

DoD Type I Data Package

Prepared for:

EA Engineering, Science & Tech

Suite 515

615 Piikoi Street

Honolulu HI 96814

Project: Moose Creek Drinking Water

Groundwater Samples

Collected on 11/10/16-11/15/16

SDG# MCR09

GROUP

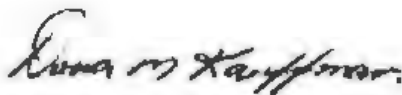
1734482

SAMPLE NUMBERS

8702096-8702106

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: 12/08/2016

Dana M. Kauffman
Manager

Any questions or concerns you might have regarding this data package should be directed to your client representative, Kay Hower at (510) 672-3979.

Table of Contents for SDG# MCR09

1. Sample Reference List3

2. Preservation Data4

3. Methodology Summary/Reference5

4. Analysis Reports / Field Chain of Custody6

5. PFAAs by LC/MS/MS Data26

 a. Case Narrative/Conformance Summary27

 b. QC Summary30

 c. Sample Data40

 d. Standards Data68

 e. Raw QC Data119

 f. Preparation Logs128

Sample Reference List for SDG Number MCR09
with a Data Package Type of I-DOD
30098 - EA Engineering, Science & Tech
 Project: Moose Creek Drinking Water

Lab Sample Number	Client Sample ID	Collection Date	Date Received
8702096	16MC-PW135-P1-1110	11/10/2016 12:10	11/17/2016 09:30
8702097	16MC-PW135-P4-1110	11/10/2016 12:15	11/17/2016 09:30
8702098	16MC-PW135-P5-1110	11/10/2016 12:20	11/17/2016 09:30
8702099	16MC-PW021-P10-1110	11/10/2016 13:05	11/17/2016 09:30
8702100	16MC-PW021-P10-1110 MS	11/10/2016 13:05	11/17/2016 09:30
8702101	16MC-PW021-P10-1110 MSD	11/10/2016 13:05	11/17/2016 09:30
8702102	16MC-PW055-P4-1111	11/11/2016 10:15	11/17/2016 09:30
8702103	16MC-PW130-P3-1114	11/14/2016 10:18	11/17/2016 09:30
8702104	16MC-PW052-P3-1114	11/14/2016 10:50	11/17/2016 09:30
8702105	16MC-PW152-P3-1114	11/14/2016 11:28	11/17/2016 09:30
8702106	16MC-PW101-WT-1115	11/15/2016 13:50	11/17/2016 09:30

Sample pH Log

SDG: MCR09

<u>LLI Sample</u> <u>Number</u>	<u>Bottle</u> <u>Code</u>	<u>Actual</u> <u>pH</u>	<u>Exp.</u> <u>pH</u>	<u>pH Check</u> <u>Code</u>	<u>Adj.</u> <u>pH</u>	<u>Adjusted</u> <u>Date</u>	<u>Adjusted</u> <u>Time</u>	<u>Preservative</u> <u>Added</u>	<u>Preservative</u> <u>Lot #</u>	<u>LLI</u> <u>Supplied</u> <u>Bottle?</u>	<u>Sulfide</u> <u>Present?</u>	<u>Corrective</u> <u>Substance</u>	<u>CS Lot #</u>	<u>Res. Cl.</u> <u>Present?</u>	<u>Corrective</u> <u>Substance</u>	<u>CS Lot #</u>	<u>Record Date</u>	<u>Employee</u>
8702096	201A		N/A	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	N	NA	NA	11/17/2016 10:02:47PM	0
8702097	201A		N/A	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	N	NA	NA	11/17/2016 10:02:59PM	0
8702098	201A		N/A	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	N	NA	NA	11/17/2016 10:03:26PM	0
8702099	201A		N/A	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	N	NA	NA	11/17/2016 10:03:18PM	0
8702100	201A		N/A	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	N	NA	NA	11/17/2016 10:02:57PM	0
8702101	201A		N/A	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	N	NA	NA	11/17/2016 10:02:52PM	0
8702102	201A		N/A	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	N	NA	NA	11/17/2016 10:02:38PM	0
8702103	201A		N/A	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	N	NA	NA	11/17/2016 10:03:02PM	0
8702104	201A		N/A	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	N	NA	NA	11/17/2016 10:02:35PM	0
8702105	201A		N/A	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	N	NA	NA	11/17/2016 10:03:21PM	0
8702106	201A		N/A	NA	NA	NA	NA	NA	NA	Y	NA	NA	NA	N	NA	NA	11/17/2016 10:02:49PM	0

Check Code Key
PK = Original container checked - pH is within the correct range. (No preservative was added) PA = Original container checked - pH adjusted to correct range. (Preservative was added) PV = Volatile container checked PC = pH checked (unpreserved container) SPK = Subsampled from an original container. Original container checked - pH is within correct range SPA = Subsampled from an original container. Subsample container checked - pH adjusted to correct range. SPC = Subsampled from an original container. pH checked (unpreserved container). SUP = Subsampled from original container. Unable to be preserved due to the matrix of the sample. UP = Unable to preserve due to matrix of the sample. NA = Not applicable

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

14091 PFAA Water Prep**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 in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LCMSMS), Version 1.1, September 2009.

Analysis Reports / Field Chain of Custody

ANALYTICAL RESULTS

Prepared by:

Prepared for:

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

EA Engineering, Science & Tech
Suite 515
615 Piikoi Street
Honolulu HI 96814

Report Date: December 06, 2016

Project: Moose Creek Drinking Water

Submittal Date: 11/17/2016

Group Number: 1734482

SDG: MCR09

PO Number: 14218

State of Sample Origin: AK

Client Sample Description

	Lancaster Labs (LL) #
16MC-PW135-P1-1110 Grab Groundwater	8702096
16MC-PW135-P4-1110 Grab Groundwater	8702097
16MC-PW135-P5-1110 Grab Groundwater	8702098
16MC-PW021-P10-1110 Grab Groundwater	8702099
16MC-PW021-P10-1110 MS Grab Groundwater	8702100
16MC-PW021-P10-1110 MSD Grab Groundwater	8702101
16MC-PW055-P4-1111 Grab Groundwater	8702102
16MC-PW130-P3-1114 Grab Groundwater	8702103
16MC-PW052-P3-1114 Grab Groundwater	8702104
16MC-PW152-P3-1114 Grab Groundwater	8702105
16MC-PW101-WT-1115 Grab Groundwater	8702106

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 current scopes of accreditation can be viewed at <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/> . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To EA Engineering, Science & Tech
Electronic Copy To EA Engineering, Science & Tech

Attn: PacificChem Mailbox
Attn: Brenda Nuding

Respectfully Submitted,



Kay Hower

(510) 672-3979

Project Name: Moose Creek Drinking Water
LL Group #: 1734482

General Comments:

All analyses have been performed in accordance with DOD QSM Version 5.0 unless otherwise noted below.

