885-371.895]
MS ICIS
A15138004-02

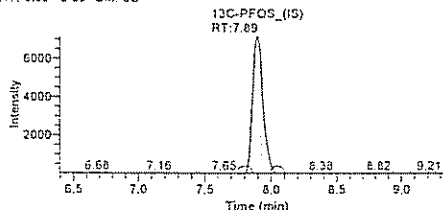
Component Name: PFOS

RT: 6.40 - 9.40 SM: 7G



NL: 1.48E1
TIC F: - c ESI SRM
m/z 498.860
[80.195-80.205,
98.995-99.005] MS
ICIS A15138004-02

RT: 6.39 - 9.39 SM: 3G



NL: 7.17E3
TIC F: - c ESI SRM
m/z 502.950
[80.275-80.285,
98.995-99.005] MS
ICIS A15138004-02

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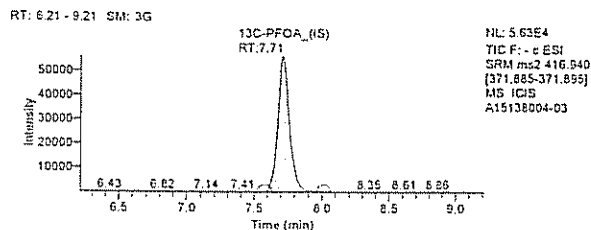
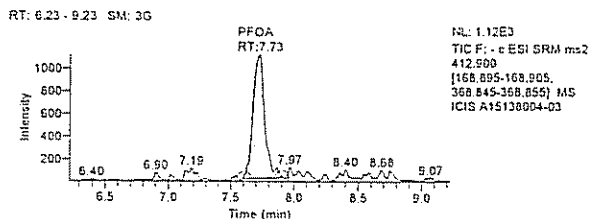
Sample Name:	CALI	Original Data Path:	C:\XCalibur\PFC\2015May
Sample ID:	CAL1	Instrument Method:	C:\XCalibur\PFC\Acquisition M\PFOAOS
Data File:	A15138004-03	Dilution Factor:	1.00
Acquisition Date:	05/29/15 04:53:47 PM	Instrument Model:	TSQ Quantum Access
Sample Type:	Std Bracket	Instrument Software Version:	2.3.0.1206 SP1
Vial:	d:3	Instrument Serial Number:	TQU01408
Run Time(min):	15.00	Operator:	Quantum
Injection Volume(µl):	10.00		

Quan Peak Table

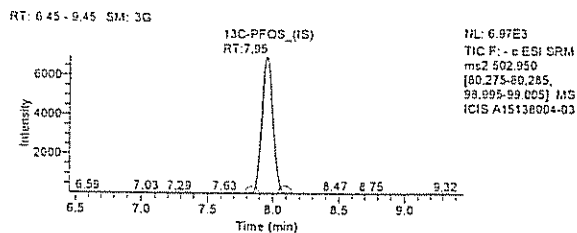
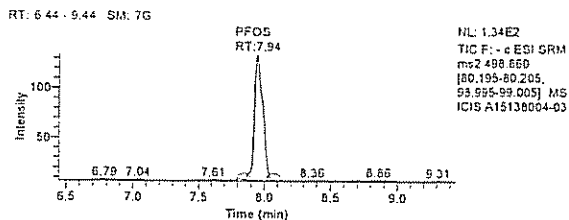
Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.71	340245.86	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	7.95	40232.98	N/A	N/A	N/A
PFOA	2.077	7.73	7022.44	340245.86	0.021	ng/L
PFOS	4.597	7.94	560.43	40232.98	0.014	ng/L

Extracted Ion Chromatogram

Component Name: PFOA



Component Name: PFOS



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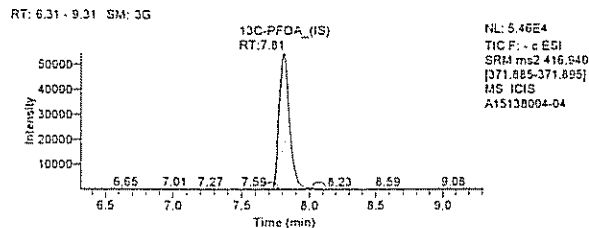
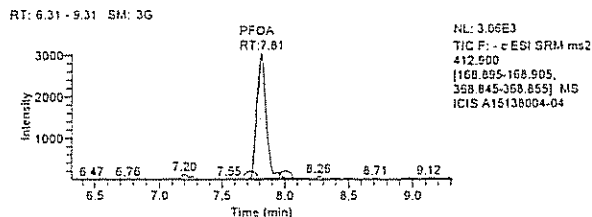
Sample Name:	CAL2	Original Data Path:	C:\XCalibur\APFC\2015May
Sample ID:	CAL2	Instrument Method:	C:\XCalibur\APFC\Acquisition MPFOAOS
Data File:	A15138004-04	Dilution Factor:	1.00
Acquisition Date:	05/29/15 05:09:34 PM	Instrument Model:	TSQ Quantum Access
Sample Type:	Std Bracket	Instrument Software Version:	2.3.0.1206 SP1
Vial:	d:4	Instrument Serial Number:	TQU01408
Run Time(min):	15.00	Operator:	Quantum
Injection Volume(μl):	10.00		

Quan Peak Table

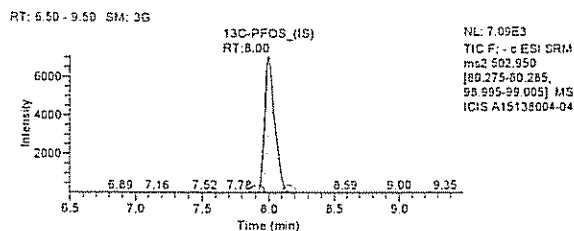
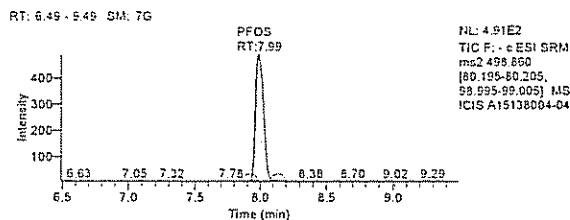
Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.81	304681.56	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	8.00	38054.53	N/A	N/A	N/A
PFOA	4.963	7.81	16144.41	304681.56	0.053	ng/L
PFOS	9.088	7.99	2141.36	38054.53	0.056	ng/L

Extracted Ion Chromatogram

Component Name: PFOA



Component Name: PFOS



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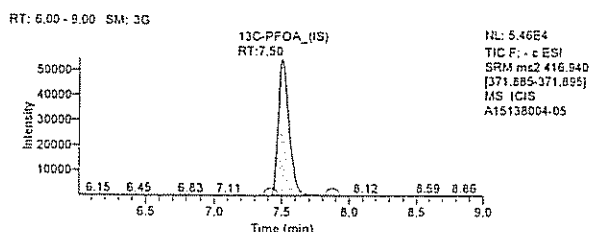
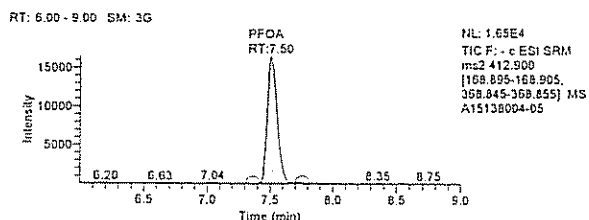
Sample Name:	CAL3	Original Data Path:	C:\XCalibur\PFC\2015May
Sample ID:	CAL3	Instrument Method:	C:\XCalibur\PFC\Acquisition\M\PFOAOS
Data File:	A15138004-05	Dilution Factor:	1.00
Acquisition Date:	05/29/15 05:25:20 PM	Instrument Model:	TSQ Quantum Access
Sample Type:	Std Bracket	Instrument Software Version:	2.3.0.1206 SPI
Vial:	d:5	Instrument Serial Number:	TQU01408
Run Time(min):	15.00	Operator:	Quantum
Injection Volume(µl):	10.00		

Quan Peak Table

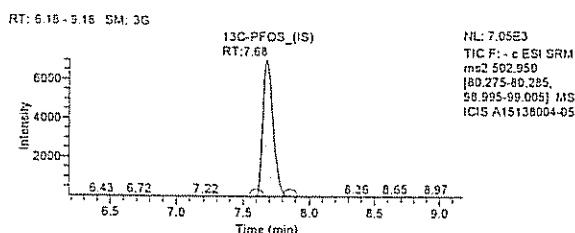
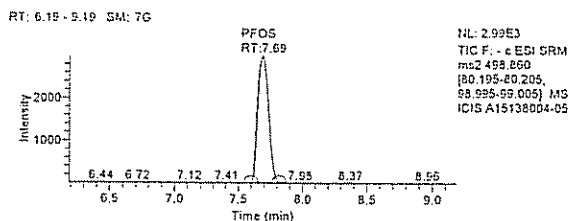
Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.50	302931.51	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	7.68	38875.86	N/A	N/A	N/A
PFOA	26.728	7.50	89963.93	302931.51	0.297	ng/L
PFOS	51.105	7.69	17586.79	38875.86	0.452	ng/L

Extracted Ion Chromatogram

Component Name: PFOA



Component Name: PFOS



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Sample Name:	CAL4	Original Data Path:	C:\XCalibur\PFC\2015May
Sample ID:	CAL4	Instrument Method:	C:\XCalibur\PFC\Acquisition MPFOAOS
Data File:	A15138004-06	Dilution Factor:	1.00
Acquisition Date:	05/29/15 05:41:07 PM	Instrument Model:	TSQ Quantum Access
Sample Type:	Std Bracket	Instrument Software Version:	2.3.0.1206 SP1
Vial:	d:6	Instrument Serial Number:	TQU01408
Run Time(min):	15.00	Operator:	Quantum
Injection Volume(μl):	10.00		

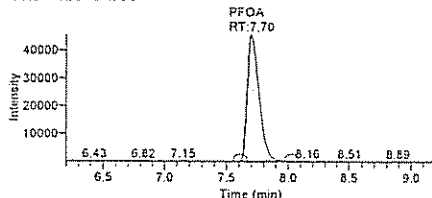
Quan Peak Table

Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.70	311073.33	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	8.00	36260.22	N/A	N/A	N/A
PFOA	88.005	7.70	306067.84	311073.33	0.984	ng/L
PFOS	178.740	8.00	60034.25	36260.22	1.656	ng/L

Extracted Ion Chromatogram

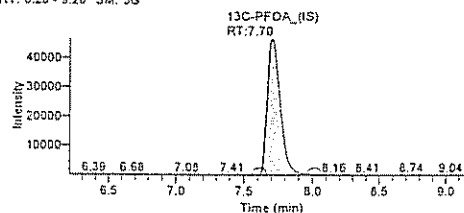
Component Name: PFOA

RT: 6.20 - 9.20 SM: 3G



NL: 4.57E4
TIC F: - c ESI SRM ms2
412.900
{166.895-168.905,
368.845-368.855} MS
ICIS A15138004-06

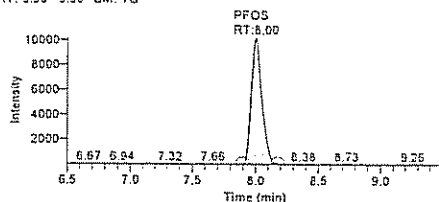
RT: 6.20 - 9.20 SM: 3G



NL: 4.67E4
TIC F: - c ESI
SRM ms2 416.940
{171.895-171.895} MS
ICIS
A15138004-06

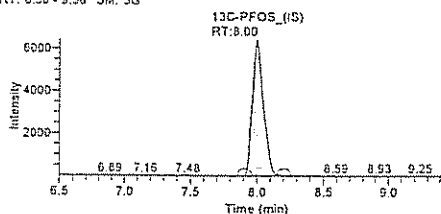
Component Name: PFOS

RT: 6.50 - 9.50 SM: 7G



NL: 1.02E4
TIC F: - c ESI SRM
ms2 498.650
{50.195-80.205,
98.095-99.005} MS
ICIS A15138004-06

RT: 6.50 - 9.50 SM: 3G



NL: 6.47E3
TIC F: - c ESI SRM
ms2 502.950
{80.275-80.285,
98.995-99.005} MS
ICIS A15138004-06

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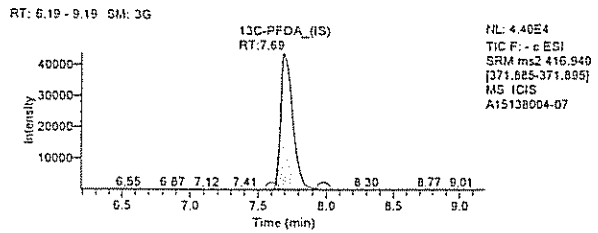
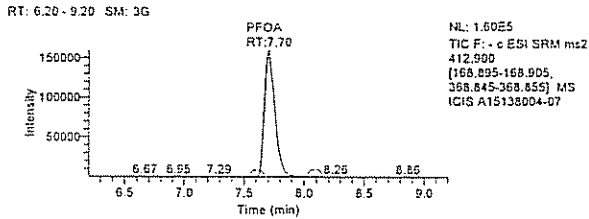
Sample Name:	CAL5	Original Data Path:	C:\XCalibur\PFC\2015May
Sample ID:	CAL5	Instrument Method:	C:\XCalibur\PFC\Acquisition MPFOAOS
Data File:	A15138004-07	Dilution Factor:	1.00
Acquisition Date:	05/29/15 05:56:54 PM	Instrument Model:	TSQ Quantum Access
Sample Type:	Std Bracket	Instrument Software Version:	2.3.0.1206 SP1
Vial:	d:7	Instrument Serial Number:	TQU01408
Run Time(min):	15.00	Operator:	Quantum
Injection Volume(μl):	10.00		

Quan Peak Table

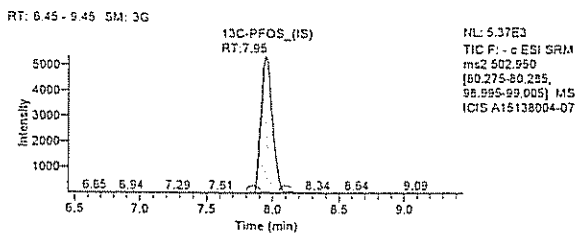
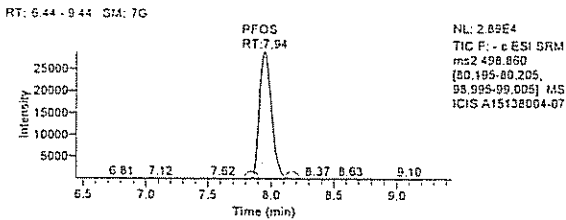
Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.69	276605.42	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	7.95	32160.30	N/A	N/A	N/A
PFOA	310.871	7.70	963216.70	276605.42	3.482	ng/L
PFOS	641.610	7.94	193583.81	32160.30	6.019	ng/L

Extracted Ion Chromatogram

Component Name: PFOA



Component Name: PFOS



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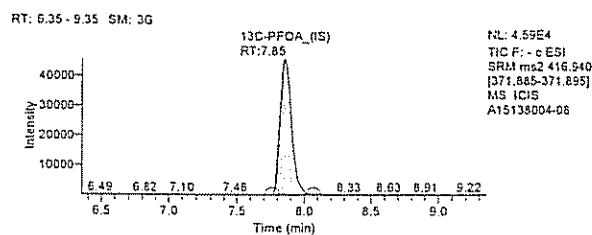
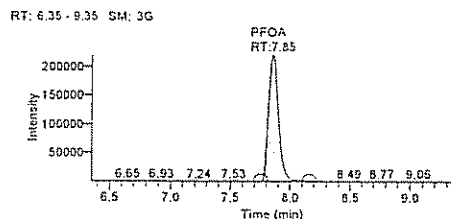
Sample Name: CAL6	Original Data Path: C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\M\PFOAOS
Sample ID: CAL6	Instrument Method:	
Data File: A15138004-08	Dilution Factor: 1.00	
Acquisition Date: 05/29/15 06:12:38 PM	Instrument Model: TSQ Quantum Access	
Sample Type: Std Bracket	Instrument Software Version: 2.3.0.1206 SP1	
Vial: d:8	Instrument Serial Number: TQU01408	
Run Time(min): 15.00	Operator: Quantum	
Injection Volume(µl): 10.00		

Quan Peak Table

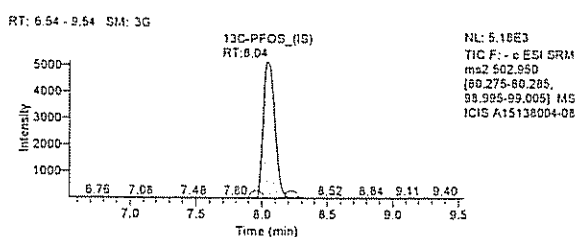
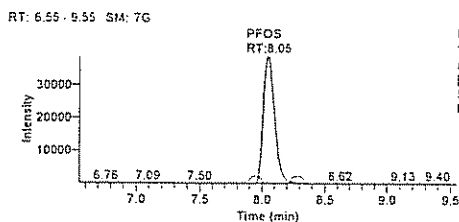
Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.85	272144.74	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	8.04	31850.89	N/A	N/A	N/A
PFOA	419.357	7.85	1278652.99	272144.74	4.698	ng/L
PFOS	818.859	8.05	244944.43	31850.89	7.690	ng/L

Extracted Ion Chromatogram

Component Name: PFOA



Component Name: PFOS



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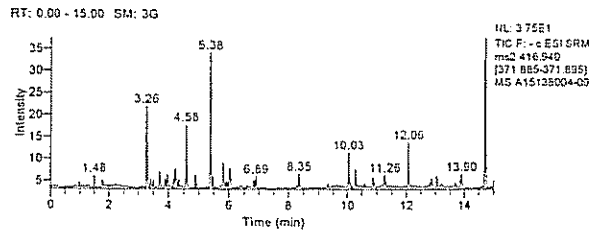
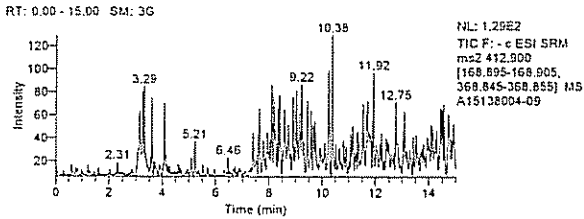
Sample Name: Recon	Original Data Path: C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\M\PFOAOS
Sample ID: Recon	Instrument Method:	
Data File: A15138004-09	Dilution Factor: 1.00	
Acquisition Date: 05/29/15 06:28:21 PM	Instrument Model: TSQ Quantum Access	
Sample Type: Unknown	Instrument Software Version: 2.3.0.1206 SP1	
Vial: d:1	Instrument Serial Number: TQU01408	
Run Time(min): 15.00	Operator: Quantum	
Injection Volume(µl): 10.00		

Quan Peak Table

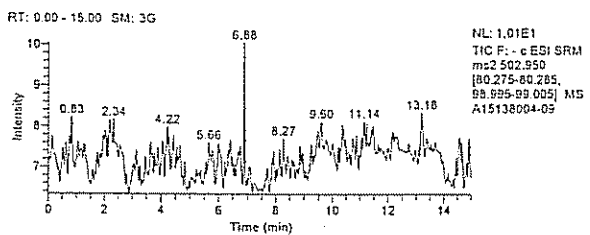
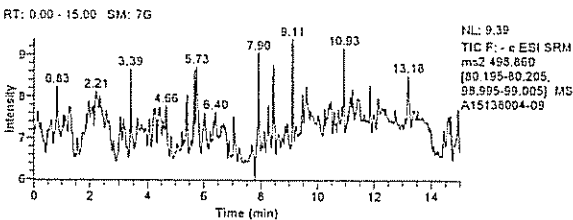
Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	N/A	N/A	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	N/A	N/A	N/A	N/A	N/A
PFOA	N/A	N/A	N/A	N/A	N/A	ng/L
PFOS	N/A	N/A	N/A	N/A	N/A	ng/L

Extracted Ion Chromatogram

Component Name: PFOA



Component Name: PFOS



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Sample Name: CCV1	Original Data Path: C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\2015May
Sample ID: CCV1	Instrument Method: C:\XCalibur\PFC\Acquisition MPFOAOS	
Data File: A15138004-11	Dilution Factor: 1.00	
Acquisition Date: 05/29/15 06:59:50 PM	Instrument Model: TSQ Quantum Access	
Sample Type: QC	Instrument Software Version: 2.3.0.1206 SP1	
Vial: d:5	Instrument Serial Number: TQU01408	
Run Time(min): 15.00	Operator: Quantum	
Injection Volume(μl): 10.00		

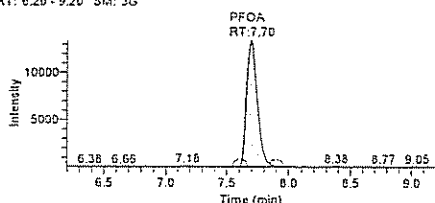
Quan Peak Table

Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.70	299101.57	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	7.95	33207.16	N/A	N/A	N/A
PFOA	24.238	7.70	80477.52	299101.57	0.269	ng/L
PFOS	50.729	7.95	14904.62	33207.16	0.449	ng/L

Extracted Ion Chromatogram

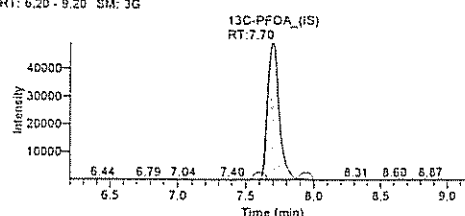
Component Name: PFOA

RT: 6.20 - 9.20 SM: 3G



NL: 1.35E4
TIC F: - c ESI SRM ms2
412.900
[168.895-168.905,
368.845-368.855] MS
ICIS A15138004-11

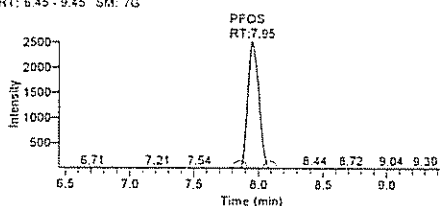
RT: 6.20 - 9.20 SM: 3G



NL: 4.94E4
TIC F: - c ESI
SRM ms2 416.940
[371.885-371.895]
MS ICIS
A15138004-11

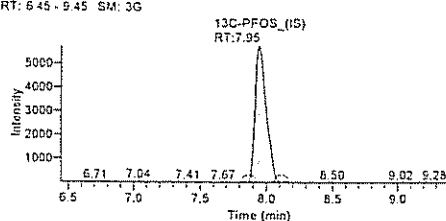
Component Name: PFOS

RT: 6.45 - 9.45 SM: 7G



NL: 2.53E3
TIC F: - c ESI SRM
ms2 498.660
[80.195-80.205,
98.995-99.005] MS
ICIS A15138004-11

RT: 6.45 - 9.45 SM: 3G



NL: 5.78E3
TIC F: - c ESI SRM
ms2 502.950
[80.275-80.285,
98.995-99.005] MS
ICIS A15138004-11

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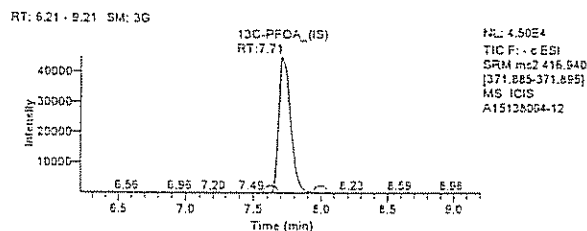
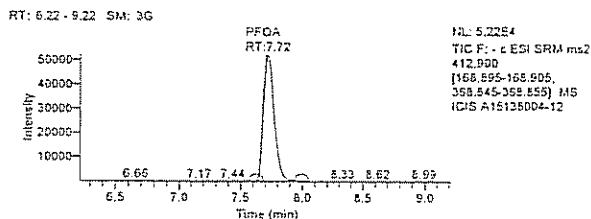
Sample Name: LCS15138004	Original Data Path: C:\XCalibur\PFC\2015May	Sample ID: LCS15138004	Instrument Method: C:\XCalibur\PFC\Acquisition M\PFOAOS
Data File: A15138004-12	Dilution Factor: 1.00	Acquisition Date: 05/29/15 07:15:36 PM	Instrument Model: TSQ Quantum Access
Sample Type: QC	Instrument Software Version: 2.3.0.1206 SP1	Vial: d:10	Instrument Serial Number: TQU01408
Run Time(min): 15.00	Operator: Quantum	Injection Volume(μl): 10.00	

Quan Peak Table

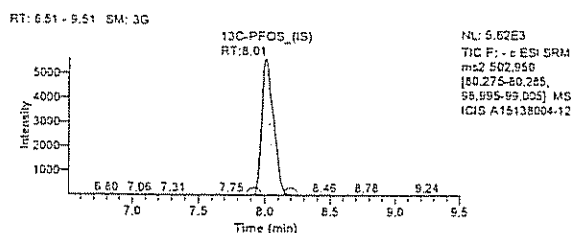
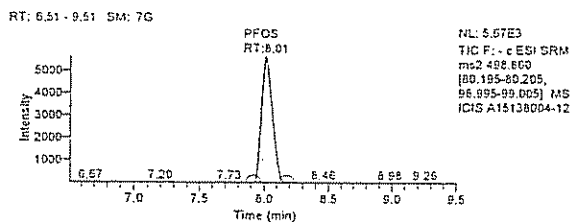
Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.71	282538.91	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	8.01	34503.22	N/A	N/A	N/A
PFOA	104.743	7.72	331006.89	282538.91	1.172	ng/L
PFOS	106.784	8.01	33719.65	34503.22	0.977	ng/L

Extracted Ion Chromatogram

Component Name: PFOA



Component Name: PFOS



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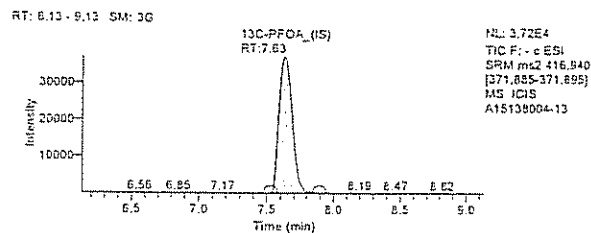
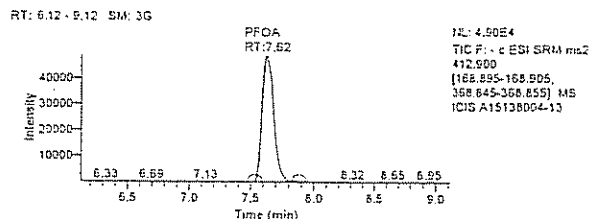
Sample Name: LCSD15138004	Original Data Path: C:\XCalibur\PFC\2015May	
Sample ID: LCSD15138004	Instrument Method: C:\XCalibur\PFC\Acquisition\MPFOAOS	
Data File: A15138004-13	Dilution Factor: 1.00	
Acquisition Date: 05/29/15 07:31:22 PM	Instrument Model: TSQ Quantum Access	
Sample Type: QC	Instrument Software Version: 2.3.0.1206 SP1	
Vial: d:11	Instrument Serial Number: TQU01408	
Run Time(min): 15.00	Operator: Quantum	
Injection Volume(μl): 10.00		

Quan Peak Table

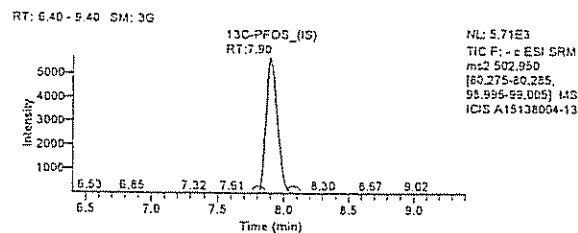
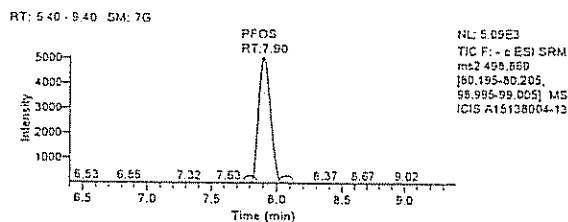
Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.63	253575.05	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	7.90	33796.79	N/A	N/A	N/A
PFOA	112.685	7.62	319651.19	253575.05	1.261	ng/L
PFOS	103.835	7.90	32089.68	33796.79	0.949	ng/L

Extracted Ion Chromatogram

Component Name: PFOA



Component Name: PFOS



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Sample Name: CCV2	Original Data Path: C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition MPFOAOS
Sample ID: CCV2	Instrument Method:	1.00
Data File: A15138004-16	Dilution Factor:	TSQ Quantum Access
Acquisition Date: 05/29/15 08:18:40 PM	Instrument Model:	2.3.0.1206 SP1
Sample Type: QC	Instrument Software Version:	TQU01408
Vial: d:6	Instrument Serial Number:	Quantum
Run Time(min): 15.00	Operator:	
Injection Volume(µl): 10.00		

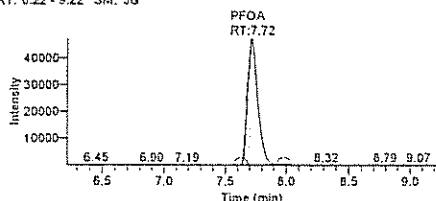
Quan Peak Table

Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.72	271321.84	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	7.96	32355.41	N/A	N/A	N/A
PFOA	91.669	7.72	278101.07	271321.84	1.025	ng/L
PFOS	178.959	7.96	53636.11	32355.41	1.658	ng/L

Extracted Ion Chromatogram

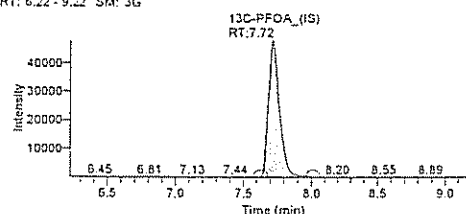
Component Name: PFOA

RT: 6.22 - 9.22 SM: 3G



NL: 4.73E4
TIC F: - c ESI SRM ms2
412.900
[168.855-168.905,
368.845-368.855] MS
ICIS A15138004-16

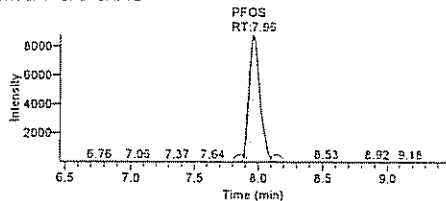
RT: 6.22 - 9.22 SM: 3G



NL: 4.75E4
TIC F: - c ESI
SRM ms2 416.940
[371.885-371.895] MS
ICIS
A15138004-16

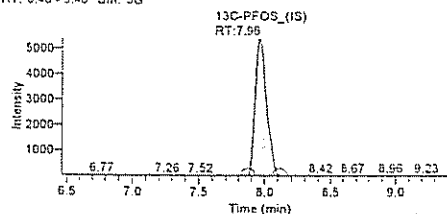
Component Name: PFOS

RT: 6.45 - 9.46 SM: 7G



NL: 8.79E3
TIC F: - c ESI SRM
ms2 498.860
[80.195-80.205,
98.895-99.005] MS
ICIS A15138004-16

RT: 6.46 - 9.46 SM: 3G



NL: 5.41E3
TIC F: - c ESI SRM
ms2 502.950
[80.275-80.285,
98.995-99.005] MS
ICIS A15138004-16

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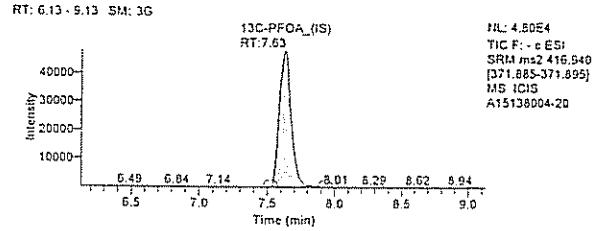
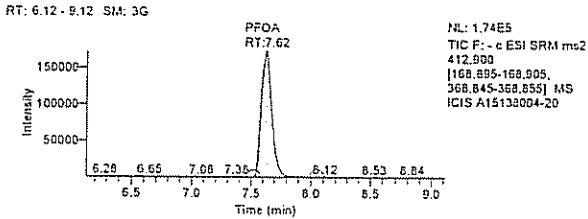
Sample Name:	CCV3	Original Data Path:	C:\XCalibur\PFC\2015May
Sample ID:	CCV3	Instrument Method:	C:\XCalibur\PFC\Acquisition MPFOAOS
Data File:	A15138004-20	Dilution Factor:	1.00
Acquisition Date:	05/29/15 09:21:43 PM	Instrument Model:	TSQ Quantum Access
Sample Type:	QC	Instrument Software Version:	2.3.0.1206 SP1
Vial:	d:7	Instrument Serial Number:	TQU01408
Run Time(min):	15.00	Operator:	Quantum
Injection Volume(μl):	10.00		

Quan Peak Table

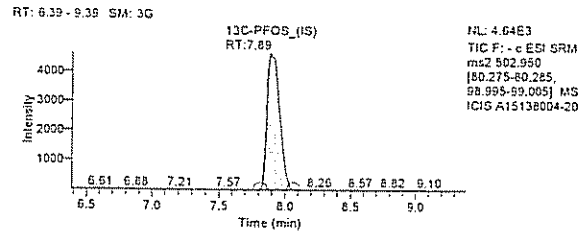
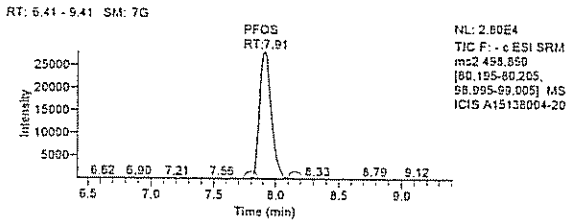
Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.63	298430.19	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	7.89	30584.51	N/A	N/A	N/A
PFOA	326.190	7.62	1090466.04	298430.19	3.654	ng/L
PFOS	667.812	7.91	191653.53	30584.51	6.266	ng/L

Extracted Ion Chromatogram

Component Name: PFOA



Component Name: PFOS



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Raw QC Data

PFAAs by LC/MS/MS

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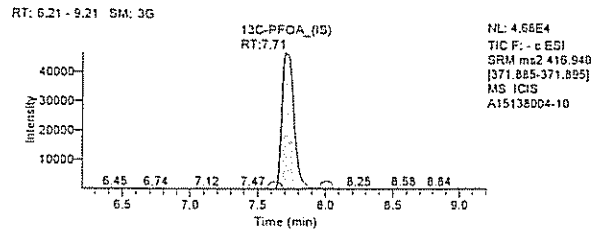
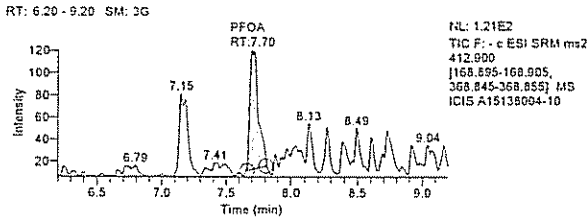
Sample Name: BLK 15138004	Original Data Path: C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition M\PFOAOS
Sample ID: BLK 15138004	Instrument Method:	
Data File: A15138004-10	Dilution Factor: 1.00	
Acquisition Date: 05/29/15 06:44:03 PM	Instrument Model: TSQ Quantum Access	
Sample Type: Unknown	Instrument Software Version: 2.3.0.1206 SP1	
Vial: d:9	Instrument Serial Number: TQU01408	
Run Time(min): 14.99	Operator: Quantum	
Injection Volume(μl): 10.00		

Quan Peak Table

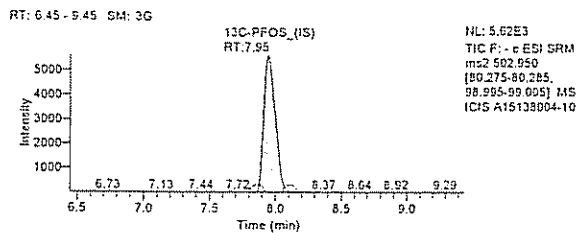
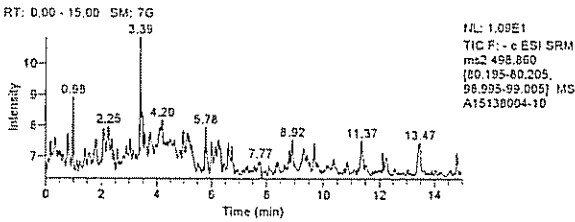
Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.71	290983.79	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	7.95	33506.49	N/A	N/A	N/A
PFOA	0.389	7.70	498.79	290983.79	0.002	ng/L
PFOS	N/A	N/A	N/A	N/A	N/A	ng/L

Extracted Ion Chromatogram

Component Name: PFOA



Component Name: PFOS



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Sample Name:	7879426 MS	Original Data Path:	C:\XCalibur\PFC\2015May
Sample ID:	7879426 MS	Instrument Method:	C:\XCalibur\PFC\Acquisition MPFOAOS
Data File:	A15138004-15	Dilution Factor:	1.00
Acquisition Date:	05/29/15 08:02:55 PM	Instrument Model:	TSQ Quantum Access
Sample Type:	Unknown	Instrument Software Version:	2.3.0.1206 SP1
Vial:	d:13	Instrument Serial Number:	TQU01408
Run Time(min):	15.00	Operator:	Quantum
Injection Volume(µl):	10.00		

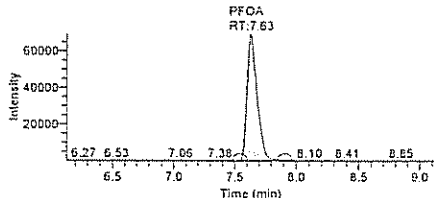
Quan Peak Table

Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.63	381250.54	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	7.89	39737.75	N/A	N/A	N/A
PFOA	95.634	7.63	407722.73	381250.54	1.069	ng/L
PFOS	102.246	7.89	37135.42	39737.75	0.935	ng/L

Extracted Ion Chromatogram

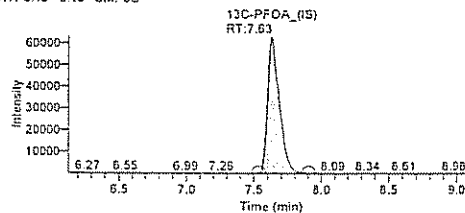
Component Name: PFOA

RT: 6.13 - 9.13 SM: 3G



NL: 6.95E4
TIC F: - c ESI SRM m/z 2
412.900
[168.895-168.905,
368.845-368.855] MS
ICIS A15138004-15

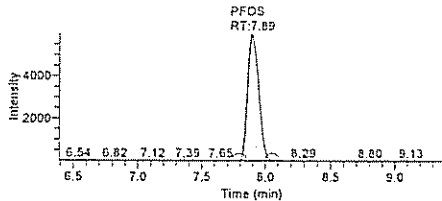
RT: 6.13 - 9.13 SM: 3G



NL: 6.31E4
TIC F: - c ESI
SRM m/z 2 416.940
[371.885-371.895]
MS ICIS
A15138004-15

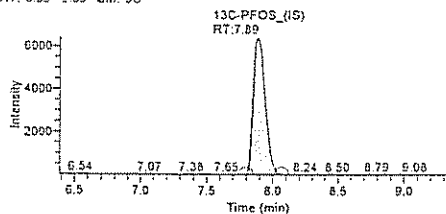
Component Name: PFOS

RT: 6.39 - 9.39 SM: 7G



NL: 5.99E3
TIC F: - c ESI SRM
m/z 2 498.850
[63.195-60.205,
98.995-99.005] MS
ICIS A15138004-15

RT: 6.39 - 9.39 SM: 3G



NL: 6.42E3
TIC F: - c ESI SRM
m/z 2 502.950
[80.275-80.285,
98.995-99.005] MS
ICIS A15138004-15

Meng Yu
Meng Yu
Principal Chemist

JUN 01 2015

Michele J. Smith

JUN 01 2015

Michele J. Smith
Senior Specialist

LCMSMS ANALYSIS REPORT

Sample Name: LCS15138004	Original Data Path: C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition M\PFOAOS
Sample ID: LCS15138004	Instrument Method:	
Data File: A15138004-12	Dilution Factor: 1.00	
Acquisition Date: 05/29/15 07:15:36 PM	Instrument Model: TSQ Quantum Access	
Sample Type: QC	Instrument Software Version: 2.3.0.1206 SP1	
Vial: d:10	Instrument Serial Number: TQU01408	
Run Time(min): 15.00	Operator: Quantum	
Injection Volume(μl): 10.00		

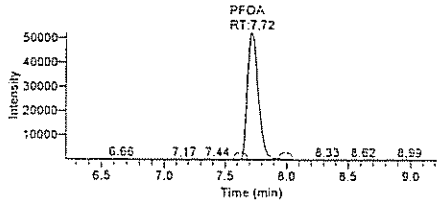
Quan Peak Table

Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.71	282538.91	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	8.01	34503.22	N/A	N/A	N/A
PFOA	104.743	7.72	331006.89	282538.91	1.172	ng/L
PFOS	106.784	8.01	33719.65	34503.22	0.977	ng/L

Extracted Ion Chromatogram

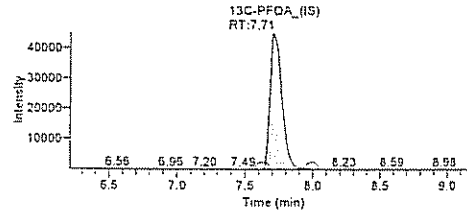
Component Name: PFOA

RT: 6.22 - 9.22 SM: 3G



NL: 5.22E4
TIC F: - c ESI SRM ms2
412.900
[166.895-168.905,
368.845-368.855] MS
ICIS A15138004-12

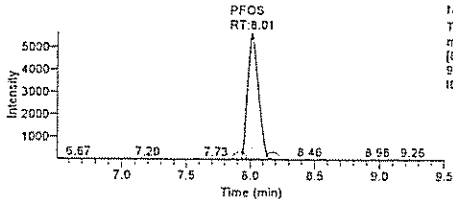
RT: 6.21 - 9.21 SM: 3G



NL: 4.50E4
TIC F: - c ESI
SRM m/z 416.940
[371.885-371.895] MS
ICIS
A15138004-12

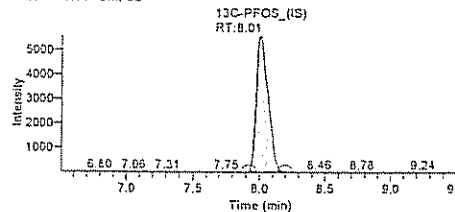
Component Name: PFOS

RT: 6.51 - 9.51 SM: 7G



NL: 5.87E3
TIC F: - c ESI SRM
m/z 468.600
[80.195-80.205,
98.995-99.005] MS
ICIS A15138004-12

RT: 6.51 - 9.51 SM: 3G



NL: 5.62E3
TIC F: - c ESI SRM
m/z 502.950
[80.275-80.285,
98.995-99.005] MS
ICIS A15138004-12

Michele J. Smith

JUN 01 2015

Michele J. Smith
Senior Specialist

Meng Yu
Meng Yu
Principal Chemist

JUN 01 2015

LCMSMS ANALYSIS REPORT

Sample Name:	LCSD15138004	Original Data Path:	C:\XCalibur\PFC\2015May
Sample ID:	LCSD15138004	Instrument Method:	C:\XCalibur\PFC\Acquisition M\PF0AOS
Data File:	A15138004-13	Dilution Factor:	1.00
Acquisition Date:	05/29/15 07:31:22 PM	Instrument Model:	TSQ Quantum Access
Sample Type:	QC	Instrument Software Version:	2.3.0.1206 SP1
Vial:	d:11	Instrument Serial Number:	TQU01408
Run Time(min):	15.00	Operator:	Quantum
Injection Volume(μl):	10.00		

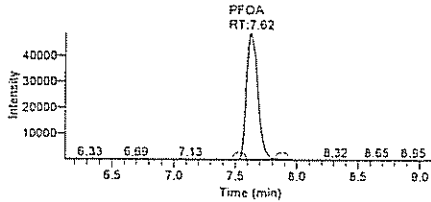
Quan Peak Table

Component Name	Calculated Amount	RT	Response	ISTD Response	Response Ratio	Units
13C-PFOA_(IS)	N/A	7.63	253575.05	N/A	N/A	N/A
13C-PFOS_(IS)	N/A	7.90	33796.79	N/A	N/A	N/A
PFOA	112.685	7.62	319651.19	253575.05	1.261	ng/L
PFOS	103.835	7.90	32089.68	33796.79	0.949	ng/L

Extracted Ion Chromatogram

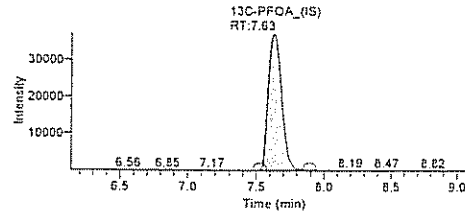
Component Name: PFOA

RT: 6.12 - 9.12 SM: 3G



NL: 4.90E4
TIC F: - c ESI SRM ms2
412.500
[168.895-168.905,
358.845-358.855] MS
ICIS A15138004-13

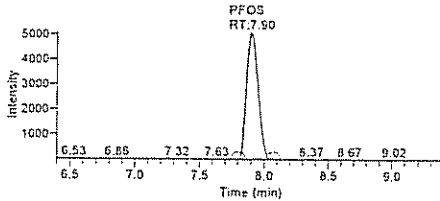
RT: 6.13 - 9.13 SM: 3G



NL: 3.72E4
TIC F: - c ESI
SRM ms2 416.940
[371.885-371.895]
MS ICIS
A15138004-13

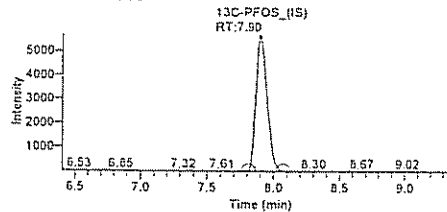
Component Name: PFOS

RT: 5.40 - 9.40 SM: 7G



NL: 5.09E3
TIC F: - c ESI SRM
ms2 490.850
[90.195-90.205,
98.995-99.005] MS
ICIS A15138004-13

RT: 6.40 - 9.40 SM: 3G



NL: 5.71E3
TIC F: - c ESI SRM
ms2 502.950
[80.275-80.285,
98.995-99.005] MS
ICIS A15138004-13

Michele J. Smith

JUN 01 2015

Michele J. Smith
Senior Specialist

Meng Yu
Meng Yu
Principal Chemist

JUN 01 2015

Preparation Logs

PFAAs by LC/MS/MS

Organic Extraction Batchlog Assigned to: 2628 Meng Yu

Reviewed by: MP/1758 Start Date: 05/21/2015

Start time: 1300

15138004

Tech 1: AMY2628 Tech 2: _____

PFAAs in Water by LC/MS/MS											
Dept. 37	Prep Analysis: 00000	Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	MS Sol.	Amt (mL)	FV (mL)	pH	BC	Comments
		7879426MS	100.1	208642-6D	0.025	208642-22C	0.02	1		2015	
		7879426MSB	100.5		0.025	NA	NA	1		NA	
		BLANKA ③	100.2		0.025	208642-22C	0.02	1			
		LCSA AMY2628	99.9		0.025		0.02	1			
		LCSDA 6/03/15									

Solvent Used	Lot No.