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 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: 16MC-PW135-P1-1110 Grab Groundwater
Moose Creek Drinking Water

LL Sample # PW 8702096
LL Group # 1734482
Account # 30098

Project Name: Moose Creek Drinking Water

Collected: 11/10/2016 12:10 by NS

EA Engineering, Science & Tech
Suite 515

Submitted: 11/17/2016 09:30

615 Piikoi Street

Reported: 12/06/2016 16:38

Honolulu HI 96814

135P1 SDG#: MCR09-01

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	36	1	2	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	590	5	10	10	1

Sample Comments

State of Alaska Lab Certification No. UST-061

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
10954	PFOA/PFOS DoD	EPA 537 Rev. 1.1 modified	1	16326003	11/22/2016 18:04	Atulbhai Patel	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16326003	11/21/2016 17:45	Devon M Whooley	1

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

Sample Description: 16MC-PW135-P4-1110 Grab Groundwater
Moose Creek Drinking Water

LL Sample # PW 8702097
LL Group # 1734482
Account # 30098

Project Name: Moose Creek Drinking Water

Collected: 11/10/2016 12:15 by NS

EA Engineering, Science & Tech
Suite 515

Submitted: 11/17/2016 09:30

615 Piikoi Street

Reported: 12/06/2016 16:38

Honolulu HI 96814

135P4 SDG#: MCR09-02

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	2 U	1	2	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	10 U	5	10	10	1

Sample Comments

State of Alaska Lab Certification No. UST-061

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
10954	PFOA/PFOS DoD	EPA 537 Rev. 1.1 modified	1	16326003	11/22/2016 18:21	Atulbhai Patel	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16326003	11/21/2016 17:45	Devon M Whooley	1

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

Sample Description: 16MC-PW135-P5-1110 Grab Groundwater
Moose Creek Drinking Water

LL Sample # PW 8702098
LL Group # 1734482
Account # 30098

Project Name: Moose Creek Drinking Water

Collected: 11/10/2016 12:20 by NS

EA Engineering, Science & Tech
Suite 515

Submitted: 11/17/2016 09:30

615 Piikoi Street

Reported: 12/06/2016 16:38

Honolulu HI 96814

135P5 SDG#: MCR09-03

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	2 U	1	2	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	10 U	5	10	10	1

Sample Comments

State of Alaska Lab Certification No. UST-061

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
10954	PFOA/PFOS DoD	EPA 537 Rev. 1.1 modified	1	16326003	11/22/2016 18:37	Atulbhai Patel	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16326003	11/21/2016 17:45	Devon M Whooley	1

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

Sample Description: 16MC-PW021-P10-1110 Grab Groundwater
Moose Creek Drinking Water

LL Sample # PW 8702099
LL Group # 1734482
Account # 30098

Project Name: Moose Creek Drinking Water

Collected: 11/10/2016 13:05 by NS

EA Engineering, Science & Tech
Suite 515

Submitted: 11/17/2016 09:30

615 Piikoi Street

Reported: 12/06/2016 16:38

Honolulu HI 96814

21P10 SDG#: MCR09-04BKG

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	2 U	1	2	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	10 U	5	10	10	1

Sample Comments

State of Alaska Lab Certification No. UST-061

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
10954	PFOA/PFOS DoD	EPA 537 Rev. 1.1 modified	1	16326003	11/22/2016 15:53	Atulbhai Patel	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16326003	11/21/2016 17:45	Devon M Whooley	1

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

Sample Description: 16MC-PW021-P10-1110 MS Grab Groundwater
Moose Creek Drinking Water

LL Sample # PW 8702100
LL Group # 1734482
Account # 30098

Project Name: Moose Creek Drinking Water

Collected: 11/10/2016 13:05 by NS

EA Engineering, Science & Tech
Suite 515

Submitted: 11/17/2016 09:30

615 Piikoi Street

Reported: 12/06/2016 16:38

Honolulu HI 96814

21P10 SDG#: MCR09-04MS

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	160	1	2	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	180	5	10	10	1

Sample Comments

State of Alaska Lab Certification No. UST-061

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
10954	PFOA/PFOS DoD	EPA 537 Rev. 1.1 modified	1	16326003	11/22/2016 16:09	Atulbhai Patel	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16326003	11/21/2016 17:45	Devon M Whooley	1

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

Sample Description: 16MC-PW021-P10-1110 MSD Grab Groundwater
Moose Creek Drinking Water

LL Sample # PW 8702101
LL Group # 1734482
Account # 30098

Project Name: Moose Creek Drinking Water

Collected: 11/10/2016 13:05 by NS

EA Engineering, Science & Tech
Suite 515

Submitted: 11/17/2016 09:30

615 Piikoi Street

Reported: 12/06/2016 16:38

Honolulu HI 96814

21P10 SDG#: MCR09-04MSD

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	200	1	2	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	190	5	10	10	1

Sample Comments

State of Alaska Lab Certification No. UST-061

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
10954	PFOA/PFOS DoD	EPA 537 Rev. 1.1 modified	1	16326003	11/22/2016 16:25	Atulbhai Patel	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16326003	11/21/2016 17:45	Devon M Whooley	1

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

Sample Description: 16MC-PW055-P4-1111 Grab Groundwater
Moose Creek Drinking Water

LL Sample # PW 8702102
LL Group # 1734482
Account # 30098

Project Name: Moose Creek Drinking Water

Collected: 11/11/2016 10:15 by NS

EA Engineering, Science & Tech
Suite 515

Submitted: 11/17/2016 09:30

615 Piikoi Street

Reported: 12/06/2016 16:38

Honolulu HI 96814

055P4 SDG#: MCR09-05

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	2 U	1	2	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	10 U	5	10	10	1

Sample Comments

State of Alaska Lab Certification No. UST-061

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
10954	PFOA/PFOS DoD	EPA 537 Rev. 1.1 modified	1	16326003	11/22/2016 18:53	Atulbhai Patel	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16326003	11/21/2016 17:45	Devon M Whooley	1

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

Sample Description: 16MC-PW130-P3-1114 Grab Groundwater
Moose Creek Drinking Water

LL Sample # PW 8702103
LL Group # 1734482
Account # 30098

Project Name: Moose Creek Drinking Water

Collected: 11/14/2016 10:18 by NS

EA Engineering, Science & Tech
Suite 515

Submitted: 11/17/2016 09:30

615 Piikoi Street

Reported: 12/06/2016 16:38

Honolulu HI 96814

130P3 SDG#: MCR09-06

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	1 J	1	2	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	10 U	5	10	10	1

Sample Comments

State of Alaska Lab Certification No. UST-061

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
10954	PFOA/PFOS DoD	EPA 537 Rev. 1.1 modified	1	16326003	11/22/2016 19:10	Atulbhai Patel	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16326003	11/21/2016 17:45	Devon M Whooley	1

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

Sample Description: 16MC-PW052-P3-1114 Grab Groundwater
Moose Creek Drinking Water

LL Sample # PW 8702104
LL Group # 1734482
Account # 30098

Project Name: Moose Creek Drinking Water

Collected: 11/14/2016 10:50 by NS

EA Engineering, Science & Tech
Suite 515

Submitted: 11/17/2016 09:30

615 Piikoi Street

Reported: 12/06/2016 16:38

Honolulu HI 96814

052P3 SDG#: MCR09-07

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	2 J	1	2	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	10 U	5	10	10	1

Sample Comments

State of Alaska Lab Certification No. UST-061

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
10954	PFOA/PFOS DoD	EPA 537 Rev. 1.1 modified	1	16326003	11/22/2016 19:26	Atulbhai Patel	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16326003	11/21/2016 17:45	Devon M Whooley	1

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

Sample Description: 16MC-PW152-P3-1114 Grab Groundwater
Moose Creek Drinking Water

LL Sample # PW 8702105
LL Group # 1734482
Account # 30098

Project Name: Moose Creek Drinking Water

Collected: 11/14/2016 11:28 by NS

EA Engineering, Science & Tech
Suite 515

Submitted: 11/17/2016 09:30

615 Piikoi Street

Reported: 12/06/2016 16:38

Honolulu HI 96814

152P3 SDG#: MCR09-08

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	2	1	2	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	10 U	5	10	10	1