PIS01 Page 1 of 280

Sample #	Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	FV (mL)	pH	BC	Analyses	List	Due Date	Prio
7873709	PITW1	100.2	208642-6D	0.025	1		2015	10954	15877	05/15/2015	Q
7879425	-TW02	100.2		0.025	1			10954	15877	05/20/2015	Q
7879426	-RB01	100.3		0.025	1			10954	15877	05/20/2015	Q

7879426 AMY2628 05/21/15
 7873709 DF100 1.00
 * weighed 1.00g of sample instead of 100g AMY2628 05/21/15

Instrumental Wet Chemistry Data

Case Narrative/Conformance Summary

Instrumental Wet Chemistry

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Instrumental Water Quality
Fraction: Instrumental Wet Chemistry

Sample #	Client ID	Matrix		DF	Comments
		Liquid	Solid		
7873707	PAI13C-SS08-0001		X	1	
7873708	PAI13C-SB05-0204		X	1	
7873710	PAI13C-TW03-20150504	X		1	
7879426	PAI-RB01-050715	X		1	Material Rinse Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

(Sample number(s): 7873710: Analysis: 12868)
The holding time was not met. The client was notified and the data reported.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

All QC is within specification.

SAMPLE ANALYSIS:

No problems were encountered with the analysis of the samples.

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Instrumental Water Quality
Fraction: Instrumental Wet Chemistry

Abbreviation Key

U = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
R = Matrix Spike (MS)	MDL = Method Detection Limit
M = Matrix Spike Duplicate (MSD)	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value
D = Duplicate (DUP)	NA = Not Applicable
HS = High Spike	ME = Method
LS = Low Spike	CO = Colorimetric
SS = Soluble Spike	G = Gravimetric
IS = Insoluble Spike	IR = Infrared Spectrophotometry
ISD = Insoluble Spike Duplicate	MTR = Meter
PDS = Post Digestion Spike	OD = Oven Dried
* = Out of Specification	TI = Titration
V = Visual	TOC = Total Organic Carbon
AK = Alpkem	IC = Ion Chromatography
TC = Total Carbon	RA = Rapid Analyzer

Quality Control and Calibration Summary Forms

Instrumental Wet Chemistry

Quality Control Reference List
Instrumental Water Quality

CLIENT: Tetra Tech Inc.
SDG: PIS01

Fraction: Instrumental Wet Chemistry

Analysis	Batch Number	Sample Number	Analysis Date
Hexavalent Chromium	15126987141A	151264BB	05/06/2015 15:19:00
		151264QQ	05/06/2015 14:59:00
		7873710 UNSPK/BKG	05/06/2015 12:06:00
		7873710 DUP	05/06/2015 13:52:00
		7873710 MS	05/06/2015 14:36:00
Hexavalent Chromium	15128987141A	151284BB	05/08/2015 15:38:00
		151284QQ	05/08/2015 15:18:00
		7879426	05/08/2015 12:38:00
Hexavalent Chromium by IC	15126243201A	P12643AB	05/07/2015 13:15:00
		P12643AQ	05/07/2015 11:52:00
		LCSSIS	05/07/2015 12:07:00
		7873707	05/07/2015 09:21:00
		7873708	05/07/2015 09:29:00

Fraction: Instrumental Wet Chemistry

15126987141A / 151264BB Parameter	ME	Analysis Date	Blank Results	Units	DL	LOD	LOQ
Hexavalent Chromium	IC	05/06/15	N.D.	ug/l	0.015	0.050	0.050

15128987141A / 151284BB Parameter	ME	Analysis Date	Blank Results	Units	DL	LOD	LOQ
Hexavalent Chromium	IC	05/08/15	N.D.	ug/l	0.015	0.050	0.050

Fraction: Instrumental Wet Chemistry

15126243201A / P12643AB Parameter	ME	Analysis Date	Blank Results	Units	DL	LOD	LOQ
Hexavalent Chromium by IC	IC	05/07/15	N.D.	mg/kg	0.14	0.40	0.40

Instrumental Water Quality

Fraction: Instrumental Wet Chemistry

UNSPK: 7873710 MS: 7873710	Batch: 15126987141A (Sample number(s): 7873710)									
Parameter	ME	Spike Added ug/l	Unspiked Conc ug/l	MS Conc ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	%Rec Limits	%RPD	%RPD Limits
Hexavalent Chromium	IC	0.500	N.D.	0.464	NA	93	NA	90-110	NA	NA

Comments:

(2) The unspiked sample result is greater than four times the spike added.

* = Out of Specification

Results are being reported on an as received basis.

Instrumental Water Quality
Fraction: Instrumental Wet Chemistry

BKG: 7873710 DUP: 7873710	Batch: 15126987141A (Sample number(s): 7873710)				
Parameter	ME	Unspiked Conc ug/l	DUP Conc ug/l	%RPD	%RPD Limits
Hexavalent Chromium	IC	N.D.	N.D.	0 (1)	20

Comments:

- (1) The sample and/or duplicate result is less than five times the LOQ.
- * = Out of Specification

Results are being reported on an as received basis.

SDG: PIS01
Matrix: LIQUID

Instrumental Water Quality
Fraction: Instrumental Wet Chemistry

LCS: 151264QQ	Batch: 15126987141A (Sample number(s): 7873710)								
Parameter	ME	Spike Added ug/l	LCS Conc ug/l	LCSD Conc ug/l	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Hexavalent Chromium	IC	100	96.85	NA	97	NA	90-110	NA	NA

LCS: 151284QQ	Batch: 15128987141A (Sample number(s): 7879426)								
Parameter	ME	Spike Added ug/l	LCS Conc ug/l	LCSD Conc ug/l	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Hexavalent Chromium	IC	100	102.55	NA	103	NA	90-110	NA	NA

SDG: PIS01
Matrix: SOLID

Instrumental Water Quality
Fraction: Instrumental Wet Chemistry

LCS: LCSSIS		Batch: 15126243201A (Sample number(s): 7873707-7873708)							
Parameter	ME	Spike Added mg/kg	LCS Conc mg/kg	LCSD Conc mg/kg	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Hexavalent Chromium by IC(LCSS-IS)	IC	720	714	NA	99	NA	11-17	NA	NA

LCS: P12643AQ		Batch: 15126243201A (Sample number(s): 7873707-7873708)							
Parameter	ME	Spike Added mg/kg	LCS Conc mg/kg	LCSD Conc mg/kg	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Hexavalent Chromium by IC	IC	5.00	4.50	NA	90	NA	80-120	NA	NA

SDG: PIS01

Instrument ID: 16539
Calibration Date: 05/07/2015

Analysis	AUTO CAL1	AUTO CAL2	AUTO CAL3	AUTO CAL4	AUTO CAL5	CC
Hex	0.1817	1.2513	2.8578	5.7907	8.7948	0.9999

Acceptance Range:
ICV/CCV: 90%-110%
ICB/CCB: < MDL

Concentration units: mg/L

Batch Numbers: 15126243201A
Run Start Dates: 05/07/2015

Sample	Hex		
	True	Result	%Rec
ICV	50	49.7591	100
ICB	0	ND	NA
CCV	200	199.5090	100
CCB	0	ND	NA
CCV	200	219.5121	109
CCB	0	ND	NA

SDG: PIS01

Instrument ID: 19751
Calibration Date: 05/06/2015

Analysis	AUTO CAL1	AUTO CAL2	AUTO CAL3	AUTO CAL4	AUTO CAL5	AUTO CAL6	CC
Hex	0.084	0.129	0.386	0.649	1.235	2.453	0.9993

Acceptance Range:
ICV/CCV: 90%-110%
ICB/CCB: < MDL

Concentration units: mg/L

Batch Numbers: 15126987141A
Run Start Dates: 05/06/2015

Sample	Hex		
	True	Result	%Rec
ICV	250	238	95
ICB	0	ND	NA
CCV	250	243	97
CCB	0	ND	NA

SDG: PIS01

Instrument ID: 19751
Calibration Date: 05/08/2015

Analysis	AUTO CAL1	AUTO CAL2	AUTO CAL3	AUTO CAL4	AUTO CAL5	AUTO CAL6	CC
Hex	0.020	0.111	0.294	0.553	1.173	2.378	0.9998

Acceptance Range:
ICV/CCV: 90%-110%
ICB/CCB: < MDL

Concentration units: mg/L

Batch Numbers: 15128987141A
Run Start Dates: 05/08/2015

Sample	Hex		
	True	Result	%Rec
ICV	250	253	101
ICB	0	ND	NA
CCV	250	252	101
CCB	0	ND	NA

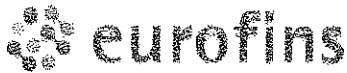
Raw Data

Instrumental Wet Chemistry

Fraction: Instrumental Wet Chemistry

12868: Hexavalent Chromium	Default	Default	Default	
Analyte Name	DL	LOD	LOQ	Units
Hexavalent Chromium	0.015	0.050	0.050	ug/l

05892: Hexavalent Chromium by IC	Default	Default	Default	
Analyte Name	DL	LOD	LOQ	Units
Hexavalent Chromium by IC	0.14	0.40	0.40	mg/kg



Lancaster
Laboratories

Determination of Low Level Hexavalent Chromium (Cr⁺⁶)

Instrument Name: IC Pro 881 Date of Analysis: 5/6/2015
 Instrument ID: 19751 Analyst: CMW 2987
 QC Stock Book/Page #: 194916/9 Run Name: 1512614
 ICV/CCV/LCSW Book/Page #: 179296/10

	<u>Cr⁺⁶ True Value (ng/L)</u>	<u>Range (ng/L)</u>
ICV	250	236 - 264
CCV	250	236 - 264
LCSW	100ug/L	95ug/L - 105ug/L

PBW/CCB (ng/L): < 15

Calibration Information:

Calibration Type: Linear by Area (r > 0.999)
 Number of Calibrants: 5

Calibration Stock Book/Page: 194916/9

Standards Book/Page #: 179296/10

<u>Standards</u>	<u>Concentration (ng/L)</u>
Std. 1	25
Std. 2	75
Std. 3	150
Std. 4	250
Std. 5	500
Std. 5	1000

Color Reagent Book/Page: 194916/26

Eluent Stock Book/Page #: 194916/26

COMMENTS:

Verified By: _____

Date: _____

Sandra J. Miller
 Sandra J. Miller
 Chemist

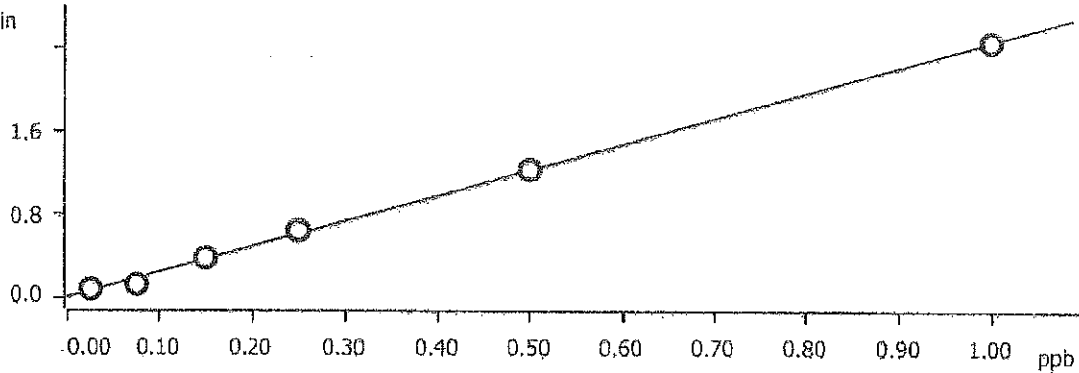
MAY 14 2015

Determination overview

Info 1	Ident	Info 3	Determination start	Dilution	Volume	Sample type	Method name	Info 2	Info 4
1	01	START-UP	2015-05-06 08:25:45 UTC-4	1	4000	Sample	Chrom-6 startup	1512614	
2	02	TEST	2015-05-06 08:25:20 UTC-4	1	4000	Sample	water_Hexchrome_4000_B_RINSE	1512614	
3	03	RINSE	2015-05-06 09:06:13 UTC-4	1	4000	Sample	water_Hexchrome_4000_C_RINSE	1512614	
4	04	CAL 1	2015-05-06 09:26:16 UTC-4	1	4000	Standard 1	water_Hexchrome_4000_A_RINSE	1512614	
5	05	CAL 2	2015-05-06 09:46:17 UTC-4	1	4000	Standard 2	water_Hexchrome_4000_B_RINSE	1512614	
6	06	CAL 3	2015-05-06 10:06:18 UTC-4	1	4000	Standard 3	water_Hexchrome_4000_C_RINSE	1512614	
7	07	CAL 4	2015-05-06 10:26:18 UTC-4	1	4000	Standard 4	water_Hexchrome_4000_A_RINSE	1512614	
8	08	CAL 5	2015-05-06 10:46:19 UTC-4	1	4000	Standard 5	water_Hexchrome_4000_B_RINSE	1512614	
9	09	CAL 6	2015-05-06 11:06:19 UTC-4	1	4000	Standard 6	water_Hexchrome_4000_C_RINSE	1512614	
10	10	ICV	2015-05-06 11:26:19 UTC-4	1	4000	Sample	water_Hexchrome_4000_A_RINSE	1512614	
11	11	ICB	2015-05-06 11:46:20 UTC-4	1	4000	Sample	water_Hexchrome_4000_B_RINSE	1512614	
12	12	7873710-U	15126987141A-2987	1	4000	Sample	water_Hexchrome_4000_B_RINSE	1512614	
13	13	7873710-R	15126987141A-2987	1	4000	Sample	water_Hexchrome_4000_B_RINSE	1512614	
14	14	7873710-D	15126987141A-2987	1	4000	Sample	water_Hexchrome_4000_B_RINSE	1512614	
15	15	7873710-R	15126987141A-2987	1	4000	Sample	water_Hexchrome_4000_B_RINSE	1512614	
16	16	LCSW	15126987141A-2987	200	4000	Sample	water_Hexchrome_4000_B_RINSE	1512614	
17	17	PEW	15126987141A-2987	1	4000	Sample	water_Hexchrome_4000_B_RINSE	1512614	
18	18	DCV	15126987141A-2987	1	4000	Sample	water_Hexchrome_4000_B_RINSE	1512614	
19	19	CCB	15126987141A-2987	1	4000	Sample	water_Hexchrome_4000_B_RINSE	1512614	
20	20	SHUTDOWN	2015-05-06 18:16:17 UTC-4	1	4000	Sample	Chrom-6 shutdown	1512614	

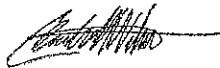
Cr+6 (Hexavalent Chromium)

(mAU) x min

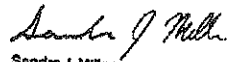


Function: $A = 7.49793E-3 + 6.11389E-4 \times Q$
 Relative standard deviation 4.359384 %
 Correlation coefficient 0.999369

Sample type	Index	Conc.	Volume	Dilution	Sample amount	Area	Ident	Date	Used
Standard 1	1	0.025	4000.0	1.0	1.0	0.084	CAL 1	2015-05-06 09:26:16 UTC-4	used
Standard 2	1	0.075	4000.0	1.0	1.0	0.129	CAL 2	2015-05-06 09:46:17 UTC-4	used
Standard 3	1	0.150	4000.0	1.0	1.0	0.386	CAL 3	2015-05-06 10:06:18 UTC-4	used
Standard 4	1	0.250	4000.0	1.0	1.0	0.649	CAL 4	2015-05-06 10:26:18 UTC-4	used
Standard 5	1	0.500	4000.0	1.0	1.0	1.235	CAL 5	2015-05-06 10:46:19 UTC-4	used
Standard 6	1	1.000	4000.0	1.0	1.0	2.453	CAL 6	2015-05-06 11:06:19 UTC-4	used


 Clinton M. Wilson
 Chemist

MAY 07 2015


 Sandra J. Miller
 Chemist

MAY 14 2015

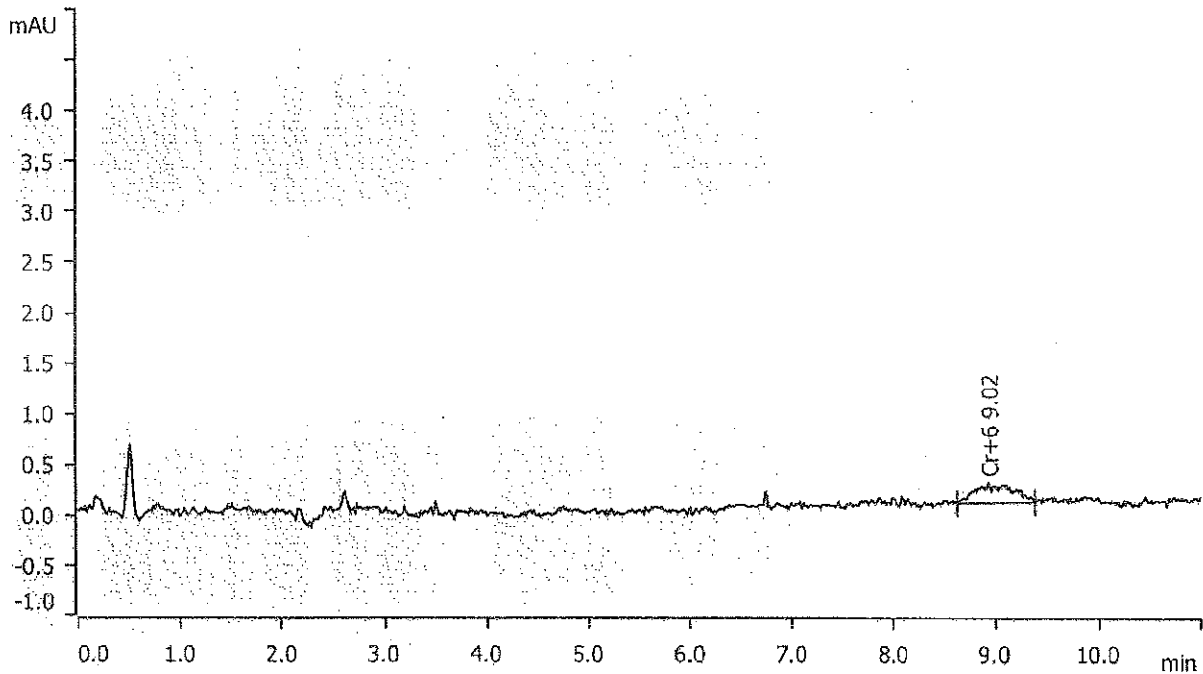
Sample data

Ident CAL 1 Injection Volume (uL) 4000
 Batch Number Dilution 1
 Determination start 2015-05-06 09:26:16 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512614
 Position 3 Calibration Date 6 MAY 2015
 Injection Number 04

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.42 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	9.015	0.0841	0.167	0.031	Cr+6

Reviewed by: *Clinton M. Wilson*
 Clinton M. Wilson
 Chemist

Date: **MAY 07 2015**

Verified by: *Sandra J. Miller*
 Sandra J. Miller
 Chemist

Date: **MAY 14 2015**

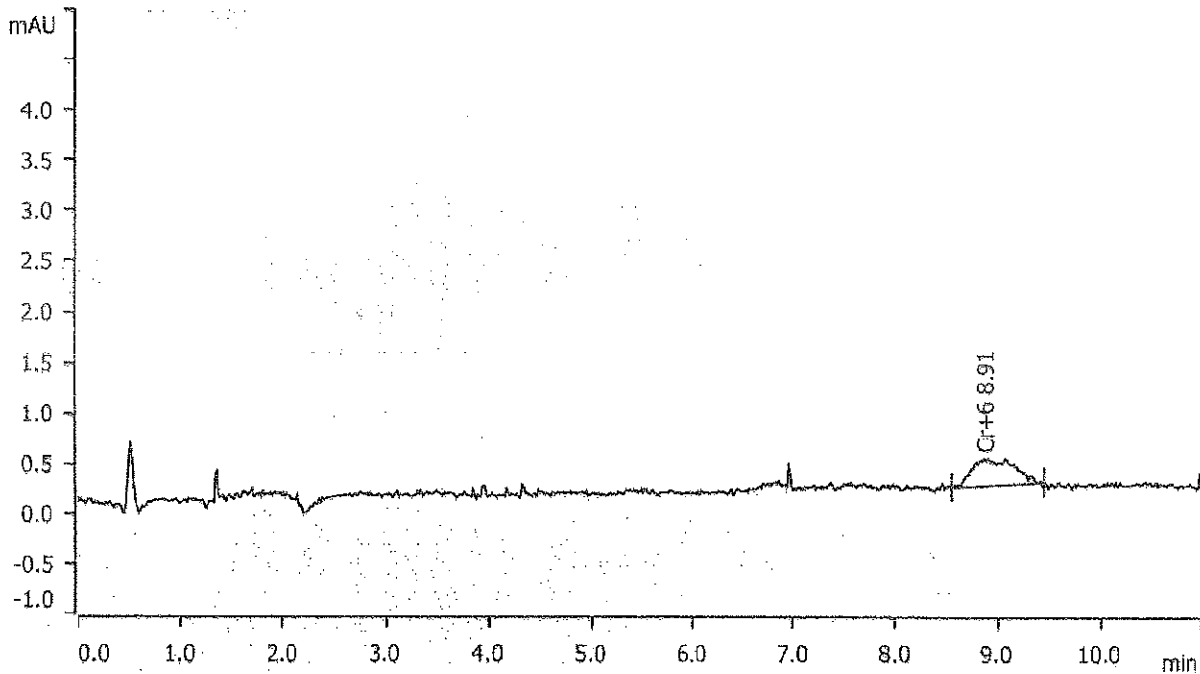
Sample data

Ident CAL 2 Injection Volume (uL) 4000
 Batch Number Dilution 1
 Determination start 2015-05-08 09:46:17 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512614
 Position 4 Calibration Date 6 MAY 2015
 Injection Number 05

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.54 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	8.910	0.1289	0.265	0.050	Cr+6

Reviewed by:

Clinton M. Wilson
 Clinton M. Wilson
 Chemist

Date:

MAY 07 2015

Verified by:

Sandra J. Miller
 Sandra J. Miller
 Chemist

Date:

MAY 14 2015

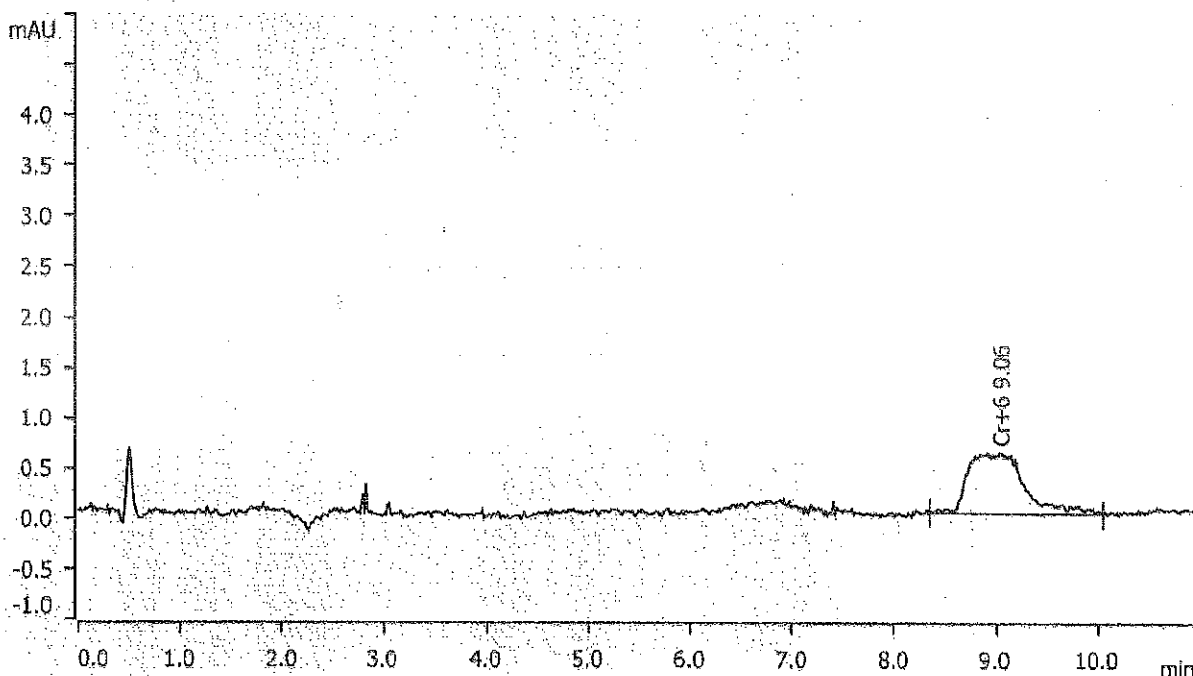
Sample data

Ident CAL 3 Injection Volume (µL) 4000
 Batch Number Dilution 1
 Determination start 2015-05-06 10:06:18 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512614
 Position 5 Calibration Date 6 MAY 2015
 Injection Number 06

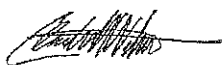
Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.48 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0


Hexavalent Chromium



Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	9.060	0.3863	0.597	0.155	Cr+6

Reviewed by: 
 Clinton M. Wilson
 Chemist

Date: **MAY 07 2015**

Verified by: 
 Sandra J. Miller
 Chemist

Date: **MAY 14 2015**

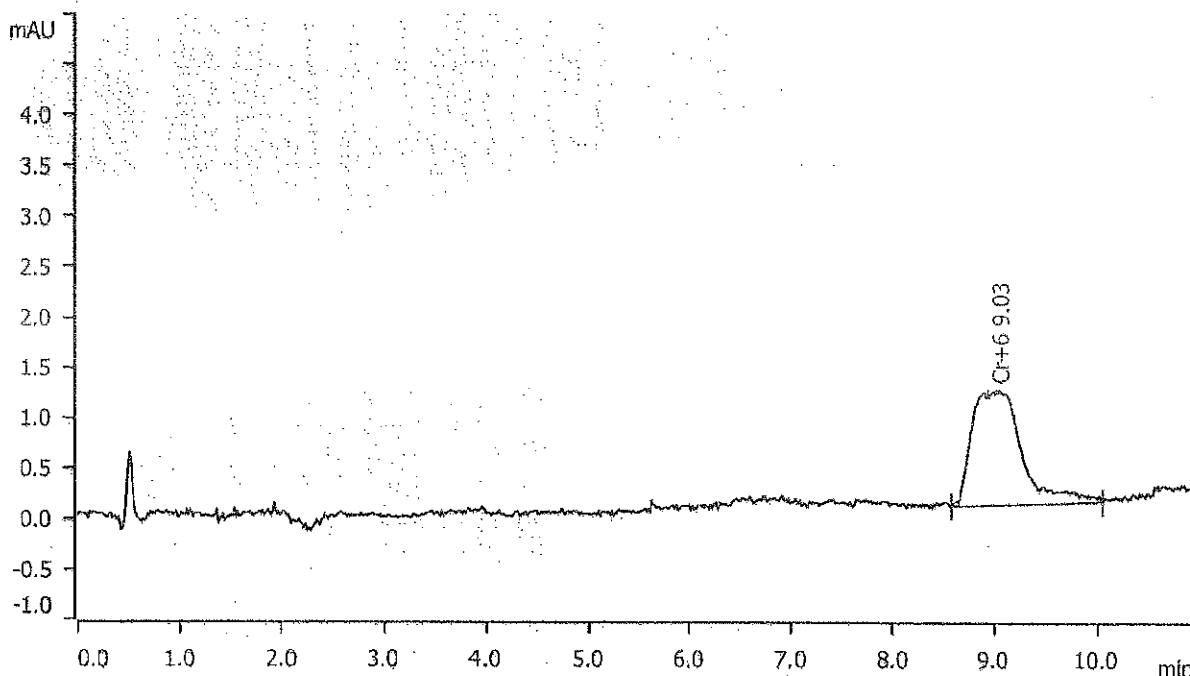
Sample data

Ident CAL 4 Injection Volume (uL) 4000
 Batch Number Dilution 1
 Determination start 2015-05-06 10:26:18 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512614
 Position 6 Calibration Date 6 MAY 2015
 Injection Number 07

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.42 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	9.030	0.6487	1.125	0.262	Cr+6

Reviewed by:

Clinton M. Wilson
Clinton M. Wilson
Chemist

Verified by:

Sandra J. Miller
Sandra J. Miller
Chemist

Date:

MAY 07 2015

Date:

MAY 14 2015

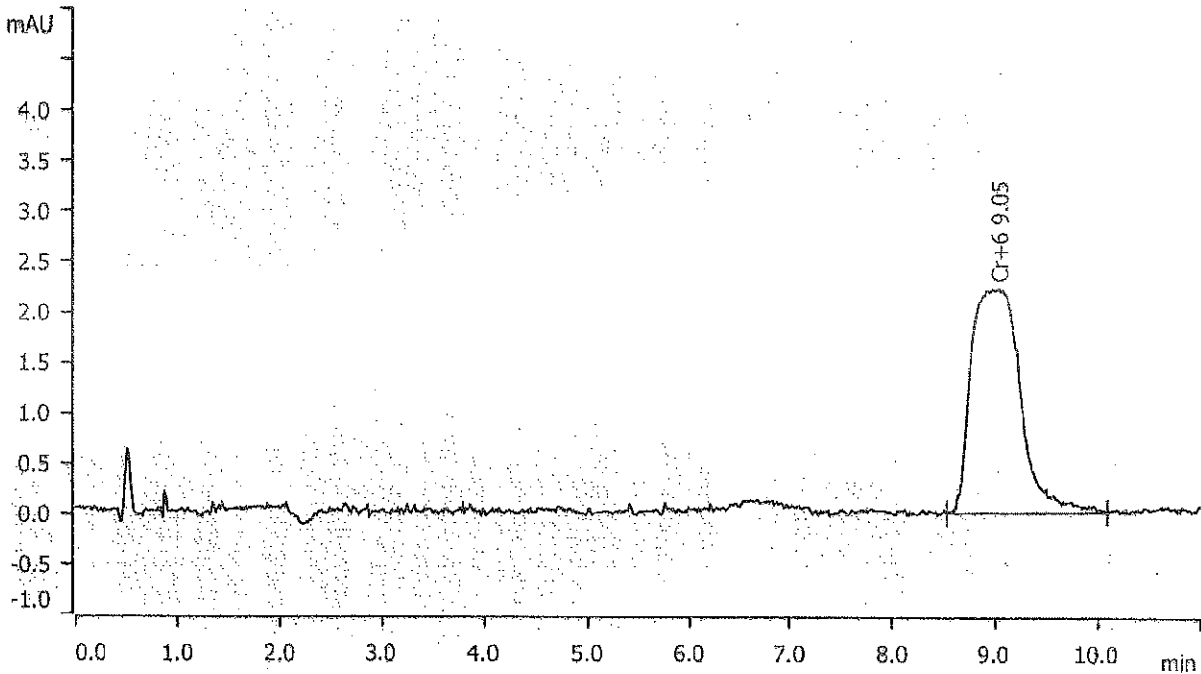
Sample data

Ident CAL 5 Injection Volume (uL) 4000
 Batch Number Dilution 1
 Determination start 2015-05-06 10:46:19 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512614
 Position 7 Calibration Date 6 MAY 2015
 Injection Number 08

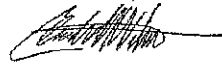
Hexavalent Chromium Injection Data

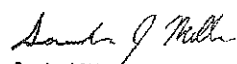
Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.42 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	9.045	1.2352	2.232	0.502	Cr+6

Reviewed by: 
 Clinton M. Wilson
 Chemist
 Date: **MAY 07 2015**

Verified by: 
 Sandra J. Miller
 Chemist
 Date: **MAY 14 2015**

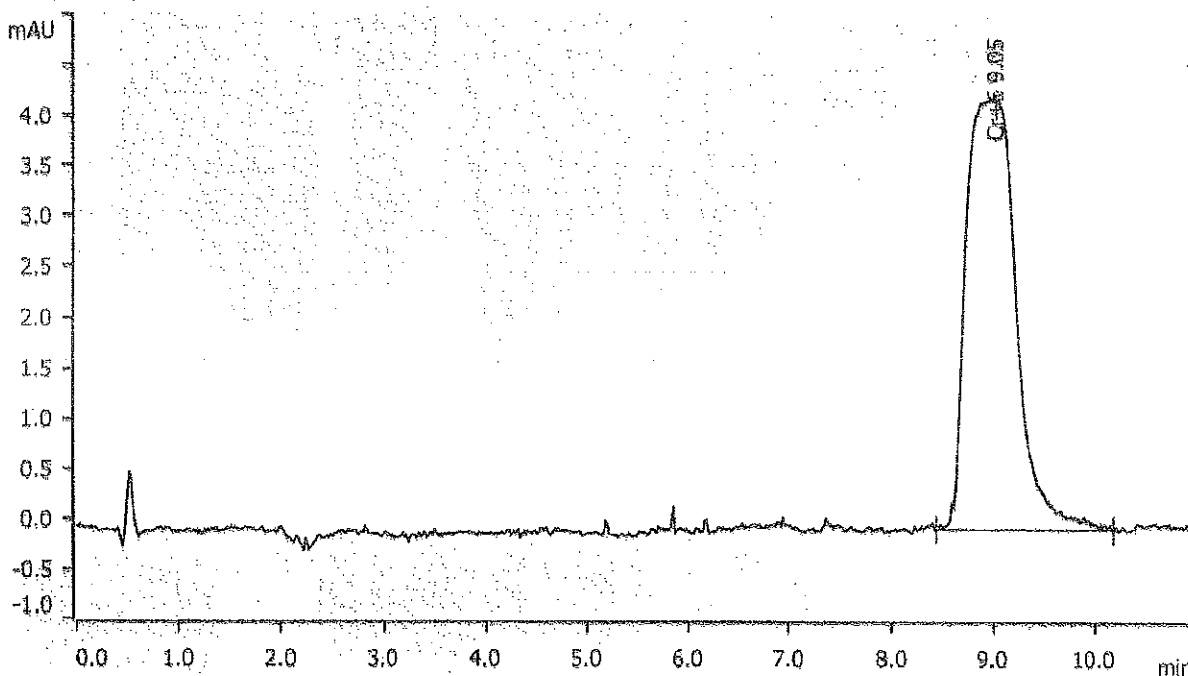
Sample data

Ident GAL 8 Injection Volume (uL) 4000
 Batch Number Dilution 1
 Determination start 2015-05-06 11:06:19 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512614
 Position 8 Calibration Date 6 MAY 2015
 Injection Number 09

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.54 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	9.045	2.4530	4.287	1.000	Cr+6

Reviewed by:

Clinton M. Wilson
Clinton M. Wilson
Chemist

Date:

MAY 07 2015

Verified by:

Sandra J. Miller
Sandra J. Miller
Chemist

Date:

MAY 14 2015

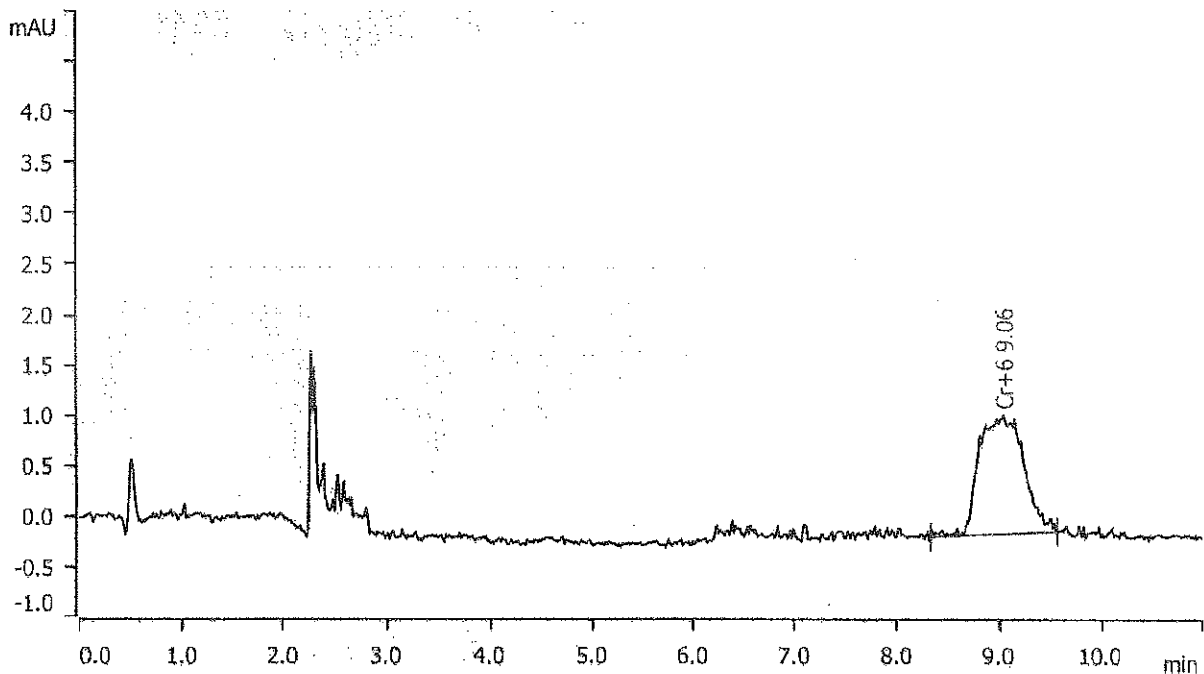
Sample data

Ident ICV Injection Volume (uL) 4000
 Batch Number Dilution 1
 Determination start 2015-05-06 11:26:19 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512614
 Position 9 Calibration Date 6 MAY 2015
 Injection Number 10

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.42 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	9.060	0.5891	1.157	0.238	Cr+6

Reviewed by:

Clinton M. Wilson
Clinton M. Wilson
Chemist

Date:

MAY 07 2015

Verified by:

Sandra J. Miller
Sandra J. Miller
Chemist

Date:

MAY 14 2015

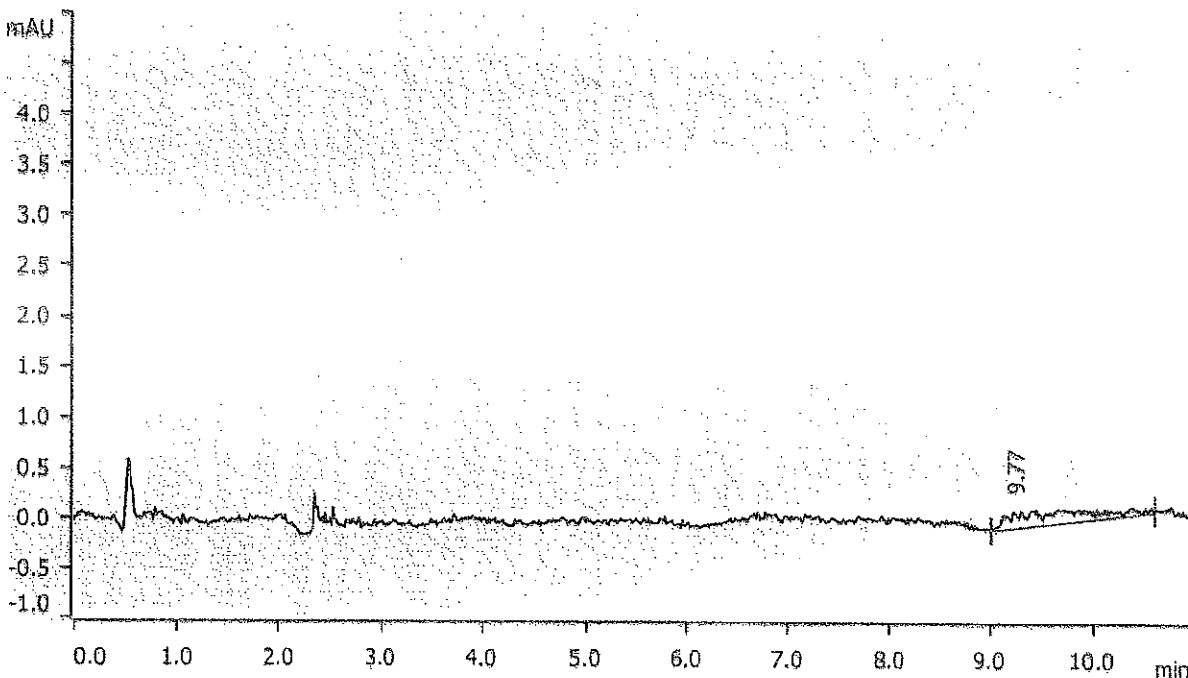
Sample data

Ident ICB Injection Volume (uL) 4000
 Batch Number Dilution 1
 Determination start 2015-05-06 11:46:20 UTC Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512614
 Position 10 Calibration Date 6 MAY 2015
 Injection Number 11