Sample Comments

State of Alaska Lab Certification No. UST-061

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
10954	PFOA/PFOS DoD	EPA 537 Rev. 1.1 modified	1	16326003	11/22/2016 19:43	Atulbhai Patel	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16326003	11/21/2016 17:45	Devon M Whooley	1

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

Sample Description: 16MC-PW101-WT-1115 Grab Groundwater
Moose Creek Drinking Water

LL Sample # PW 8702106
LL Group # 1734482
Account # 30098

Project Name: Moose Creek Drinking Water

Collected: 11/15/2016 13:50 by NS

EA Engineering, Science & Tech
Suite 515

Submitted: 11/17/2016 09:30

615 Piikoi Street

Reported: 12/06/2016 16:38

Honolulu HI 96814

101WT SDG#: MCR09-09

CAT No.	Analysis Name	CAS Number	Result	Detection Limit*	Limit of Detection	Limit of Quantitation	DF
Misc. Organics		EPA 537 Rev. 1.1 modified	ng/l	ng/l	ng/l	ng/l	
10954	Perfluorooctanoic acid	335-67-1	11	1	2	2	1
10954	Perfluoro-octanesulfonate	1763-23-1	37	5	10	10	1

Sample Comments

State of Alaska Lab Certification No. UST-061

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
10954	PFOA/PFOS DoD	EPA 537 Rev. 1.1 modified	1	16326003	11/22/2016 19:59	Atulbhai Patel	1
14091	PFAA Water Prep	EPA 537 Rev. 1.1 modified	1	16326003	11/21/2016 17:45	Devon M Whooley	1

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

Quality Control Summary

Client Name: EA Engineering, Science & Tech
Reported: 12/06/2016 16:38

Group Number: 1734482

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.

Method Blank

Analysis Name	Result	DL**	LOD	LOQ
	ng/l	ng/l	ng/l	ng/l
Batch number: 16326003	Sample number(s): 8702096-8702106			
Perfluorooctanoic acid	2 U	1	2	2
Perfluoro-octanesulfonate	10 U	5	10	10

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ng/l	ng/l	ng/l	ng/l					
Batch number: 16326003	Sample number(s): 8702096-8702106								
Perfluorooctanoic acid	200	167.77			84		70-130		
Perfluoro-octanesulfonate	191	174.94			92		70-130		

MS/MSD

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

Analysis Name	Unspiked Conc	MS Spike Added	MS Conc	MSD Spike Added	MSD Conc	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
	ng/l	ng/l	ng/l	ng/l	ng/l					
Batch number: 16326003	Sample number(s): 8702096-8702106				UNSPK: 8702099					
Perfluorooctanoic acid	2 U	200.22	161.61	199.16	196.66	81	99	70-130	20	30
Perfluoro-octanesulfonate	10 U	191.21	175.77	190.2	192.78	92	101	70-130	9	30

*- 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.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: EA Engineering, Science & Tech
Reported: 12/06/2016 16:38

Group Number: 1734482

*- 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.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Environmental Analysis Request/Chain of Custody



Lancaster Laboratories
Environmental

Acct. # 30098

Group # 1734482

Sample # 8702096-106

COC# 106 Pg 1 of 1

Client: EA Engineering, Inc., PBC.				Matrix ☐ Sediment ☒ Ground ☐ Surface ☐ Potable ☐ NPDES ☐ Water ☐ Other:		Analyses Requested										For Lab Use Only			
Project Name/ #: Moose Creek Drinking Water		Site ID #:				Preservation Codes										SF #: _____			
Project Manager: Mark Wilkinson/Brenda Nuding		P.O. #: 14218		P None N O None H, As										SCR #: _____					
Sampler: N. Stoecklein		PWSID #:		Total Organic Carbon (SM5310C) Total Dissolved Solids (SM2540C) Metals, Hardness (EPA 200.7/200.8/245.1, SM2340B) PFCs (EPA Method 537) Total Suspended Solids (SM2540D) VOCs (EPA 824.2)										Preservation Codes H = HCl T = Thiosulfate N = HNO ₃ B = NaOH S = H ₂ SO ₄ P = H ₃ PO ₄ O = Other - Na ₂ S ₂ O ₃					
Phone #: 907-456-4751		Quote #:												State where sample(s) were collected: Alaska		Total # of Containers		Remarks	
Sample Identification		Date	Time	Grab	Composite	Soil	Water	Other:	Total # of Containers										
16MC-PW135-P1-1110		11/10/16	1210	X			X		1										
16MC-PW135-P4-1110		11/10/16	1215	X			X		1										
16MC-PW135-P5-1110		11/10/16	1220	X			X		1										
16MC-PW021-P10-1110		11/10/16	1305	X			X		3										
16MC-PW055-P4-1111		11/11/16	1015	X			X		1										
16MC-PW130-P3-1114		11/14/16	1018	X			X		1										
16MC-PW052-P3-1114		11/14/16	1050	X			X		1										
16MC-PW152-P3-1114		11/14/16	1128	X			X		1										
16MC-PW101-WT-1115		11/15/16	1350	X			X		1										
Turnaround Time Requested (TAT) (please check): Standard ☒ Rush ☐						Relinquished by: <i>Nicole Stoecklein, Eng.</i>		Date	Time	Received by:		Date	Time						
Date results are needed:						Relinquished by:		Date	Time	Received by:		Date	Time						
Rush results requested by (please check): E-Mail ☒ Phone ☐						Relinquished by:		Date	Time	Received by:		Date	Time						
E-mail Address: <u>gmanning@eaest.com</u>						Relinquished by:		Date	Time	Received by:		Date	Time						
Phone: 808-589-1455 X 102						Relinquished by:		Date	Time	Received by:		Date	Time						
Data Package Options (please check if required)						Relinquished by:		Date	Time	Received by:		Date	Time						
Type I (Validation/non-CLP) ☐ MA MCP ☐						Relinquished by:		Date	Time	Received by:		Date	Time						
Type III (Reduced non-CLP) ☐ CT RCP ☐						Relinquished by:		Date	Time	Received by:		Date	Time						
Type IV (CLP SOW) ☒ TX TRRP-13 ☐						Relinquished by:		Date	Time	Received by:		Date	Time						
Type VI (Raw Data Only) ☐						Relinquished by:		Date	Time	Received by:		Date	Time						
EDD Required? Yes ☒ No ☐ If yes, format: SEDD						Relinquished by Commercial Carrier:		UPS ☒		Temperature upon receipt <u>2.7</u> °C									

Sample Administration
Receipt Documentation LogDoc Log ID: 168467
Group Number(s): 1734482Client: EA Engineering**Delivery and Receipt Information**

Delivery Method:	<u>UPS</u>	Arrival Timestamp:	<u>11/17/2016 9:30</u>
Number of Packages:	<u>1</u>	Number of Projects:	<u>1</u>
State/Province of Origin:	<u>AK</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:	N/A
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 Melvin Sanchez (8943) at 14:56 on 11/17/2016***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	DT146	2.7	DT	Wet	N	Bagged	N

Explanation of Symbols and Abbreviations

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

BMQL	Below Minimum Quantitation Level	mg	milligram(s)
C	degrees Celsius	mL	milliliter(s)
cfu	colony forming units	MPN	Most Probable Number
CP Units	cobalt-chloroplatinate units	N.D.	none detected
F	degrees Fahrenheit	ng	nanogram(s)
g	gram(s)	NTU	nephelometric turbidity units
IU	International Units	pg/L	picogram/liter
kg	kilogram(s)	RL	Reporting Limit
L	liter(s)	TNTC	Too Numerous To Count
lb.	pound(s)	µg	microgram(s)
m3	cubic meter(s)	µL	microliter(s)
meq	milliequivalents	umhos/cm	micromhos/cm
<	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...
- W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

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, and ISO 17025) 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.

PFAAs by LC/MS/MS Data

Case Narrative/Conformance Summary

PFAAs by LC/MS/MS

Case Narrative/Conformance Summary

CLIENT: EA Engineering, Science & Tech
SDG: MCR09

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

Sample #	Client ID	Matrix		DF	Comments
		Liquid	Solid		
8702096	16MC-PW135-P1-1110	X		1	
8702097	16MC-PW135-P4-1110	X		1	
8702098	16MC-PW135-P5-1110	X		1	
8702099	16MC-PW021-P10-1110	X		1	Unspiked
8702100	16MC-PW021-P10-1110 MS	X		1	Matrix Spike
8702101	16MC-PW021-P10-1110 MSD	X		1	Matrix Spike Duplicate
8702102	16MC-PW055-P4-1111	X		1	
8702103	16MC-PW130-P3-1114	X		1	
8702104	16MC-PW052-P3-1114	X		1	
8702105	16MC-PW152-P3-1114	X		1	
8702106	16MC-PW101-WT-1115	X		1	

All analyses have been performed in accordance with DOD QSM Version 5.0 unless otherwise noted below.
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:

Surrogate

(Sample number(s): 8702101MSD: Analysis: 10954)
The surrogate recovery for 13C4-PFOA was outside of specifications.

Case Narrative/Conformance Summary

CLIENT: EA Engineering, Science & Tech
SDG: MCR09

Specialty Services Group

Fraction: PFAAs by LC/MS/MS

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
D = Duplicate (DUP)	E= out of calibration range
LCS = Lab Control Sample	RE = Repreparation/Reanalysis
LCSD = Lab Control Sample Duplicate	* = Out of Specification

QC Summary

PFAAs by LC/MS/MS

Quality Control Reference List
Specialty Services Group**CLIENT: EA Engineering, Science & Tech**
SDG: MCR09**Fraction: PFAAs by LC/MS/MS**

Analysis	Batch Number	Sample Number	Analysis Date
PFOA/PFOS DoD	16326003	BLK326003	11/22/2016 15:20:00
		LCS326003	11/22/2016 15:36:00
		8702096	11/22/2016 18:04:00
		8702097	11/22/2016 18:21:00
		8702098	11/22/2016 18:37:00
		8702099 UNSPK	11/22/2016 15:53:00
		8702100 MS	11/22/2016 16:09:00
		8702101 MSD	11/22/2016 16:25:00
		8702102	11/22/2016 18:53:00
		8702103	11/22/2016 19:10:00
		8702104	11/22/2016 19:26:00
		8702105	11/22/2016 19:43:00
		8702106	11/22/2016 19:59:00

Fraction: PFAAs by LC/MS/MS

16326003 / BLK326003 Analyte	Analysis Date	Blank Results	Units	DL	LOD	LOQ
Perfluorooctanoic acid	11/22/16	N.D.	ng/l	1	2	2
Perfluoro-octanesulfonate	11/22/16	N.D.	ng/l	5	10	10

SDG No.: MCR09
Matrix: WATER

16326003	13C4-PFOA	13C4-PFOS	Limits
LAB SAMPLE ID	% Recovery	% Recovery	
BLK326003	87	101	70-130
LCS326003	74	90	70-130
8702099	99	111	70-130
8702100MS	79	101	70-130
8702101MSD	65 *	84	70-130
8702096	86	80	70-130
8702097	106	112	70-130
8702098	98	115	70-130
8702102	95	98	70-130
8702103	94	97	70-130
8702104	108	109	70-130
8702105	97	110	70-130
8702106	90	99	70-130

* = Outside of the QC Limits.

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

UNSPK: 8702099 MS: 8702100 MSD: 8702101 Analyte	Batch: 16326003 (Sample number(s): 8702096-8702106)								
	Spike Added ng/l MS/MSD	Unspiked Conc ng/l	MS Conc ng/l	MSD Conc ng/l	MS %Rec	MSD %Rec	%Rec Limits	%RPD	%RPD Limits
Perfluorooctanoic acid	200.22 / 199.16	N.D.	161.61	196.66	81	99	70-130	20	30
Perfluoro-octanesulfonate	191.21 / 190.2	N.D.	175.77	192.78	92	101	70-130	9	30

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.

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

LCS: LCS326003	Batch: 16326003 (Sample number(s): 8702096-8702106)							
Analyte	Spike Added ng/l	LCS Conc ng/l	LCSD Conc ng/l	LCS %Rec	LCSD %Rec	%Rec Limits	%RPD	%RPD Limits
Perfluorooctanoic acid	200	167.77	NA	84	NA	70-130	NA	NA
Perfluoro-octanesulfonate	191	174.94	NA	92	NA	70-130	NA	NA

SDG No.: MCR09

Instrument ID: 24743

Lab File ID: 15:03

Date/Time Analyzed: 11/22/2016 15:03

Lab Sample ID: CCV1

Init. Calib. Date/Times: 11/22/2016 12:35

11/22/2016 13:57

Analytes	Average ICAL Area	CCV Area	Specified Amount	Calculated Amount	% Difference	Limit
Perfluorobutanesulfonate	1838497	488794	9.99	10.43	4.38	±40
Perfluorohexanoic acid	981357	213861	2.50	2.74	9.74	±30
Perfluoroheptanoic acid	821371	279595	2.50	2.71	8.46	±30
Perfluorohexanesulfonate	1525358	402329	10.00	10.36	3.59	±30
Perfluorooctanoic acid	1853312	414832	2.50	2.39	-4.53	±30
Perfluorononanoic acid	1887880	626925	2.50	2.91	16.59	±30
Perfluoro- octanesulfonate	1551901	465091	9.99	10.73	7.45	±30
Perfluorodecanoic acid	2392683	641676	2.50	2.76	10.40	±30
Perfluoroundecanoic acid	2216571	569626	2.50	2.77	10.78	±30
NMeFOSAA	1687802	422083	10.00	11.31	13.12	±30
NEtFOSAA	1386442	356953	10.00	9.29	-7.15	±30
Perfluorododecanoic acid	5665016	1444714	5.00	5.20	3.94	±30
Perfluorotridecanoic acid	5228392	1299719	5.00	5.10	1.91	±40
Perfluorotetradecanoic acid	4995064	1110469	5.00	4.52	-9.60	±40

* Outside QC Limits.

SDG No.: MCR09

Instrument ID: 24743

Lab File ID: 17:48

Date/Time Analyzed: 11/22/2016 17:48

Lab Sample ID: CCV2

Init. Calib. Date/Times: 11/22/2016 12:35

11/22/2016 13:57

Analytes	Average ICAL Area	CCV Area	Specified Amount	Calculated Amount	% Difference	Limit
Perfluorooctanoic acid	1853312	442981	2.50	2.61	4.43	±30
Perfluoro- octanesulfonate	1551901	471894	9.99	10.77	7.85	±30

* Outside QC Limits.