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.48 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metresep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	9.765	0.1382	0.133	invalid	

Reviewed by:

Clinton M. Wilson
 Clinton M. Wilson
 Chemist

Date:

MAY 07 2015

Verified by:

Sandra J. Miller
 Sandra J. Miller
 Chemist

Date:

MAY 14 2015

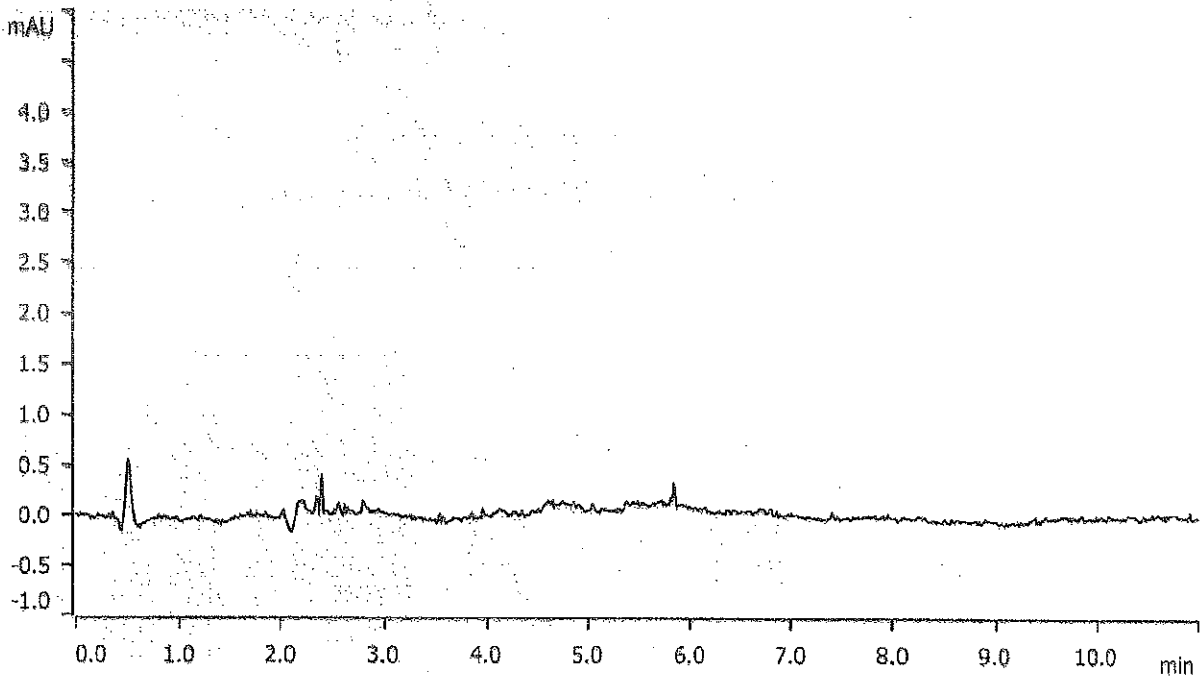
Sample data

Ident 7873710-U Injection Volume (uL) 4000
Batch Number 15126987141A-2987 Dilution 1
Determination start 2015-05-06 12:06:20 UTC Sample Weight 1
Method water_Hexchrome_4000_ Sequence Name 1512614
Position 84 Calibration Date 6 MAY 2015
Injection Number 12

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
Pressure (MPa) 7.54 Channel Channel 1 (530 nm)
Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Reviewed by:

Clinton M. Wilson
Chemist

Date:

MAY 07 2015

Verified by:

Sandra J. Miller
Chemist

Date:

MAY 14 2015

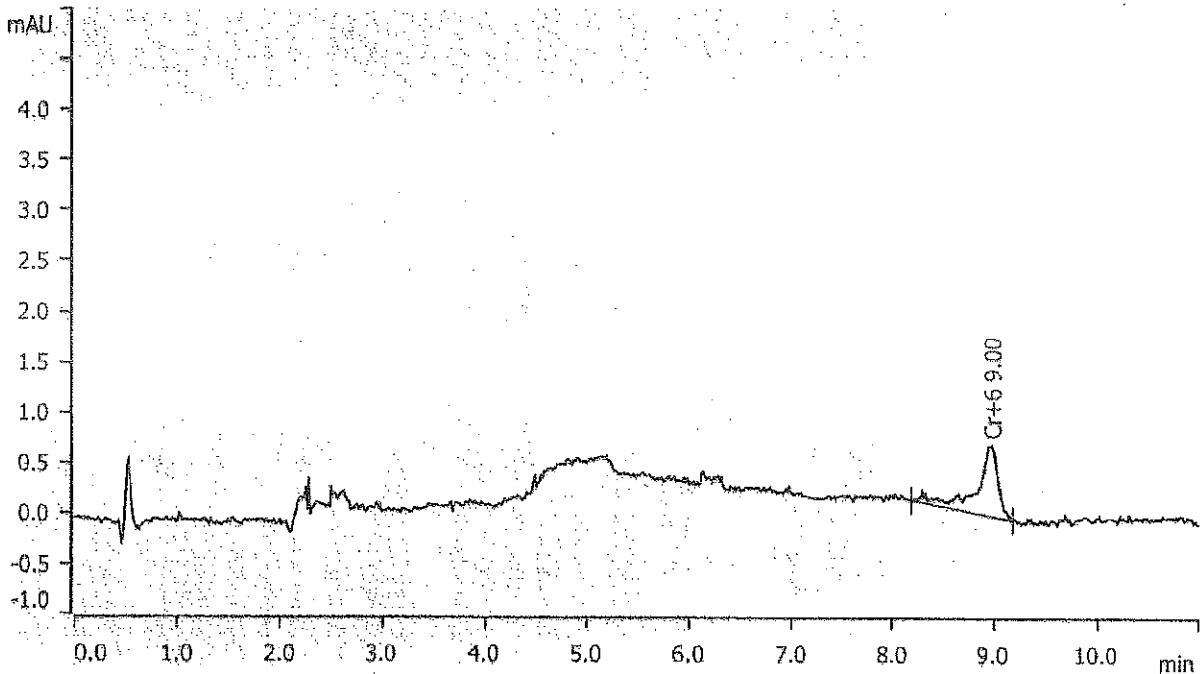
Sample data

Ident	7873710-R	Injection Volume (uL)	4000
Batch Number	15126987141A-2987	Dilution	1
Determination start	2015-05-06 13:32:52 UTC-	Sample Weight	1
Method	water_Hexchrome_4000_	Sequence Name	1512614
Position	85	Calibration Date	6 MAY 2015
Injection Number	13		

Hexavalent Chromium Injection Data

Integration	Automatically	Recording Time (min)	11.0
Pressure (MPa)	7.48	Channel	Channel 1 (530 nm)
Temperature (C)	45.0	Column Type	Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	9.000	0.1765	0.700	0.069	Cr+6

Reviewed by:

Clinton M. Wilson
Clinton M. Wilson
Chemist

Verified by:

[Handwritten signature]

Date:

MAY 07 2015

Date:

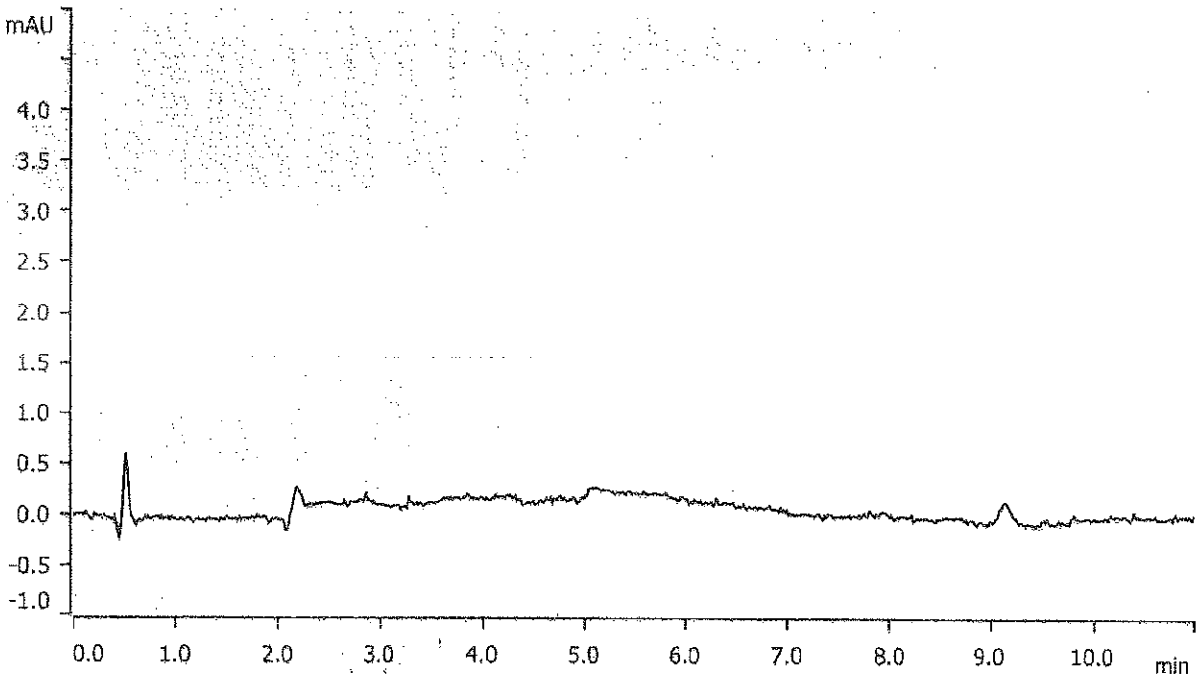
Sample data

Ident 7873710-D Injection Volume (uL) 4000
Batch Number 15126987141A-2987 Dilution 1
Determination start 2015-05-06 13:52:52 UTC- Sample Weight 1
Method water_Hexchrome_4000_ Sequence Name 1512614
Position 86 Calibration Date 6 MAY 2015
Injection Number 14

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
Pressure (MPa) 7.54 Channel Channel 1 (530 nm)
Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Reviewed by:

Clinton M. Wilson
Clinton M. Wilson
Chemist

Date:

MAY 07 2015

Verified by:

Sandra J. Miller
Sandra J. Miller
Chemist

Date:

MAY 14 2015

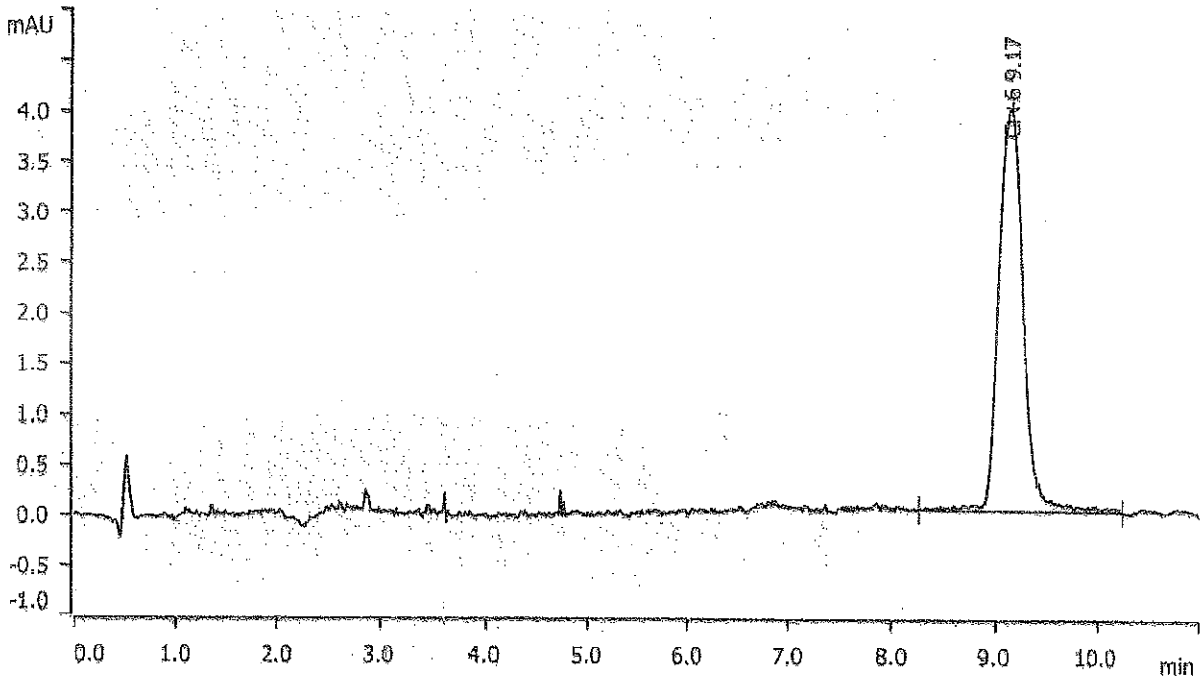
Sample data

Ident 7873710-R Injection Volume (uL) 4000
 Batch Number 15126987141A-2987 Dilution 1
 Determination start 2015-05-06 14:36:49 UTC Sample Weight 1
 Method water_Hexchrome_4000 Sequence Name 1512614
 Position 87 Calibration Date 6 MAY 2015
 Injection Number 15

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.59 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium




Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	9.165	1.1423	3.995	0.464	Cr+6

SA (ng/L)
93

Reviewed by: 
 Christen M. Wilson
 Chemist

Date: **MAY 07 2015**

Verified by: 
 Sandra J. Miller
 Chemist

Date: **MAY 14 2015**

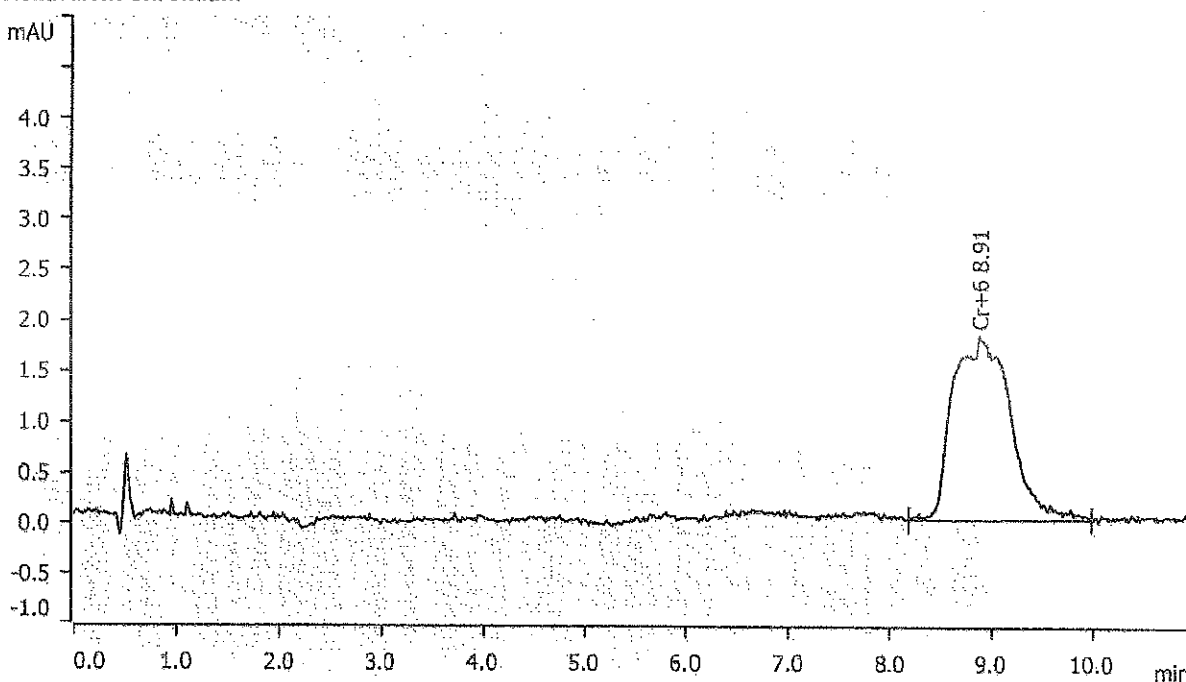
Sample data

Ident LCSW Injection Volume (uL) 4000
 Batch Number 15126987141A-2987 Dilution 200
 Determination start 2015-05-06 14:59:17 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512614
 Position 88 Calibration Date 6 MAY 2015
 Injection Number 16

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.59 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	8.910	1.1917	1.797	96.849	Cr+6

Reviewed by: *Clinton M. Wilson*
 Clinton M. Wilson
 Chemist

Date: **MAY 07 2015**

Verified by:

Sandra J. Miller
 Sandra J. Miller
 Chemist

Date: **MAY 14 2015**

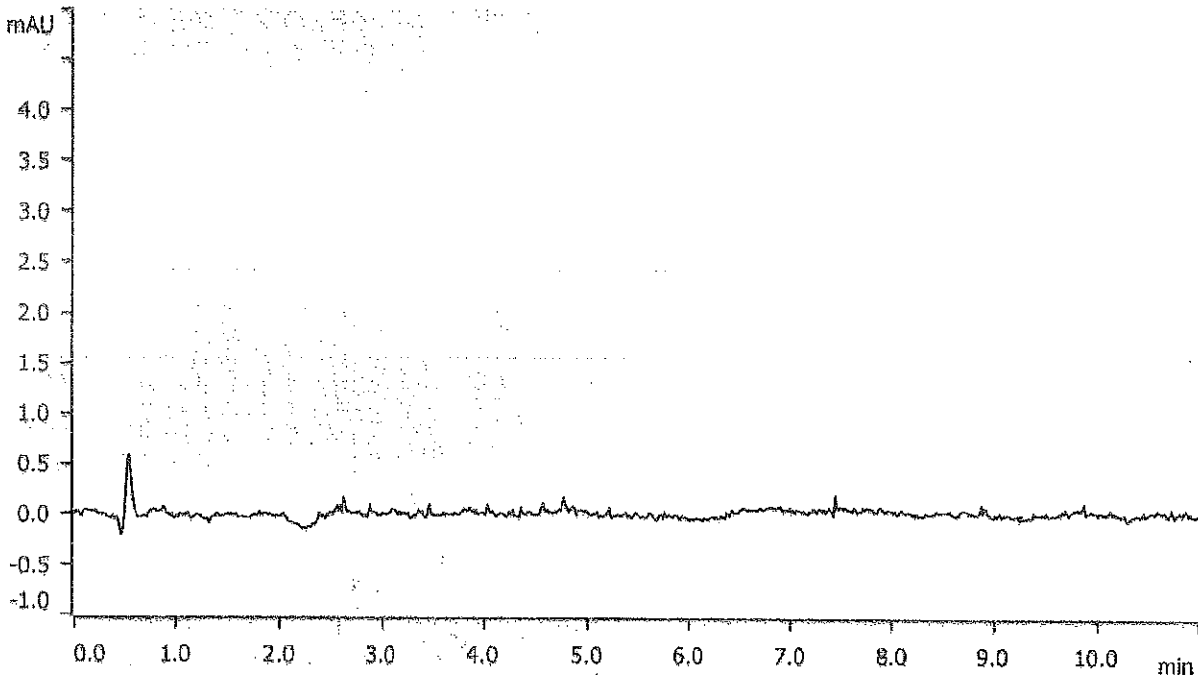
Sample data

Ident PBW Injection Volume (uL) 4000
Batch Number 15126987141A-2987 Dilution 1
Determination start 2015-05-06 15:19:17 UTC- Sample Weight 1
Method water_Hexchrome_4000_ Sequence Name 1512614
Position 89 Calibration Date 6 MAY 2015
Injection Number 17

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
Pressure (MPa) 7.59 Channel Channel 1 (530 nm)
Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Reviewed by:

Clinton M. Wilson
Chemist

Date:

MAY 07 2015

Verified by:

Sandra J. Miller
Chemist

Date:

MAY 14 2015

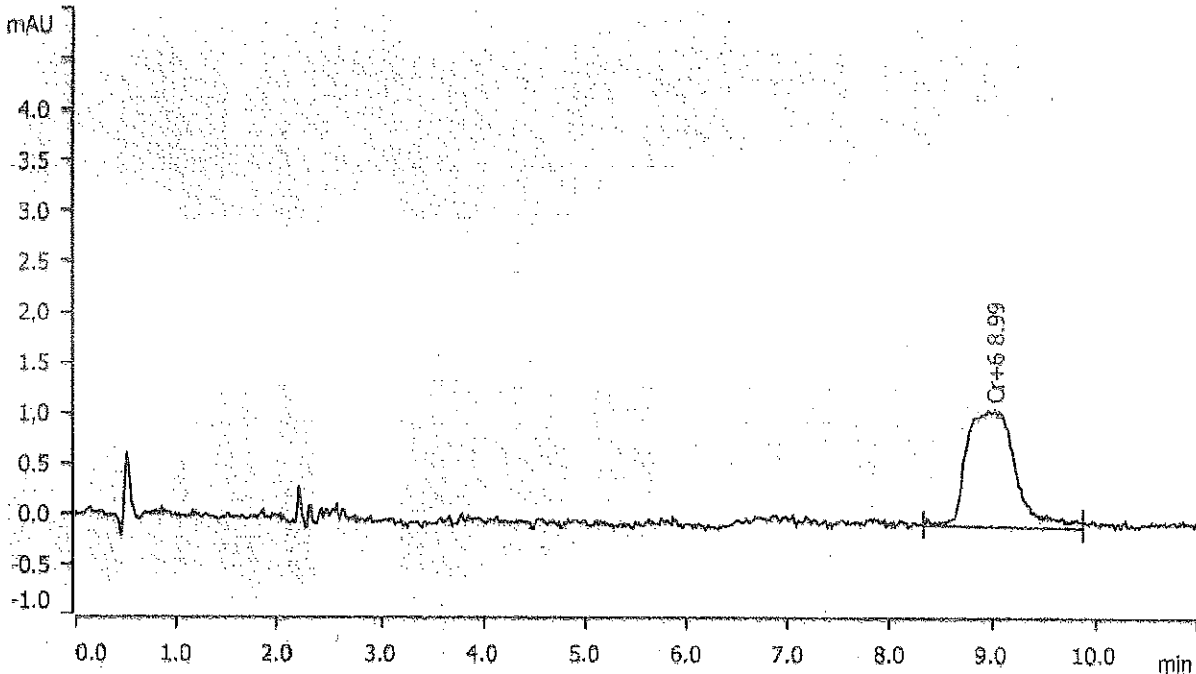
Sample data

Ident CCV Injection Volume (uL) 4000
 Batch Number Dilution 1
 Determination start 2015-05-06 15:39:17 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512614
 Position 90 Calibration Date 6 MAY 2015
 Injection Number 18

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.54 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metresep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	8.985	0.6417	1.146	0.259	Cr+6

Reviewed by:

Clinton M. Wilson
Clinton M. Wilson
Chemist

Date:

MAY 07 2015

Verified by:

Sandra J. Miller
Sandra J. Miller
Chemist

Date:

MAY 14 2015

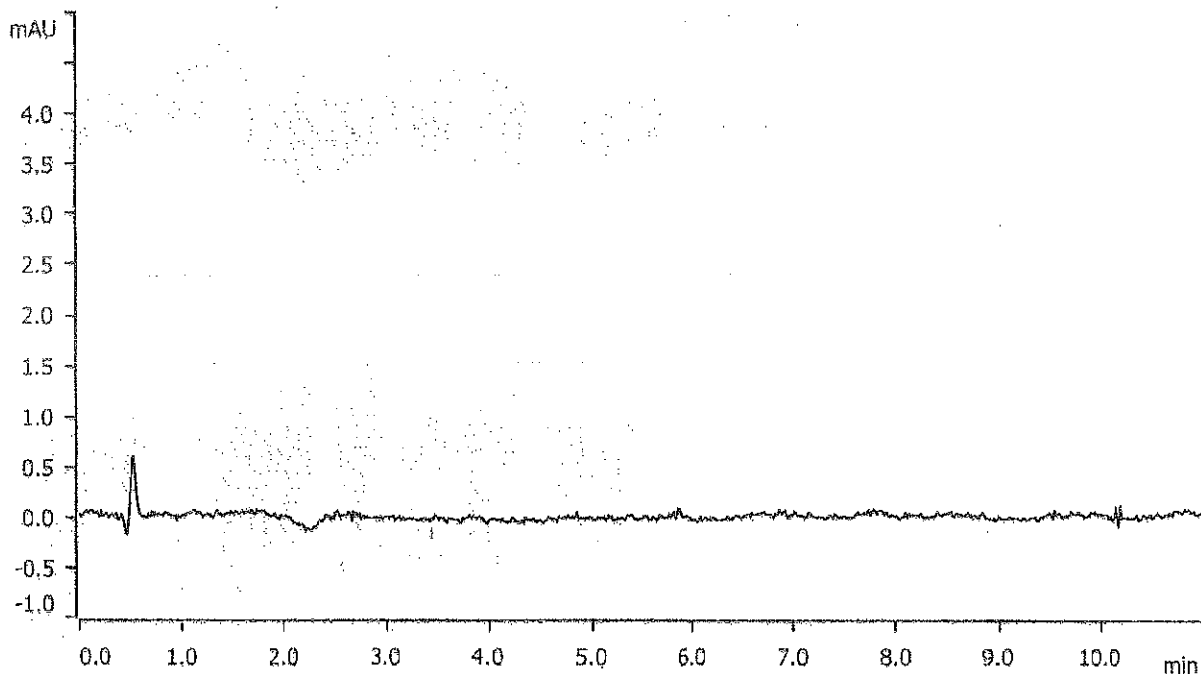
Sample data

Ident CCB Injection Volume (uL) 4000
Batch Number Dilution 1
Determination start 2015-05-06 15:59:17 UTC- Sample Weight 1
Method water_Hexchrome_4000_ Sequence Name 1512614
Position 91 Calibration Date 6 MAY 2015
Injection Number 19

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
Pressure (MPa) 7.59 Channel Channel 1 (530 nm)
Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Reviewed by:

Clinton M. Wilson
Clinton M. Wilson
Chemist

Date:

MAY 07 2015

Verified by:

Sandra J. Miller
Sandra J. Miller
Chemist

Date:

MAY 14 2015



Lancaster
Laboratories

Determination of Hexavalent Chromium (Cr⁺⁶)

Instrument Name: ICS-3000

Date of Analysis: 5-7-15

Instrument ID: 16539

Analyst: CW1989

QC Stock Book/Page #: 194916/9

Run Name: 151278

ICV/CCV/LCSW Book/Page #: 168739/20

	<u>Cr⁺⁶ True Value (µg/L)</u>	<u>Range (µg/L)</u>
ICV	50	45 – 55
CCV	200	180 – 220
LCSW	100	90 – 110
LCSS	5.0 (mg/kg)	3.98 – 6.02 (mg/kg)

PBW/CCB (µg/L): < 10

PBS (mg/kg): < 1.0

Calibration Information:

Calibration Type: Linear by Area (r > 0.999)

Number of Calibrants: 5

Calibration Stock Book/Page: 194916/9

Standards Book/Page #: 168739/20

<u>Standards</u>	<u>Concentration (µg/L)</u>
Std. 1	10
Std. 2	50
Std. 3	100
Std. 4	200
Std. 5	300

Color Reagent Book/Page: 194916/25

Eluent Stock Book/Page #: 194916/25

COMMENTS:

LCS IS/ IS: 0.1ml into 10 ml volumetric → up to volume

SS: 2.0ml into 10ml volumetric → up to volume

PDS: 10ml sample + 1.0ml PDS spiking solution into 100ml volumetric → up to volume

Verified By: SP/UB

Date: 5/8/15

Sequence: 151278
Operator: Dept27IC

Page 1 of 4
Printed: 5/8/2015 12:02:44 PM

Title: IQ Test

Datasource: EX09294_local
Location: _ICS3000\Sequence
Timebase: _ICS3000
#Samples: 57

Created: 5/7/2015 7:29:30 AM by Dept27IC
(Modified, not saved)

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2	Cal 0	Standard	1	40.0	HEXTest	HEXTest	Finished	5/7/2015 7:40:38 AM
3	Cal 1	Standard	2	40.0	HEXTest	HEXTest	Finished	5/7/2015 7:48:11 AM
4	Cal 2	Standard	3	40.0	HEXTest	HEXTest	Finished	5/7/2015 7:55:44 AM
5	Cal 3	Standard	4	40.0	HEXTest	HEXTest	Finished	5/7/2015 8:03:17 AM
6	Cal 4	Standard	5	40.0	HEXTest	HEXTest	Finished	5/7/2015 8:10:50 AM
7	Cal 5	Standard	6	40.0	HEXTest	HEXTest	Finished	5/7/2015 8:18:23 AM
8	ICV	Unknown	7	40.0	HEXTest	HEXTest	Finished	5/7/2015 8:25:55 AM
9	ICB	Unknown	8	40.0	HEXTest	HEXTest	Finished	5/7/2015 8:43:58 AM
10	7868085	Unknown	71	40.0	HEXTest	HEXTest	Finished	5/7/2015 8:59:04 AM
11	7868085	Unknown	71	40.0	HEXTest	HEXTest	Finished	5/7/2015 9:06:37 AM
12	7873707	Unknown	72	40.0	HEXTest	HEXTest	Finished	5/7/2015 9:14:09 AM
13	7873707	Unknown	72	40.0	HEXTest	HEXTest	Finished	5/7/2015 9:21:42 AM
14	7873708	Unknown	73	40.0	HEXTest	HEXTest	Finished	5/7/2015 9:29:15 AM
15	7873708	Unknown	73	40.0	HEXTest	HEXTest	Finished	5/7/2015 9:36:48 AM
16	7874919	Unknown	74	40.0	HEXTest	HEXTest	Finished	5/7/2015 9:44:21 AM
17	7874919	Unknown	74	40.0	HEXTest	HEXTest	Finished	5/7/2015 9:51:53 AM
18	7874920	Unknown	75	40.0	HEXTest	HEXTest	Finished	5/7/2015 9:59:26 AM
19	7874920	Unknown	75	40.0	HEXTest	HEXTest	Finished	5/7/2015 10:06:59 AM
20	7874921	Unknown	76	40.0	HEXTest	HEXTest	Finished	5/7/2015 10:14:31 AM
21	7874921	Unknown	76	40.0	HEXTest	HEXTest	Finished	5/7/2015 10:22:04 AM
22	7874922-U	Unknown	77	40.0	HEXTest	HEXTest	Finished	5/7/2015 10:29:37 AM
23	7874922-U	Unknown	77	40.0	HEXTest	HEXTest	Finished	5/7/2015 10:37:09 AM
24	7874930	Unknown	78	40.0	HEXTest	HEXTest	Finished	5/7/2015 10:44:42 AM
25	7874930	Unknown	78	40.0	HEXTest	HEXTest	Finished	5/7/2015 10:52:15 AM
26	7874931	Unknown	79	40.0	HEXTest	HEXTest	Finished	5/7/2015 10:59:48 AM
27	7874931	Unknown	79	40.0	HEXTest	HEXTest	Finished	5/7/2015 11:07:21 AM
28	CCV	Unknown	91	40.0	HEXTest	HEXTest	Finished	5/7/2015 11:14:53 AM
29	CCB	Unknown	100	40.0	HEXTest	HEXTest	Finished	5/7/2015 11:22:27 AM
30	7874921	Unknown	80	40.0	HEXTest	HEXTest	Finished	5/7/2015 11:29:59 AM
31	7874921	Unknown	80	40.0	HEXTest	HEXTest	Finished	5/7/2015 11:37:31 AM
32	LCSS	Unknown	62	40.0	HEXTest	HEXTest	Finished	5/7/2015 11:45:04 AM
33	LCSS	Unknown	62	40.0	HEXTest	HEXTest	Finished	5/7/2015 11:52:37 AM
34	LCSSIS	Unknown	63	40.0	HEXTest	HEXTest	Finished	5/7/2015 12:00:09 PM
35	LCSSIS	Unknown	63	40.0	HEXTest	HEXTest	Finished	5/7/2015 12:07:42 PM
36	7874923-SS	Unknown	64	40.0	HEXTest	HEXTest	Finished	5/7/2015 12:15:15 PM
37	7874923-SS	Unknown	64	40.0	HEXTest	HEXTest	Finished	5/7/2015 12:22:48 PM
38	7874925-IS	Unknown	65	40.0	HEXTest	HEXTest	Finished	5/7/2015 12:30:21 PM
39	7874925-IS	Unknown	65	40.0	HEXTest	HEXTest	Finished	5/7/2015 12:37:53 PM
40	7874926-PDS	Unknown	66	40.0	HEXTest	HEXTest	Finished	5/7/2015 12:45:27 PM
41	7874926-PDS	Unknown	66	40.0	HEXTest	HEXTest	Finished	5/7/2015 12:52:59 PM
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Sequence: 151278
Operator: Dept271C

Page 2 of 4
Printed: 5/8/2015 12:02:44 PM

Title: IQ Test

Datasource: EX09294_local
Location: _ICS3000\Sequence
Timebase: _ICS3000
#Samples: 57

Created: 5/7/2015 7:29:30 AM by Dept271C
(Modified, not saved)

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3	Cal 1	1.0000	1.0000	1.0000	
4	Cal 2	1.0000	1.0000	1.0000	
5	Cal 3	1.0000	1.0000	1.0000	
6	Cal 4	1.0000	1.0000	1.0000	
7	Cal 5	1.0000	1.0000	1.0000	
8	ICV	1.0000	1.0000	1.0000	
9	ICB	1.0000	1.0000	1.0000	
10	7868085	25.2000	1.0000	1.0000	15126243201A-2987
11	7868085	25.2000	1.0000	1.0000	15126243201A-2987
12	7873707	25.3000	1.0000	1.0000	15126243201A-2987
13	7873707	25.3000	1.0000	1.0000	15126243201A-2987
14	7873708	25.0000	1.0000	1.0000	15126243201A-2987
15	7873708	25.0000	1.0000	1.0000	15126243201A-2987
16	7874919	25.1000	1.0000	1.0000	15126243201A-2987
17	7874919	25.1000	1.0000	1.0000	15126243201A-2987
18	7874920	25.1000	500.0000	1.0000	15126243201A-2987
19	7874920	25.1000	500.0000	1.0000	15126243201A-2987
20	7874921	25.3000	10.0000	1.0000	15126243201A-2987
21	7874921	25.3000	10.0000	1.0000	15126243201A-2987
22	7874922-U	25.0000	1.0000	1.0000	15126243201A-2987
23	7874922-U	25.0000	1.0000	1.0000	15126243201A-2987
24	7874930	25.1000	100.0000	1.0000	15126243201A-2987
25	7874930	25.1000	100.0000	1.0000	15126243201A-2987
26	7874931	25.3000	500.0000	1.0000	15126243201A-2987
27	7874931	25.3000	500.0000	1.0000	15126243201A-2987
28	CCV	1.0000	1.0000	1.0000	
29	CCB	1.0000	1.0000	1.0000	
30	7874921	25.3000	20.0000	1.0000	15126243201A-2987
31	7874921	25.3000	20.0000	1.0000	15126243201A-2987
32	LCSS	25.0000	1.0000	1.0000	15126243201A-2987
33	LCSS	25.0000	1.0000	1.0000	15126243201A-2987
34	LCSSIS	25.0000	100.0000	1.0000	15126243201A-2987
35	LCSSIS	25.0000	100.0000	1.0000	15126243201A-2987
36	7874923-SS	25.1000	1.0000	1.0000	15126243201A-2987
37	7874923-SS	25.1000	1.0000	1.0000	15126243201A-2987
38	7874925-IS	25.3000	1.0000	1.0000	15126243201A-2987
39	7874925-IS	25.3000	1.0000	1.0000	15126243201A-2987
40	7874926-PDS	25.0000	10.0000	1.0000	15126243201A-2987
41	7874926-PDS	25.0000	10.0000	1.0000	15126243201A-2987
42	7874929-D	25.4000	1.0000	1.0000	15126243201A-2987

Sequence: 151278
Operator: Dept27IC

Page 3 of 4
Printed: 5/8/2015 12:02:44 PM

Title: IQ Test
Datasource: EX09294_local
Location: _ICS3000\Sequence
Timebase: _ICS3000
#Samples: 57
Created: 5/7/2015 7:29:30 AM by Dept27IC
(Modified, not saved)

No.	Name	Type	Pos.	Inj. Vol.	Program	Method	Status	Inj. Date/Time
43	7874929-D	Unknown	67	40.0	HEXTest	HEXTest	Finished	5/7/2015 1:08:05 PM
44	PBS	Unknown	68	40.0	HEXTest	HEXTest	Finished	5/7/2015 1:15:38 PM
45	PBS	Unknown	68	40.0	HEXTest	HEXTest	Finished	5/7/2015 1:23:11 PM
46	CCV	Unknown	91	40.0	HEXTest	HEXTest	Finished	5/7/2015 1:30:44 PM
47	CCB	Unknown	100	40.0	HEXTest	HEXTest	Finished	5/7/2015 1:38:16 PM
48	LCSW	Unknown	9	40.0	HEXTest	HEXTest	Finished	5/7/2015 1:51:37 PM
49	LCSW	Unknown	9	40.0	HEXTest	HEXTest	Finished	5/7/2015 1:59:10 PM
50	LCSDW	Unknown	9	40.0	HEXTest	HEXTest	Finished	5/7/2015 2:06:43 PM
51	LCSDW	Unknown	9	40.0	HEXTest	HEXTest	Finished	5/7/2015 2:14:16 PM
52	PBW	Unknown	10	40.0	HEXTest	HEXTest	Finished	5/7/2015 2:21:49 PM
53	PBW	Unknown	10	40.0	HEXTest	HEXTest	Finished	5/7/2015 2:29:22 PM
54	7877176	Unknown	40	40.0	HEXTest	HEXTest	Finished	5/7/2015 2:36:54 PM
55	7877176	Unknown	40	40.0	HEXTest	HEXTest	Finished	5/7/2015 2:44:28 PM
56	CCV	Unknown	91	40.0	HEXTest	HEXTest	Finished	5/7/2015 2:54:13 PM
57	CCB	Unknown	100	40.0	HEXTest	HEXTest	Finished	5/7/2015 3:01:46 PM

Sequence: 151278
Operator: Dept271C

Page 4 of 4
Printed: 5/8/2015 12:02:44 PM

Title: IQ Test
Datasource: EX09294_local
Location: _ICS3000\Sequence
Timebase: _ICS3000
#Samples: 57
Created: 5/7/2015 7:29:30 AM by Dept271C
(Modified, not saved)

No.	Name	Weight	Dil. Factor	ISTD Amount	Comment
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44	PBS	25.0000	1.0000	1.0000	15126243201A-2987
45	PBS	25.0000	1.0000	1.0000	15126243201A-2987
46	CCV	1.0000	1.0000	1.0000	
47	CCB	1.0000	1.0000	1.0000	
48	LC5W	1.0000	1.0000	1.0000	15127987801A-2987
49	LC5W	1.0000	1.0000	1.0000	15127987801A-2987
50	LC5DW	1.0000	1.0000	1.0000	15127987801A-2987
51	LC5DW	1.0000	1.0000	1.0000	15127987801A-2987
52	PBW	1.0000	1.0000	1.0000	15127987801A-2987
53	PBW	1.0000	1.0000	1.0000	15127987801A-2987
54	7877176	1.0000	1.0000	1.0000	15127987801A-2987
55	7877176	1.0000	1.0000	1.0000	15127987801A-2987
56	CCV	1.0000	1.0000	1.0000	
57	CCB	1.0000	1.0000	1.0000	



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LABORATORIES

Hexavalent Chromium by IC

Reviewer/Enterer:

Clinton M. Wilson
Clinton M. Wilson
Chemist

Date:

MAY 08 2015

Sample Name: Cal 5

Batch Number/Analyst:

Date/Time Injected: 5/7/2015 8:18

Dilution Factor: 1.00

Sample Weight: 1.00

Injection Number: 7

Instrument No.: 16539

Calibration Date: 5/7/2015

Schedule File Name: 151278

Channel: UV_VIS_1

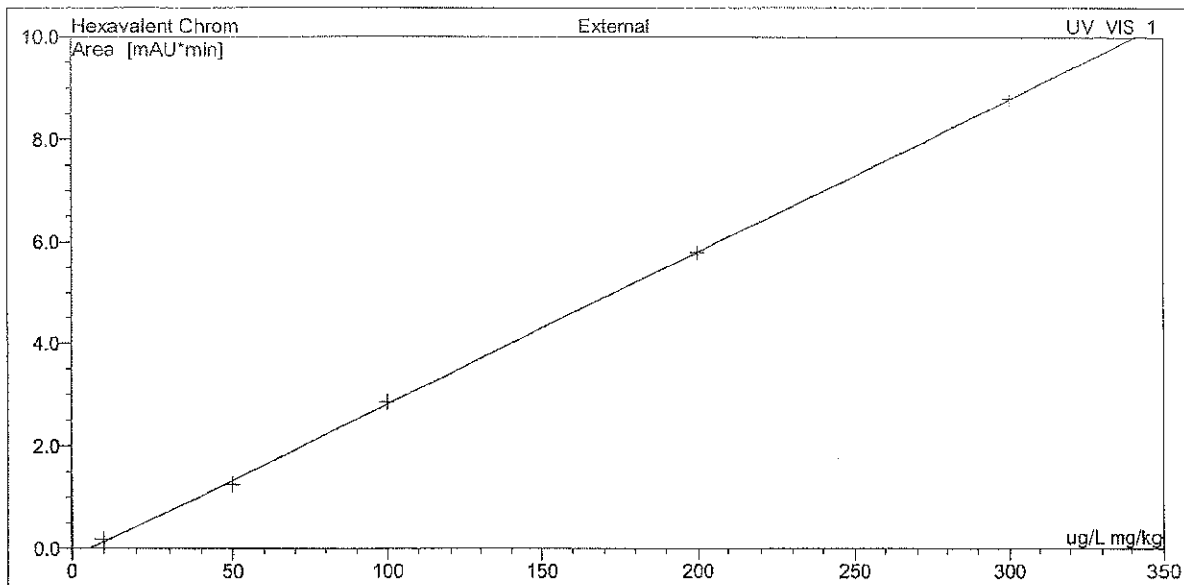
Column Type - Ser #: NG1-024770

AS7-015396

Peak Information: All Components

No.	Peak Name	Cal.Type	#Points	Coeff.Det. %
1	Hexavalent Chrom	LOff	5	99.9805

F=0.999502



Reviewed/Verified By:

Erik J. Frederiksen
Erik J. Frederiksen
Manager

Date:

MAY 08 2015

5/8/2015 11:54 AM



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Laboratories

Hexavalent Chromium by IC

Reviewer/Enterer:

Clinton M. Wilson
Chemist

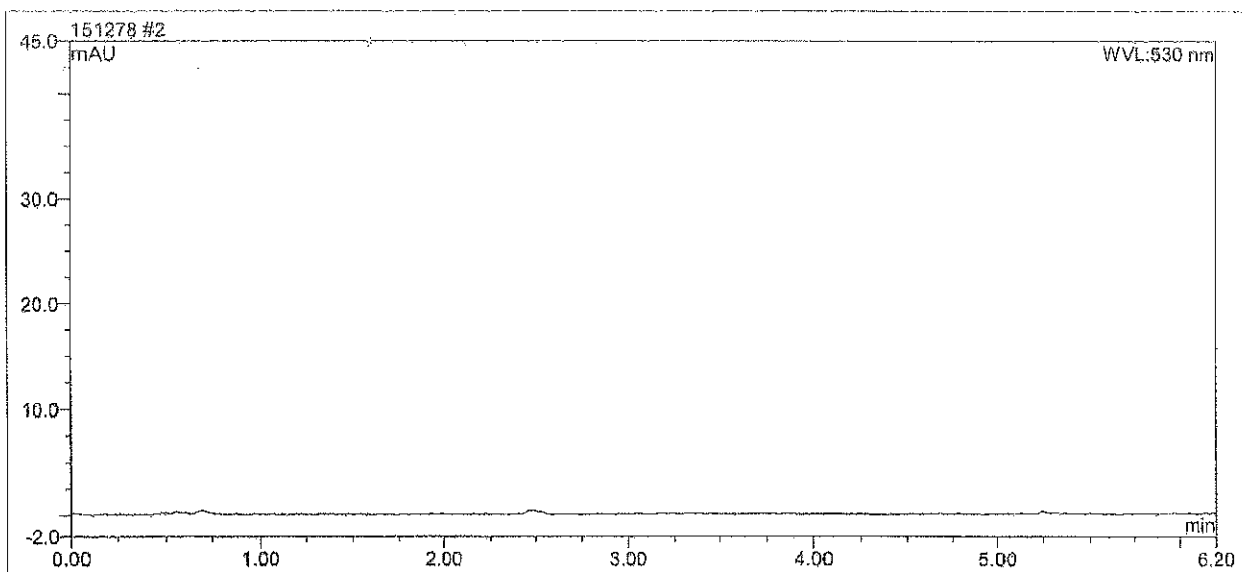
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MAY 07 2015

Sample Name:	Cal 0	Instrument No.	16539
Batch Number/Analyst:		Calibration Date:	5/7/2015
Date/Time Injected:	5/7/2015 7:40	Schedule File Name:	151278
Dilution Factor:	1.00	Channel:	UV_VIS_1
Sample Weight:	1.00	Column Type - Ser #:	NG1-024770
Injection Number:	2		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
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Reviewed/Verified By:

Erik J. Frederiksen
Manager

Date:

MAY 08 2015

5/7/2015 12:23 PM



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Hexavalent Chromium by IC

Reviewer/Enterer:

Clinton M. Wilson
Chemist

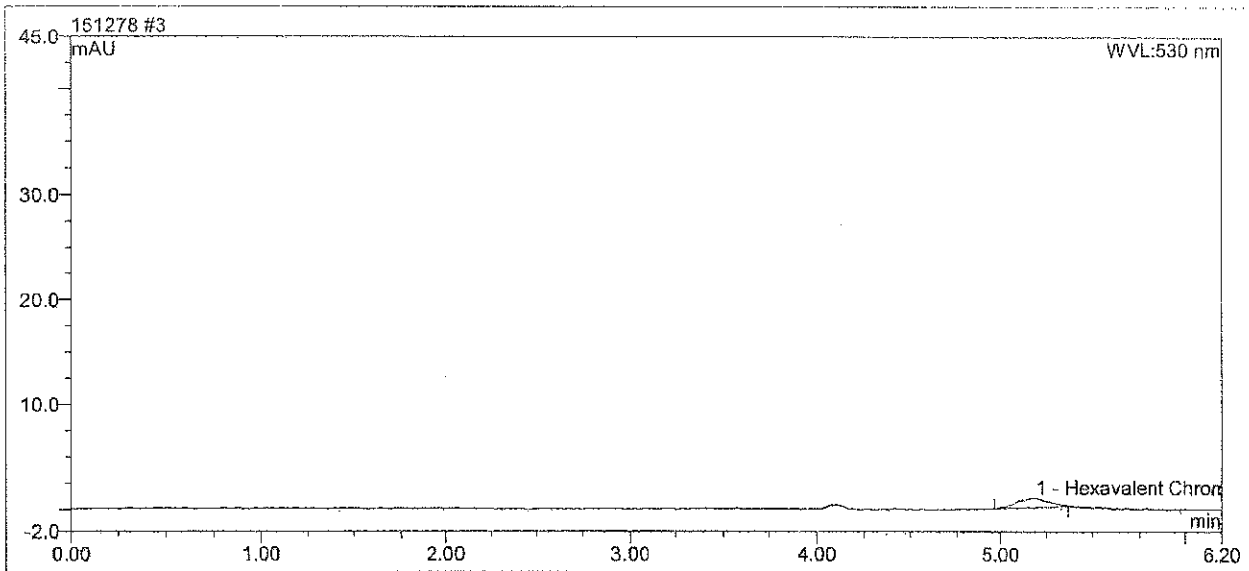
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MAY 07 2015

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Batch Number/Analyst:		Calibration Date:	5/7/2015
Date/Time Injected:	5/7/2015 7:48	Schedule File Name:	151278
Dilution Factor:	1.00	Channel:	UV_VIS_1
Sample Weight:	1.00	Column Type - Ser #:	NG1-024770
Injection Number:	3		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
1	Hexavalent Chrom	5.19	0.1817	11.483324



Erik J. Frederiksen
Manager

Reviewed/Verified By:

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Date:

5/7/2015 12:23 PM



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Hexavalent Chromium by IC

Reviewer/Enterer:

Date:

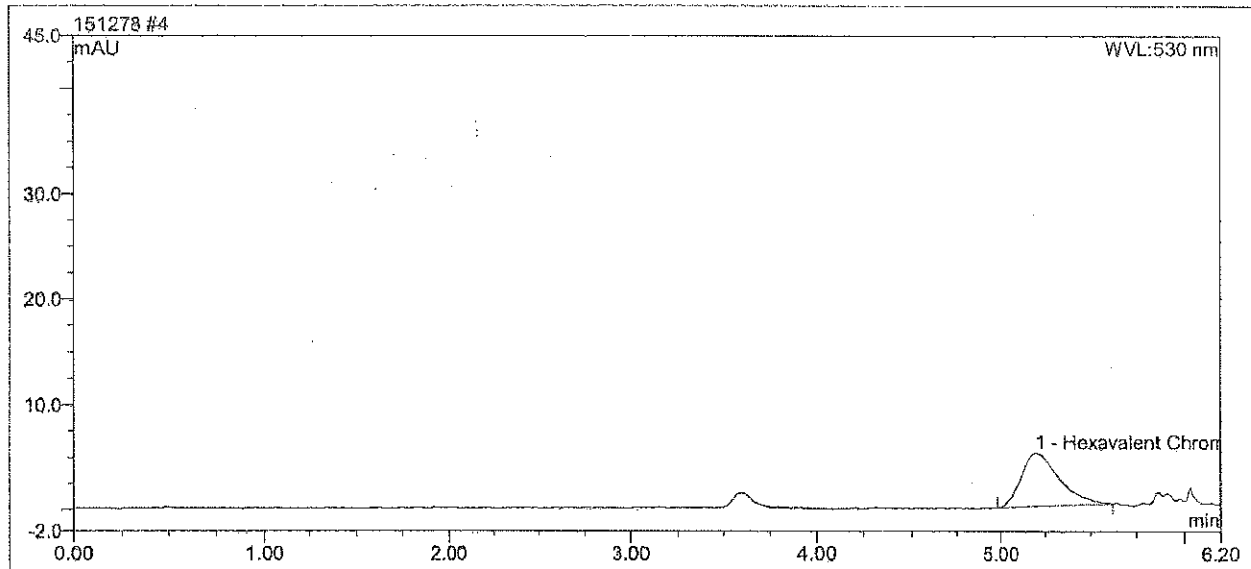
Clinton M. Wilson
Chemist

MAY 07 2015

Sample Name:	Cal 2	Instrument No.	16539
Batch Number/Analyst:		Calibration Date:	5/7/2015
Date/Time Injected:	5/7/2015 7:55	Schedule File Name:	151278
Dilution Factor:	1.00	Channel:	UV_VIS_1
Sample Weight:	1.00	Column Type - Ser #:	NG1-024770
Injection Number:	4		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
1	Hexavalent Chrom	5.19	1.2513	47.375611



Reviewed/Verified By:

Erik J. Frederiksen
Manager

Date:

MAY 08 2015

5/7/2015 12:23 PM



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Hexavalent Chromium by IC

Reviewer/Enterer:

Clinton M. Wilson
Chemist

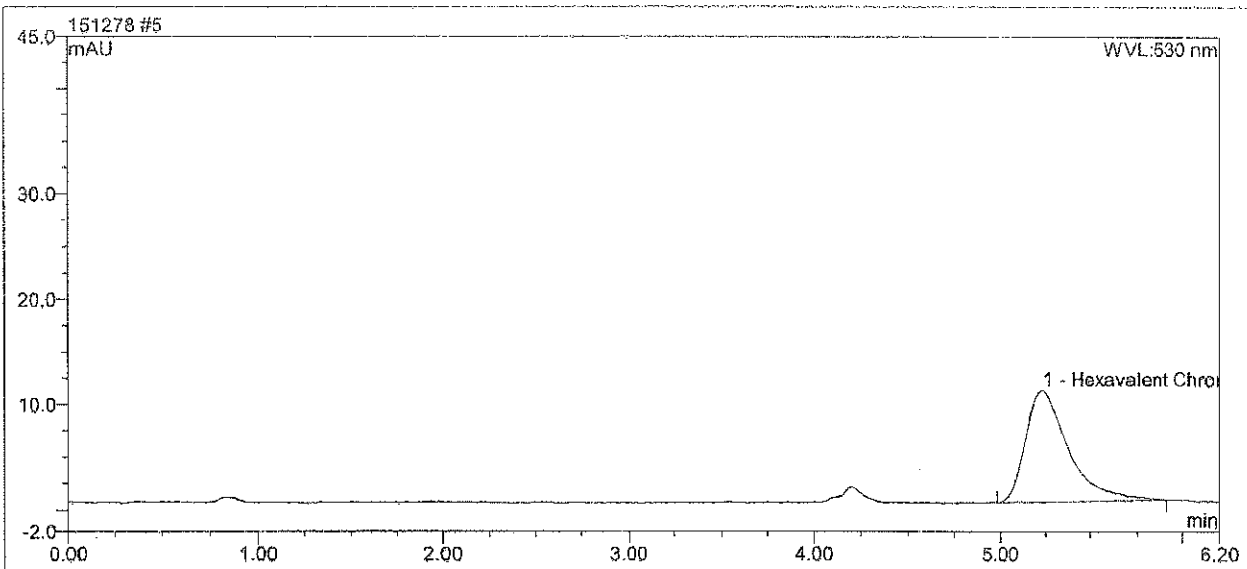
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MAY 07 2015

Sample Name:	Cal 3	Instrument No.	16539
Batch Number/Analyst:		Calibration Date:	5/7/2015
Date/Time Injected:	5/7/2015 8:03	Schedule File Name:	151278
Dilution Factor:	1.00	Channel:	UV_VIS_1
Sample Weight:	1.00	Column Type - Ser #:	NG1-024770
Injection Number:	5		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
1	Hexavalent Chrom	5.23	2.8578	101.281416



Reviewed/Verified By:

Date:

Erik J. Frederiksen
Manager

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Hexavalent Chromium by IC

Reviewer/Enterer:

Clinton M. Wilson
Chemist

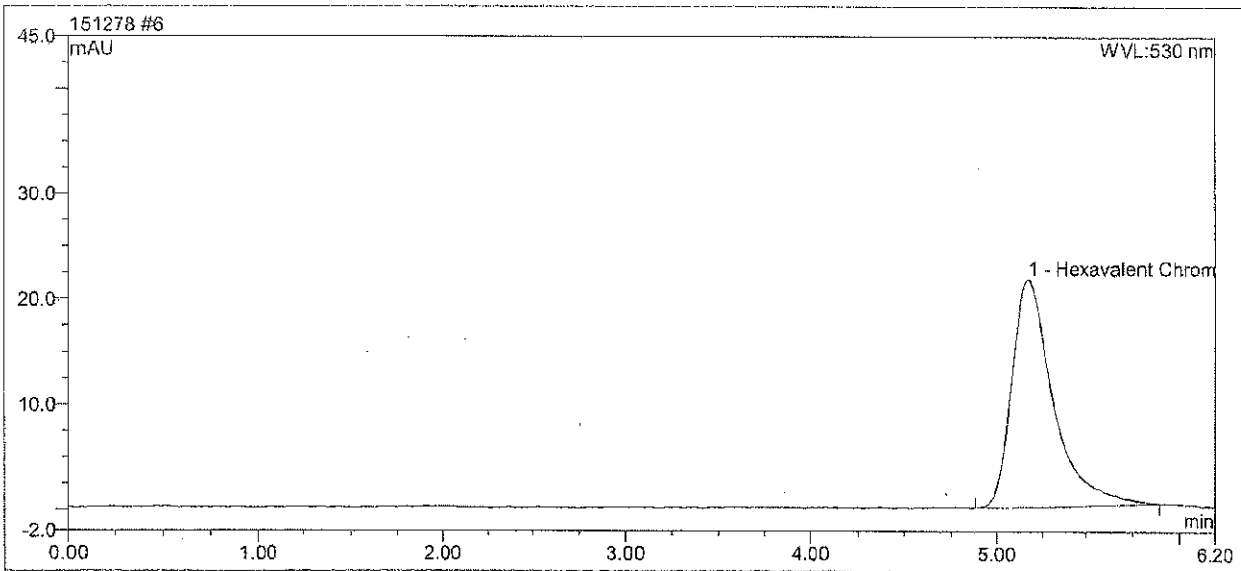
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MAY 07 2015

Sample Name:	Cal 4	Instrument No.	16539
Batch Number/Analyst:		Calibration Date:	5/7/2015
Date/Time Injected:	5/7/2015 8:10	Schedule File Name:	151278
Dilution Factor:	1.00	Channel:	UV_VIS_1
Sample Weight:	1.00	Column Type - Ser #:	NG1-024770
Injection Number:	6		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
1	Hexavalent Chrom	5.17	5.7907	199.696500



Reviewed/Verified By:

Date:

Erik J. Frederiksen
Manager

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Hexavalent Chromium by IC

Reviewer/Enterer:

Clinton M. Wilson
Clinton M. Wilson
Chemist

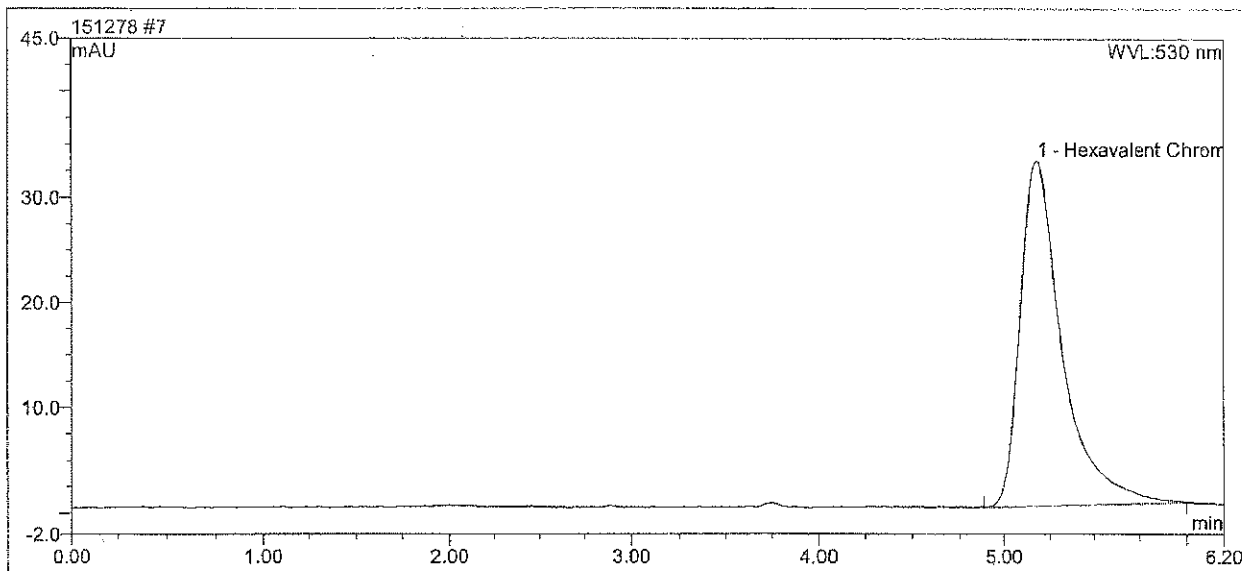
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MAY 07 2015

Sample Name:	Cal 5	Instrument No.	16539
Batch Number/Analyst:		Calibration Date:	5/7/2015
Date/Time Injected:	5/7/2015 8:18	Schedule File Name:	151278
Dilution Factor:	1.00	Channel:	UV_VIS_1
Sample Weight:	1.00	Column Type - Ser #:	NG1-024770
Injection Number:	7		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
1	Hexavalent Chrom	5.18	8.7848	300.163149



Reviewed/Verified By:

Date:

Erik J. Frederiksen
Erik J. Frederiksen
Manager

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Laboratories

Hexavalent Chromium by IC

Reviewer/Enterer:

Clinton M. Wilson
Clinton M. Wilson
Chemist

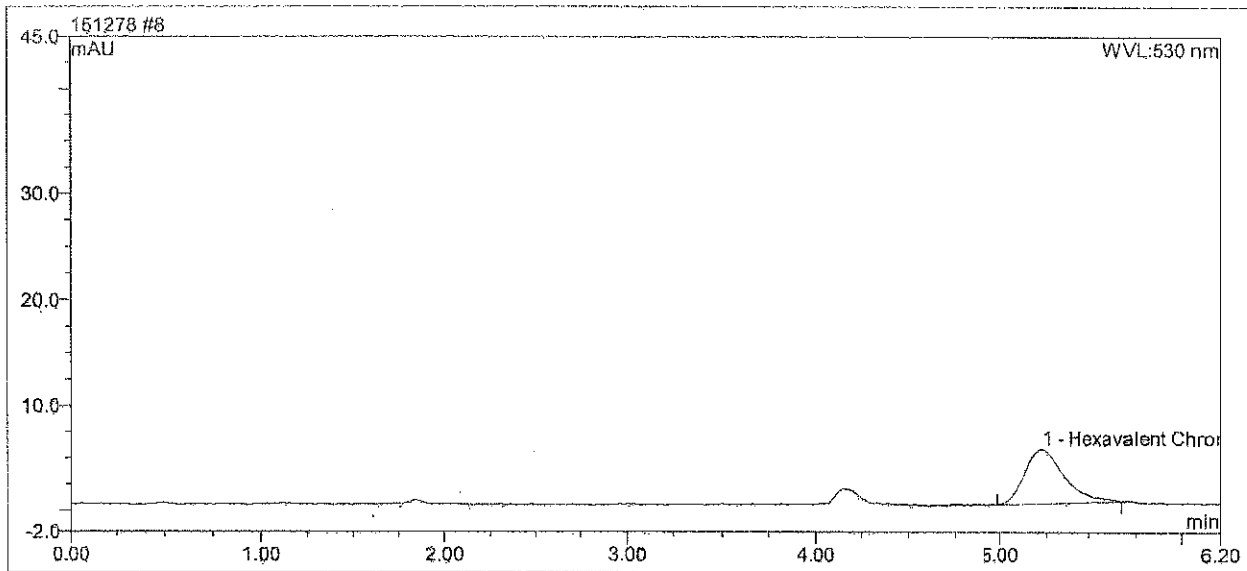
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MAY 07 2015

Sample Name:	ICV	Instrument No.	16539
Batch Number/Analyst:		Calibration Date:	5/7/2015
Date/Time Injected:	5/7/2015 8:25	Schedule File Name:	151278
Dilution Factor:	1.00	Channel:	UV_VIS_1
Sample Weight:	1.00	Column Type - Ser # :	NG1-024770
Injection Number:	8		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
1	Hexavalent Chrom	5.23	1.3224	49.759165



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Date:

Erik J. Frederiksen
Erik J. Frederiksen
Manager

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Hexavalent Chromium by IC

Reviewer/Enterer:

Date:

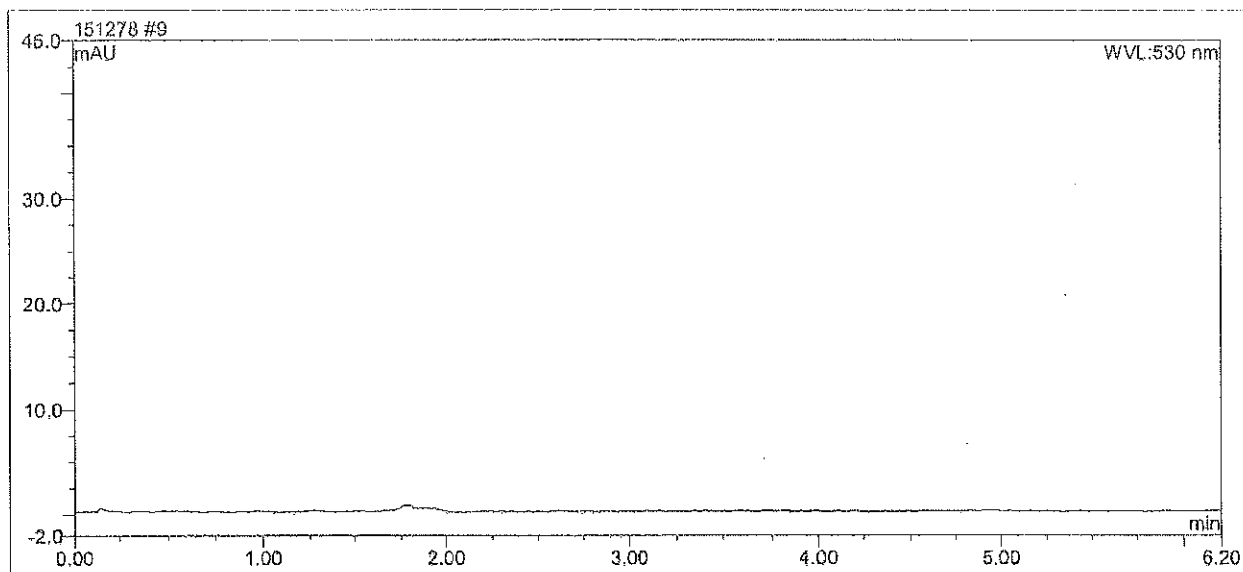
Clinton M. Wilson
Chemist

MAY 07 2015

Sample Name:	ICB	Instrument No.	16539
Batch Number/Analyst:		Calibration Date:	5/7/2015
Date/Time Injected:	5/7/2015 8:43	Schedule File Name:	151278
Dilution Factor:	1.00	Channel:	UV_VIS_1
Sample Weight:	1.00	Column Type - Ser #:	NG1-024770
Injection Number:	9		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
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Reviewed/Verified By:

Date:

Erik J. Frederiksen
Manager

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Hexavalent Chromium by IC

Reviewer/Enterer:

Date:

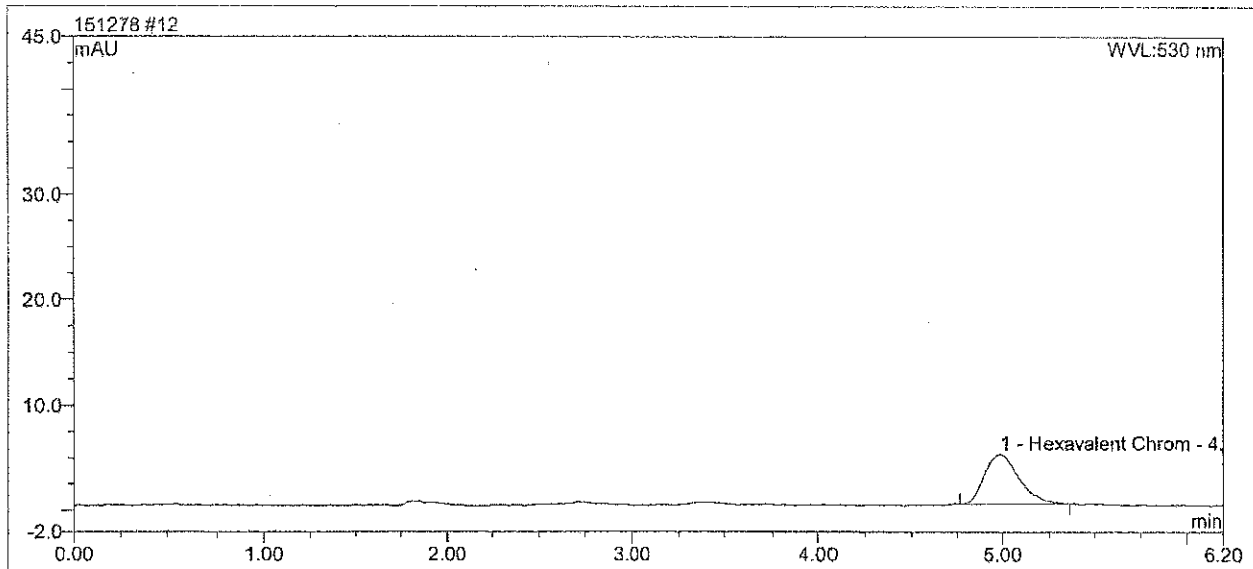
Clinton M. Wilson
Chemist

MAY 07 2015

Sample Name:	7873707	Instrument No.	16539
Batch Number/Analyst:	15126243201A-2987	Calibration Date:	5/7/2015
Date/Time Injected:	5/7/2015 9:14	Schedule File Name:	151278
Dilution Factor:	1.00	Channel:	UV_VIS_1
Sample Weight:	25.30	Column Type - Ser #:	NG1-024770
Injection Number:	12		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
1	Hexavalent Chrom	4.99	1.0277	1.575935



Reviewed/Verified By:

Date:

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Hexavalent Chromium by IC

Reviewer/Enterer:

Clinton M. Wilson
Chemist

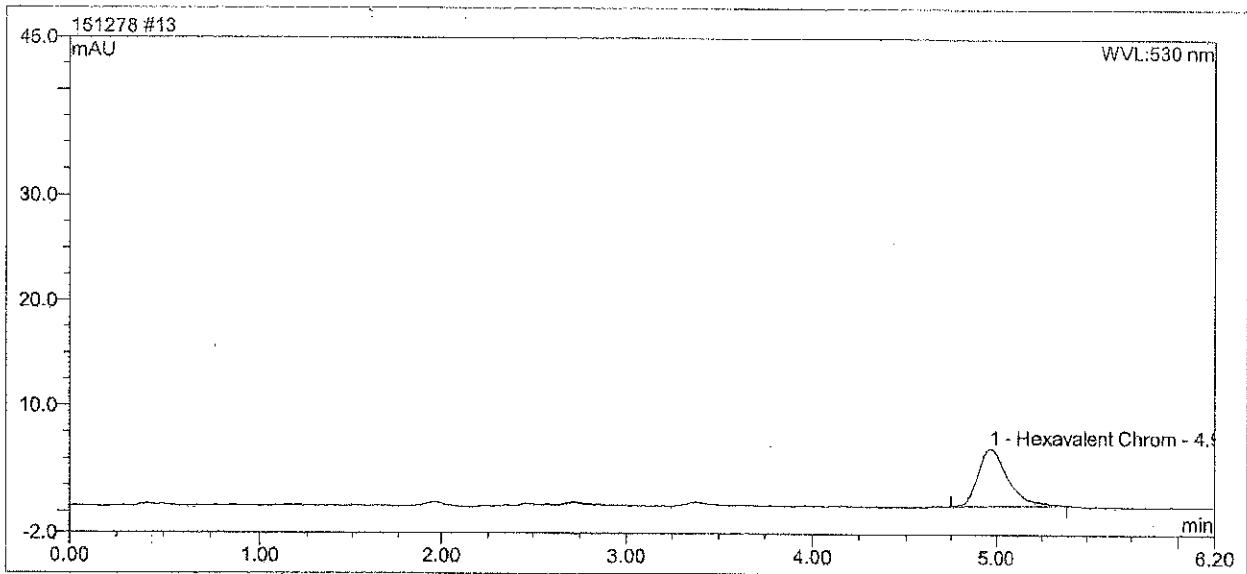
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MAY 07 2015

Sample Name:	7873707	Instrument No.	16539
Batch Number/Analyst:	15126243201A-2987	Calibration Date:	5/7/2015
Date/Time Injected:	5/7/2015 9:21	Schedule File Name:	151278
Dilution Factor:	1.00	Channel:	UV_VIS_1
Sample Weight:	25.30	Column Type - Ser #:	NG1-024770
Injection Number:	13		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
1	Hexavalent Chrom	4.96	1.0790	1.643962



Reviewed/Verified By:

Clinton M. Wilson
Clinton M. Wilson
Senior Chemist/Group Leader

Date:

MAY 11 2015

5/7/2015 12:28 PM



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Hexavalent Chromium by IC

Reviewer/Enterer:

Clinton M. Wilson
Clinton M. Wilson
Chemist

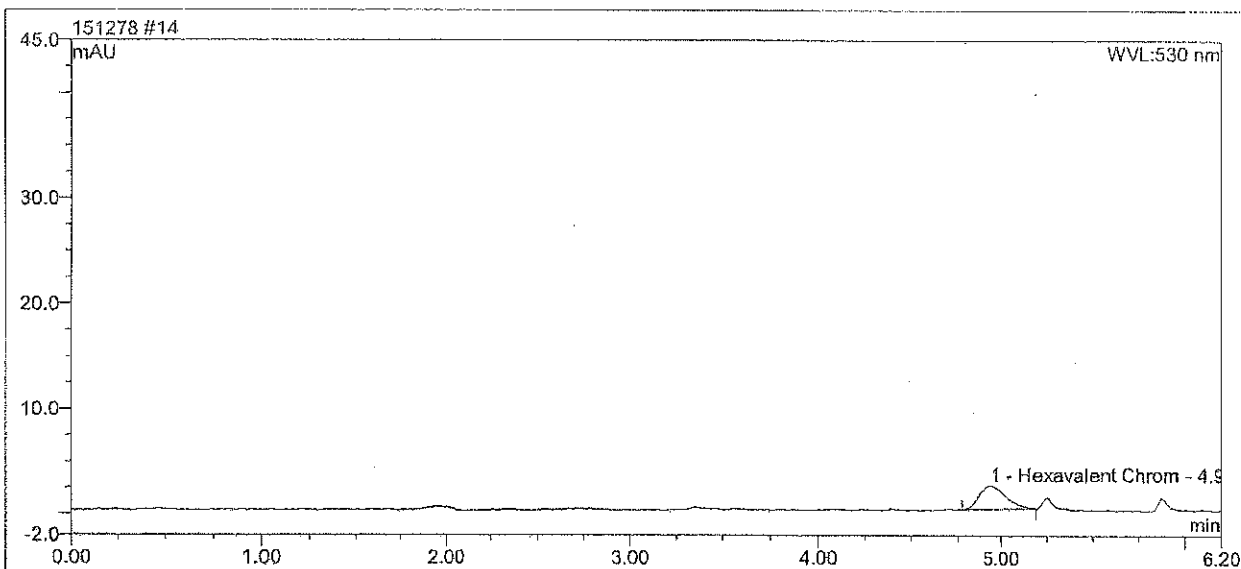
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MAY 07 2015

Sample Name:	7873708	Instrument No.	16539
Batch Number/Analyst:	15126243201A-2987	Calibration Date:	5/7/2015
Date/Time Injected:	5/7/2015 9:29	Schedule File Name:	151278
Dilution Factor:	1.00	Channel:	UV_VIS_1
Sample Weight:	25.00	Column Type - Ser #:	NG1-024770
Injection Number:	14		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
1	Hexavalent Chrom	4.94	0.4025	0.755774



Reviewed/Verified By:

Nicole M. Vebey
Nicole M. Vebey
Senior Chemist/Group Leader

Date:

MAY 11 2015

5/7/2015 12:28 PM



Lancaster
Laboratories

Hexavalent Chromium by IC

Reviewer/Enterer:

Clinton M. Wilson
Chemist

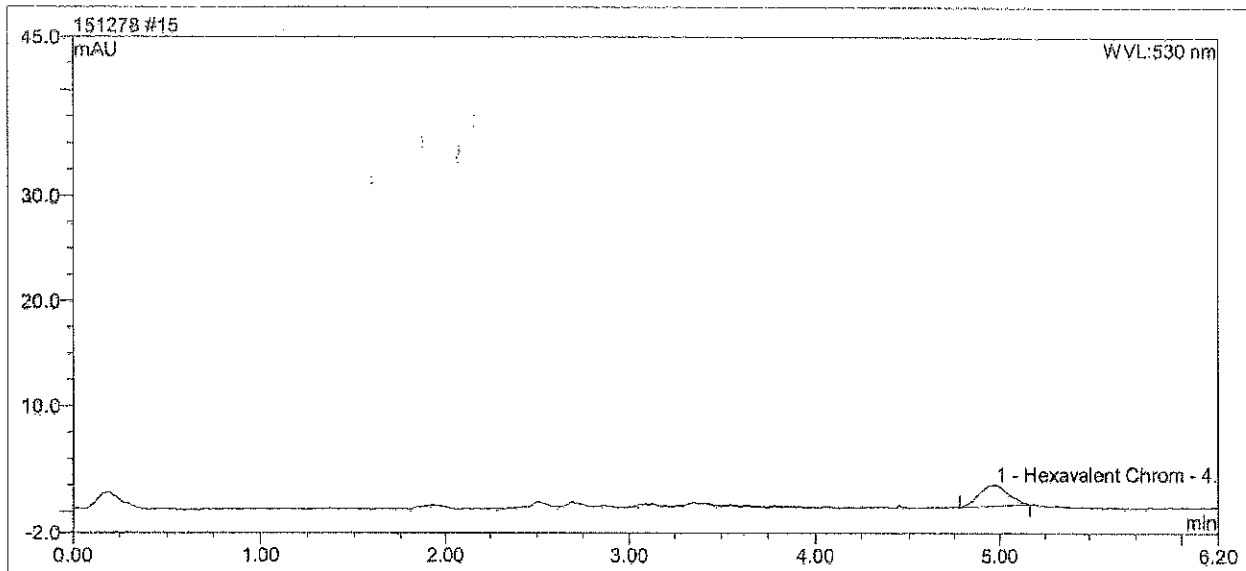
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MAY 07 2015

Sample Name:	7873708	Instrument No.	16539
Batch Number/Analyst:	15126243201A-2987	Calibration Date:	5/7/2015
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Sample Weight:	25.00	Column Type - Ser #:	NG1-024770
Injection Number:	15		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
1	Hexavalent Chrom	4.98	0.3797	0.725149



Reviewed/Verified By:

Date:

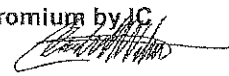
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Lancaster
Laboratories

Hexavalent Chromium by IC

Reviewer/Enterer:


Clinton M. Wilson
Chemist

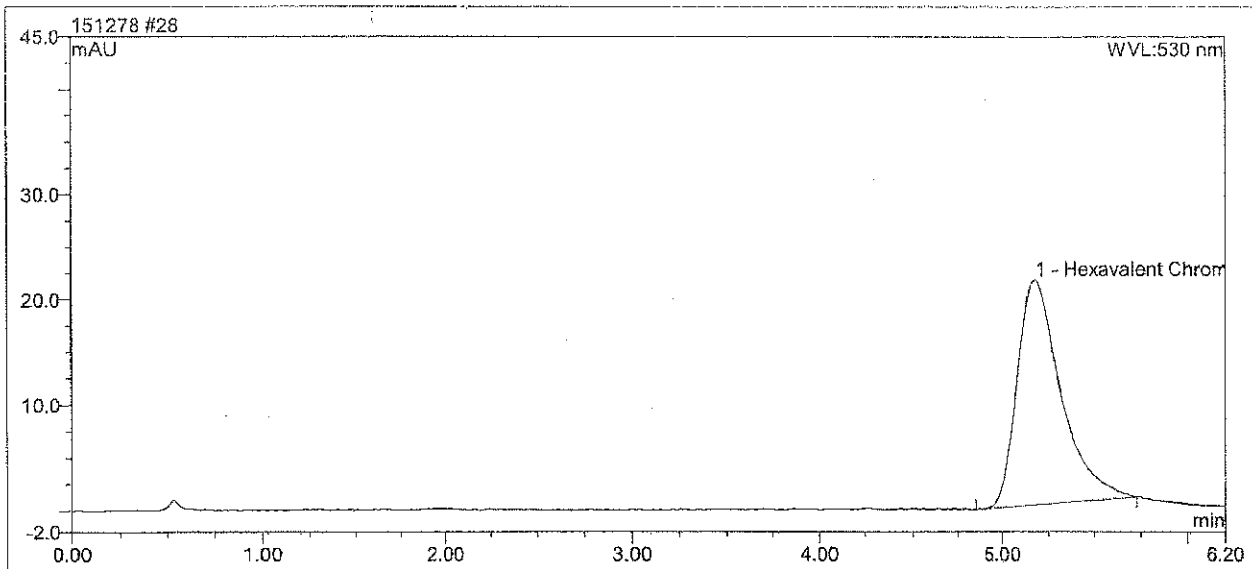
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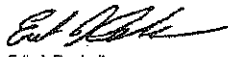
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Batch Number/Analyst:		Calibration Date:	5/7/2015
Date/Time Injected:	5/7/2015 11:14	Schedule File Name:	151278
Dilution Factor:	1.00	Channel:	UV_VIS_1
Sample Weight:	1.00	Column Type - Ser #:	NG1-024770
Injection Number:	28		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
1	Hexavalent Chrom	5.18	5.7851	199.509000



Reviewed/Verified By:


Erik J. Frederiksen
Manager

Date:

MAY 08 2015

5/7/2015 12:28 PM



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Laboratories

Hexavalent Chromium by IC

Reviewer/Enterer:

Clinton M. Wilson
Chemist

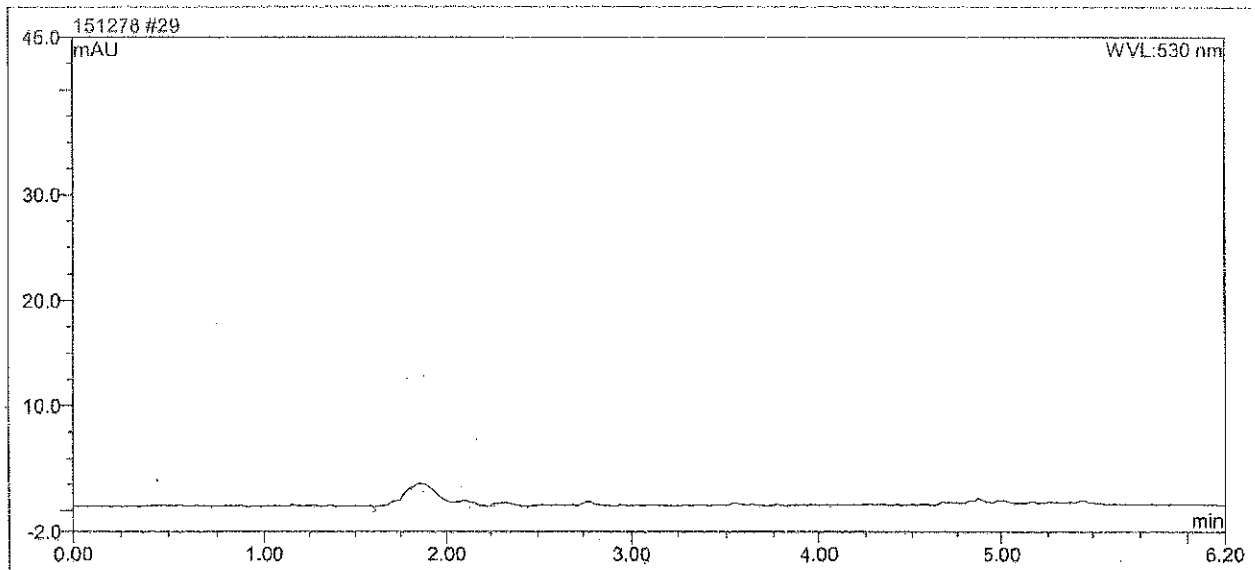
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MAY 07 2015

Sample Name:	CCB	Instrument No.	16539
Batch Number/Analyst:		Calibration Date:	5/7/2015
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Dilution Factor:	1.00	Channel:	UV_VIS_1
Sample Weight:	1.00	Column Type - Ser #:	NG1-024770
Injection Number:	29		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
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Reviewed/Verified By:

Date:

Erik J. Frederiksen
Manager

MAY 08 2015

5/7/2015 12:28 PM



Lancaster
Laboratories

Hexavalent Chromium by IC

Reviewer/Enterer:

Clinton M. Wilson
Clinton M. Wilson
Chemist

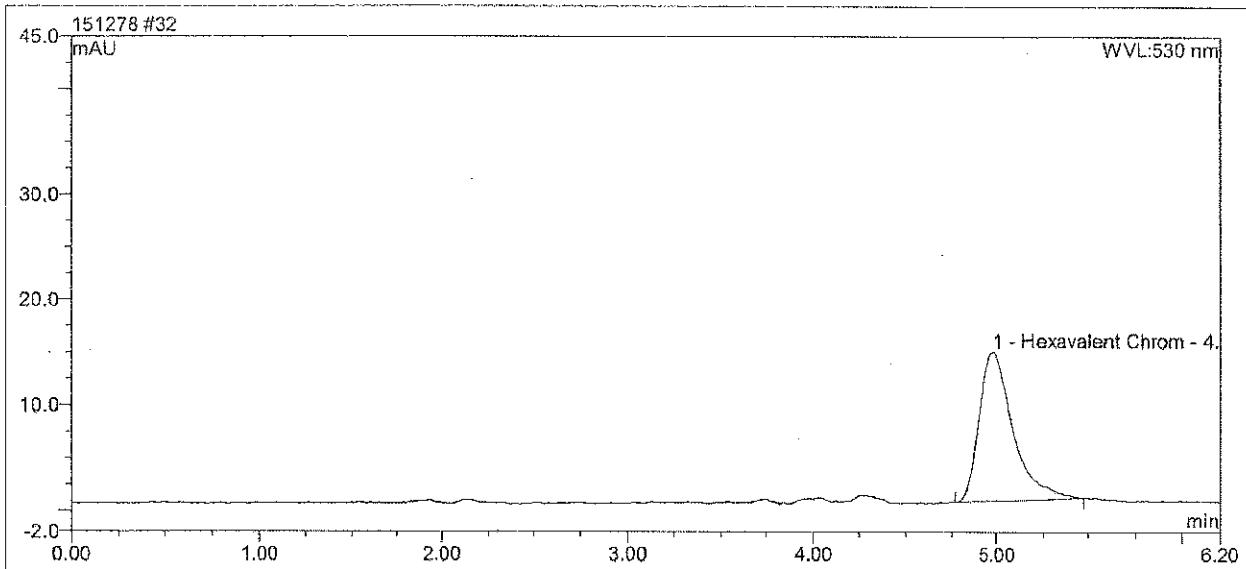
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Dilution Factor:	1.00	Channel:	UV_VIS_1
Sample Weight:	25.00	Column Type - Ser # :	NG1-024770
Injection Number:	32		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
1	Hexavalent Chrom	4.98	3.1397	4.429668



Reviewed/Verified By:

Date:

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Lancaster
Laboratories

Hexavalent Chromium by IC

Reviewer/Enterer:

Clinton M. Wilson
Clinton M. Wilson
Chemist

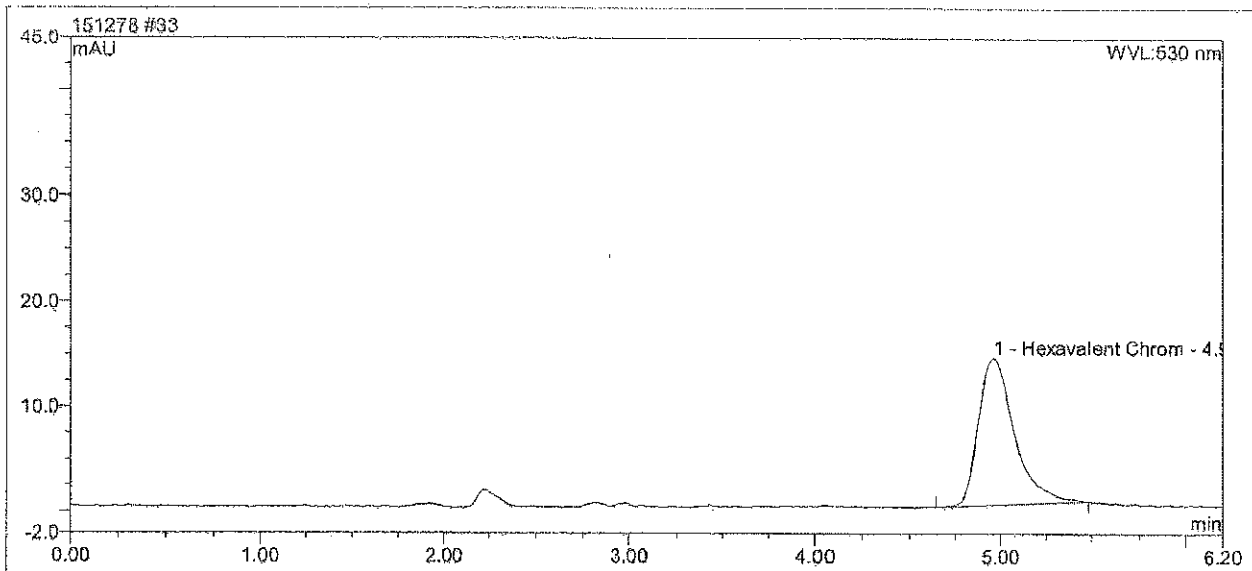
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Batch Number/Analyst:	15126243201A-2987	Calibration Date:	5/7/2015
Date/Time Injected:	5/7/2015 11:52	Schedule File Name:	151278
Dilution Factor:	1.00	Channel:	UV_VIS_1
Sample Weight:	25.00	Column Type - Ser #:	NG1-024770
Injection Number:	33		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
1	Hexavalent Chrom	4.96	3.1947	4.503386



Reviewed/Verified By:

Date:

Erik J. Frederiksen
Erik J. Frederiksen
Manager

MAY 08 2015

5/7/2015 12:28 PM



Lancaster
Laboratories

Hexavalent Chromium by IC

Reviewer/Enterer:

Clinton M. Wilson
Chemist

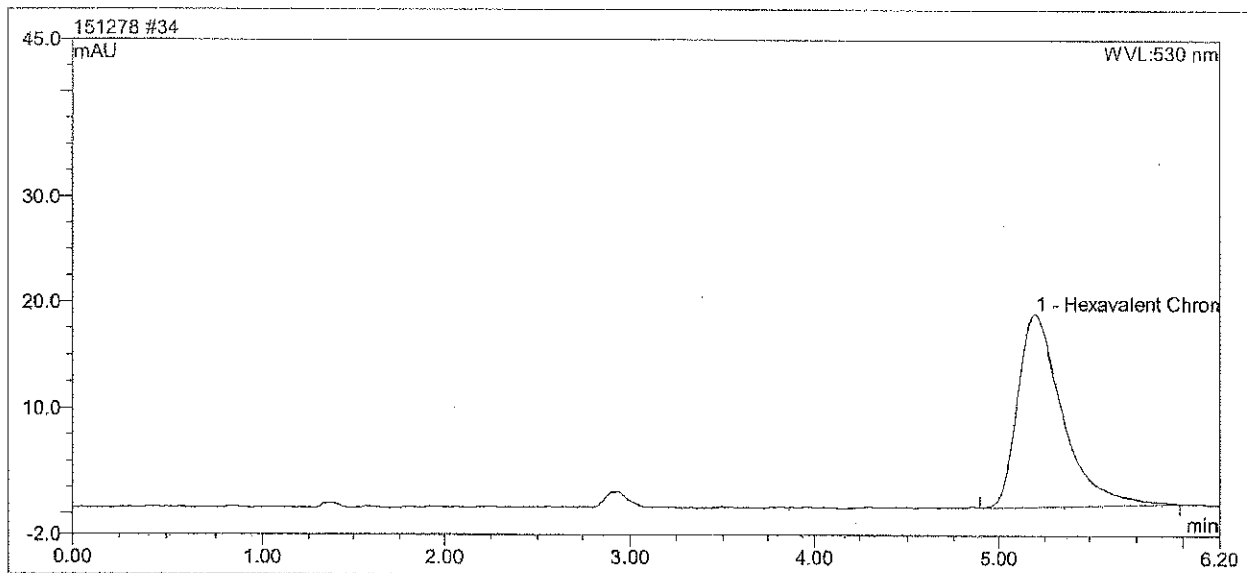
Date:

MAY 07 2015

Sample Name:	LCSSIS	Instrument No.	16539
Batch Number/Analyst:	15126243201A-2987	Calibration Date:	5/7/2015
Date/Time Injected:	5/7/2015 12:00	Schedule File Name:	151278
Dilution Factor:	100.00	Channel:	UV_VIS_1
Sample Weight:	25.00	Column Type - Ser #:	NG1-024770
Injection Number:	34		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
1	Hexavalent Chrom	5.20	5.1234	709.219554



Reviewed/Verified By:

Date:

5/7/2015 12:28 PM



Lancaster
Laboratories

Hexavalent Chromium by IC

Reviewer/Enterer:

Clinton M. Wilson
Clinton M. Wilson
Chemist

Date:

MAY 07 2015

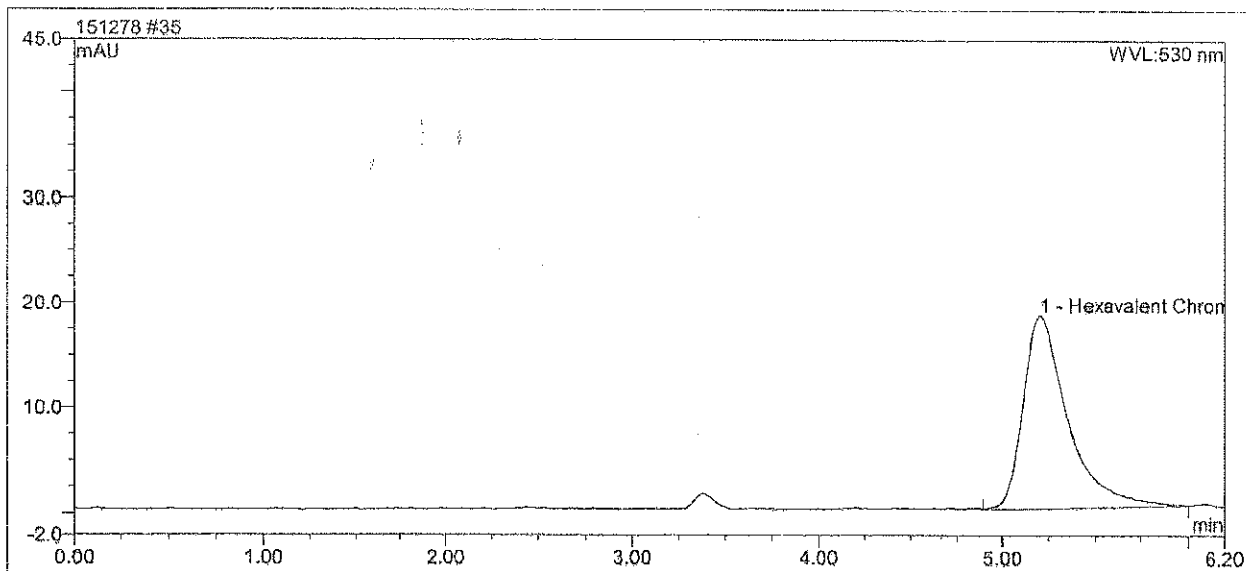
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Batch Number/Analyst:	15126243201A-2987	Calibration Date:	5/7/2015
Date/Time Injected:	5/7/2015 12:07	Schedule File Name:	151278
Dilution Factor:	100.00	Channel:	UV_VIS_1
Sample Weight:	25.00	Column Type - Ser #:	NG1-024770
Injection Number:	35		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
1	Hexavalent Chrom	5.20	5.1591	714.004691

± 720 mg/kg

99%



Reviewed/Verified By:

Erik J. Frederiksen
Erik J. Frederiksen
Manager

Date:

MAY 08 2015

5/7/2015 12:28 PM



Lancaster
Laboratories

Hexavalent Chromium by IC

Reviewer/Enterer:

Date:

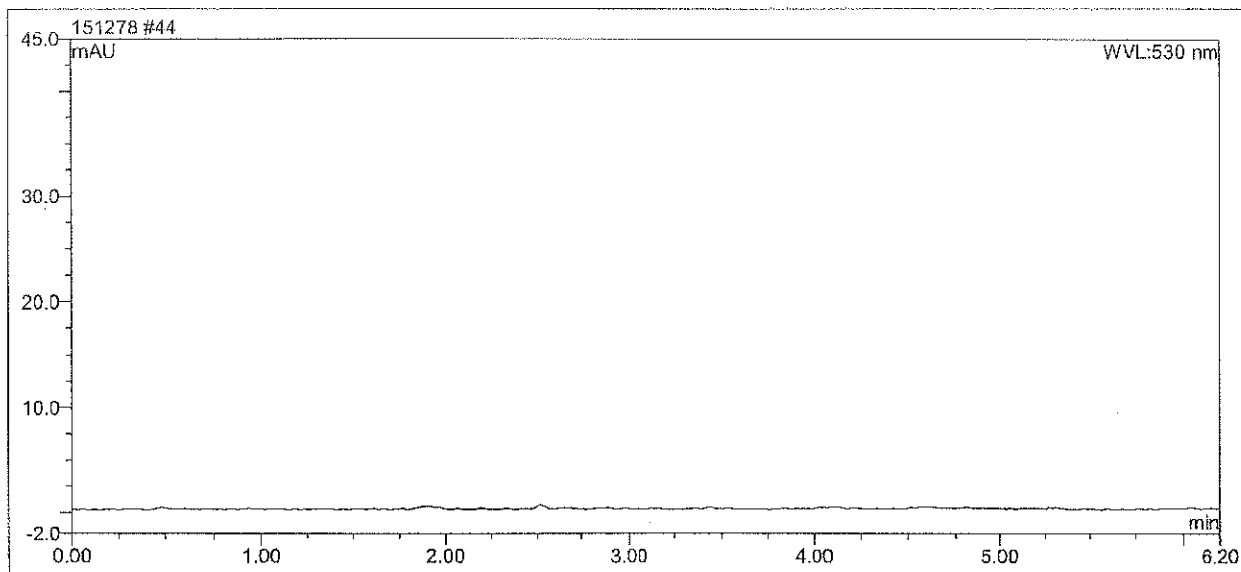
Clinton M. Wilson
Chemist

MAY 08 2015

Sample Name:	PBS	Instrument No.	16539
Batch Number/Analyst:	15126243201A-2987	Calibration Date:	5/7/2015
Date/Time Injected:	5/7/2015 13:15	Schedule File Name:	151278
Dilution Factor:	1.00	Channel:	UV_VIS_1
Sample Weight:	25.00	Column Type - Ser # :	NG1-024770
Injection Number:	44		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
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Reviewed/Verified By:

Erik J. Frederiksen
Manager

Date:

MAY 08 2015

5/8/2015 11:53 AM



Lancaster
Laboratories

Hexavalent Chromium by IC

Reviewer/Enterer:

Clinton M. Wilson
Chemist

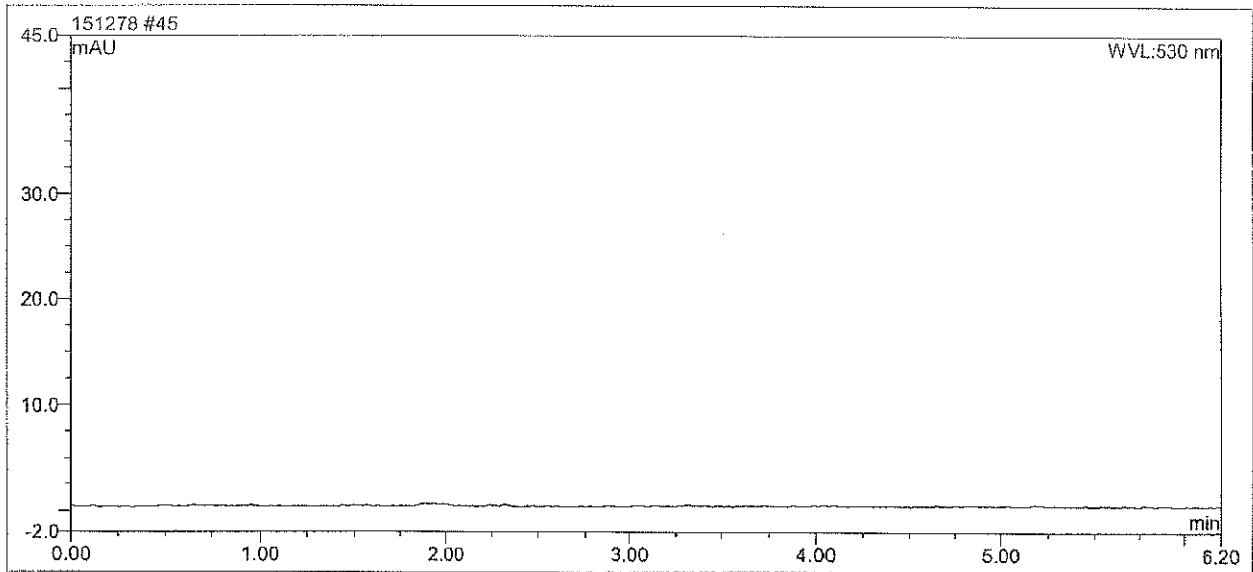
Date:

MAY 08 2015

Sample Name:	PBS	Instrument No.	16539
Batch Number/Analyst:	15126243201A-2987	Calibration Date:	5/7/2015
Date/Time Injected:	5/7/2015 13:23	Schedule File Name:	151278
Dilution Factor:	1.00	Channel:	UV_VIS_1
Sample Weight:	25.00	Column Type - Ser #:	NG1-024770
Injection Number:	45		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
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Reviewed/Verified By:

Date:

5/8/2015 11:53 AM



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Laboratories

Hexavalent Chromium by IC

Reviewer/Enterer:

Date:

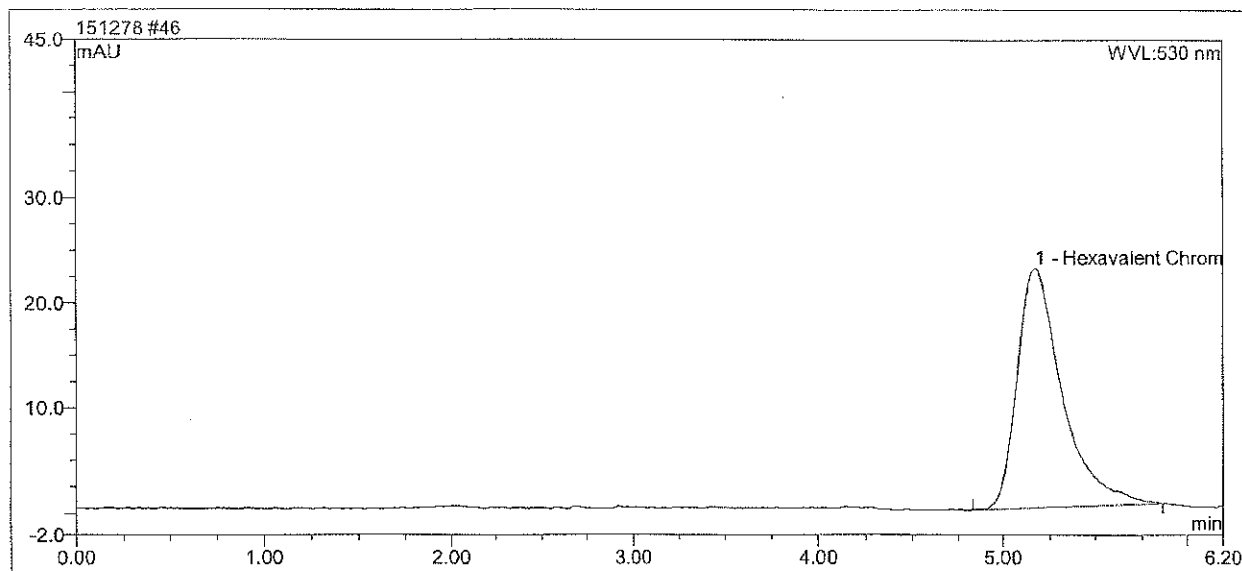
Clinton M. Wilson
Chemist

MAY 08 2015

Sample Name:	CCV	Instrument No.	16539
Batch Number/Analyst:		Calibration Date:	5/7/2015
Date/Time Injected:	5/7/2015 13:30	Schedule File Name:	151278
Dilution Factor:	1.00	Channel:	UV_VIS_1
Sample Weight:	1.00	Column Type - Ser # :	NG1-024770
Injection Number:	46		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
1	Hexavalent Chrom	5.17	6.3812	219.512126



Reviewed/Verified By:

Erik J. Frederiksen
Manager

Date:

MAY 08 2015

5/8/2015 11:53 AM



Lancaster
Laboratories

Hexavalent Chromium by IC

Reviewer/Enterer:

Date:

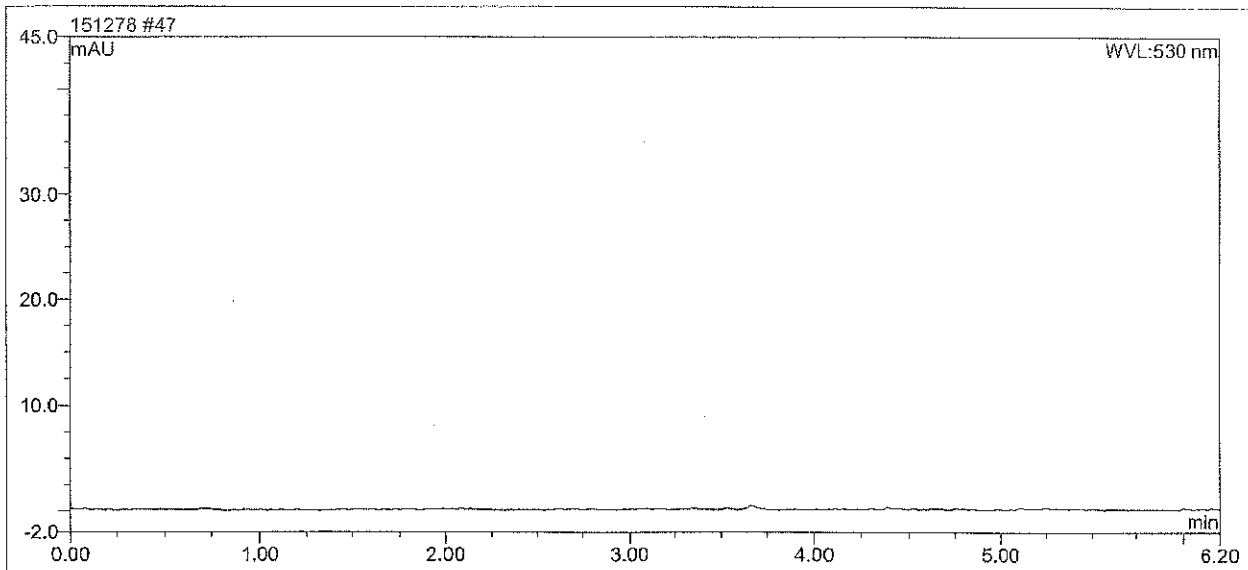
Clinton M. Wilson
Chemist

MAY 08 2015

Sample Name:	CCB	Instrument No.	16539
Batch Number/Analyst:		Calibration Date:	5/7/2015
Date/Time Injected:	5/7/2015 13:38	Schedule File Name:	151278
Dilution Factor:	1.00	Channel:	UV_VIS_1
Sample Weight:	1.00	Column Type - Ser #:	NG1-024770
Injection Number:	47		AS7-015396

Peak Information: All Components

Peak Number	Peak Name	Ret. Time min	Area mAU*min	Amount ug/L / mg/kg
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Reviewed/Verified By:

Erik J. Frederiksen
Manager

Date:

MAY 08 2015

5/8/2015 11:53 AM



Lancaster
Laboratories

Determination of Low Level Hexavalent Chromium (Cr⁺⁶)

Instrument Name: IC Pro 881 Date of Analysis: 5/8/2015
Instrument ID: 19751 Analyst: CMW 2987
QC Stock Book/Page #: 194916/9 Run Name: 1512814
ICV/CCV/LCSW Book/Page #: 179296/11

	<u>Cr⁺⁶ True Value (ng/L)</u>	<u>Range (ng/L)</u>
ICV	250	236 – 264
CCV	250	236 – 264
LCSW	100ug/L	95ug/L – 105ug/L

PBW/CCB (ng/L): < 15

Calibration Information:

Calibration Type: Linear by Area ($r > 0.999$)
Number of Calibrants: 5

Calibration Stock Book/Page: 194916/9

Standards Book/Page #: 179296/11

<u>Standards</u>	<u>Concentration (ng/L)</u>
Std. 1	25
Std. 2	75
Std. 3	150
Std. 4	250
Std. 5	500
Std. 5	1000

Color Reagent Book/Page: 194916/26

Eluent Stock Book/Page #: 194916/26

COMMENTS:

Verified By: *Sandra J Miller*
Sandra J. Miller
Chemist

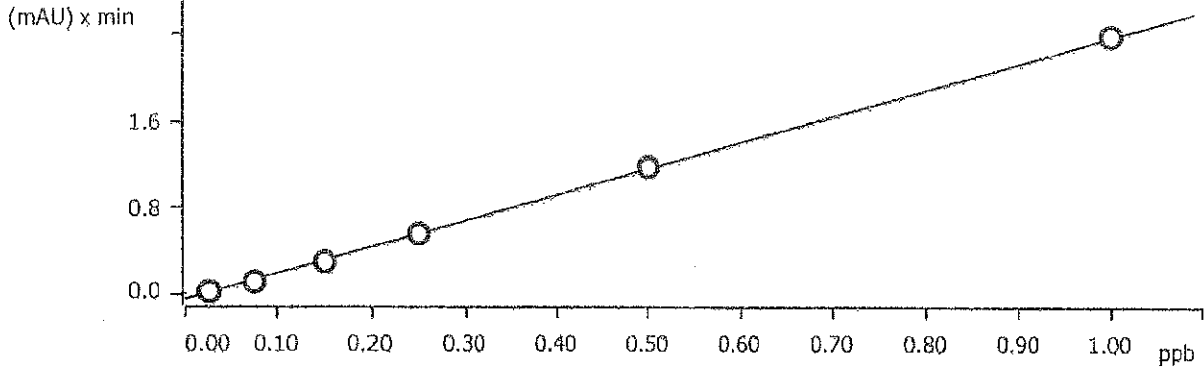
Date:

MAY 20 2015

Determination overview

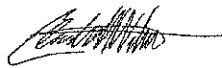
Info 1	Ident	Info 2	Determination start	Dilution	Volume	Sample type	Method name	Info 2	Info 4
1	01	START-UP	2015-05-08 08:45:28 UTC-4	1	4000	Sample	Chrom-5 startup	1512814	
2	02	RINSE	2015-05-08 08:50:02 UTC-4	1	4000	Sample	water_Hexachrome_4000_A_RINSE	1512814	
3	03	TEST	2015-05-08 09:11:34 UTC-4	1	4000	Sample	water_Hexachrome_4000_B_RINSE	1512814	
4	04	RINSE	2015-05-08 09:31:37 UTC-4	1	4000	Sample	water_Hexachrome_4000_C_RINSE	1512814	
5	05	CAL 1	2015-05-08 09:51:37 UTC-4	1	4000	Standard 1	water_Hexachrome_4000_A_RINSE	1512814	
6	06	CAL 2	2015-05-08 10:11:38 UTC-4	1	4000	Standard 2	water_Hexachrome_4000_B_RINSE	1512814	
7	07	CAL 3	2015-05-08 10:31:38 UTC-4	1	4000	Standard 3	water_Hexachrome_4000_C_RINSE	1512814	
8	08	CAL 4	2015-05-08 10:51:39 UTC-4	1	4000	Standard 4	water_Hexachrome_4000_A_RINSE	1512814	
9	09	CAL 5	2015-05-08 11:11:39 UTC-4	1	4000	Standard 5	water_Hexachrome_4000_B_RINSE	1512814	
10	10	CAL 6	2015-05-08 11:31:40 UTC-4	1	4000	Standard 6	water_Hexachrome_4000_C_RINSE	1512814	
11	11	ICV	2015-05-08 11:51:40 UTC-4	1	4000	Sample	water_Hexachrome_4000_A_RINSE	1512814	
12	12	ICB	2015-05-08 12:11:40 UTC-4	1	4000	Sample	water_Hexachrome_4000_B_RINSE	1512814	
13	13	7878428	2015-05-08 12:38:14 UTC-4	1	4000	Sample	water_Hexachrome_4000_C_RINSE	1512814	
14	14	7878248	2015-05-08 12:58:15 UTC-4	1	4000	Sample	water_Hexachrome_4000_A_RINSE	1512814	
15	15	7878249	2015-05-08 13:18:15 UTC-4	1	4000	Sample	water_Hexachrome_4000_B_RINSE	1512814	
16	16	7878250	2015-05-08 13:38:16 UTC-4	1	4000	Sample	water_Hexachrome_4000_C_RINSE	1512814	
17	17	7878251-U	2015-05-08 13:58:16 UTC-4	1	4000	Sample	water_Hexachrome_4000_A_RINSE	1512814	
18	18	7878250	2015-05-08 14:18:16 UTC-4	5	4000	Sample	water_Hexachrome_4000_C_RINSE	1512814	
19	19	7878251-D	2015-05-08 14:38:17 UTC-4	1	4000	Sample	water_Hexachrome_4000_A_RINSE	1512814	
20	20	7878251-R	2015-05-08 14:58:17 UTC-4	1	4000	Sample	water_Hexachrome_4000_B_RINSE	1512814	
21	21	LCSW	2015-05-08 15:18:18 UTC-4	200	4000	Sample	water_Hexachrome_4000_C_RINSE	1512814	
22	22	PBW	2015-05-08 15:38:18 UTC-4	1	4000	Sample	water_Hexachrome_4000_A_RINSE	1512814	
23	23	CCV	2015-05-08 15:58:19 UTC-4	1	4000	Sample	water_Hexachrome_4000_B_RINSE	1512814	
24	24	CCB	2015-05-08 16:18:20 UTC-4	1	4000	Sample	water_Hexachrome_4000_C_RINSE	1512814	
25	25	SHUTDOWN	2015-05-08 16:38:20 UTC-4	1	4000	Sample	Chrom-5 shutdown	1512814	

Cr+6 (Hexavalent Chromium)




Function: $A = -0.0490603 + 6.02918E-4 \times Q$
 Relative standard deviation: 2.407655 %
 Correlation coefficient: 0.999835

Sample type	Index	Conc.	Volume	Dilution	Sample amount	Area	Ident	Date	Used
Standard 1	1	0.025	4000.0	1.0	1.0	0.020	CAL 1	2015-05-08 09:51:37 UTC-4	used
Standard 2	1	0.075	4000.0	1.0	1.0	0.111	CAL 2	2015-05-08 10:11:38 UTC-4	used
Standard 3	1	0.150	4000.0	1.0	1.0	0.294	CAL 3	2015-05-08 10:31:38 UTC-4	used
Standard 4	1	0.250	4000.0	1.0	1.0	0.553	CAL 4	2015-05-08 10:51:39 UTC-4	used
Standard 5	1	0.500	4000.0	1.0	1.0	1.173	CAL 5	2015-05-08 11:11:39 UTC-4	used
Standard 6	1	1.000	4000.0	1.0	1.0	2.378	CAL 6	2015-05-08 11:31:40 UTC-4	used


 Clinton M. Wilson
 Chemist

MAY 18 2015


 Sandra J. Miller
 Chemist

MAY 20 2015

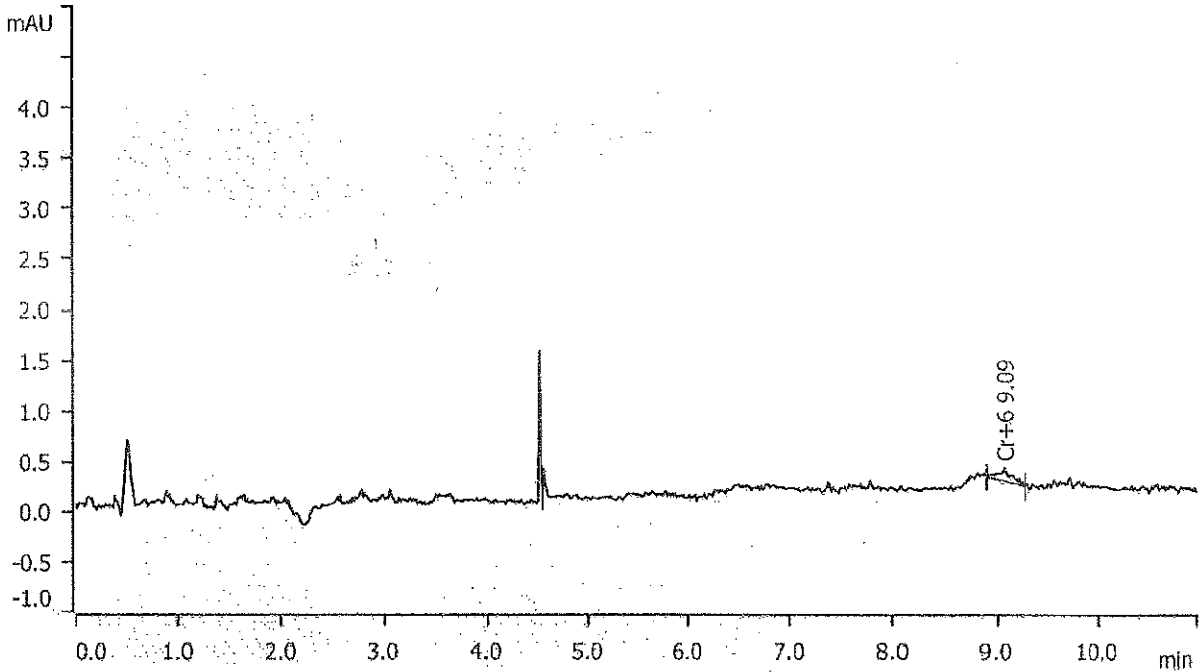
Sample data

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 Batch Number Dilution 1
 Determination start 2015-05-08 09:51:37 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512814
 Position 3 Calibration Date 8 MAY 2015
 Injection Number 05

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.54 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time	Area	Height	Concentration	Component name
	min	(mAU) x min	mAU	ppb	
1	9.090	0.0201	0.132	0.029	Cr+6

Reviewed by:

Clinton M. Wilson
 Clinton M. Wilson
 Chemist

Date:

MAY 18 2015

Verified by:

Sandra J. Miller
 Sandra J. Miller
 Chemist

Date:

MAY 20 2015

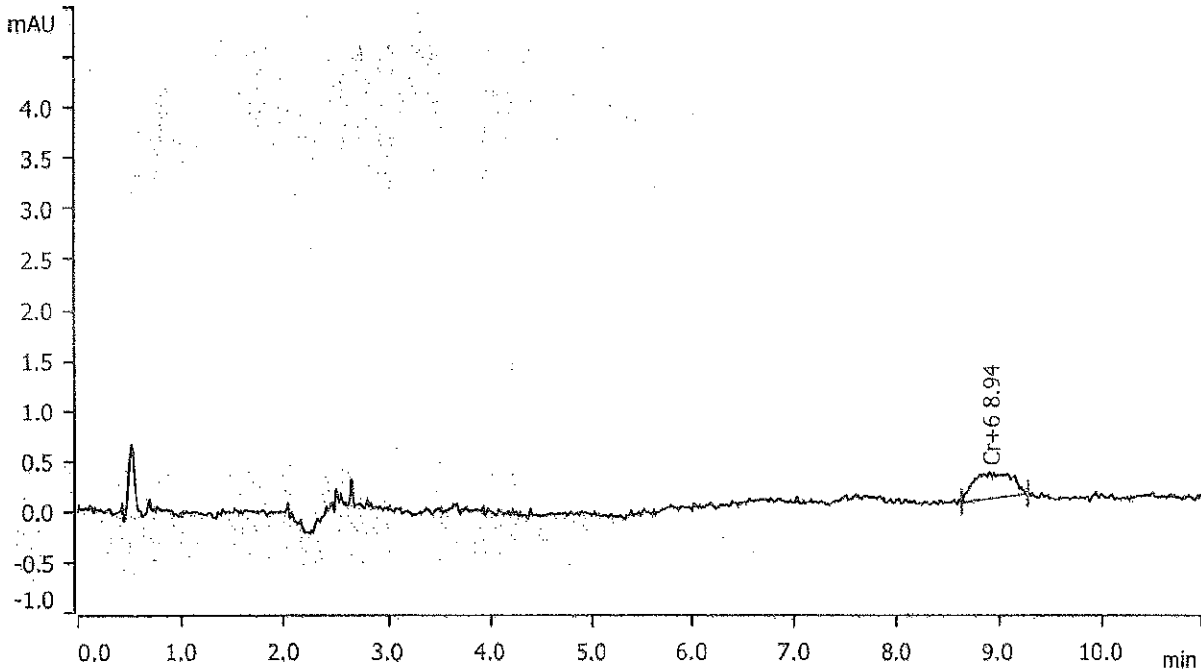
Sample data

Ident CAL 2 Injection Volume (uL) 4000
 Batch Number Dilution 1
 Determination start 2015-05-08 10:11:38 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512814
 Position 4 Calibration Date 8 MAY 2015
 Injection Number 06

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.54 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time	Area	Height	Concentration	Component name
	min	(mAU) x min	mAU	ppb	
1	8.940	0.1113	0.260	0.066	Cr+6

Reviewed by:

Clinton M. Wilson
Clinton M. Wilson
Chemist

Date:

MAY 18 2015

Verified by:

Sandra J. Miller
Sandra J. Miller
Chemist

Date:

MAY 20 2015

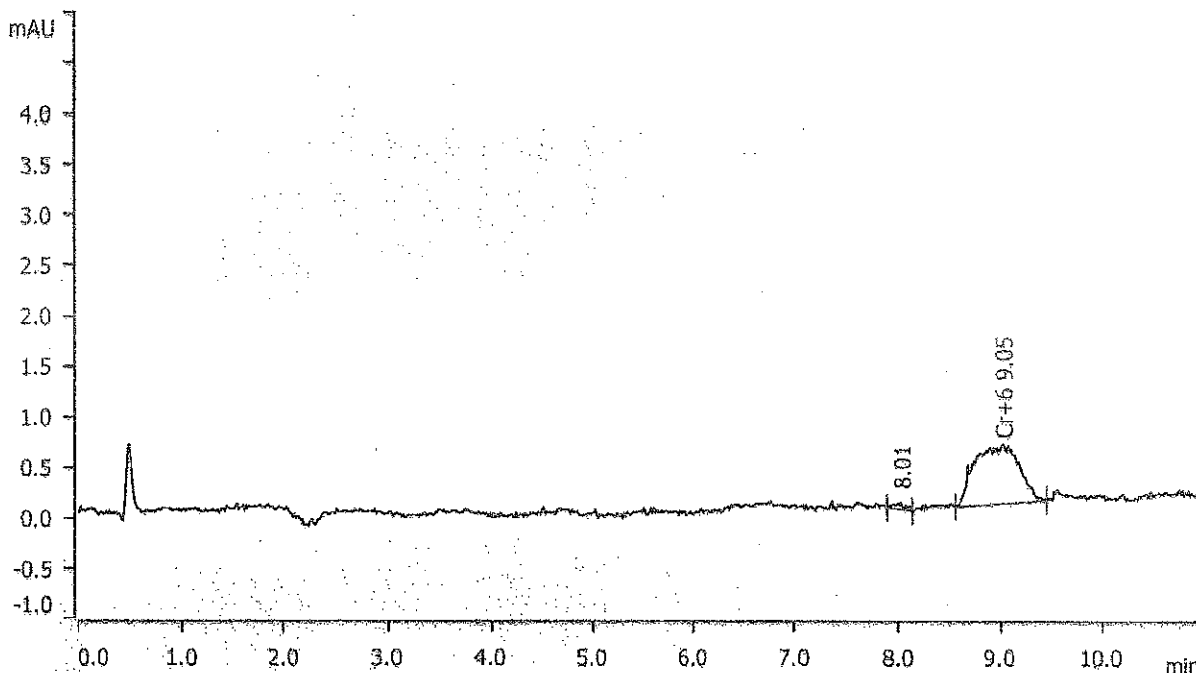
Sample data

Ident CAL 3 Injection Volume (uL) 4000
 Batch Number Dilution 1
 Determination start 2015-05-08 10:31:38 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512814
 Position 5 Calibration Date 8 MAY 2015
 Injection Number 07

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.71 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time	Area	Height	Concentration	Component name
	min	(mAU) x min	mAU	ppb	
1	8.010	0.0581	0.052	invalid	
2	9.045	0.2942	0.584	0.142	Cr+6

Reviewed by:

Clinton M. Wilson
 Clinton M. Wilson
 Chemist

Date:

MAY 18 2015

Verified by:

Sandra J. Miller
 Sandra J. Miller
 Chemist

Date:

MAY 20 2015

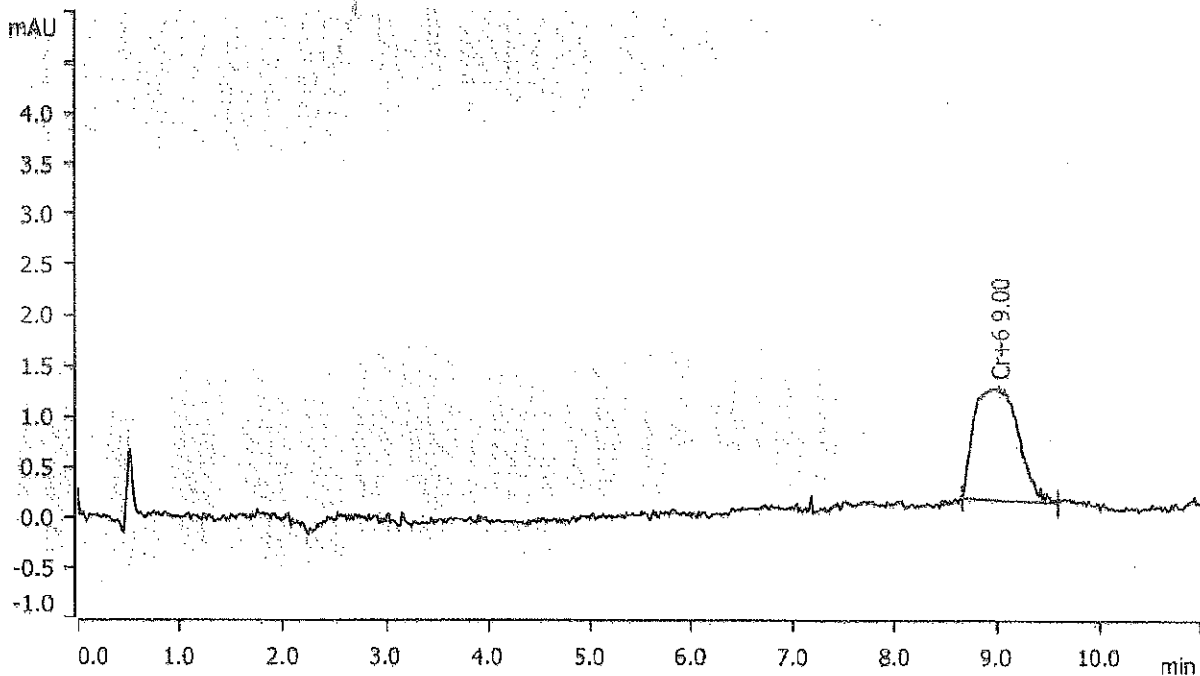
Sample data

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 Batch Number Dilution 1
 Determination start 2015-05-08 10:51:39 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512814
 Position 6 Calibration Date 8 MAY 2015
 Injection Number 08

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.42 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time	Area	Height	Concentration	Component name
	min	(mAU) x min	mAU	ppb	
1	9.000	0.5531	1.099	0.250	Cr+6

Reviewed by: *Clinton M. Wilson*
 Clinton M. Wilson
 Chemist

Date: MAY 18 2015

Verified by: *Sandra J. Miller*
 Sandra J. Miller
 Chemist

Date: MAY 20 2015

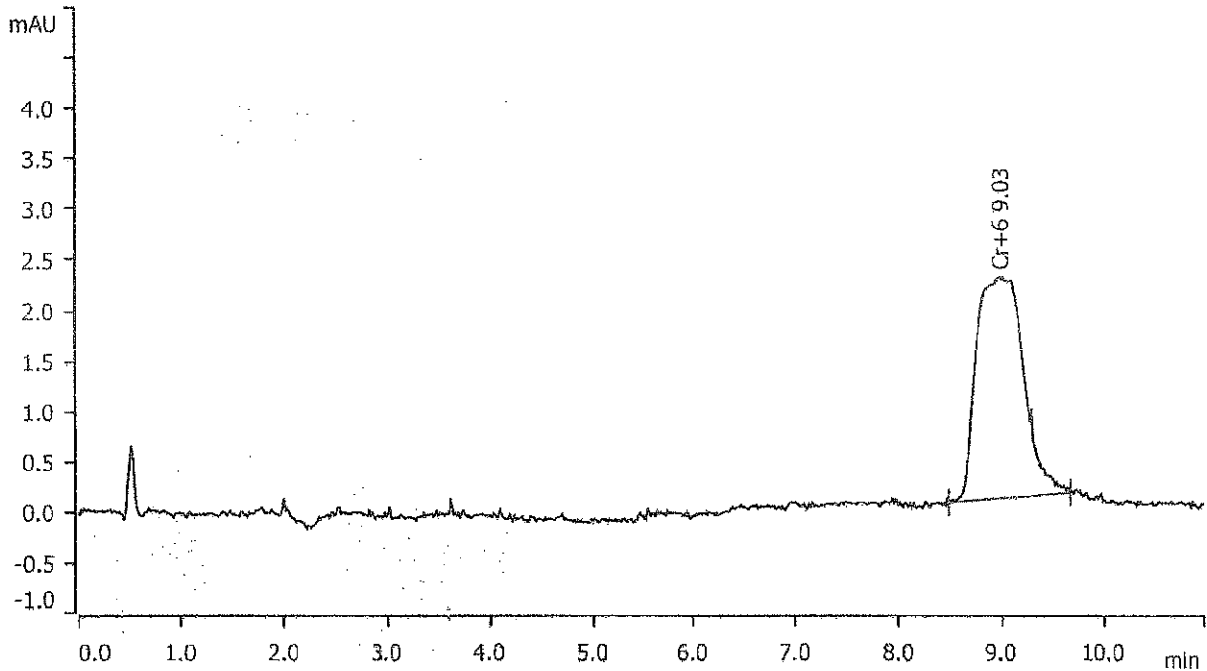
Sample data

Ident CAL 5 Injection Volume (uL) 4000
 Batch Number Dilution 1
 Determination start 2015-05-08 11:11:39 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512814
 Position 7 Calibration Date 8 MAY 2015
 Injection Number 09

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.37 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	9.030	1.1728	2.200	0.507	Cr+6