SDG No.: MCR09

Instrument ID: 24743 Lab File ID: 20:16
Date/Time Analyzed: 11/22/2016 20:16 Lab Sample ID: CCV3
Init. Calib. Date/Times: 11/22/2016 12:35 11/22/2016 13:57

Analytes	Average ICAL Area	CCV Area	Specified Amount	Calculated Amount	% Difference	Limit
Perfluorooctanoic acid	1853312	448201	2.50	2.65	6.19	±30
Perfluoro- octanesulfonate	1551901	481667	9.99	10.63	6.44	±30

* Outside QC Limits.

SDG No.: MCR09
Matrix: WATER

16326003	13C4-PFOA	13C4-PFOS
	Area	Area
Average ICAL Response	593262	167117
UPPER LIMIT	889893	250676
LOWER LIMIT	296631	83559
LAB SAMPLE ID		
BLK326003	518997	168645
LCS326003	440670	150318
8702099	590082	186226
8702100MS	467418	168931
8702101MSD	385421	139724
8702096	507569	133747
8702097	629525	186911
8702098	582082	192442
8702102	562138	163783
8702103	557415	162831
8702104	641714	182481
8702105	576911	183715
8702106	534913	165828

AREA: Upper limit: 150% of the internal standard area.
Lower Limit: 50% of the internal standard area.

* = Outside of the QC Limits.

Sample Data

PFAs by LC/MS/MS

Fraction: PFAAs by LC/MS/MS

10954: PFOA/PFOS DoD Analyte Name	Default DL	Default LOD	Default LOQ	Units
Perfluorooctanoic acid	1	2	2	ng/l
Perfluoro-octanesulfonate	5	10	10	ng/l

Sample Name:	8702096		Data File:	16NOV22-11.wiff
Sample ID:	EPA 537 Rev. 1.1 modified 16326003 16MC-PW135-P1-1110 Grab Groundwater		Acquis Date:	2016-11-22T18:04:39
Sample Type:	Unknown		Instrument:	Triple Quad 4500, 0, LM24743
Vial Position:	21		Acquis Method:	PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00		Result Table:	MQ16326003
			ICAL Name:	16NOV22ICAL
Batch Number:	16326003		Operator:	US19INS00015\4500TRIPLE
Sample Wt.:	0.10026		Dilution Factor:	1.00
Sample Vol.:	1.000		Prep Factor:	1.000

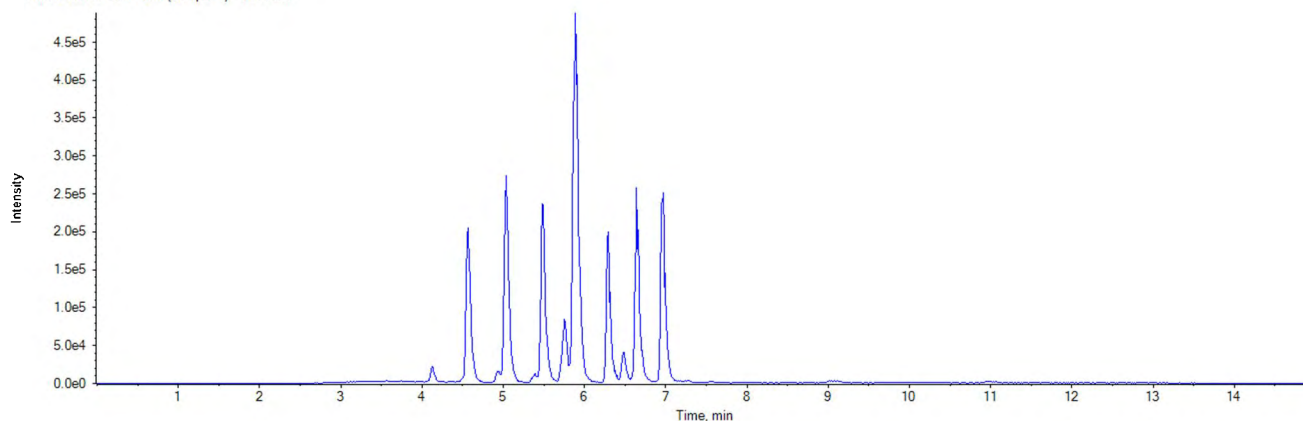
Quantitation Peak Table

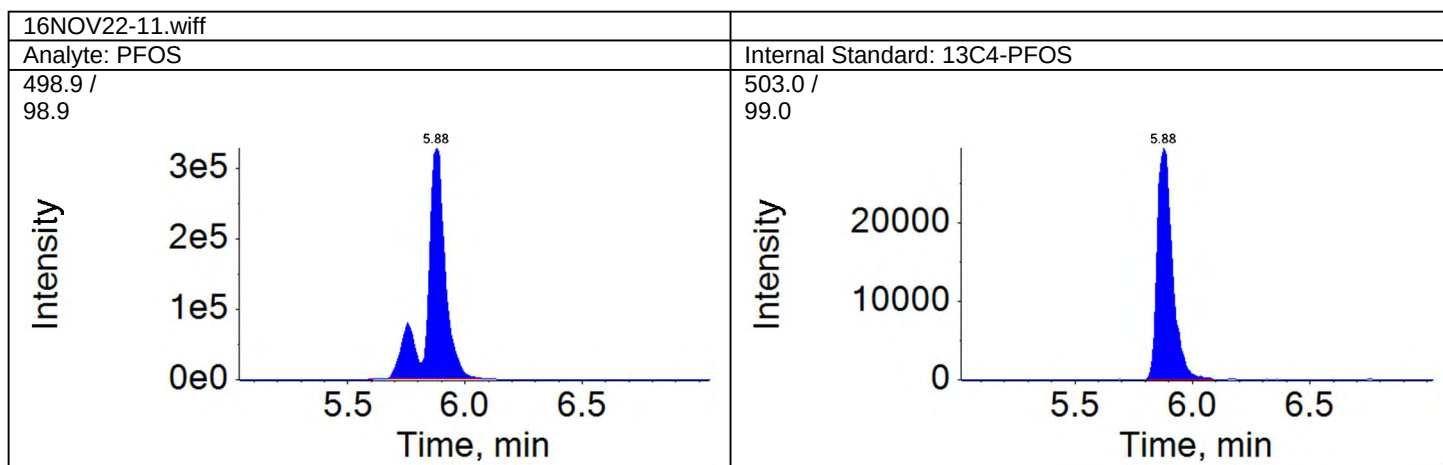
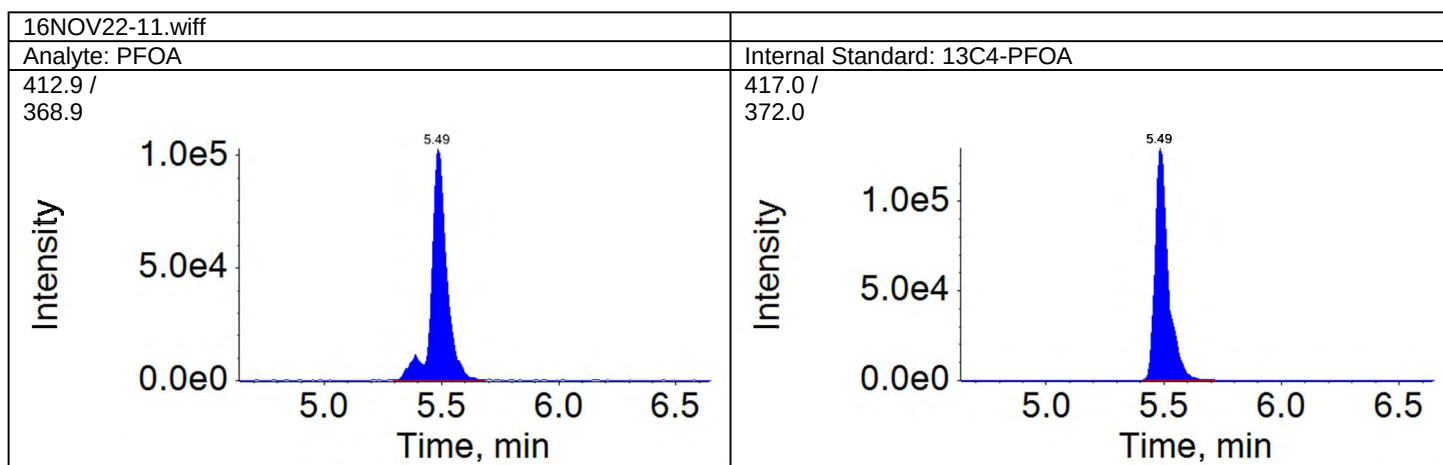
Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	5.49	1.000	469591.6	M	13C4-PFOA	5.49	507569.2	0.925	36.044
PFOS	5.88	1.000	1827997.4	M	13C4-PFOS	5.88	133746.6	13.668	593.146