Reviewed by: *Clinton M. Wilson*
 Clinton M. Wilson
 Chemist

Date: **MAY 18 2015**

Verified by: *Sandra J. Miller*
 Sandra J. Miller
 Chemist

Date: **MAY 20 2015**

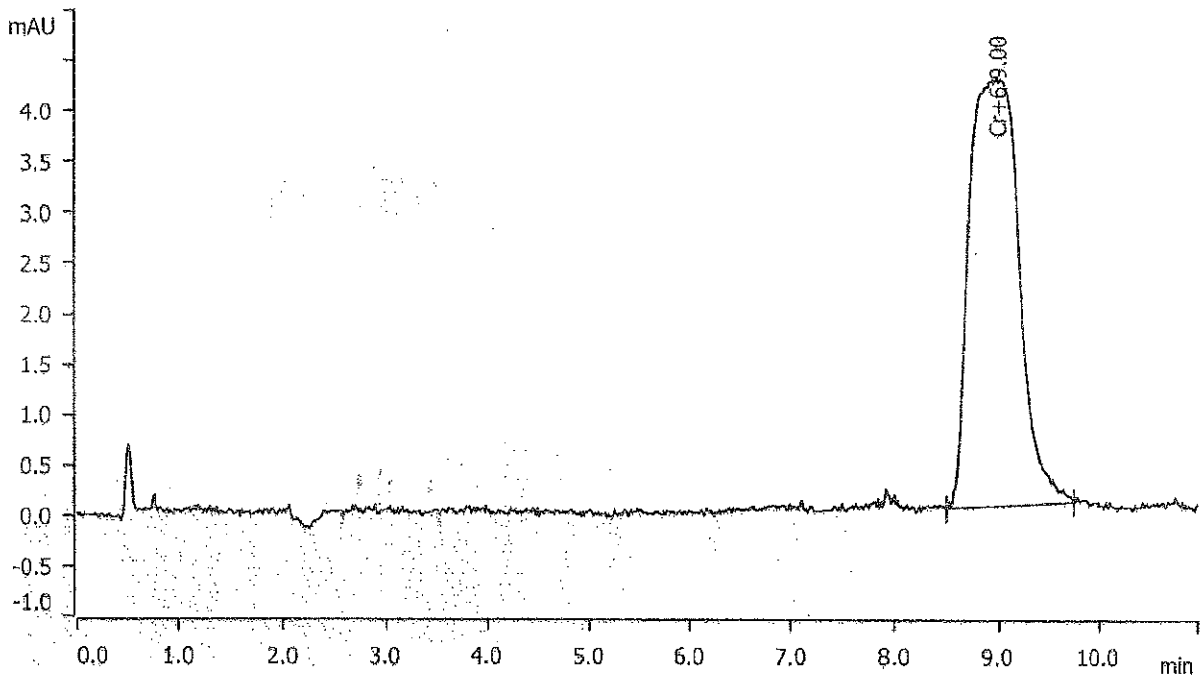
Sample data

Ident CAL 6 Injection Volume (uL) 4000
 Batch Number Dilution 1
 Determination start 2015-05-08 11:31:40 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512814
 Position 8 Calibration Date 8 MAY 2015
 Injection Number 10

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.54 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	9.000	2.3775	4.240	1.006	Cr+6

Reviewed by:

Clinton M. Wilson
Clinton M. Wilson
Chemist

Date:

MAY 18 2015

Verified by:

Sandra J. Miller
Sandra J. Miller
Chemist

Date:

MAY 20 2015

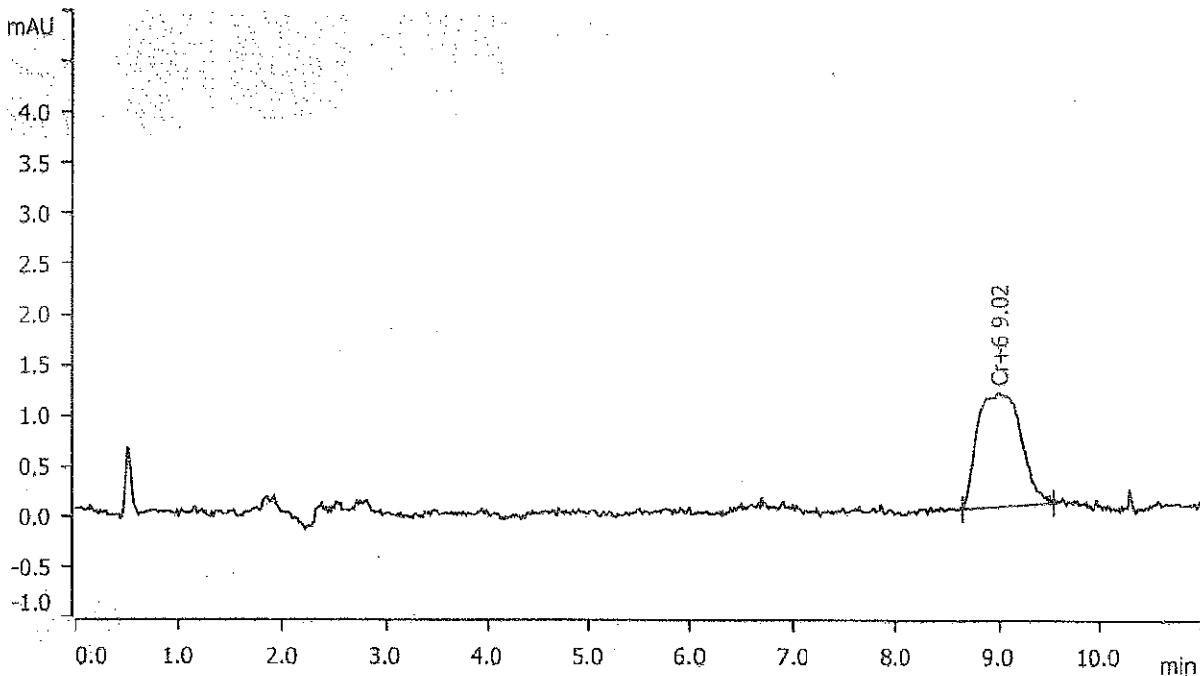
Sample data

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 Batch Number Dilution 1
 Determination start 2015-05-08 11:51:40 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512814
 Position 9 Calibration Date 8 MAY 2015
 Injection Number 11

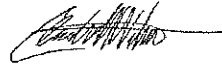
Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.48 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0


Hexavalent Chromium



Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	9.015	0.5599	1.131	0.253	Cr+6

Reviewed by: 
 Clinton M. Wilson
 Chemist

Date: **MAY 18 2015**

Verified by: 
 Sandra J. Miller
 Chemist

Date: **MAY 20 2015**

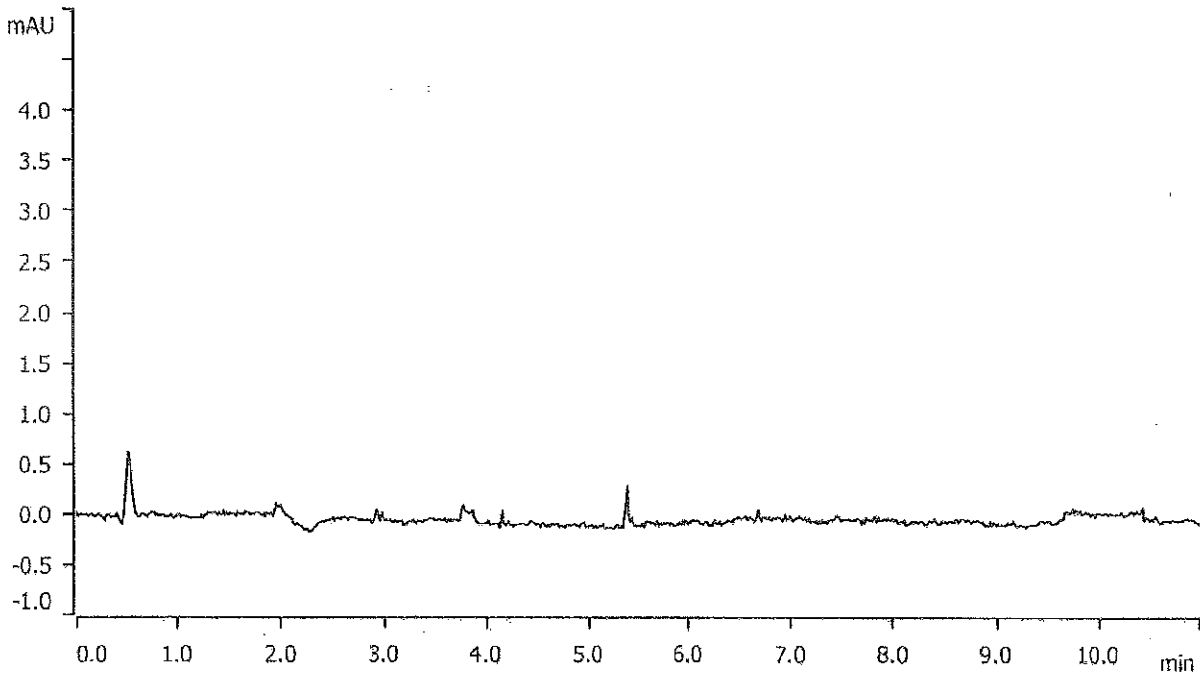
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Ident ICB Injection Volume (uL) 4000
Batch Number Dilution 1
Determination start 2015-05-08 12:11:40 UTC- Sample Weight 1
Method water_Hexchrome_4000_ Sequence Name 1512814
Position 10 Calibration Date 8 MAY 2015
Injection Number 12

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
Pressure (MPa) 7.37 Channel Channel 1 (530 nm)
Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Reviewed by:

Clinton M. Wilson
Clinton M. Wilson
Chemist

Date:

MAY 18 2015

Verified by:

Sandra J. Miller
Sandra J. Miller
Chemist

Date:

MAY 20 2015

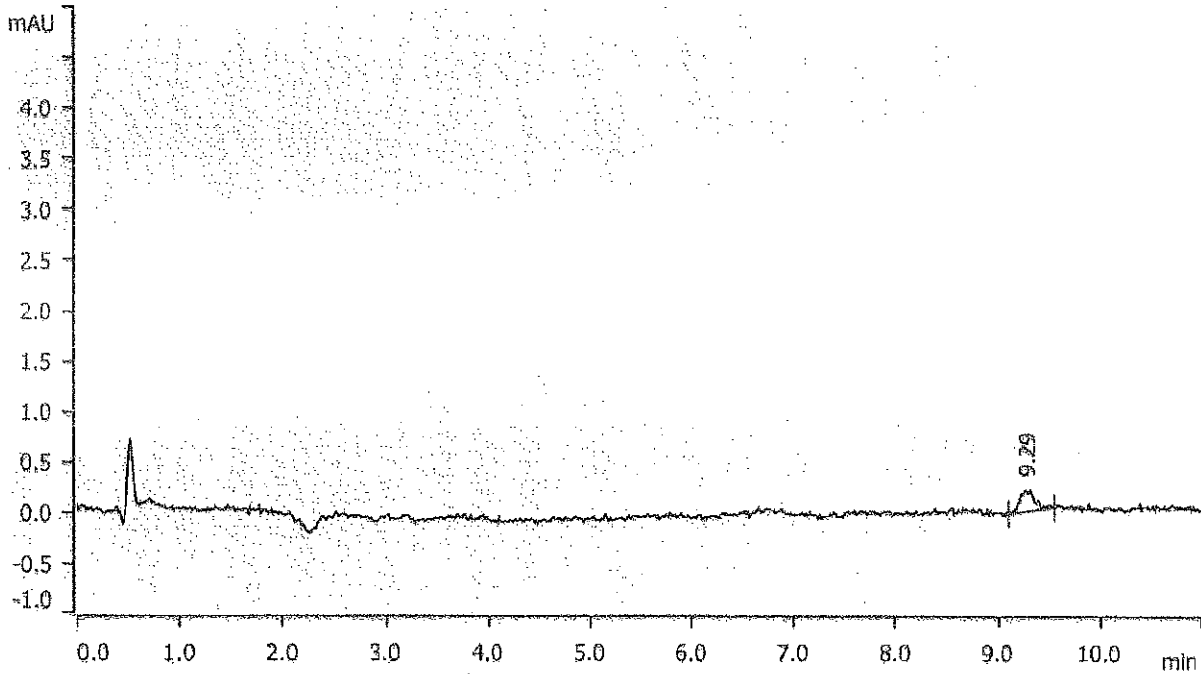
Sample data

Ident 7878426 Injection Volume (uL) 4000
 Batch Number 15128967141A Dilution 1
 Determination start 2015-05-08 12:38:14 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512814
 Position 11 Calibration Date 8 MAY 2015
 Injection Number 13

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.59 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	9.285	0.0372	0.209	Invalid	

Reviewed by:

Clinton M. Wilson
 Clinton M. Wilson
 Chemist

Date:

MAY 18 2015

Verified by:

Sandra J. Miller
 Sandra J. Miller
 Chemist

Date:

MAY 20 2015

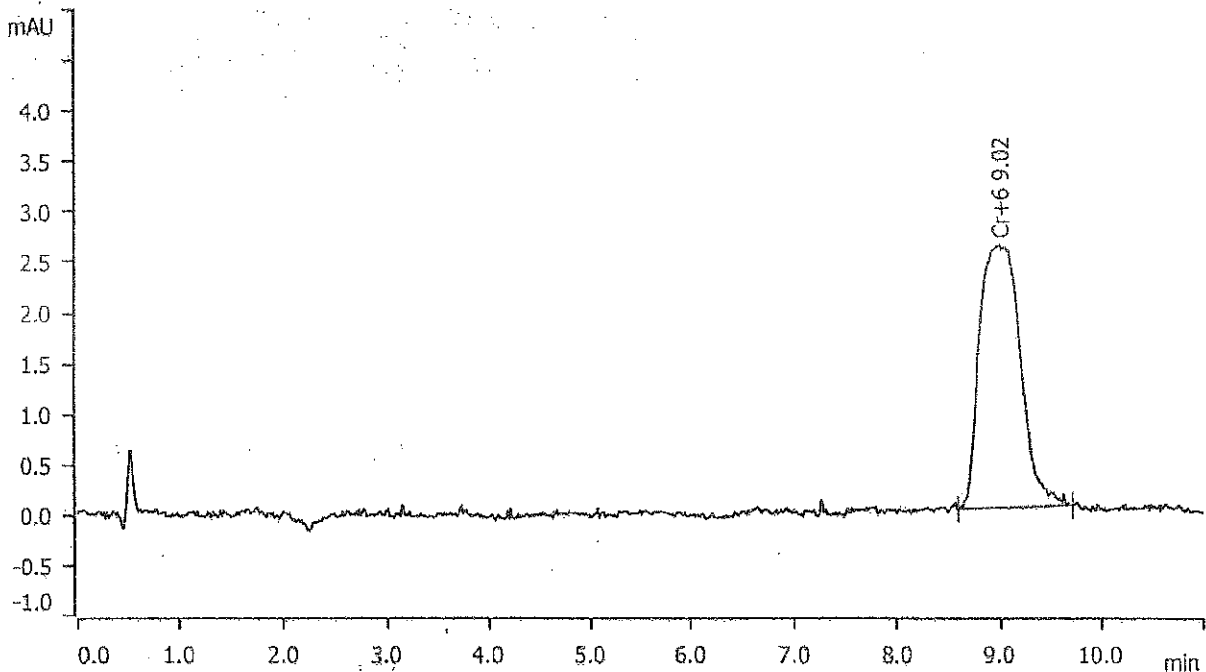
Sample data

Ident LCSW Injection Volume (uL) 4000
 Batch Number 15128987141A Dilution 200
 Determination start 2015-05-08 15:18:18 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512814
 Position 19 Calibration Date 8 MAY 2015
 Injection Number 21

Hexavalent Chromium Injection Data

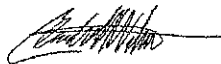
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 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium

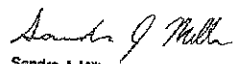


Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	9.015	1.1876	2.600	102.553	Cr+6

TU
100 103%

Reviewed by: 
 Clinton M. Wilson
 Chemist

Date: **MAY 18 2015**

Verified by: 
 Sandra J. Miller
 Chemist

Date: **MAY 20 2015**

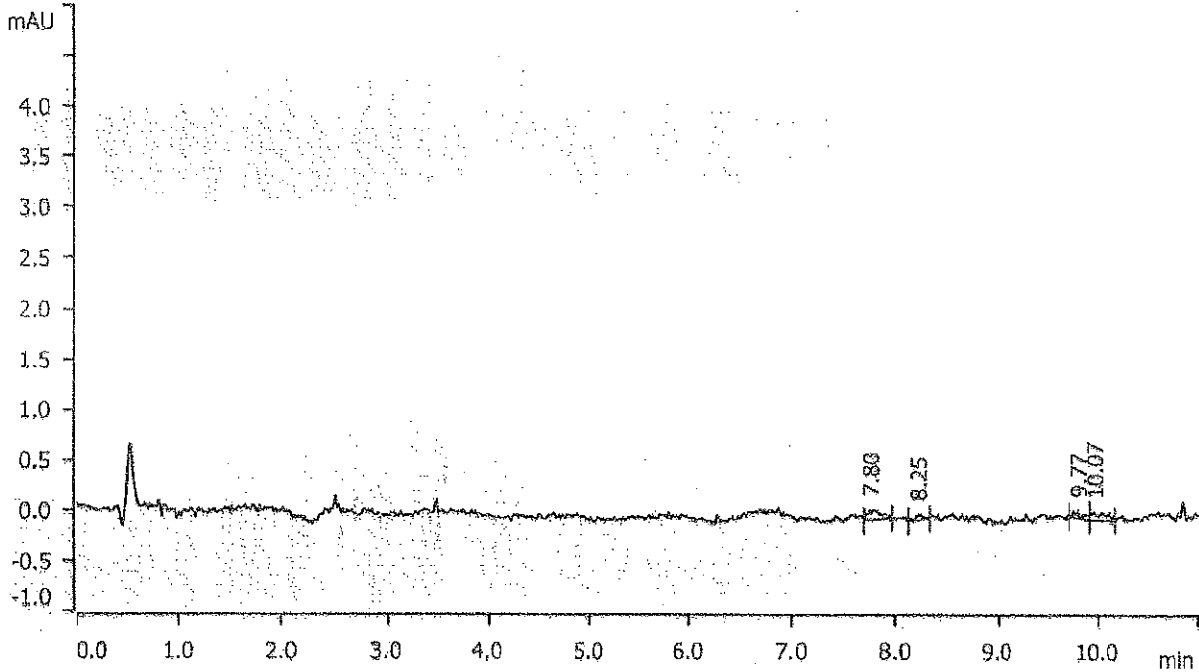
Sample data

Ident PBW Injection Volume (uL) 4000
 Batch Number 15128987141A Dilution 1
 Determination start 2015-05-08 15:38:18 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512814
 Position 20 Calibration Date 8 MAY 2015
 Injection Number 22

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.54 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	7.800	0.0145	0.095	invalid	
2	8.250	0.0061	0.055	invalid	
3	9.765	0.0068	0.065	invalid	
4	10.065	0.0155	0.210	invalid	

Reviewed by:

Clinton M. Wilson
 Clinton M. Wilson
 Chemist

Date:

MAY 18 2015

Verified by:

Sandra J. Miller
 Sandra J. Miller
 Chemist

Date:

MAY 20 2015

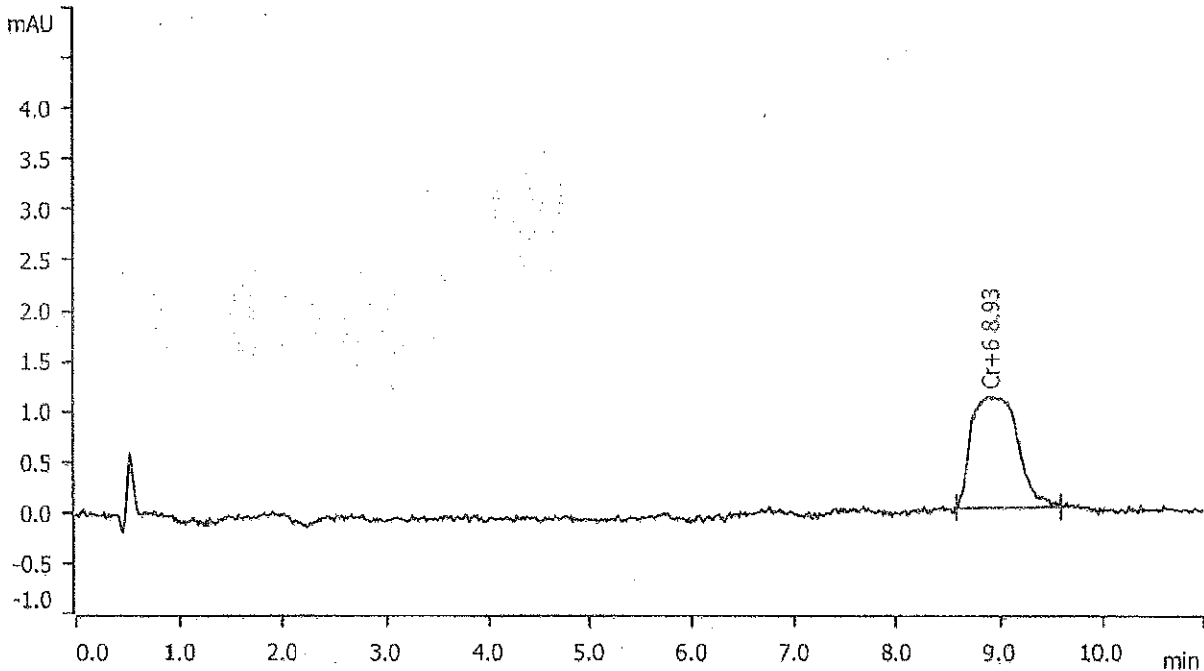
Sample data

Ident CCV Injection Volume (uL) 4000
 Batch Number Dilution 1
 Determination start 2015-05-08 15:58:19 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512814
 Position 21 Calibration Date 8 MAY 2015
 Injection Number 23

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.42 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	8.925	0.5582	1.101	0.252	Cr+6

Reviewed by:

Clinton M. Wilson
Clinton M. Wilson
Chemist

Date:

MAY 18 2015

Verified by:

Sandra J. Miller
Sandra J. Miller
Chemist

Date:

MAY 20 2015

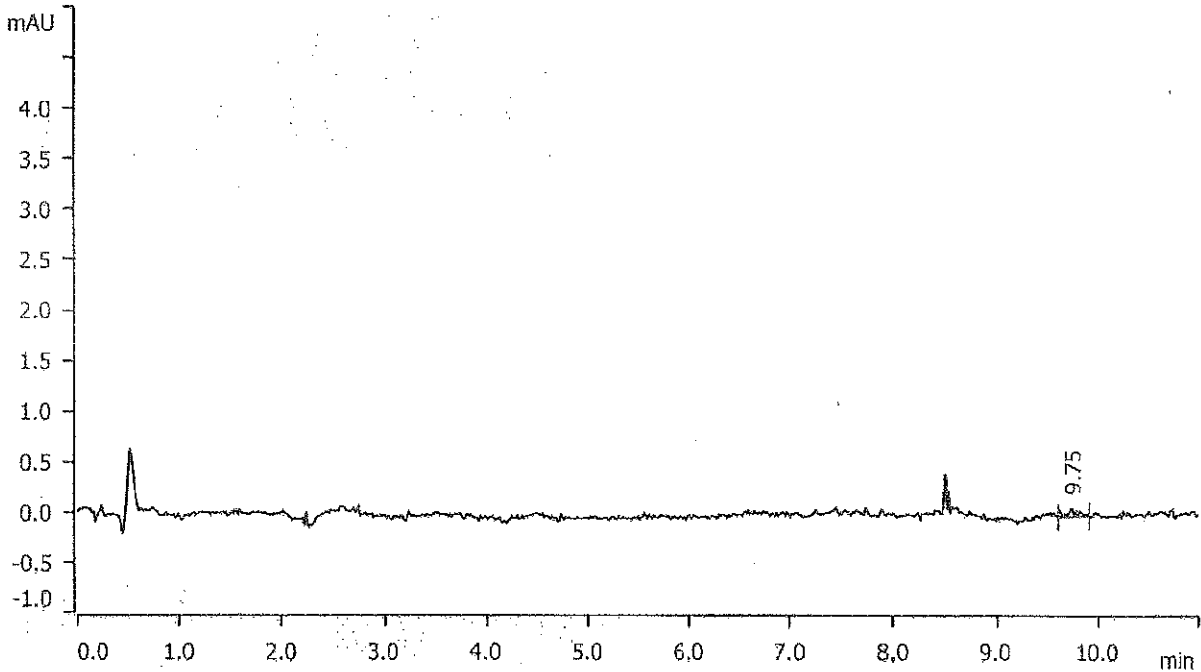
Sample data

Ident CCB Injection Volume (uL) 4000
 Batch Number Dilution 1
 Determination start 2015-05-08 16:18:20 UTC- Sample Weight 1
 Method water_Hexchrome_4000_ Sequence Name 1512814
 Position 22 Calibration Date 8 MAY 2015
 Injection Number 24

Hexavalent Chromium Injection Data

Integration Automatically Recording Time (min) 11.0
 Pressure (MPa) 7.54 Channel Channel 1 (530 nm)
 Temperature (C) 45.0 Column Type Metrosep A Supp 5 - 150/4.0

Hexavalent Chromium



Peak number	Retention time min	Area (mAU) x min	Height mAU	Concentration ppb	Component name
1	9.750	0.0099	0.087	invalid	

Reviewed by: *Clinton M. Wilson*
 Clinton M. Wilson
 Chemist

Date: **MAY 18 2015**

Verified by: *Sandra J. Miller*
 Sandra J. Miller
 Chemist

Date: **MAY 20 2015**

Wet Chemistry Data

Case Narrative/Conformance Summary

Wet Chemistry

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Water Quality

Fraction: Wet Chemistry

Sample #	Client ID	Matrix			Comments
		Liquid	Solid	DF	
7873707	PAI13C-SS08-0001		X	1	
7873708	PAI13C-SB05-0204		X	1	
7873710	PAI13C-TW03-20150504	X		1	
7879426	PAI-RB01-050715	X		1	Material Rinse Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

MS/MSD

Matrix QC may not be included if site-specific QC were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, laboratory spike data (LCS) are provided.

SAMPLE ANALYSIS:

(Sample number(s): 7873707: Analysis: 00394)
The pH was measured in water at 19 C.

(Sample number(s): 7873708: Analysis: 00394)
The pH was measured in water at 18.9 C.

No other problems were encountered with the analysis of the samples.

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Water Quality

Fraction: Wet Chemistry

Abbreviation Key

U = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
R = Matrix Spike (MS)	MDL = Method Detection Limit
M = Matrix Spike Duplicate (MSD)	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value
D = Duplicate (DUP)	NA = Not Applicable
HS = High Spike	ME = Method
LS = Low Spike	CO = Colorimetric
SS = Soluble Spike	G = Gravimetric
IS = Insoluble Spike	IR = Infrared Spectrophotometry
ISD = Insoluble Spike Duplicate	MTR = Meter
PDS = Post Digestion Spike	OD = Oven Dried
* = Out of Specification	TI = Titration
V = Visual	TOC = Total Organic Carbon
AK = Alpkem	IC = Ion Chromatography
TC = Total Carbon	RA = Rapid Analyzer

QC Summary

Wet Chemistry

**Quality Control Reference List
Water Quality**

**CLIENT: Tetra Tech Inc.
SDG: PIS01**

Fraction: Wet Chemistry

Analysis	Batch Number	Sample Number	Analysis Date
Oxidation Reduction Potential	15126182101A	P126182Q	05/06/2015 20:30:00
Oxidation Reduction Potential	15126182101B	7873710	05/06/2015 20:30:00
Oxidation Reduction Potential	15126182102A	P126182Q	05/06/2015 21:00:00
Oxidation Reduction Potential	15126182102B	7873707 7873708	05/06/2015 21:00:00 05/06/2015 21:00:00
Oxidation Reduction Potential	15131182101A	P131182Q 7879426	05/11/2015 18:00:00 05/11/2015 18:00:00
pH	15126039401A	P126039Q	05/06/2015 21:00:00
pH	15126039401B	7873707 7873708	05/06/2015 21:00:00 05/06/2015 21:00:00
pH	15126121521A	P126121Q	05/06/2015 20:30:00
pH	15126121521B	7873710	05/06/2015 20:30:00
pH	15131121521A	P131121Q 7879426	05/11/2015 18:00:00 05/11/2015 18:00:00

SDG: PIS01
Matrix: SOLID

Water Quality
Fraction: Wet Chemistry

LCS: P126039Q	Batch: 15126039401B (Sample number(s): 7873707-7873708)								
Parameter	ME	Spike Added Std. Units	LCS Conc Std. Units	LCSD Conc Std. Units	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
pH	MTR	7.00	7.04	NA	101	NA	95-105	NA	NA

LCS: P126182Q	Batch: 15126182102B (Sample number(s): 7873707-7873708)								
Parameter	ME	Spike Added mV	LCS Conc mV	LCSD Conc mV	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Oxidation Reduction Potential	TI	427	432.5	NA	101	NA	98-102	NA	NA

SDG: PIS01
Matrix: LIQUID

Water Quality
Fraction: Wet Chemistry

LCS: P126121Q	Batch: 15126121521B (Sample number(s): 7873710)								
Parameter	ME	Spike Added Std. Units	LCS Conc Std. Units	LCSD Conc Std. Units	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
pH	MTR	7.00	7.02	NA	100	NA	95-105	NA	NA

LCS: P126182Q	Batch: 15126182101B (Sample number(s): 7873710)								
Parameter	ME	Spike Added mV	LCS Conc mV	LCSD Conc mV	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Oxidation Reduction Potential	TI	427	434	NA	102	NA	98-102	NA	NA

LCS: P131121Q	Batch: 15131121521A (Sample number(s): 7879426)								
Parameter	ME	Spike Added Std. Units	LCS Conc Std. Units	LCSD Conc Std. Units	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
pH	MTR	7.00	7.02	NA	100	NA	95-105	NA	NA

LCS: P131182Q	Batch: 15131182101A (Sample number(s): 7879426)								
Parameter	ME	Spike Added mV	LCS Conc mV	LCSD Conc mV	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Oxidation Reduction Potential	TI	427	433	NA	101	NA	98-102	NA	NA

Raw Data

Wet Chemistry

Fraction: Wet Chemistry

01821: Oxidation Reduction Potential Analyte Name	Default DL	Default LOD	Default LOQ	Units
Oxidation Reduction Potential	10.0	10.0	10.0	mV

00394: pH Analyte Name	Default DL	Default LOD	Default LOQ	Units
pH	0.0100	0.0100	0.0100	Std. Units

12152: pH Analyte Name	Default DL	Default LOD	Default LOQ	Units
pH	0.010	0.010	0.010	Std. Units

Raw Data Logbook
Oxidation Reduction Potential **1821/7552**

Std Ref (Book/pg): Lot # 2411734 Analysis #: 1821

Batch #

1	S	1	2	6
---	---	---	---	---

1	8	2	1
---	---	---	---

0	1	A
---	---	---

Date: 5-6-15 Time: 2030		Inst. #: 16324 Analyst: mjm		LOQ = 10.0				
	Sample Number	mV Rdg Trial 1	mV Rdg Trial 2	mV Rdg Average	Calc. Value (mV)	Batch Letter	BC	Comments
1	CS (421)	235	235	235	434	-	-	(1028)
2	7865937U	187	186	186.5	385.5	A	04P	-
3	7865940D	185	184	184.5	383.5	A	04P	LR = 1 (15)
4	7865947	119	119	119	318	A	04P	-
5	7868107	110	110	110	309	A	04P	-
6	7868108	95	95	95	294	A	04P	-
7	7868109	95	95	95	294	A	04P	-
8	7868110	33	34	33.5	232.5	A	04P	-
9	787 7871950	-41	-39	-40	159	A	04P	-
10	^{MIX 5-6-15} 7871951	-10	-8	-9	190	A	04P	-
11	7871952	55	55	55	254	A	04P	-
12	CS (421)	232	232	232	431	-	-	(1017)
13	7871953	125	125	125	324	B	04P	-
14	7871954	75	74	74.5	273.5	B	04P	-
15	7871955	44	43	45	244	B	04P	-
16	7873710	210	211	213	412	B	85P	-
17	7874716U	141	141	141	340	B	04P	(15)
18	7874716D	140	140	140	339	B	04P	LR = 0
19	7874932	100	100	100	305	B	85P	-
20	CS (421)	235	234	236	435	-	-	(1028)
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

Verified by: KAB/957

Date: 5/7/15 ^{MIX WITH 5-6-15}

Raw Data Logbook
Oxidation Reduction Potential **1821/7552**

Std Ref (Book/pg): lot # 2411734 Analysis #: 1821

Batch #

1	S	1	2	6
---	---	---	---	---

1	8	2	1
---	---	---	---

0	2	A
---	---	---

Date: 5-6-15 Time: 2110		Inst. #: 16314 Analyst: mjm		LOQ = 10.0				
	Sample Number	mV Rdg Trial 1	mV Rdg Trial 2	mV Rdg Average	Calc. Value (mV)	Batch Letter	BC	Comments
1	CS (427)	233	234	233.5	432.5	-	-	(148)
2	7852998U	221	220	220.5	419.5	A	96P	
3	7852998D	220	220	220	419	A	96P	TR 0 (E)
4	7852999	141	141	141	310	A	96P	
5	7853000	118	119	118.5	317.5	A	96P	
6	7854894	101	101	101	300	A	21A	
7	7854904	147	147	147	346	A	21A	
8	7854911	144	145	144.5	343.5	A	96P	
9	7854912	146	146	146	345	A	96P	
10	7854915	133	132	132.5	331.5	A	96P	
11	7854916	132	132	132	331	A	96P	
12	CW (427)	232	233	232.5	431.5	-	-	(161)
13	7873707	279	279	279	478	B	21A	
14	7873708	233	233	233	432	B	21A	
15	7874919	178	177	179	378	B	20P	
16	7874920	151	151	151	350	B	20P	
17	7874921	144	145	144.5	343.5	B	20P	
18	7874922U	116	114	115	314	B	20P	(20)
19	7874922D	114	113	113.5	312.5	B	20P	TR 0
20	7874930	110	109	111	310	B	20P	
21	7874931	105	103	104	303	B	20P	
22	7876198	-67	-67	-67	132	B	30P	
23	CW	230	230	230	429	-	-	(149)
24								
25								
26								
27								
28								
29								
30								

KAB/957 5/25/15

N/A
KAB/957
5/7/15

Verified by: KAB/957 Date: 5/7/15

Raw Data Logbook
Oxidation Reduction Potential **1821/7552**

Std Ref (Book/pg): lot # 2411734 Analysis #: 1821

Batch #

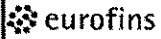
1	S	1	3	1
---	---	---	---	---

1	8	2	1
---	---	---	---

0	1	A
---	---	---

Date: 5-11-15 Time: 1800		Inst. #: 1121 Analyst: mj11521		LOQ = 10.0				
	Sample Number	mV Rdg Trial 1	mV Rdg Trial 2	mV Rdg Average	Calc. Value (mV)	Batch Letter	BC	Comments
1	LS (427)	234	234	234	433	-	-	(1018)
2	7870961	179	179	179	378	A	210	-
3	7870965	163	162	162.5	361.5	A	210	-
4	7879353U	150	149	149.5	348.5	A	200	-
5	7879360D	145	146	145.5	344.5	A	200	- R ₂ = 1
6	7879361	123	122	122.5	321.5	A	200	-
7	7879362	100	105	105.5	304.5	A	200	-
8	7879363	9	10	9.5	208.5	A	200	-
9	7879364	-	-	-	-	A	-	-
10	787926	56	56	56	-	A	700	-
11	CU (427)	234	330 233	233.5	432.5	-	-	(1018)
12	② mV s-l-r							
13	<div style="border: 1px solid black; width: 100%; height: 100%; transform: rotate(45deg);"></div>							
14								
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30								

Verified by: KAG/957 Date: 5/12/15 WPM 5-11-15



Lancaster Laboratories
Environmental

Document Title:

Raw Data Logbook Solid pH (Analysis #0394) Corrosivity (Analysis #0496)

Eurofins Document Reference:
1-P-QM-FOR-9010004

Revision: 4

Historical Reference: Form 2670

Effective date: Jun 26, 2014

Status: Effective

pH Buffer Reference: E030-19 Balance ID#: 10491

Batch #

1	S	1	2	6
---	---	---	---	---

0	3	9
---	---	---

4	0	1	A
---	---	---	---

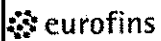
Date: 5-6-15
Time: 2100

Inst. #: 1121
Analyst: my1152

	Sample Number	Sample Wt. (g)	DI H ₂ O Wt. (g)	Reading	Temp (°C)	Std. True Value	QC#	Batch Letter	Bottle Code	Comments
1	LC5	-	-	7.04	19.0	7.00	21	-	-	(1019)
2	78529980	25.04	25	6.93	19.1		③	A	96A	-
3	78529980	25.11	25	6.92	19.1		MW2	A	96A	✓R (10)
4	7852999	25.34	25	7.23	19.0		5-15	A	96A	-
5	7853000	25.96	25	7.46	19.4			A	96A	-
6	7854894	25.78	25	8.16	19.1			A	21A	-
7	7854901	24.84	25	7.28	19.2			A	21A	-
8	7854911	25.86	25	7.77	19.3			A	96A	-
9	7854912	25.90	25	6.91	19.1			A	96A	-
10	7854915	25.03	25	7.25	19.2			A	96A	-
11	7854916	26.27	25	7.17	19.0			A	96A	-
12	CW	-	-	7.01	19.0	7.00	1	-	-	(1057)
13	7873707	25.02	25	5.97	19.0			B	21A	-
14	7873708	25.43	25	5.89	18.9			B	21A	-
15	7874919	25.53	25	8.31	19.5			B	20A	-
16	7874920	24.88	25	8.92	19.8			B	20A	-
17	7874921	25.26	25	8.61	19.2			B	20A	-
18	7874922U	25.44	25	8.81	19.0			B	20A	(12)
19	7874929D	25.91	25	8.80	19.0			B	20A	✓R 0
20	7874930	25.21	25	9.01	19.0			B	20A	-
21	③ 7874931	25.81	25	9.31	19.1			B	20A	-
22	7876198	25.81	25	8.27	19.2			B	36A	✓
23	CW	-	-	7.00	19.1	7.00	1	-	-	(1058)
24										
25										
26										
27										
28										
29										
30										
31										

Verified by: KAB/95+

Date: 5/7/15 AP my1152 5-6-15



Lancaster Laboratories
Environmental

Document Title:
Raw Data Logbook pH Analysis #12152

Eurofins Document Reference:
1-P-QM-FOR-9010003

Revision: 5

Historical Reference: Form 2669

Effective date: Apr 18, 2014

Status: Effective

pH Buffer Reference: 2030-19

Batch #

1 5 1 2 6

1 2 1

5 2 1 A

Date: 5-6-15 Time: 2030		Inst #: 11221 Analyst: M1020							
Sample Number	Reading	Temp (°C)	Std. True Value	QC#	Batch Letter	Bottle Code	Comments		
1	CS	7.02	19.1	7.00	2	-	-	(10) ?	
2	7865937U	7.24	16.6			A	04A	-	
3	7865940D	7.25	16.6			A	04A	✓ R 0 (15)	
4	7865947	6.66	16.3			A	04A	-	
5	7868107	6.96	16.6			A	04A	-	
6	7868108	7.11	17.1			A	04A	-	
7	7868109	7.04	17.5			A	04A	-	
8	7868110	7.14	16.2			A	04A	-	
9	7871950	11.71	16.1			A	04A	-	
10	7871951	11.30	16.4			A	04A	-	
11	7871952	9.61	17.1			A	04A	-	
12	CS	7.04	19.1	7.00	2	-	-	(10) ?	
13	7871953	7.69	18.8			B	04A	-	
14	7871954	11.87	17.5			B	04A	-	
15	7871955	12.72	16.9			B	04A	-	
16	7873710	7.38	17.7			B	85A	-	
17	7874716U	8.19	18.2			B	04A	- (15)	
18	7874716O	8.17	18.2			B	04A	✓ R 0 (15)	
19	7874932	8.53	17.4			B	85A	-	
20	CS	7.03	19.0	7.00	2	-	-	(10) ?	
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

Verified by: KAB/937

Date: 5/7/15 MPM SCAS



Lancaster Laboratories
Environmental

Document Title:
Raw Data Logbook pH Analysis #12152

Eurofins Document Reference:
1-P-QM-FOR-9010003

Revision: 5

Historical Reference: Form 2669

Effective date: Apr 18, 2014

Status: Effective

pH Buffer Reference: 2030-19

Batch #

15131

121

521A

Date: 5-11-15 Time: 18:00		Inst #: 1121 Analyst: mylw							
Sample Number	Reading	Temp (°C)	Std. True Value	QC#	Batch Letter	Bottle Code	Comments		
1	LS	7.02	20.2	7.00	2	-	-	(1058)	
2	7879304					A			
3	7879426	9.34	16.6			A	700	-	
4	7880203	12.36	19.0			A	12A	-	
5	7880205	10.75	18.5			A	12A	-	
6	7880207	10.53	19.1			A	12A	-	
7	7880209	10.73	19.0			A	12A	-	
8	7880210	11.86	19.8			A	12A	-	
9	7880410	11.87	19.8			A	99A	✓ R=0.15	
10	7882015	13.00	15.7			A	99A	-	
11	7882016	13.09	15.8			A	99A	-	
12	cw	7.05	20.0	7.00	2	-	-	(1078)	
13	7882017	13.11	16.0			B	99A	-	
14	7882018	12.33	16.1			B	99A	-	
15	7882019	12.82	15.2			B	99A	-	
16	7882020	13.27	15.8			B	99A	-	
17	7882021	13.26	15.2			B	99A	-	
18	7882022U	13.24	15.5			B	99A	-	
19	7882022D	13.25	15.5			B	99A	✓ R	
20	cw	7.01	19.7	7.00	2	-	-	(1078)	
21	/								
22	/								
23	/								
24	/								
25	/								
26	/								
27	/								
28	/								
29	/								
30	/								

Verified by: KAB/157

Date: 5/12/15 WDM/MS/15

Moisture Data

MOISTURE

SAMPLE NUMBERS:

<u>Sample #</u>	<u>Sample Code</u>
7873706	PIS28
7873707	PIS08
7873708	PISB5

COMMENTS:

Method defined actions are taken for any failed matrix QC.

Laboratory Compliance Quality Control

<u>Analysis Name</u>	<u>LCS</u>	<u>LCSD</u>	<u>LCS/LCSD</u>	<u>RPD</u>	<u>RPD Max</u>
	<u>%REC</u>	<u>%REC</u>	<u>Limits</u>		
Batch number: 15133820001A	Sample number(s): 7873706-7873708, 7873706-7873708				
Moisture	100		99-101		

Sample Matrix Quality Control

<u>Analysis Name</u>	<u>BKG</u>	<u>DUP</u>	<u>RPD</u>	<u>RPD Max</u>
	<u>Conc</u>	<u>Conc</u>		
Batch number: 15133820001A	Sample number(s): 7873706-7873708, 7873706-7873708			
Moisture	38.7	34.4	12*	5

* - Outside of specification

(1) - The result for one or both determinations was less than five times the LOQ.