Total Ion Chromatogram

EPA 537 Rev. 1.1 modified 16326003 16MC-PW135-P1-1110 Grab Groundwater

TIC from 16NOV22-11.wiff (sample 1) - 8702096

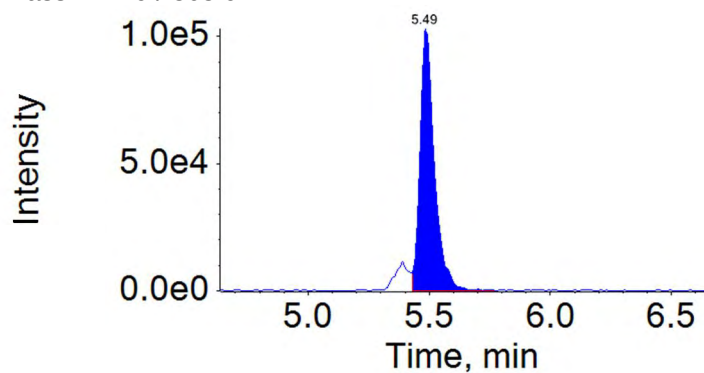




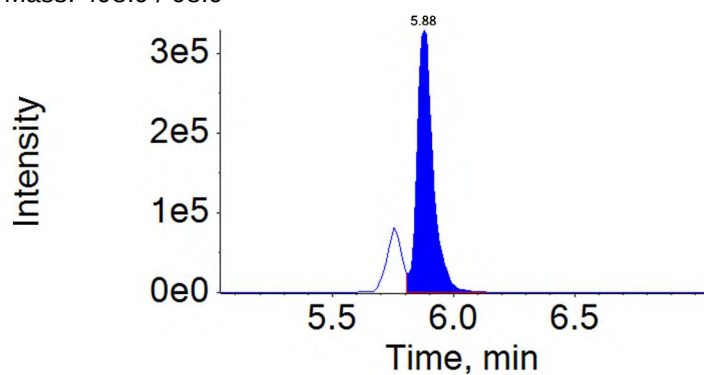
Auto Integrations prior to Manual Integration

<u>File Name</u>	<u>Acquis Date</u>	<u>Sample Name</u>	<u>Component</u>	<u>RT</u>	<u>Peak Area</u>
16NOV22-11.wiff	2016-11-22T18:04:39	8702096	PFOA	5.49	423758.9
16NOV22-11.wiff	2016-11-22T18:04:39	8702096	PFOS	5.88	1518463.9

Component: PFOA
Mass: 412.9 / 368.9



Component: PFOS
Mass: 498.9 / 98.9



Sample Name:	8702097		Data File:	16NOV22-12.wiff
Sample ID:	EPA 537 Rev. 1.1 modified 16326003 16MC-PW135-P4-1110 Grab Groundwater		Acquis Date:	2016-11-22T18:21:04
Sample Type:	Unknown		Instrument:	Triple Quad 4500, 0, LM24743
Vial Position:	22		Acquis Method:	PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00		Result Table:	MQ16326003
			ICAL Name:	16NOV22ICAL
Batch Number:	16326003		Operator:	US19INS00015\4500TRIPLE
Sample Wt.:	0.10042		Dilution Factor:	1.00
Sample Vol.:	1.000		Prep Factor:	1.000