Moisture Data Report

Batch #: 15133820001

<u>Sample ID</u>	<u>Batch ID</u>	<u>Analysis#</u>	<u>Tare Wt</u>	<u>Sample</u>	<u>Dry Wt</u>	<u>%Moisture</u>	<u>Analysis</u>	<u>Verified</u>
				<u>Wt</u>			<u>Date (Emp#)</u>	<u>Date (Emp#)</u>
7873706	A	00111	1.0866	6.8891	6.4854	21.63	5/13/15 (1201/SWF)	5/14/15 (0236/CW)
7873707BKG	A	00111	1.0859	6.4195	5.0184	38.74	5/13/15 (1201/SWF)	5/14/15 (0236/CW)
7873707DUP	A	00111	1.0847	6.4549	5.3199	34.39	5/13/15 (1201/SWF)	5/14/15 (0236/CW)
7873708	A	00111	1.0879	7.9205	5.8945	39.31	5/13/15 (1201/SWF)	5/14/15 (0236/CW)
LCS 89.5% Std.		00111	1.0666	5.0455	1.5979	89.47	5/13/15 (1201/SWF)	5/14/15 (0236/CW)

"PAI04-SB28-0608" "SM 2540 G-1997" "RES" "7873706" "LL" "LDC-0265" "Moisture" "21.6"
"% "0.50" "DL" "TRG" "0.50" "LOQ" "YES" "-99" "0.50"

"PAI04-SB28-0608" "SW-846 6850 1/2007" "RES" "7873706" "LL" "14797-73-0" "Perchlorate in Soil
LC/MS/MS" "2.7" "ug/Kg" "U" "2.7" "DL" "TRG" "6.4" "LOQ" "YES" "-99"
"5.4"

"PAI13C-SS08-0001" "SM 2540 G-1997" "RES" "7873707" "LL" "LDC-0265" "Moisture" "38.7"
"% "0.50" "DL" "TRG" "0.50" "LOQ" "YES" "-99" "0.50"

"PAI13C-SS08-0001" "SW-846 9045C modified" "RES" "7873707" "LL" "PH" "pH" "5.97" "pH"
"0.0100" "DL" "TRG" "0.0100" "LOQ" "YES" "-99" "0.0100"

"PAI13C-SS08-0001" "ASTM D1498" "RES" "7873707" "LL" "ORP" "Oxidation Reduction Potential"
"478" "mV" "10.0" "DL" "TRG" "10.0" "LOQ" "YES" "-99" "10.0"

"PAI13C-SS08-0001" "SW-846 7199" "RES" "7873707" "LL" "18540-29-9" "Hexavalent Chromium by
IC" "2.7" "mg/Kg" "0.23" "DL" "TRG" "0.64" "LOQ" "YES" "-99" "0.64"

"PAI13C-SS08-0001" "SW-846 6850 1/2007" "RES" "7873707" "LL" "14797-73-0" "Perchlorate in Soil
LC/MS/MS" "3.4" "ug/Kg" "U" "3.4" "DL" "TRG" "8.2" "LOQ" "YES" "-99"
"6.9"

"PAI13C-SB05-0204" "SM 2540 G-1997" "RES" "7873708" "LL" "LDC-0265" "Moisture" "39.3"
"% "0.50" "DL" "TRG" "0.50" "LOQ" "YES" "-99" "0.50"

"PAI13C-SB05-0204" "SW-846 9045C modified" "RES" "7873708" "LL" "PH" "pH" "5.89" "pH"
"0.0100" "DL" "TRG" "0.0100" "LOQ" "YES" "-99" "0.0100"

"PAI13C-SB05-0204" "ASTM D1498" "RES" "7873708" "LL" "ORP" "Oxidation Reduction Potential"
"432" "mV" "10.0" "DL" "TRG" "10.0" "LOQ" "YES" "-99" "10.0"

"PAI13C-SB05-0204" "SW-846 7199" "RES" "7873708" "LL" "18540-29-9" "Hexavalent Chromium by
IC" "1.2" "mg/Kg" "0.23" "DL" "TRG" "0.66" "LOQ" "YES" "-99" "0.66"

"PAI13C-SB05-0204" "SW-846 6850 1/2007" "RES" "7873708" "LL" "14797-73-0" "Perchlorate in Soil
LC/MS/MS" "3.5" "ug/Kg" "U" "3.5" "DL" "TRG" "8.2" "LOQ" "YES" "-99"
"6.9"

"PAI04-TW01-20150504" "SW-846 6850 1/2007" "RES" "7873709" "LL" "14797-73-0" "Perchlorate in
Water LC/MS/MS" "0.20" "ug/L" "U" "0.20" "DL" "TRG" "1.0" "LOQ" "YES" "-99"
"0.40"

"PAI04-TW01-20150504" "EPA 537 Rev. 1.1 modified" "DL1" "7873709" "LL" "335-67-1"
"Perfluorooctanoic acid" "11000" "ng/L" "100" "DL" "TRG" "200" "LOQ" "YES" "-99"
"200"

"PAI04-TW01-20150504" "EPA 537 Rev. 1.1 modified" "RES" "7873709" "LL" "1763-23-1" "Perfluoro-
octanesulfonate" "5" "ng/L" "U" "5" "DL" "TRG" "10" "LOQ" "YES" "-99"
"10"

"PAI13C-TW03-20150504" "ASTM D1498" "RES" "7873710" "LL" "ORP" "Oxidation Reduction Potential"
"412" "mV" "10.0" "DL" "TRG" "10.0" "LOQ" "YES" "-99" "10.0"

"PAI13C-TW03-20150504" "SW-846 9040C" "RES" "7873710" "LL" "PH" "pH" "7.4" "pH"
"0.010" "DL" "TRG" "0.010" "LOQ" "YES" "-99" "0.010"

"PAI13C-TW03-20150504" "EPA 218.6" "RES" "7873710" "LL" "18540-29-9" "Hexavalent Chromium"
"0.015" "ug/L" "U" "0.015" "DL" "TRG" "0.050" "LOQ" "YES" "-99" "0.050"

"PAI04-TW02-20150506" "SW-846 6850 1/2007" "RES" "7879425" "LL" "14797-73-0" "Perchlorate in
Water LC/MS/MS" "0.20" "ug/L" "U" "0.20" "DL" "TRG" "1.0" "LOQ" "YES" "-99"
"0.40"

"PAI04-TW02-20150506" "EPA 537 Rev. 1.1 modified" "RES" "7879425" "LL" "335-67-1"
"Perfluorooctanoic acid" "12" "ng/L" "1" "DL" "TRG" "2" "LOQ" "YES" "-99"
"2"

"PAI04-TW02-20150506" "EPA 537 Rev. 1.1 modified" "RES" "7879425" "LL" "1763-23-1" "Perfluoro-
octanesulfonate" "78" "ng/L" "5" "DL" "TRG" "10" "LOQ" "YES" "-99"
"10"

"PAI-RB01-050715" "ASTM D1498" "RES" "7879426" "LL" "ORP" "Oxidation Reduction Potential"
"255" "mV" "10.0" "DL" "TRG" "10.0" "LOQ" "YES" "-99" "10.0"

"PAI-RB01-050715" "SW-846 6850 1/2007" "RES" "7879426" "LL" "14797-73-0" "Perchlorate in Water

LC/MS/MS "0.20" "ug/L" "U" "0.20" "DL" "TRG" "1.0" "LOQ" "YES" "-99"
"0.40"
"PAI-RB01-050715" "EPA 537 Rev. 1.1 modified" "RES" "7879426" "LL" "335-67-1"
"Perfluorooctanoic acid" "1" "ng/L" "J" "1" "DL" "TRG" "2" "LOQ" "YES" "-99"
"2"
"PAI-RB01-050715" "EPA 537 Rev. 1.1 modified" "RES" "7879426" "LL" "1763-23-1" "Perfluoro-
octanesulfonate" "5" "ng/L" "U" "5" "DL" "TRG" "10" "LOQ" "YES" "-99"
"10"
"PAI-RB01-050715" "SW-846 9040C" "RES" "7879426" "LL" "PH" "pH" "9.3" "pH" "0.010"
"DL" "TRG" "0.010" "LOQ" "YES" "-99" "0.010"
"PAI-RB01-050715" "EPA 218.6" "RES" "7879426" "LL" "18540-29-9" "Hexavalent Chromium"
"0.015" "ug/L" "U" "0.015" "DL" "TRG" "0.050" "LOQ" "YES" "-99" "0.050"
"LCS15126039401B" "SW-846 9045C modified" "RES" "LCS15126039401B" "LL" "PH" "pH" "7.04"
"pH" "-99" "NA" "SPK" "101" "-99" "NA" "YES" "7.00" "0.0100"
"LCS15126121521B" "SW-846 9040C" "RES" "LCS15126121521B" "LL" "PH" "pH" "7.0" "pH"
"-99" "NA" "SPK" "100" "-99" "NA" "YES" "7.0" "0.010"
"LCS15126182101B" "ASTM D1498" "RES" "LCS15126182101B" "LL" "ORP" "Oxidation Reduction
Potential" "434" "mV" "-99" "NA" "SPK" "102" "-99" "NA" "YES" "427"
"10.0"
"LCS15126182102B" "ASTM D1498" "RES" "LCS15126182102B" "LL" "ORP" "Oxidation Reduction
Potential" "433" "mV" "-99" "NA" "SPK" "101" "-99" "NA" "YES" "427"
"10.0"
"BLK15126243201A" "SW-846 7199" "RES" "BLK15126243201A" "LL" "18540-29-9" "Hexavalent
Chromium by IC" "0.14" "mg/Kg" "U" "0.14" "DL" "TRG" "0.40" "LOQ" "YES" "-99"
"0.40"
"LCS15126243201A" "SW-846 7199" "RES" "LCS15126243201A" "LL" "18540-29-9" "Hexavalent
Chromium by IC" "4.5" "mg/Kg" "-99" "NA" "SPK" "90" "-99" "NA" "YES" "5.0"
"0.40"
"BLK15126987141A" "EPA 218.6" "RES" "BLK15126987141A" "LL" "18540-29-9" "Hexavalent
Chromium" "0.015" "ug/L" "U" "0.015" "DL" "TRG" "0.050" "LOQ" "YES" "-99"
"0.050"
"LCS15126987141A" "EPA 218.6" "RES" "LCS15126987141A" "LL" "18540-29-9" "Hexavalent
Chromium" "96.8" "ug/L" "-99" "NA" "SPK" "97" "-99" "NA" "YES" "100"
"0.050"
"BLK15128987141A" "EPA 218.6" "RES" "BLK15128987141A" "LL" "18540-29-9" "Hexavalent
Chromium" "0.015" "ug/L" "U" "0.015" "DL" "TRG" "0.050" "LOQ" "YES" "-99"
"0.050"
"LCS15128987141A" "EPA 218.6" "RES" "LCS15128987141A" "LL" "18540-29-9" "Hexavalent
Chromium" "103" "ug/L" "-99" "NA" "SPK" "103" "-99" "NA" "YES" "100"
"5.0"
"LCS15131121521A" "SW-846 9040C" "RES" "LCS15131121521A" "LL" "PH" "pH" "7.0" "pH"
"-99" "NA" "SPK" "100" "-99" "NA" "YES" "7.0" "0.010"
"LCS15131182101A" "ASTM D1498" "RES" "LCS15131182101A" "LL" "ORP" "Oxidation Reduction
Potential" "433" "mV" "-99" "NA" "SPK" "101" "-99" "NA" "YES" "427"
"10.0"
"BLK151320023A" "SW-846 6850 1/2007" "RES" "BLK151320023A" "LL" "14797-73-0" "Perchlorate in Soil
LC/MS/MS" "2.1" "ug/Kg" "U" "2.1" "DL" "TRG" "5.0" "LOQ" "YES" "-99"
"4.2"
"LCS151320023A" "SW-846 6850 1/2007" "RES" "LCS151320023A" "LL" "14797-73-0" "Perchlorate in Soil
LC/MS/MS" "98" "ug/Kg" "-99" "NA" "SPK" "98" "-99" "NA" "YES" "100"
"4.2"
"LCS15133820001A" "SM 2540 G-1997" "RES" "LCS15133820001A" "LL" "LDC-0265" "Moisture"
"89.5" "%" "-99" "NA" "SPK" "100" "-99" "NA" "YES" "89.5" "0.50"
"BLK151340030A" "SW-846 6850 1/2007" "RES" "BLK151340030A" "LL" "14797-73-0" "Perchlorate in Water

LC/MS/MS "0.20" "ug/L" "U" "0.20" "DL" "TRG" "1.0" "LOQ" "YES" "-99"
"0.40"
"LCS151340030A" "SW-846 6850 1/2007" "RES" "LCS151340030A" "LL" "14797-73-0" "Perchlorate in Water
LC/MS/MS "0.88" "ug/L" "J" "-99" "NA" "SPK" "88" "-99" "NA" "YES" "1.0"
"0.40"
"BLK15138004" "EPA 537 Rev. 1.1 modified" "RES" "BLK15138004" "LL" "335-67-1" "Perfluorooctanoic
acid" "1" "ng/L" "U" "1" "DL" "TRG" "2" "LOQ" "YES" "-99" "2"
"BLK15138004" "EPA 537 Rev. 1.1 modified" "RES" "BLK15138004" "LL" "1763-23-1" "Perfluoro-
octanesulfonate" "5" "ng/L" "U" "5" "DL" "TRG" "10" "LOQ" "YES" "-99"
"10"
"LCS15138004" "EPA 537 Rev. 1.1 modified" "RES" "LCS15138004" "LL" "335-67-1" "Perfluorooctanoic
acid" "100" "ng/L" "-99" "NA" "SPK" "105" "-99" "NA" "YES" "100"
"2"
"LCS15138004" "EPA 537 Rev. 1.1 modified" "RES" "LCS15138004" "LL" "1763-23-1" "Perfluoro-
octanesulfonate" "110" "ng/L" "-99" "NA" "SPK" "107" "-99" "NA" "YES" "100"
"10"
"LCSD15138004" "EPA 537 Rev. 1.1 modified" "RES" "LCSD15138004" "LL" "335-67-1"
"Perfluorooctanoic acid" "110" "ng/L" "-99" "NA" "SPK" "113" "7" "-99" "NA" "YES"
"100" "2"
"LCSD15138004" "EPA 537 Rev. 1.1 modified" "RES" "LCSD15138004" "LL" "1763-23-1" "Perfluoro-
octanesulfonate" "100" "ng/L" "-99" "NA" "SPK" "104" "3" "-99" "NA" "YES" "100"
"10"
"1110299" "Parris Island, SC" "PAI04-SB28-0608" "05/02/2015 12:30" "SO" "7873706" "NM"
"-99" "SM2540G" "NONE" "RES" "05/13/2015 18:31" "05/13/2015 18:31" "LL" "COA" "NA" "NA"
"1" "NA" "NA" "00/00/0000 00:00" "21.6" "15133820001A" "15133820001A" "15133820001A"
"15133820001A" "PIS01" "05/05/2015 09:10" "06/01/2015 15:13"
"1110299" "Parris Island, SC" "PAI04-SB28-0608" "05/02/2015 12:30" "SO" "7873706" "NM"
"-99" "6850" "SW-846 6850 1/2007" "RES" "05/13/2015 07:40" "05/13/2015 14:02" "LL" "COA" "Dry"
"NA" "1" "NA" "NA" "00/00/0000 00:00" "21.6" "151320023A" "151320023A" "151320023A"
"151320023A" "PIS01" "05/05/2015 09:10" "06/01/2015 15:13"
"1110299" "Parris Island, SC" "PAI13C-SS08-0001" "05/03/2015 13:15" "SO" "7873707" "NM"
"-99" "SM2540G" "NONE" "RES" "05/13/2015 18:31" "05/13/2015 18:31" "LL" "COA" "NA" "NA"
"1" "NA" "NA" "00/00/0000 00:00" "38.7" "15133820001A" "15133820001A" "15133820001A"
"15133820001A" "PIS01" "05/05/2015 09:10" "06/01/2015 15:13"
"1110299" "Parris Island, SC" "PAI13C-SS08-0001" "05/03/2015 13:15" "SO" "7873707" "NM"
"-99" "9045M" "NONE" "RES" "05/06/2015 21:00" "05/06/2015 21:00" "LL" "COA" "NA" "NA" "1"
"NA" "NA" "00/00/0000 00:00" "38.7" "15126039401B" "15126039401B" "15126039401B" "15126039401B"
"PIS01" "05/05/2015 09:10" "06/01/2015 15:13"
"1110299" "Parris Island, SC" "PAI13C-SS08-0001" "05/03/2015 13:15" "SO" "7873707" "NM"
"-99" "ASTM D1498" "NONE" "RES" "05/06/2015 21:00" "05/06/2015 21:00" "LL" "COA" "NA"
"NA" "1" "NA" "NA" "00/00/0000 00:00" "38.7" "15126182102B" "15126182102B" "15126182102B"
"15126182102B" "PIS01" "05/05/2015 09:10" "06/01/2015 15:13"
"1110299" "Parris Island, SC" "PAI13C-SS08-0001" "05/03/2015 13:15" "SO" "7873707" "NM"
"-99" "7199" "3060A" "RES" "05/06/2015 19:10" "05/07/2015 09:21" "LL" "COA" "Dry" "NA" "1"
"NA" "NA" "00/00/0000 00:00" "38.7" "15126243201A" "15126243201A" "15126243201A" "15126243201A"
"PIS01" "05/05/2015 09:10" "06/01/2015 15:13"
"1110299" "Parris Island, SC" "PAI13C-SS08-0001" "05/03/2015 13:15" "SO" "7873707" "NM"
"-99" "6850" "SW-846 6850 1/2007" "RES" "05/13/2015 07:40" "05/13/2015 14:40" "LL" "COA" "Dry"
"NA" "1" "NA" "NA" "00/00/0000 00:00" "38.7" "151320023A" "151320023A" "151320023A"
"151320023A" "PIS01" "05/05/2015 09:10" "06/01/2015 15:13"
"1110299" "Parris Island, SC" "PAI13C-SB05-0204" "05/03/2015 13:30" "SO" "7873708" "NM"
"-99" "SM2540G" "NONE" "RES" "05/13/2015 18:31" "05/13/2015 18:31" "LL" "COA" "NA" "NA"
"1" "NA" "NA" "00/00/0000 00:00" "39.3" "15133820001A" "15133820001A" "15133820001A"
"15133820001A" "PIS01" "05/05/2015 09:10" "06/01/2015 15:13"

"1110299" "Parris Island, SC" "PAI13C-SB05-0204" "05/03/2015 13:30" "SO" "7873708" "NM"
"-99" "9045M" "NONE" "RES" "05/06/2015 21:00" "05/06/2015 21:00" "LL" "COA" "NA" "NA" "1"
"NA" "NA" "00/00/0000 00:00" "39.3" "15126039401B" "15126039401B" "15126039401B" "15126039401B"
"PIS01" "05/05/2015 09:10" "06/01/2015 15:13"
"1110299" "Parris Island, SC" "PAI13C-SB05-0204" "05/03/2015 13:30" "SO" "7873708" "NM"
"-99" "ASTM D1498" "NONE" "RES" "05/06/2015 21:00" "05/06/2015 21:00" "LL" "COA" "NA"
"NA" "1" "NA" "NA" "00/00/0000 00:00" "39.3" "15126182102B" "15126182102B" "15126182102B"
"15126182102B" "PIS01" "05/05/2015 09:10" "06/01/2015 15:13"
"1110299" "Parris Island, SC" "PAI13C-SB05-0204" "05/03/2015 13:30" "SO" "7873708" "NM"
"-99" "7199" "3060A" "RES" "05/06/2015 19:10" "05/07/2015 09:29" "LL" "COA" "Dry" "NA" "1"
"NA" "NA" "00/00/0000 00:00" "39.3" "15126243201A" "15126243201A" "15126243201A" "15126243201A"
"PIS01" "05/05/2015 09:10" "06/01/2015 15:13"
"1110299" "Parris Island, SC" "PAI13C-SB05-0204" "05/03/2015 13:30" "SO" "7873708" "NM"
"-99" "6850" "SW-846 6850 1/2007" "RES" "05/13/2015 07:40" "05/13/2015 14:53" "LL" "COA" "Dry"
"NA" "1" "NA" "NA" "00/00/0000 00:00" "39.3" "151320023A" "151320023A" "151320023A"
"151320023A" "PIS01" "05/05/2015 09:10" "06/01/2015 15:13"
"1110299" "Parris Island, SC" "PAI04-TW01-20150504" "05/04/2015 08:55" "AQ" "7873709" "NM"
"-99" "6850" "NONE" "RES" "05/14/2015 17:35" "05/14/2015 17:35" "LL" "COA" "Wet" "NA" "1"
"NA" "NA" "00/00/0000 00:00" "100" "151340030A" "151340030A" "151340030A" "151340030A"
"PIS01" "05/05/2015 09:10" "06/01/2015 15:13"
"1110299" "Parris Island, SC" "PAI04-TW01-20150504" "05/04/2015 08:55" "AQ" "7873709" "NM"
"-99" "EPA 537 Rev. 1.1 modified" "NONE" "DL1" "05/29/2015 20:34" "05/29/2015 20:34" "LL" "COA"
"Wet" "NA" "100" "NA" "NA" "00/00/0000 00:00" "100" "15138004" "15138004" "15138004"
"15138004" "PIS01" "05/05/2015 09:10" "06/01/2015 15:13"
"1110299" "Parris Island, SC" "PAI04-TW01-20150504" "05/04/2015 08:55" "AQ" "7873709" "NM"
"-99" "EPA 537 Rev. 1.1 modified" "NONE" "RES" "05/29/2015 20:50" "05/29/2015 20:50" "LL" "COA"
"Wet" "NA" "1" "NA" "NA" "00/00/0000 00:00" "100" "15138004" "15138004" "15138004"
"15138004" "PIS01" "05/05/2015 09:10" "06/01/2015 15:13"
"1110299" "Parris Island, SC" "PAI13C-TW03-20150504" "05/04/2015 16:45" "AQ" "7873710" "NM"
"-99" "ASTM D1498" "NONE" "RES" "05/06/2015 20:30" "05/06/2015 20:30" "LL" "COA" "NA"
"NA" "1" "NA" "NA" "00/00/0000 00:00" "100" "15126182101B" "15126182101B" "15126182101B"
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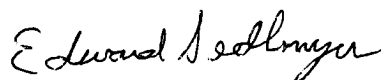
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TO: L. KLINK
SDG: PIS01

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The data for these analyses were reviewed with reference to the USEPA National Functional Guidelines for Organic Data Validation (June 2008), USEPA National Functional Guidelines for Inorganic Review (January 2010), and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (July 2013). The text of this report has been formulated to address only those areas affecting data quality.



Tetra Tech, Inc.
Edward Sedlmyer
Chemist/Data Validator



Tetra Tech Inc.
Joseph A. Samchuck
Data Validation Manager

Attachments:

Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted method detection limit for sample and method.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
R	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
UR	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

- A = Lab Blank Contamination
- B = Field Blank Contamination
- C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
- C01 = GC/MS Tuning Noncompliance
- D = MS/MSD Recovery Noncompliance
- E = LCS/LCSD Recovery Noncompliance
- F = Lab Duplicate Imprecision
- G = Field Duplicate Imprecision
- H = Holding Time Exceedance
- I = ICP Serial Dilution Noncompliance
- J = ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
- K = ICP Interference - includes ICS % R Noncompliance
- L = Instrument Calibration Range Exceedance
- M = Sample Preservation Noncompliance
- N = Internal Standard Noncompliance
- N01 = Internal Standard Recovery Noncompliance Dioxins
- N02 = Recovery Standard Noncompliance Dioxins
- N03 = Clean-up Standard Noncompliance Dioxins
- O = Poor Instrument Performance (i.e., base-time drifting)
- P = Uncertainty near detection limit ($< 2 \times$ IDL for inorganics and $<$ CRQL for organics)
- Q = Other problems (can encompass a number of issues; i.e. chromatography, interferences, etc.)
- R = Surrogates Recovery Noncompliance
- S = Pesticide/PCB Resolution
- T = % Breakdown Noncompliance for DDT and Endrin
- U = RPD between columns/detectors $>40\%$ for positive results determined via GC/HPLC
- V = Non-linear calibrations; correlation coefficient $r < 0.995$
- W = EMPC result
- X = Signal to noise response drop
- Y = Percent solids $<30\%$
- Z = Uncertainty at 2 standard deviations is greater than sample activity
- Z1 = Tentatively Identified Compound considered presumptively present
- Z2 = Tentatively Identified Compound column bleed
- Z3 = Tentatively Identified Compound aldol condensate

PROJ_NO: 01509 SDG: PIS01 FRACTION: OS MEDIA: WATER	NSAMPLE	PAI04-TW01-20150504			PAI04-TW02-20150506			PAI-RB01-050715		
	LAB_ID	7873709			7879425			7879426		
	SAMP_DATE	5/4/2015			5/6/2015			5/7/2015		
	QC_TYPE	NM			NM			RB		
	UNITS	NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0		
	DUP_OF									
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
PENTADECAFLUOROOCTANOIC ACID	11000			12			1	J	P	
PERFLUOROOCTANE SULFONIC ACID	10	U		78			10	U		

PROJ_NO: 01509 SDG: PIS01 FRACTION: MISC MEDIA: WATER	NSAMPLE	PAI04-TW01-20150504			PAI04-TW02-20150506			PAI13C-TW03-20150504				
	LAB_ID	7873709			7879425			7873710				
	SAMP_DATE	5/4/2015			5/6/2015			5/4/2015				
	QC_TYPE	NM			NM			NM				
	UNITS	UG/L			UG/L			MV		S.U.		
	PCT_SOLIDS							0.0				
	DUP_OF											
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
HEXAVALENT CHROMIUM												
OXIDATION REDUCTION POTENTIAL							412					
PERCHLORATE		0.4 U			0.4 U							
PH										7.4		

PROJ_NO: 01509 SDG: PIS01 FRACTION: MISC MEDIA: WATER	NSAMPLE	PAI13C-TW03-20150504			PAI-RB01-050715							
	LAB_ID	7873710			7879426							
	SAMP_DATE	5/4/2015			5/7/2015							
	QC_TYPE	NM			NM			RB				
	UNITS	UG/L			S.U.			UG/L			MV	
	PCT_SOLIDS										0.0	
	DUP_OF											
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
HEXAVALENT CHROMIUM	0.05	UJ	H				0.05	U				
OXIDATION REDUCTION POTENTIAL										255		
PERCHLORATE							0.4	U				
PH				9.3								

PROJ_NO: 01509 SDG: PIS01 FRACTION: MISC MEDIA: SOIL	NSAMPLE	PAI04-SB28-0608						PAI13C-SB05-0204					
	LAB_ID	7873706						7873708					
	SAMP_DATE	5/2/2015						5/3/2015					
	QC_TYPE	NM						NM					
	UNITS	%			UG/KG			%			MG/KG		
	PCT_SOLIDS	78.4			78.4								
	DUP_OF												
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
HEXAVALENT CHROMIUM										1.2			
OXIDATION REDUCTION POTENTIAL													
PERCENT MOISTURE	21.6						39.3						
PERCHLORATE				5.4	U								
PH													

PROJ_NO: 01509 SDG: PIS01 FRACTION: MISC MEDIA: SOIL	NSAMPLE	PAI13C-SB05-0204										PAI13C-SS08-0001		
	LAB_ID	7873708										7873707		
	SAMP_DATE	5/3/2015										5/3/2015		
	QC_TYPE	NM										NM		
	UNITS	MV			S.U.			UG/KG			%			
	PCT_SOLIDS	60.7												
	DUP_OF													
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD		
HEXAVALENT CHROMIUM														
OXIDATION REDUCTION POTENTIAL	432													
PERCENT MOISTURE										38.7				
PERCHLORATE							6.9	U						
PH				5.89										

PROJ_NO: 01509 SDG: PIS01 FRACTION: MISC MEDIA: SOIL	NSAMPLE	PAI13C-SS08-0001											
	LAB_ID	7873707											
	SAMP_DATE	5/3/2015											
	QC_TYPE	NM											
	UNITS	MG/KG	MV			S.U.			UG/KG				
	PCT_SOLIDS	61.3											
	DUP_OF												
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
HEXAVALENT CHROMIUM	2.7												
OXIDATION REDUCTION POTENTIAL				478									
PERCENT MOISTURE													
PERCHLORATE										6.9	U		
PH							5.97						

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

Sample Description: PAI04-SB28-0608 Grab Soil
Parris Island, SC

LL Sample # SW 7873706
LL Group # 1558459
Account # 07558

Project Name: Parris Island, SC

Collected: 05/02/2015 12:30 by TR

Tetra Tech Inc.

Submitted: 05/05/2015 09:10

Foster Plaza VII

Reported: 06/01/2015 15:12

661 Andersen Drive

Pittsburgh PA 15220

PIS28 SDG#: PIS01-01

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Detection Limit*	Dry Limit of Detection	Dry Limit of Quantitation	DF
Perchlorate							
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007 14797-73-0	ug/kg N.D.	ug/kg 2.7	ug/kg 5.4	ug/kg 6.4	1
Wet Chemistry							
00111	Moisture	SM 2540 G-1997 n.a.	% 21.6	% 0.50	% 0.50	% 0.50	1
Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.							

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	151320023A	05/13/2015 14:02	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	2	151320023A	05/13/2015 07:40	Maria Davenport	1
00111	Moisture	SM 2540 G-1997	1	15133820001A	05/13/2015 18:31	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: PAI13C-SS08-0001 Grab Soil
Parris Island, SC

LL Sample # SW 7873707
LL Group # 1558459
Account # 07558

Project Name: Parris Island, SC

Collected: 05/03/2015 13:15 by TR

Tetra Tech Inc.

Submitted: 05/05/2015 09:10

Foster Plaza VII

Reported: 06/01/2015 15:12

661 Andersen Drive

Pittsburgh PA 15220

PIS08 SDG#: PIS01-02

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Detection Limit*	Dry Limit of Detection	Dry Limit of Quantitation	DF
Perchlorate							
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007 14797-73-0	ug/kg N.D.	ug/kg 3.4	ug/kg 6.9	ug/kg 8.2	1
Wet Chemistry							
05892	Hexavalent Chromium by IC	SW-846 7199 18540-29-9	mg/kg 2.7	mg/kg 0.23	mg/kg 0.64	mg/kg 0.64	1
ASTM D1498							
01821	Oxidation Reduction Potential The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.	n.a.	mV 478	mV 10.0	mV 10.0	mV 10.0	1
SW-846 9045C modified							
00394	pH The pH was measured in water at 19 C.	n.a.	Std. Units 5.97	Std. Units 0.0100	Std. Units 0.0100	Std. Units 0.0100	1
Wet Chemistry							
00111	Moisture Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.	SM 2540 G-1997 n.a.	% 38.7	% 0.50	% 0.50	% 0.50	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	151320023A	05/13/2015 14:40	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	2	151320023A	05/13/2015 07:40	Maria Davenport	1
05892	Hexavalent Chromium by IC	SW-846 7199	1	15126243201A	05/07/2015 09:21	Clinton M Wilson	1
01821	Oxidation Reduction Potential	ASTM D1498	1	15126182102B	05/06/2015 21:00	Michelle L Lalli	1
00394	pH	SW-846 9045C modified	1	15126039401B	05/06/2015 21:00	Michelle L Lalli	1
02432	Hexavalent Cr Extraction - IC	SW-846 3060A	1	15126243201A	05/06/2015 19:10	Daniel S Smith	1
00111	Moisture	SM 2540 G-1997	1	15133820001A	05/13/2015 18:31	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: PAI13C-SB05-0204 Grab Soil
Parris Island, SC

LL Sample # SW 7873708
LL Group # 1558459
Account # 07558

Project Name: Parris Island, SC

Collected: 05/03/2015 13:30 by TR

Tetra Tech Inc.

Submitted: 05/05/2015 09:10

Foster Plaza VII

Reported: 06/01/2015 15:12

661 Andersen Drive

Pittsburgh PA 15220

PISB5 SDG#: PIS01-03

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Detection Limit*	Dry Limit of Detection	Dry Limit of Quantitation	DF
Perchlorate							
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007 14797-73-0	ug/kg N.D.	ug/kg 3.5	ug/kg 6.9	ug/kg 8.2	1
Wet Chemistry							
05892	Hexavalent Chromium by IC	SW-846 7199 18540-29-9	mg/kg 1.2	mg/kg 0.23	mg/kg 0.66	mg/kg 0.66	1
ASTM D1498							
01821	Oxidation Reduction Potential The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.	n.a.	mV 432	mV 10.0	mV 10.0	mV 10.0	1
SW-846 9045C modified							
00394	pH The pH was measured in water at 18.9 C.	n.a.	Std. Units 5.89	Std. Units 0.0100	Std. Units 0.0100	Std. Units 0.0100	1
Wet Chemistry							
00111	Moisture Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.	SM 2540 G-1997 n.a.	% 39.3	% 0.50	% 0.50	% 0.50	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06557	Perchlorate in Soil LC/MS/MS	SW-846 6850 1/2007	1	151320023A	05/13/2015 14:53	Richard A Shober	1
06568	Perchlorate Soil Prep	SW-846 6850 1/2007	2	151320023A	05/13/2015 07:40	Maria Davenport	1
05892	Hexavalent Chromium by IC	SW-846 7199	1	15126243201A	05/07/2015 09:29	Clinton M Wilson	1
01821	Oxidation Reduction Potential	ASTM D1498	1	15126182102B	05/06/2015 21:00	Michelle L Lalli	1
00394	pH	SW-846 9045C modified	1	15126039401B	05/06/2015 21:00	Michelle L Lalli	1
02432	Hexavalent Cr Extraction - IC	SW-846 3060A	1	15126243201A	05/06/2015 19:10	Daniel S Smith	1
00111	Moisture	SM 2540 G-1997	1	15133820001A	05/13/2015 18:31	Scott W Freisher	1

*=This limit was used in the evaluation of the final result

Sample Description: PAI04-TW01-20150504 Grab Groundwater
Parris Island, SC

LL Sample # WW 7873709
LL Group # 1558459
Account # 07558

Project Name: Parris Island, SC

Collected: 05/04/2015 08:55 by TR

Tetra Tech Inc.

Submitted: 05/05/2015 09:10

Foster Plaza VII

Reported: 06/01/2015 15:12

661 Andersen Drive

Pittsburgh PA 15220

PITW1 SDG#: PIS01-04

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Perchlorate							
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007 14797-73-0	ug/l N.D.	ug/l 0.20	ug/l 0.40	ug/l 1.0	1
Misc. Organics							
EPA 537 Rev. 1.1 modified							
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	10	10	1
10954	Perfluorooctanoic acid	335-67-1	11,000	100	200	200	100

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007	1	151340030A	05/14/2015 17:35	Richard A Shober	1
10954	PFAAs in Water by LC/MS/MS	EPA 537 Rev. 1.1 modified	1	15138004	05/29/2015 20:34	Meng Yu	100
10954	PFAAs in Water by LC/MS/MS	EPA 537 Rev. 1.1 modified	1	15138004	05/29/2015 20:50	Meng Yu	1

*=This limit was used in the evaluation of the final result

Sample Description: PAI13C-TW03-20150504 Grab Groundwater
Parris Island, SC

LL Sample # WW 7873710
LL Group # 1558459
Account # 07558

Project Name: Parris Island, SC

Collected: 05/04/2015 16:45 by TR

Tetra Tech Inc.

Submitted: 05/05/2015 09:10

Foster Plaza VII

Reported: 06/01/2015 15:12

661 Andersen Drive

Pittsburgh PA 15220

PITW3 SDG#: PIS01-05

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Wet Chemistry							
	EPA 218.6		ug/l	ug/l	ug/l	ug/l	
12868	Hexavalent Chromium The holding time was not met. The client was notified and the data reported.	18540-29-9	N.D.	0.015	0.050	0.050	1
	ASTM D1498		mV	mV	mV	mV	
01821	Oxidation Reduction Potential The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.	n.a.	412	10.0	10.0	10.0	1
	SW-846 9040C		Std. Units	Std. Units	Std. Units	Std. Units	
12152	pH The 40 CFR Part 136 requires that this analysis be performed immediately (within 15 minutes) upon sample collection. Because this was not possible, the result may not be used for reporting purposes.	n.a.	7.4	0.010	0.010	0.010	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
12868	Hexavalent Chromium	EPA 218.6	1	15126987141A	05/06/2015 12:06	Clinton M Wilson	1
01821	Oxidation Reduction Potential	ASTM D1498	1	15126182101B	05/06/2015 20:30	Michelle L Lalli	1
12152	pH	SW-846 9040C	1	15126121521B	05/06/2015 20:30	Michelle L Lalli	1

*=This limit was used in the evaluation of the final result

Sample Description: PAI04-TW02-20150506 Groundwater
PARRIS ISLAND

LL Sample # WW 7879425
LL Group # 1559656
Account # 07558

Project Name: Parris Island, SC

Collected: 05/06/2015 09:55 by TR

Tetra Tech Inc.

Submitted: 05/08/2015 09:25

Foster Plaza VII

Reported: 06/01/2015 15:13

661 Andersen Drive

Pittsburgh PA 15220

-TW02 SDG#: PIS01-06

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Perchlorate							
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007 14797-73-0	ug/l N.D.	ug/l 0.20	ug/l 0.40	ug/l 1.0	1
Misc. Organics							
EPA 537 Rev. 1.1 modified							
10954	Perfluoro-octanesulfonate	1763-23-1	78	5	10	10	1
10954	Perfluorooctanoic acid	335-67-1	12	1	2	2	1

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007	1	151340030A	05/14/2015 18:38	Richard A Shober	1
10954	PFAAs in Water by LC/MS/MS	EPA 537 Rev. 1.1 modified	1	15138004	05/29/2015 21:05	Meng Yu	1

*=This limit was used in the evaluation of the final result

Sample Description: PAI-RB01-050715 Water
PARRIS ISLAND

LL Sample # WW 7879426
LL Group # 1559656
Account # 07558

Project Name: Parris Island, SC

Collected: 05/07/2015 14:00 by TR

Tetra Tech Inc.

Submitted: 05/08/2015 09:25

Foster Plaza VII

Reported: 06/01/2015 15:13

661 Andersen Drive

Pittsburgh PA 15220

-RB01 SDG#: PIS01-07RB

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Perchlorate							
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007 14797-73-0	ug/l N.D.	ug/l 0.20	ug/l 0.40	ug/l 1.0	1
Misc. Organics							
EPA 537 Rev. 1.1 modified							
10954	Perfluoro-octanesulfonate	1763-23-1	N.D.	5	10	10	1
10954	Perfluorooctanoic acid	335-67-1	1 J	1	2	2	1
Wet Chemistry							
EPA 218.6							
12868	Hexavalent Chromium	18540-29-9	N.D.	0.015	0.050	0.050	1
ASTM D1498							
01821	Oxidation Reduction Potential	n.a.	255	10.0	10.0	10.0	1
The oxidation-reduction potential is reported in mV as referred to the standard hydrogen scale.							
SW-846 9040C							
12152	pH	n.a.	9.3	0.010	0.010	0.010	1
The 40 CFR Part 136 requires that this analysis be performed immediately (within 15 minutes) upon sample collection. Because this was not possible, the result may not be used for reporting purposes.							

General Sample Comments

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06386	Perchlorate in Water LC/MS/MS	SW-846 6850 1/2007	1	151340030A	05/14/2015 18:51	Richard A Shober	1
10954	PFAAs in Water by LC/MS/MS	EPA 537 Rev. 1.1 modified	1	15138004	05/29/2015 19:47	Meng Yu	1
12868	Hexavalent Chromium	EPA 218.6	1	15128987141A	05/08/2015 12:38	Clinton M Wilson	1
01821	Oxidation Reduction Potential	ASTM D1498	1	15131182101A	05/11/2015 18:00	Michelle L Lalli	1
12152	pH	SW-846 9040C	1	15131121521A	05/11/2015 18:00	Michelle L Lalli	1

*=This limit was used in the evaluation of the final result

APPENDIX C

SUPPORT DOCUMENTATION

Summary Data Package

Prepared for:

Tetra Tech Inc.
Foster Plaza VII
661 Andersen Drive
Pittsburgh PA 15220

Project: Parris Island, SC
Groundwater, Soil and Water Samples
Collected on 05/02/15-05/07/15

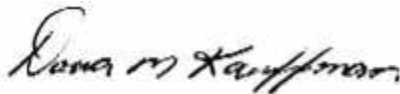
SDG# PIS01

GROUP	SAMPLE NUMBERS
1558459	7873706-7873710
1559656	7879425-7879426

PA Cert. # 36-00037
NY Cert. # 10670
NJ Cert. # PA011
NC Cert. # 521
TX Cert. # T104704194-13-10
AZ Cert. # AZ0780

Through our technical processes and second person review of data, we have established that our data/deliverables are in compliance with the methods and project requirements unless otherwise noted or previously resolved with the client.

Authorized by:



Date: 06/04/2015

Dana M. Kauffman
Manager

Any questions or concerns you might have regarding this data package should be directed to your client representative, Angela Miller at (717) 556-7260.

**Sample Reference List for SDG Number PIS01
with a Data Package Type of SUMMARY**

07558 - Tetra Tech Inc.
Project: Parris Island, SC

Lab Sample Number	Lab Sample Code	Client Sample Description
7873706	PIS28	PAI04-SB28-0608 Grab Soil
7873707	PIS08	PAI13C-SS08-0001 Grab Soil
7873708	PISB5	PAI13C-SB05-0204 Grab Soil
7873709	PITW1	PAI04-TW01-20150504 Grab Groundwater
7873710	PITW3	PAI13C-TW03-20150504 Grab Groundwater
7879425	-TW02	PAI04-TW02-20150506 Groundwater
7879426	-RB01	PAI-RB01-050715 Water



TETRA TECH NUS, INC.

CHAIN OF CUSTODY

NUMBER

No

1603

PAGE 1 OF 1

7558 | 1558459 | 7873706-10

PROJECT NO: 112G01509		FACILITY: PARRIS ISLAND		PROJECT MANAGER P. CHURCHILL		PHONE NUMBER (321) 636-6470		LABORATORY NAME AND CONTACT: LANCASTER LABORATORIES							
SAMPLERS (SIGNATURE) <i>Tony Gish</i>				FIELD OPERATIONS LEADER S. H. II		PHONE NUMBER (973) 607-7988		ADDRESS 2425 NEW HOLLAND PIKE							
				CARRIER/WAYBILL NUMBER FED Ex AB # 8631 3888 2244		CITY, STATE LANCASTER PA 17601									
				STANDARD TAT <input checked="" type="checkbox"/> RUSH TAT <input type="checkbox"/> <input type="checkbox"/> 24 hr. <input type="checkbox"/> 48 hr. <input type="checkbox"/> 72 hr. <input type="checkbox"/> 7 day <input type="checkbox"/> 14 day		CONTAINER TYPE PLASTIC (P) or GLASS (G)		PRESERVATIVE USED							
DATE YEAR 2015	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS Perchlorate (Soil) - G 4oz Jars Hex Chrom (Cr6+) - G ORP & moisture - G Perchlorate / PH (Soil) - G 4oz Jars PFAA - G PFAA - G Hex Chrom (Cr6+) - G PH - G				COMMENTS		
5/2	1230	PAI04-SB28-0608	SB28	6	8	SO	G	1	1						
5/3	1315	PAI13C-SS08-0001	SS08	0	1	SO	G	2	-	1	1				
5/3	1330	PAI13C-SB05-0204	SB05	2	4	SO	G	2	-	1	1				
5/4	0855	PAI04-TW01-20150504	TW01	-	-	GW	G	3	-	-	-	1	1	1	
5/4	1645	PAI13C-TW03-20150504	TW03	-	-	GW	G	2	-	-	-	-	-	1	1

1. RELINQUISHED BY <i>Tony Gish</i>	DATE 5-04-15	TIME 2000	1. RECEIVED BY FED EX	DATE 5-04-15	TIME 2000
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY <i>Brenna Buckley</i>	DATE 5:15	TIME 910



TETRA TECH NUS, INC.