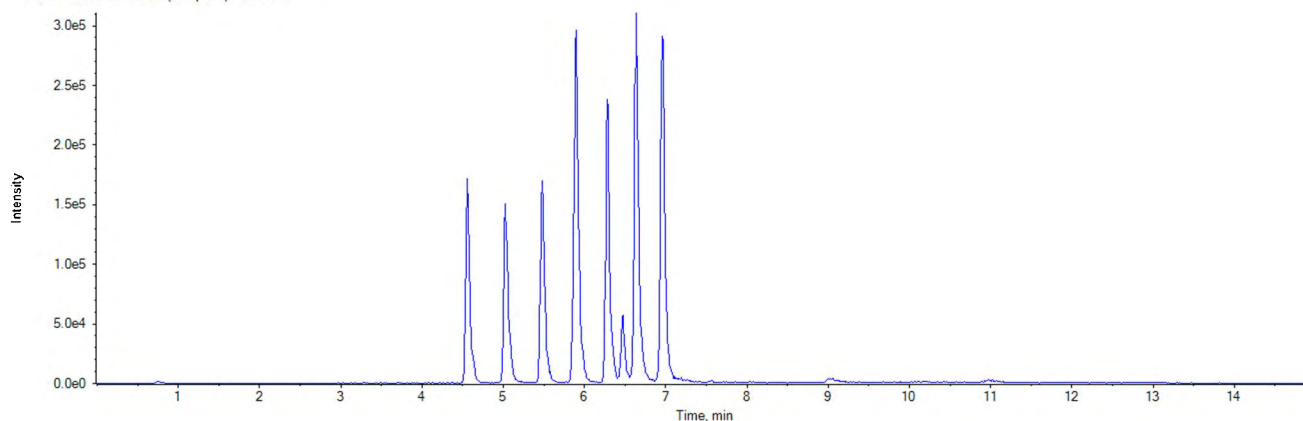
Quantitation Peak Table

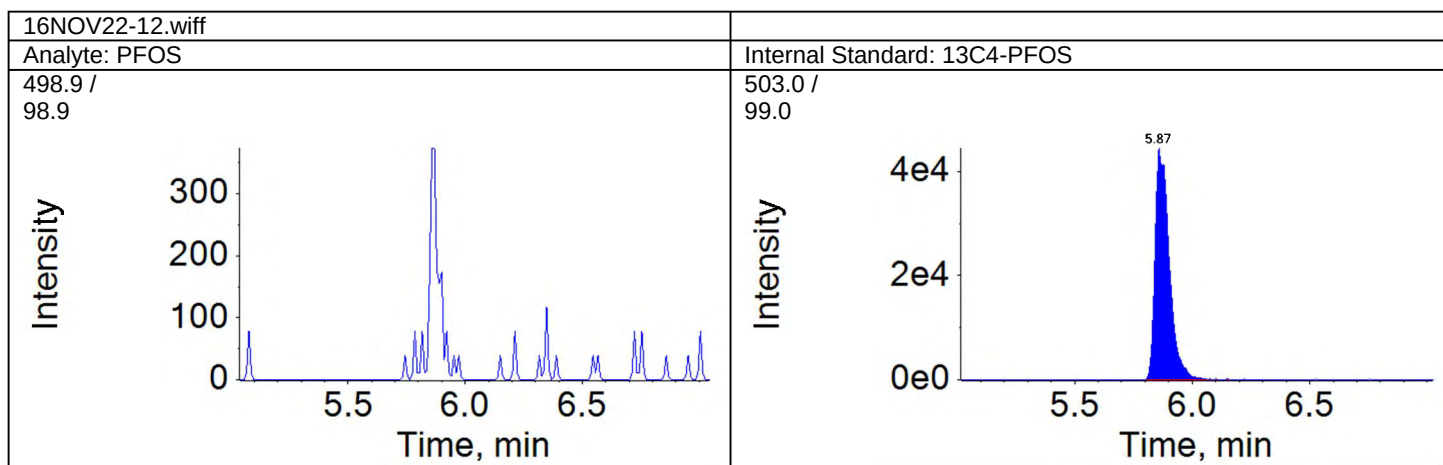
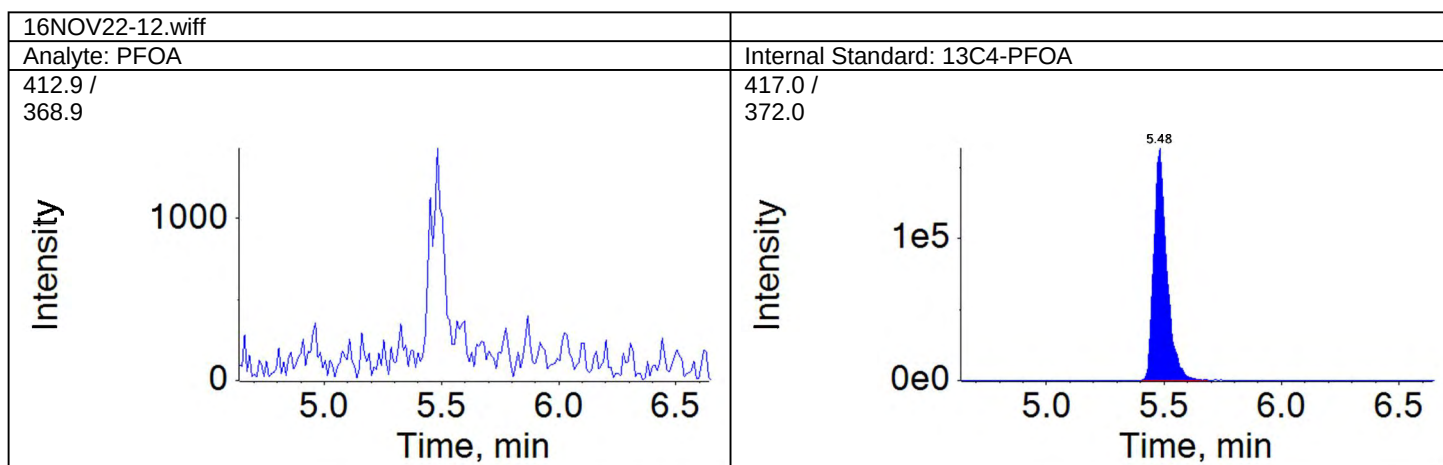
Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	N/A	N/A	N/A	A	13C4-PFOA	5.48	629525.2	N/A	N/A
PFOS	N/A	N/A	N/A	A	13C4-PFOS	5.87	186911.1	N/A	N/A

Total Ion Chromatogram

EPA 537 Rev. 1.1 modified 16326003 16MC-PW135-P4-1110 Grab Groundwater

TIC from 16NOV22-12.wiff (sample 1) - 8702097





Sample Name:	8702098		Data File:	16NOV22-13.wiff
Sample ID:	EPA 537 Rev. 1.1 modified 16326003 16MC-PW135-P5-1110 Grab Groundwater		Acquis Date:	2016-11-22T18:37:34
Sample Type:	Unknown		Instrument:	Triple Quad 4500, 0, LM24743
Vial Position:	23		Acquis Method:	PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00		Result Table:	MQ16326003
			ICAL Name:	16NOV22ICAL
Batch Number:	16326003		Operator:	US19INS00015\4500TRIPLE
Sample Wt.:	0.10033		Dilution Factor:	1.00
Sample Vol.:	1.000		Prep Factor:	1.000