7558/1559656/7879425-26

CHAIN OF CUSTODY

NUMBER **Nº 1610**

PAGE **1** OF **1**

PROJECT NO: 112601509		FACILITY: PARRIS ISLAND			PROJECT MANAGER P. CHURCHILL			PHONE NUMBER (321)636-6470			LABORATORY NAME AND CONTACT: LANCASTER LABS / A. Miller												
SAMPLERS (SIGNATURE) 					FIELD OPERATIONS LEADER S. Hill			PHONE NUMBER (973)607-7988			ADDRESS 2425 NEW HOLLAND PIKE												
					CARRIER/WAYBILL NUMBER FED EX AB#806518981677						CITY, STATE LANCASTER PA 17601												
					CONTAINER TYPE PLASTIC (P) or GLASS (G)						PRESERVATIVE USED												
STANDARD TAT <input checked="" type="checkbox"/> RUSH TAT <input type="checkbox"/> <input type="checkbox"/> 24 hr. <input type="checkbox"/> 48 hr. <input type="checkbox"/> 72 hr. <input type="checkbox"/> 7 day <input type="checkbox"/> 14 day											TYPE OF ANALYSIS <i>Perchlorate Asym vial PFAAS PFAAS PH "Cr6"/ORP</i>												
DATE YEAR 2015		TIME		SAMPLE ID		LOCATION ID		TOP DEPTH (FT)		BOTTOM DEPTH (FT)		MATRIX (GW, SO, SW, SD, QC, ETC.)		COLLECTION METHOD GRAB (G) COMP (C)		No. OF CONTAINERS		COMMENTS *"SHORT HOLD"					
5/06		0955		PAI04-TW02-20150506		TW02		-		-		GW		G		3							
5/07		1400		PAI-RB01-050715		QC		-		-		QC		G		5							
1. RELINQUISHED BY					DATE 5-07-15		TIME 1800		1. RECEIVED BY FED EX					DATE 5-07-15		TIME 1800							
2. RELINQUISHED BY					DATE		TIME		2. RECEIVED BY					DATE		TIME							
3. RELINQUISHED BY					DATE		TIME		3. RECEIVED BY ELLE					DATE 5/8/15		TIME 0925							
COMMENTS																							

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Pesticide Residue Analysis

Fraction: Perchlorate

Perchlorate in Soil LC/MS/MS

Sample #	Client ID	Matrix		DF	Comments
		Liquid	Solid		
7873706	PAI04-SB28-0608		X	1	
7873707	PAI13C-SS08-0001		X	1	
7873708	PAI13C-SB05-0204		X	1	
7873709	PAI04-TW01-20150504	X		1	
7879425	PAI04-TW02-20150506	X		1	
7879426	PAI-RB01-050715	X		1	Material Rinse Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

All QC is within specification.

SAMPLE ANALYSIS:

No problems were encountered with the analysis of the samples.

Abbreviation Key

UNSPK = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
MS = Matrix Spike	MDL = Method Detection Limit

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Specialty Services Group
 Fraction: PFAAs by LC/MS/MS

Sample #	Client ID	Matrix		DF	Comments
		Liquid	Solid		
7873709	PAI04-TW01-20150504	X		1; 100	
7879425	PAI04-TW02-20150506	X		1	
7879426	PAI-RB01-050715	X		1	Material Rinse Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

All QC is within specification.

The LCS serves as the ICV second source check.

SAMPLE ANALYSIS:

No problems were encountered with the analysis of the samples.

Abbreviation Key

UNSPK = Unspiked (for MS/MSD)	LOQ = Limit of Quantitation
MS = Matrix Spike	MDL = Method Detection Limit
MSD = Matrix Spike Duplicate	ND = Not Detected
BKG = Background (for Duplicate)	J = Estimated Value

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Instrumental Water Quality
Fraction: Instrumental Wet Chemistry

Sample #	Client ID	Matrix		DF	Comments
		Liquid	Solid		
7873707	PAI13C-SS08-0001		X	1	
7873708	PAI13C-SB05-0204		X	1	
7873710	PAI13C-TW03-20150504	X		1	
7879426	PAI-RB01-050715	X		1	Material Rinse Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

(Sample number(s): 7873710: Analysis: 12868)
The holding time was not met. The client was notified and the data reported.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

All QC is within specification.

SAMPLE ANALYSIS:

No problems were encountered with the analysis of the samples.

Case Narrative/Conformance Summary

CLIENT: Tetra Tech Inc.
SDG: PIS01

Water Quality

Fraction: Wet Chemistry

Sample #	Client ID	Matrix			Comments
		Liquid	Solid	DF	
7873707	PAI13C-SS08-0001		X	1	
7873708	PAI13C-SB05-0204		X	1	
7873710	PAI13C-TW03-20150504	X		1	
7879426	PAI-RB01-050715	X		1	Material Rinse Blank

See QC Reference List for Associated Batch QC Samples

SAMPLE RECEIPT:

Samples were received in good condition and within temperature requirements.

HOLDING TIME:

All holding times were met.

PREPARATION/EXTRACTION/DIGESTION:

No problems were encountered.

CALIBRATION/STANDARDIZATION:

All criteria were met.

QUALITY CONTROL AND NONCONFORMANCE SUMMARY:

MS/MSD

Matrix QC may not be included if site-specific QC were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, laboratory spike data (LCS) are provided.

SAMPLE ANALYSIS:

(Sample number(s): 7873707: Analysis: 00394)
The pH was measured in water at 19 C.

(Sample number(s): 7873708: Analysis: 00394)
The pH was measured in water at 18.9 C.

No other problems were encountered with the analysis of the samples.

2425 New Holland Pike, PO Box 12425, Lancaster, PA 17605-2425 · 717-656-2300 Fax: 717-656-2681 · www.lancasterlabs.com

06386 Perchlorate in Water LC/MS/MS**06568 Perchlorate Soil Prep**

Water samples are filtered through a 0.45-um syringe filter, followed by direct injection into a LC/MS/MS system followed by multiple reaction monitoring. Quantitation is performed using an isotopic internal standard.

Reference: Test Methods for Evaluating Solid Waste, EPA SW-846, Method 6850, 1/2007.

06557 Perchlorate in Soil LC/MS/MS

Soil samples are extracted with water, then filtered through a 0.45-um syringe filter and analyzed by LC/MS/MS. Quantitation is performed using an isotopic internal standard.

Reference: Test Methods for Evaluating Solid Waste, EPA SW-846, Method 6850, 1/2007.

12868 Hexavalent Chromium

A measured volume of sample is introduced into the ion chromatograph using a well buffered ammonium sulfate, ammonium hydroxide eluent. A guard column removes organics from the sample before hex chrome is separated on an anion exchange separator column. Postcolumn derivatization of the Cr(VI) with diphenylcarbohydrazide is followed by detection of the colored complex at 530 nm.

Reference: Method 218.6, Methods for the Chemical Analysis of Water and Wastes USEPA 600, Rev. May 1994

05892 Hexavalent Chromium by IC

A measured volume of sample is introduced into the ion chromatograph using a well buffered ammonium sulfate, ammonium hydroxide eluent. A guard column removes organics from the sample before hex chrome is separated on an anion exchange separator column. Postcolumn derivatization of the Cr(VI) with diphenylcarbohydrazide is followed by detection of the colored complex at 530 nm.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 7199, December 1996.

12152 pH

The activity of hydrogen ions in the sample is measured using a glass electrode and a reference electrode.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 9040C.

00394 pH

A 1:1 slurry is prepared. The activity of hydrogen ions in the supernatant is measured using a glass electrode and a reference electrode.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 9045C Modified, September 1994.

01821 Oxidation Reduction Potential

The oxidation-reduction potential is measured using a platinum electrode and a reference electrode. The potential reported is the electromotive force between the platinum electrode and the reference electrode, referred to the standard hydrogen scale.

Reference: Annual Book of ASTM Standards, Method D 1498

02432 Hexavalent Cr Extraction - IC

The sample is digested using a 3% sodium carbonate - 2% sodium hydroxide solution and then filtered through a 0.45 micron filter.

Reference: Test Methods for Evaluating Solid Wastes, SW-846 Method 3060A, December 1996

10954 PFAAs in Water by LC/MS/MS

A 100 ml sample of water is extracted using a solid phase extraction (SPE) cartridge. The resulting extract is analyzed by LC/MS/MS in negative electrospray ionization (ESI) mode.

Reference: Determination of Selected Perfluorinated Alkyl Acids (PFAAs) in Aqueous Samples by LC/MS/MS

00111 Moisture

A well-mixed sample is placed in a tared container and dried to a constant weight in an oven at 103-105C. The increase in weight is the total solids.

Reference: Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998, Method 2540 G-1997

Project Name: Parris Island, SC
LL Group #: 1558459

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:**EPA 218.6, Wet Chemistry**

Sample #s: 7873710

The holding time was not met. The client was notified and the data reported.

SW-846 7199, Wet Chemistry

Batch #: 15126243201A (Sample number(s): 7873707-7873708 UNSPK: P874922 BKG: P874922)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Hexavalent Chromium by IC

SW-846 9045C modified, wet Chemistry

Sample #s: 7873708

The pH was measured in water at 18.9 C.

Sample #s: 7873707

The pH was measured in water at 19 C.

SM 2540 G-1997, Wet Chemistry

Batch #: 15133820001A (Sample number(s): 7873706-7873708 BKG: 7873707)

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Moisture

Angela Miller

From: Angela Miller
Sent: Tuesday, May 05, 2015 4:52 PM
To: Christine Jampo; Coffman, Michelle
Cc: Hill, Shannon
Subject: RE: Final Redline SAP and response to EPA feedback on the redline

Good afternoon,

We received the first sample submission today for this project and unfortunately, we were not able to meet the 24 hour hold time for the hexavalent chromium analysis for the groundwater sample we received.

Please let me know when we can expect to receive the second hexavalent chromium water sample and equipment blank sample so that our technical center can be prepared for the next submittal.

Kind regards,
Angela

Angela Miller
Specialist

Eurofins Lancaster Laboratories Environmental, LLC

2425 New Holland Pike

Lancaster, PA 17601

USA

Phone: +1 717-556-7260

www.LancasterLabsEnv.com

Look for Eurofins Lancaster Laboratories Environmental at these upcoming conferences and industry events.

From: Christine Jampo
Sent: Tuesday, April 28, 2015 1:33 PM
To: Coffman, Michelle; Angela Miller
Cc: Hill, Shannon
Subject: RE: Final Redline SAP and response to EPA feedback on the redline

Directly to Vista if you can.

Christine Jampo
Senior Account Manager

Eurofins Lancaster Laboratories Environmental, LLC

2425 New Holland Pike

Lancaster, PA. 17601

Mobile: 717-327-7726

Perchlorate



Lancaster Laboratories
Environmental

Quality Control Summary
Method Blank
Pesticide Residue Analysis
SDG: PIS01
Matrix: LIQUID

Fraction: Perchlorate

151340030A / PBLK30134 Analyte	Analysis Date	Blank Results	Units	DL	LOD	LOQ
Perchlorate in Water LC/MS/MS	05/14/15	N.D.	ug/l	0.20	0.40	1.0



Lancaster Laboratories
Environmental

Quality Control Summary
Method Blank
Pesticide Residue Analysis
SDG: PIS01
Matrix: SOLID

Fraction: Perchlorate

151320023A / PBLK23132 Analyte	Analysis Date	Blank Results	Units	DL	LOD	LOQ
Perchlorate in Soil LC/MS/MS	05/13/15	N.D.	ug/kg	2.1	4.2	5.0

Quant Calibration Report (ISTD)

Batch Info

Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13315.batch.xml
Analysis Time 2015-05-14 07:55 **Analyst Name** Administrator
Report Time 2015-05-14 07:56 **Reporter Name** Administrator
Last Calib Update 2015-05-14 07:51 **Batch State** ResultsDirty

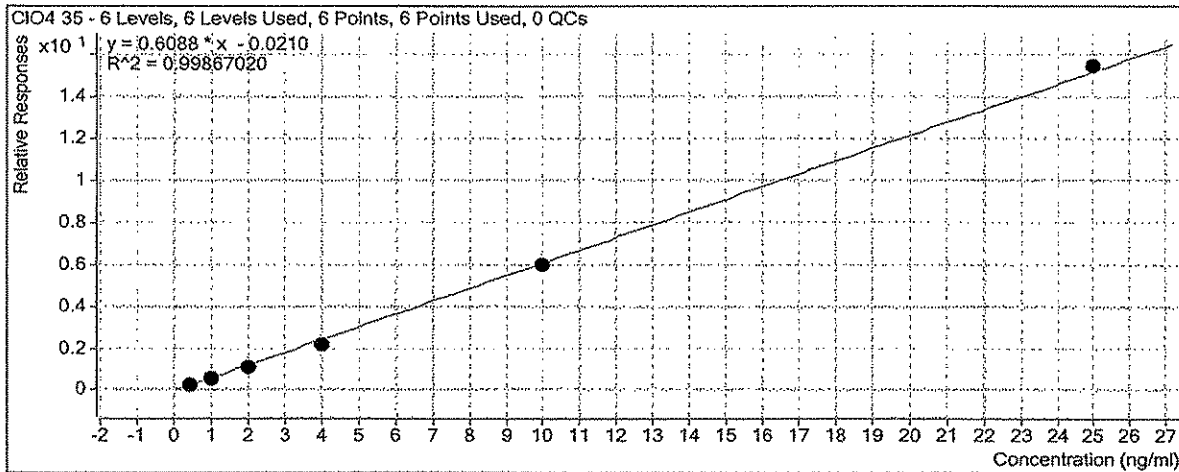
Calibration Info

ISTD Compound CIO4 18

13269

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p13315004.d	Calibration	L1	<input checked="" type="checkbox"/>	13982	10.0000	1398.1985
ms5p13315005.d	Calibration	L2	<input checked="" type="checkbox"/>	13752	10.0000	1375.1688
ms5p13315006.d	Calibration	L3	<input checked="" type="checkbox"/>	13641	10.0000	1364.1199
ms5p13315007.d	Calibration	L4	<input checked="" type="checkbox"/>	14301	10.0000	1430.1211
ms5p13315008.d	Calibration	L5	<input checked="" type="checkbox"/>	12728	10.0000	1272.8137
ms5p13315009.d	Calibration	L6	<input checked="" type="checkbox"/>	11213	10.0000	1121.3033

Target Compound CIO4 35



Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p13315004.d	Calibration	L1	<input checked="" type="checkbox"/>	3422	0.4000	6.1184
ms5p13315005.d	Calibration	L2	<input checked="" type="checkbox"/>	8306	1.0000	6.0402
ms5p13315006.d	Calibration	L3	<input checked="" type="checkbox"/>	15608	2.0000	5.7209
ms5p13315007.d	Calibration	L4	<input checked="" type="checkbox"/>	31856	4.0000	5.5687
ms5p13315008.d	Calibration	L5	<input checked="" type="checkbox"/>	75765	10.0000	5.9525
ms5p13315009.d	Calibration	L6	<input checked="" type="checkbox"/>	173965	25.0000	6.2058

100% RATIO USING LEVEL 4

2.93

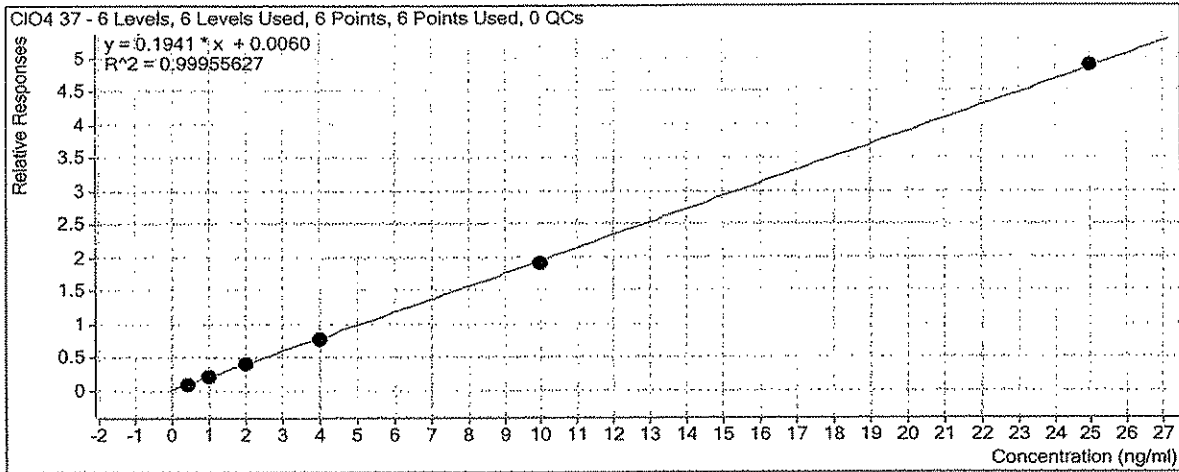
Valeria L. Tomayko
 Principal Specialist

MAY 15 2015

JUA 84 5/14/15

Quant Calibration Report (ISTD)

Target Compound *ClO4 37*



Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p13315004.d	Calibration	L1	<input checked="" type="checkbox"/>	1115	0.4000	1.9938
ms5p13315005.d	Calibration	L2	<input checked="" type="checkbox"/>	2900	1.0000	2.1091
ms5p13315006.d	Calibration	L3	<input checked="" type="checkbox"/>	5567	2.0000	2.0404
ms5p13315007.d	Calibration	L4	<input checked="" type="checkbox"/>	10849	4.0000	1.8965
ms5p13315008.d	Calibration	L5	<input checked="" type="checkbox"/>	24337	10.0000	1.9121
ms5p13315009.d	Calibration	L6	<input checked="" type="checkbox"/>	54904	25.0000	1.9586

Quant Calibration Report (ISTD)

Batch Info

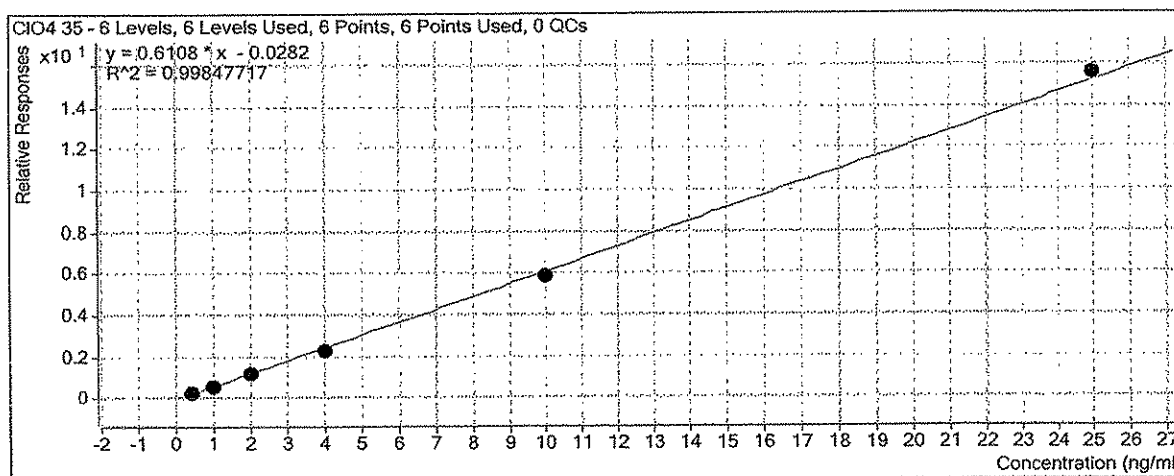
Batch Data Path D:\MassHunter\Data\perchlorate\QuantResults\ms5p13415.batch.xml
Analysis Time 2015-05-15 07:54 **Analyst Name** Administrator
Report Time 2015-05-15 07:55 **Reporter Name** Administrator
Last Calib Update 2015-05-15 07:47 **Batch State** ResultsDirty

Calibration Info

ISTD Compound CIO4 18

Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p13415004.d	Calibration	L1	<input checked="" type="checkbox"/>	10476	10.0000	1047.6414
ms5p13415005.d	Calibration	L2	<input checked="" type="checkbox"/>	10677	10.0000	1067.6842
ms5p13415006.d	Calibration	L3	<input checked="" type="checkbox"/>	10977	10.0000	1097.6637
ms5p13415007.d	Calibration	L4	<input checked="" type="checkbox"/>	10998	10.0000	1099.8230
ms5p13415008.d	Calibration	L5	<input checked="" type="checkbox"/>	10018	10.0000	1001.7944
ms5p13415009.d	Calibration	L6	<input checked="" type="checkbox"/>	8552	10.0000	855.2489

Target Compound CIO4 35



Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p13415004.d	Calibration	L1	<input checked="" type="checkbox"/>	2457	0.4000	5.8624
ms5p13415005.d	Calibration	L2	<input checked="" type="checkbox"/>	6420	1.0000	6.0131
ms5p13415006.d	Calibration	L3	<input checked="" type="checkbox"/>	12687	2.0000	5.7792
ms5p13415007.d	Calibration	L4	<input checked="" type="checkbox"/>	24919	4.0000	5.6643
ms5p13415008.d	Calibration	L5	<input checked="" type="checkbox"/>	58480	10.0000	5.8375
ms5p13415009.d	Calibration	L6	<input checked="" type="checkbox"/>	133700	25.0000	6.2531

ION RATIO USING LEVELY

2.98

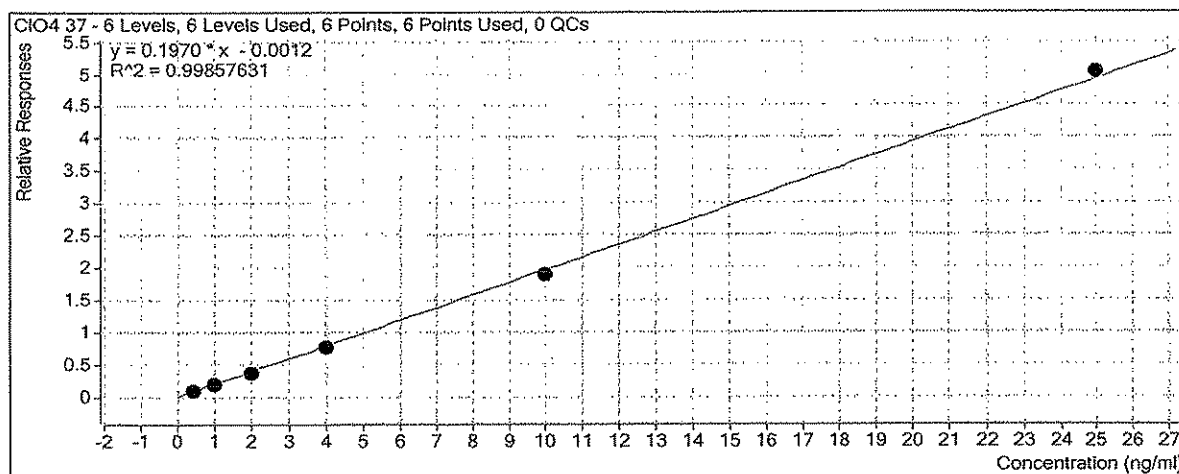
Valerie L. Tomayko
 Principal Specialist

MAY 15 2015

RMSK sls/15

Quant Calibration Report (ISTD)

Target Compound *C104 37*



Calibration STD	Cal Type	Level	Enabled	Response	Exp Conc	RF
ms5p13415004.d	Calibration	L1	<input checked="" type="checkbox"/>	892	0.4000	2.1288
ms5p13415005.d	Calibration	L2	<input checked="" type="checkbox"/>	2129	1.0000	1.9941
ms5p13415006.d	Calibration	L3	<input checked="" type="checkbox"/>	4044	2.0000	1.8420
ms5p13415007.d	Calibration	L4	<input checked="" type="checkbox"/>	8346	4.0000	1.8970
ms5p13415008.d	Calibration	L5	<input checked="" type="checkbox"/>	18915	10.0000	1.8882
ms5p13415009.d	Calibration	L6	<input checked="" type="checkbox"/>	43152	25.0000	2.0182

Continuing Calibration Method 6850

Run # ms5p13315

MS5P13315010	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.86 perchlorate	3.8	4		-5% ICV

MS5P13315021	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.86 perchlorate	0.4	0.4		0%

MS5P13315030	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.86 perchlorate	3.7	4		-8%

entered by MA 800 5/14/15

verified by NT047 5/15/15

Continuing Calibration Method 6850

Run # ms5p13415

MS5P13415010	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.86 perchlorate	3.8	4		-5% ICV

MS5P13415021	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.86 perchlorate	0.42	0.4		5%

MS5P13415032	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.85 perchlorate	3.8	4		-5%

MS5P13415043	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.85 perchlorate	4.8	0.4		1100%
		4.0		10%

Incorrect "Added" concentration used.
EWS 6/24/15

MS5P13415048	Found	Added	%D	
RT (min)	ug/L	ug/L		
1.85 perchlorate	3.8	4		-5%

entered by MAA 5/15/15

verified by Wray 5/15/15

PFAAs by LC/MS/MS

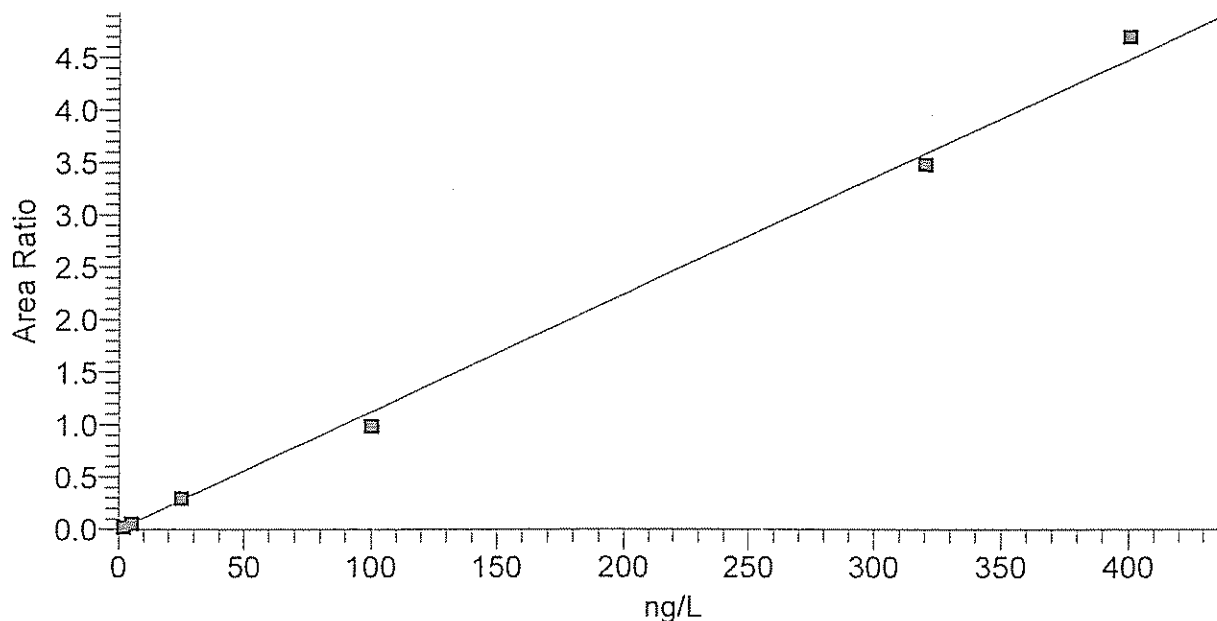
Fraction: PFAAs by LC/MS/MS

15138004 / BLK Analyte	Analysis Date	Blank Results	Units	DL	LOD	LOQ
Perfluorooctanoic acid	05/29/15	N.D.	ng/l	1	2	2
Perfluoro-octanesulfonate	05/29/15	N.D.	ng/l	5	10	10

LCMSMS ANALYSIS REPORT

Component Name: PFOA

PFOA
 $Y = -0.00264355 + 0.0112102 * X$ $R^2 = 0.9966$ $W: 1/X$



Identification Filter: - c ESI SRM ms2 412.90
 [168.90-168.91, 368.85-368.86]
 2nd Trace Type: N/A
 Mass Range 2 (m/z): N/A
 Base Peak(BP):
 Retention Time Window (sec): 30.00000
 RT Reference: No
 Adjust Using: N/A
 Detection Options
 ICIS Smoothing Points: 3
 Area Noise Factor: 10
 ICIS Constrain Peak Width: No
 ICIS Tailing Factor: N/A
 ICIS Peak Detection
 ICIS Minimum Peak Height (S/N): 5.0
 ICIS Window %:
 ICIS Forward: 0
 ICIS Match: 0
 ICIS Advanced Parameters
 Minimum Peak Width: 3
 Area Tail Extension: 5
 Component Type: Target Compound
 ISTD Amount: N/A
 ISTD: 13C-PFOA_(IS)
 Origin: IgnoreOrigin
 Calibration Curve: Linear
 Number of Cal. Levels: 6
 Scan Threshold (mAU): N/A
 Limit ScanRange (nm): N/A

Component Name: PFOA
 1st Trace Type: TIC
 Mass Range 1 (m/z):
 Wavelength Range 2 (nm): N/A
 Expected RT (min): 7.60000
 View Width (min): 3.00000
 Adjust Expected RT: No
 Peak Detection Algorithm: ICIS
 ICIS Peak Integration
 Baseline Window: 200
 Peak Noise Factor: 10
 ICIS Peak Height (%): N/A
 ICIS Identify By: Nearest RT
 ICIS Ion Ratio Confirmation: Disabled
 ICIS Qualifier Ion Coelution (min): N/A
 ICIS Spectrum Thresholds
 ICIS Reverse: 0
 Noise Method: Incos
 Multiplet Resolution: 10
 Area Scan Window: 0
 Calibration
 %RSD Calculation Method: Use calculated amounts
 Internal Standard
 ISTD Units: N/A
 Target Compounds
 Weighting: OneOverX
 Response: Area
 Target Units: ng/L
 Number of QC Levels: 5
 Peak Purity Options
 Peak Coverage (%): N/A

Michele J. Smith

JUN 01 2015

Michele J. Smith,
Senior Specialist

Meng Yu
Meng Yu
Principal Chemist

JUN 01 2015
PIS01 Page 78 of 99

LCMSMS ANALYSIS REPORT

Component Cal Level Table

Cal Level	Amount
1	2.000
2	5.000
3	25.000
4	100.000
5	320.000
6	400.000

Component QC Level Table

QC Level	Amount
ICV	200.000
VICV	100.000
1	25.000
2	100.000
3	320.000

ICV & CCV Result Table

Sample ID	Data File Name	Calculated Amount	Area	ISTD Area	Area Ratio	% Diff
CAL1	A15138004-03	2.077	7022.44	340245.86	0.021	3.85
CAL2	A15138004-04	4.963	16144.41	304681.56	0.053	-0.75
CAL3	A15138004-05	26.728	89963.93	302931.51	0.297	6.91
CAL4	A15138004-06	88.005	306067.84	311073.33	0.984	-12.00
CAL5	A15138004-07	310.871	963216.70	276605.42	3.482	-2.85
CAL6	A15138004-08	419.357	1278652.99	272144.74	4.698	4.84
CCV1	A15138004-11	24.238	80477.52	299101.57	0.269	-3.05
LCS15138004	A15138004-12	104.743	331006.89	282538.91	1.172	4.74
LCSD15138004	A15138004-13	112.685	319651.19	253575.05	1.261	12.69
CCV2	A15138004-16	91.669	278101.07	271321.84	1.025	-8.33
CCV3	A15138004-20	326.190	1090466.04	298430.19	3.654	1.93

Michele J. Smith

JUN 01 2015

Michele J. Smith
Senior Specialist

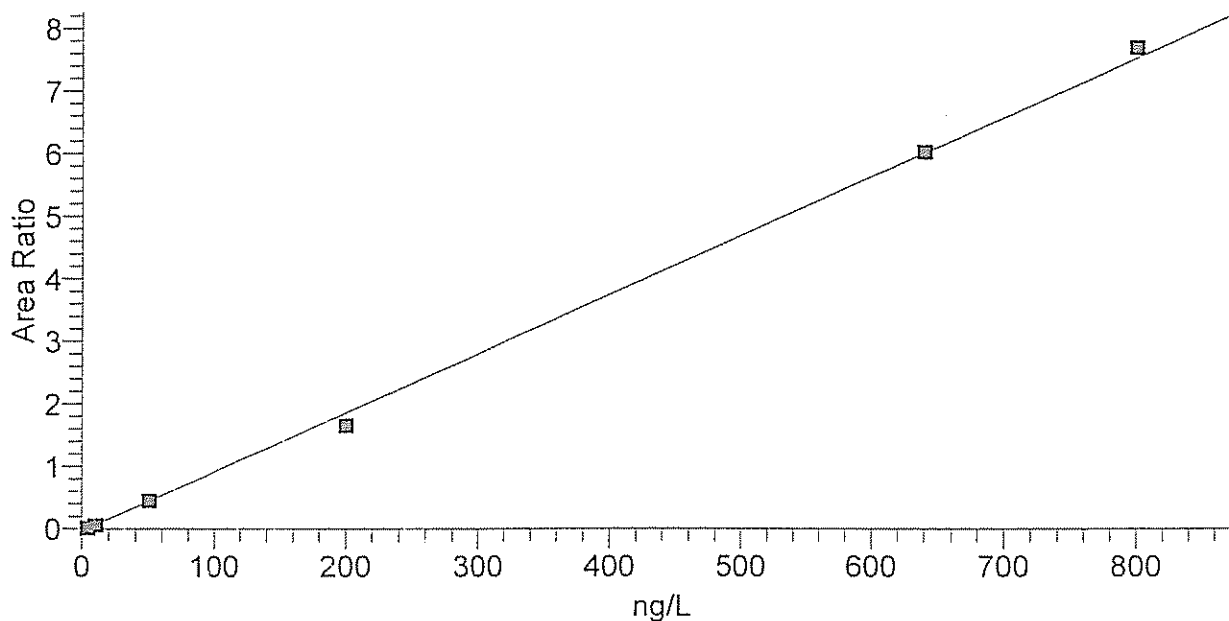
Meng Yu
Meng Yu
Principal Chemist

JUN 01 2015

LCMSMS ANALYSIS REPORT

Component Name: **PFOS**

PFOS
 $Y = -0.0294091 + 0.00942745 * X$ $R^2 = 0.9982$ $W: 1/X$



Identification
 Filter: - c ES1 SRM ms2 498.86
 [80.19-80.20, 99.00-99.00]
 2nd Trace Type: N/A
 Mass Range 2 (m/z):
 Base Peak(BP):
 Retention Time
 Window (sec): 50.00000
 RT Reference: No
 Adjust Using: N/A

Component Name: PFOS
 1st Trace Type: TIC
 Mass Range 1 (m/z):
 Wavelength Range 2 (nm): N/A
 Expected RT (min): 7.80000
 View Width (min): 3.00000
 Adjust Expected RT: No

Detection Options
 ICIS Smoothing Points: 3
 Area Noise Factor: 5
 ICIS Constrain Peak Width: No
 ICIS Tailing Factor: N/A
 ICIS Peak Detection
 ICIS Minimum Peak Height (S/N): 5.0
 ICIS Window %:

Peak Detection Algorithm: ICIS
 ICIS Peak Integration
 Baseline Window: 75
 Peak Noise Factor: 10
 ICIS Peak Height (%): N/A
 ICIS Identify By: Nearest RT
 ICIS Ion Ratio Confirmation: Disabled
 ICIS Qualifier Ion Coelution (min): N/A
 ICIS Spectrum Thresholds

ICIS Forward: 0
 ICIS Match: 0
 ICIS Advanced Parameters
 Minimum Peak Width: 3
 Area Tail Extension: 5

ICIS Reverse: 0
 Noise Method: Incos
 Multiplet Resolution: 10
 Area Scan Window: 0
 Calibration

Component Type: Target Compound
 ISTD Amount: N/A
 ISTD: 13C-PFOS_(IS)
 Origin: IgnoreOrigin
 Calibration Curve: Linear
 Number of Cal. Levels: 6

%RSD Calculation Method: Use calculated amounts
 Internal Standard
 ISTD Units: N/A
 Target Compounds
 Weighting: OneOverX
 Response: Area
 Target Units: ng/L
 Number of QC Levels: 5
 Peak Purity Options
 Peak Coverage (%): N/A

Scan Threshold (mAU): N/A
 Limit ScanRange (nm): N/A

Michele J. Smith

JUN 01 2015

**Michele J. Smith
 Senior Specialist**

Meng Yu
 Meng Yu
 Principal Chemist

JUN 01 2015
 PIS01 Page 80 of 99

LCMSMS ANALYSIS REPORT

Component Cal Level Table

Cal Level	Amount
1	4.000
2	10.000
3	50.000
4	200.000
5	640.000
6	800.000

Component QC Level Table

QC Level	Amount
VICV	100.000
ICV	200.000
1	50.000
2	200.000
3	640.000

ICV & CCV Result Table

Sample ID	Data File Name	Calculated Amount	Area	ISTD Area	Area Ratio	% Diff
CAL1	A15138004-03	4.597	560.43	40232.98	0.014	14.93
CAL2	A15138004-04	9.088	2141.36	38054.53	0.056	-9.12
CAL3	A15138004-05	51.105	17586.79	38875.86	0.452	2.21
CAL4	A15138004-06	178.740	60034.25	36260.22	1.656	-10.63
CAL5	A15138004-07	641.610	193583.81	32160.30	6.019	0.25
CAL6	A15138004-08	818.859	244944.43	31850.89	7.690	2.36
CCV1	A15138004-11	50.729	14904.62	33207.16	0.449	1.46
LCS15138004	A15138004-12	106.784	33719.65	34503.22	0.977	6.78
LCSD15138004	A15138004-13	103.835	32089.68	33796.79	0.949	3.83
CCV2	A15138004-16	178.959	53636.11	32355.41	1.658	-10.52
CCV3	A15138004-20	667.812	191653.53	30584.51	6.266	4.35

Meng Yu
Principal Chemist

JUN 01 2015

Michele J. Smith

JUN 01 2015

Michele J. Smith
Senior Specialist

Sequence Table

File Name	Sample ID	Sample Type	Level	Vial	Inj Vol	Dil Factor	Path	Inst Method	Proc Method
A15138004-01	equi	Unknown	N/A	d:1	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-02	SYS	Unknown	N/A	d:2	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-03	CAL1	Std Bracket	1	d:3	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-04	CAL2	Std Bracket	2	d:4	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-05	CAL3	Std Bracket	3	d:5	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-06	CAL4	Std Bracket	4	d:6	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-07	CAL5	Std Bracket	5	d:7	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-08	CAL6	Std Bracket	6	d:8	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-09	Recon	Unknown	N/A	d:1	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-10	BLK 15138004	Unknown	N/A	d:9	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-11	CCV1	QC	1	d:5	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-12	LCS15138004	QC	VICV	d:10	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-13	LCS15138004	QC	VICV	d:11	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-14	7879426 (BKG)	Unknown	N/A	d:12	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-15	7879426 MS	Unknown	N/A	d:13	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-16	CCV2	QC	2	d:6	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-17	7873709 DF100	Unknown	N/A	d:14	10.0	100.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-18	7873709	Unknown	N/A	d:15	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-19	7879425	Unknown	N/A	d:16	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan
A15138004-20	CCV3	QC	3	d:7	10.0	1.000	C:\XCalibur\PFC\2015May	C:\XCalibur\PFC\Acquisition\MIPFOAOS	C:\XCalibur\PFC\Quan

Michelle J. Smith

JUN 01 2015

**Michele J. Smith
Senior Specialist**

M. Yu
Meng Yu
Principal Chemist

JUN 01 2015

Instrumental Wet Chemistry

Fraction: Instrumental Wet Chemistry

15126987141A / 151264BB Parameter	ME	Analysis Date	Blank Results	Units	DL	LOD	LOQ
Hexavalent Chromium	IC	05/06/15	N.D.	ug/l	0.015	0.050	0.050

15128987141A / 151284BB Parameter	ME	Analysis Date	Blank Results	Units	DL	LOD	LOQ
Hexavalent Chromium	IC	05/08/15	N.D.	ug/l	0.015	0.050	0.050

Fraction: Instrumental Wet Chemistry

15126243201A / P12643AB Parameter	ME	Analysis Date	Blank Results	Units	DL	LOD	LOQ
Hexavalent Chromium by IC	IC	05/07/15	N.D.	mg/kg	0.14	0.40	0.40

Fraction: Instrumental Wet Chemistry

12868: Hexavalent Chromium	Default	Default	Default	
Analyte Name	DL	LOD	LOQ	Units
Hexavalent Chromium	0.015	0.050	0.050	ug/l

05892: Hexavalent Chromium by IC	Default	Default	Default	
Analyte Name	DL	LOD	LOQ	Units
Hexavalent Chromium by IC	0.14	0.40	0.40	mg/kg

Wet Chemistry

SDG: PIS01
Matrix: SOLID

Water Quality
Fraction: Wet Chemistry

LCS: P126039Q		Batch: 15126039401B (Sample number(s): 7873707-7873708)							
Parameter	ME	Spike Added Std. Units	LCS Conc Std. Units	LCSD Conc Std. Units	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
pH	MTR	7.00	7.04	NA	101	NA	95-105	NA	NA

LCS: P126182Q		Batch: 15126182102B (Sample number(s): 7873707-7873708)							
Parameter	ME	Spike Added mV	LCS Conc mV	LCSD Conc mV	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Oxidation Reduction Potential	TI	427	432.5	NA	101	NA	98-102	NA	NA

SDG: PIS01
Matrix: LIQUID

Water Quality
Fraction: Wet Chemistry

LCS: P126121Q		Batch: 15126121521B (Sample number(s): 7873710)								
Parameter	ME	Spike Added Std. Units	LCS Conc Std. Units	LCSD Conc Std. Units	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits	
pH	MTR	7.00	7.02	NA	100	NA	95-105	NA	NA	

LCS: P126182Q		Batch: 15126182101B (Sample number(s): 7873710)								
Parameter	ME	Spike Added mV	LCS Conc mV	LCSD Conc mV	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits	
Oxidation Reduction Potential	TI	427	434	NA	102	NA	98-102	NA	NA	

LCS: P131121Q		Batch: 15131121521A (Sample number(s): 7879426)								
Parameter	ME	Spike Added Std. Units	LCS Conc Std. Units	LCSD Conc Std. Units	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits	
pH	MTR	7.00	7.02	NA	100	NA	95-105	NA	NA	

LCS: P131182Q		Batch: 15131182101A (Sample number(s): 7879426)								
Parameter	ME	Spike Added mV	LCS Conc mV	LCSD Conc mV	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits	
Oxidation Reduction Potential	TI	427	433	NA	101	NA	98-102	NA	NA	

DODCMD_ID	INSTALLATION_ID	SDG	SITE_NAME	NORM_SITE_NAME	LOCATION_NAME	LOCATION_TYPE_DESC	COORD_X	COORD_Y	CONTRACT_ID	DO_CTO_NUMBER	CONTR_NAME	SAMPLE_NAME	SAMPLE_MATRIX_DESC	SAMPLE_TYPE_DESC	COLLECT_DATE	ANALYTICAL_METHOD	ANALYTICAL_METHOD_GRP_DESC
MID_ATLANTIC	PARRIS_ISLAND_MCRD	PIS01							N6246704D0055	110	TETRA TECH NUS, INC.	PAI-RB01-050715	Water for QC samples	Equipment blank	7-May-15	537	Perfluoroalkyl Compounds
MID_ATLANTIC	PARRIS_ISLAND_MCRD	PIS01	SITE 00004	SITE 00004	PAI04TW02	Temporary well point	2102227.306	182838.8033	N6246704D0055	110	TETRA TECH NUS, INC.	PAI-04-TW02-20150506	Ground water	Normal (Regular)	6-May-15	537	Perfluoroalkyl Compounds
MID_ATLANTIC	PARRIS_ISLAND_MCRD	PIS01	SITE 00004	SITE 00004	PAI04TW01	Temporary well point	2102048.853	183008.2689	N6246704D0055	110	TETRA TECH NUS, INC.	PAI-04-TW01-20150504	Ground water	Normal (Regular)	4-May-15	537	Perfluoroalkyl Compounds