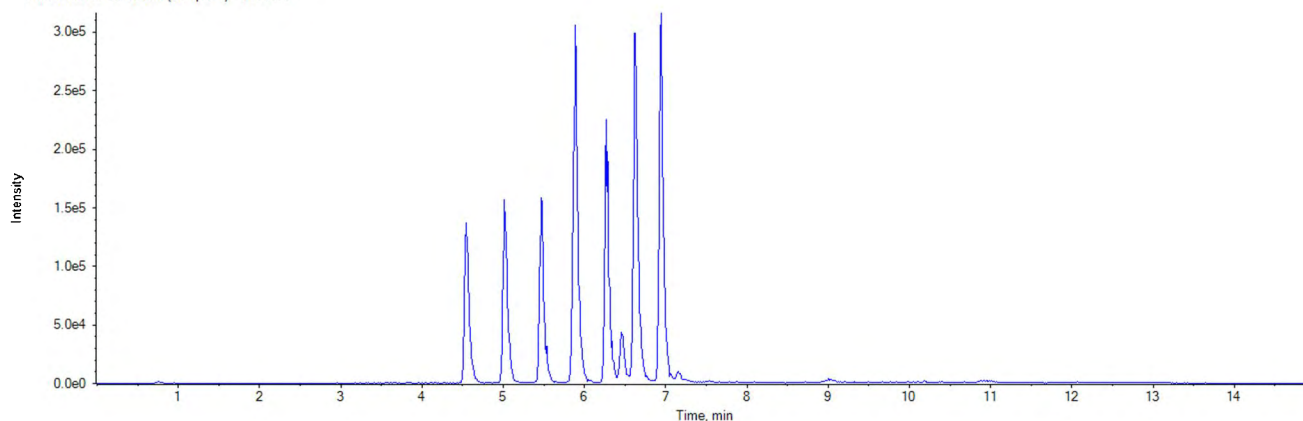
Quantitation Peak Table

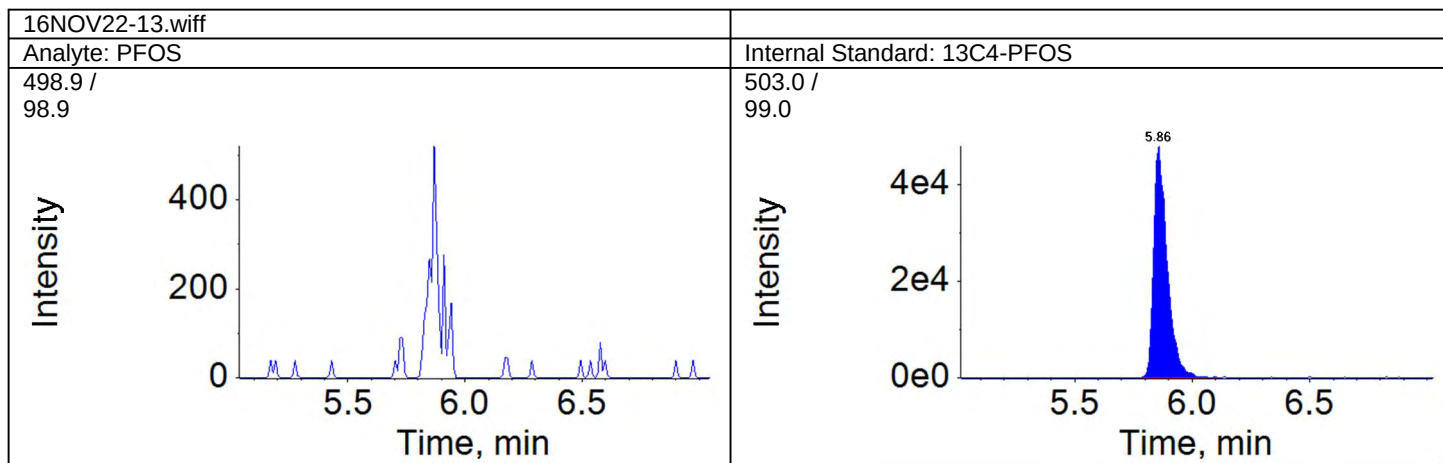
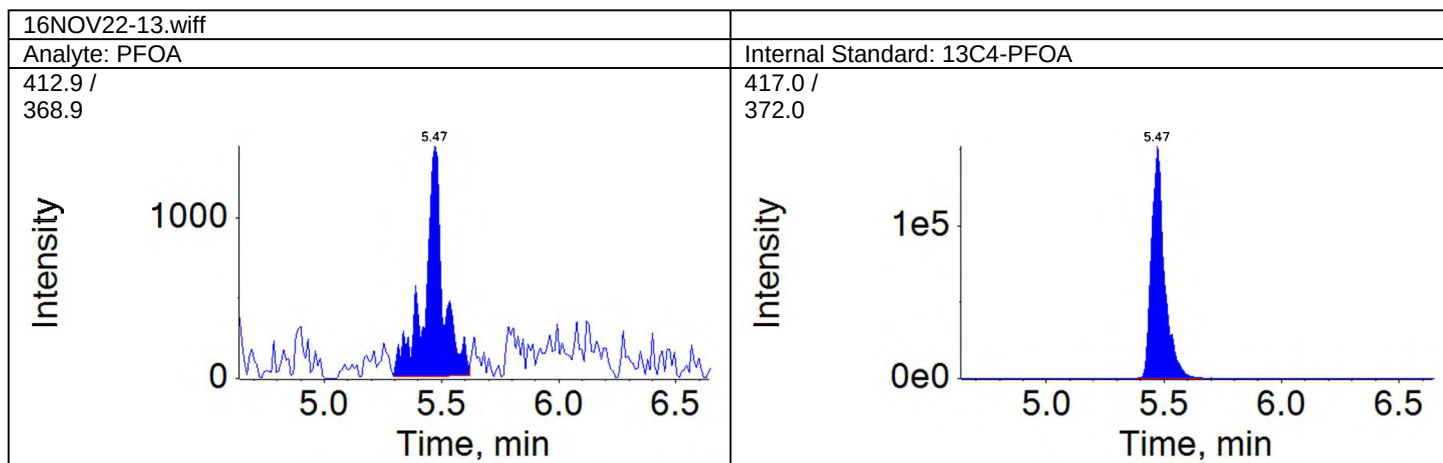
Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	5.47	1.000	7960.1	M	13C4-PFOA	5.47	582081.7	0.014	0.532
PFOS	N/A	N/A	N/A	A	13C4-PFOS	5.86	192441.9	N/A	N/A

Total Ion Chromatogram

EPA 537 Rev. 1.1 modified 16326003 16MC-PW135-P5-1110 Grab Groundwater

TIC from 16NOV22-13.wiff (sample 1) - 8702098

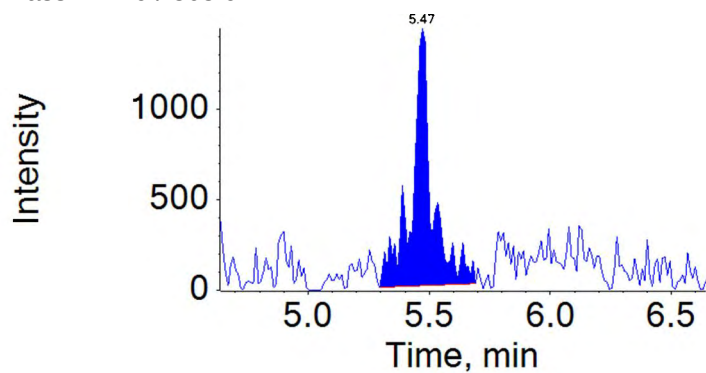




Auto Integrations prior to Manual Integration

<u>File Name</u>	<u>Acquis Date</u>	<u>Sample Name</u>	<u>Component</u>	<u>RT</u>	<u>Peak Area</u>
16NOV22-13.wiff	2016-11-22T18:37:34	8702098	PFOA	5.47	8212.7

Component: PFOA
Mass: 412.9 / 368.9



Sample Name:	8702099BKG		Data File:	16NOV22-03.wiff
Sample ID:	EPA 537 Rev. 1.1 modified 16326003 16MC-PW021-P10- 1110 Grab Groundwater		Acquis Date:	2016-11-22T15:53:03
Sample Type:	Unknown		Instrument:	Triple Quad 4500, 0, LM24743
Vial Position:	14		Acquis Method:	PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00		Result Table:	MQ16326003
			ICAL Name:	16NOV22ICAL
Batch Number:	16326003		Operator:	US19INS00015\4500TRIPLE
Sample Wt.:	0.10014		Dilution Factor:	1.00
Sample Vol.:	1.000		Prep Factor:	1.000

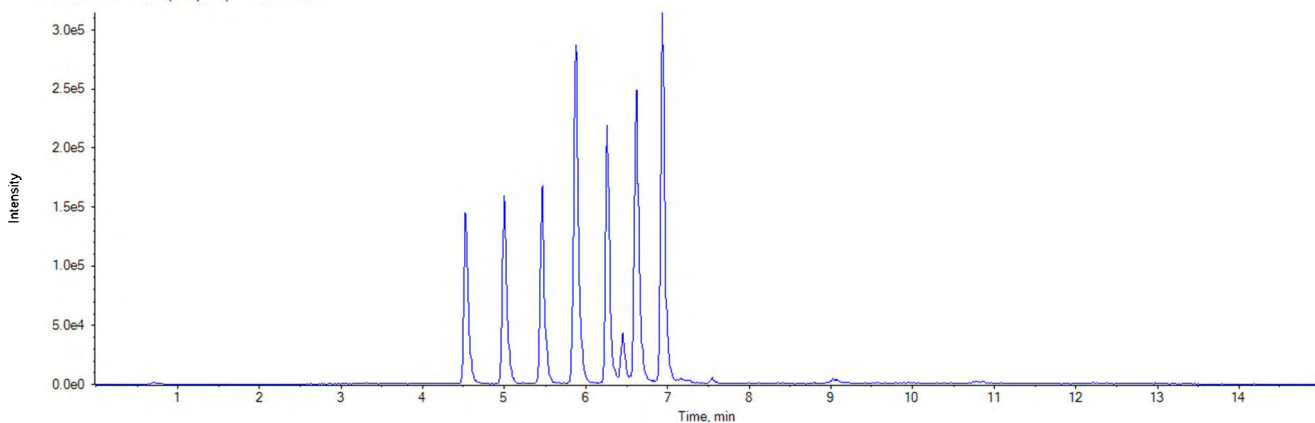
Quantitation Peak Table

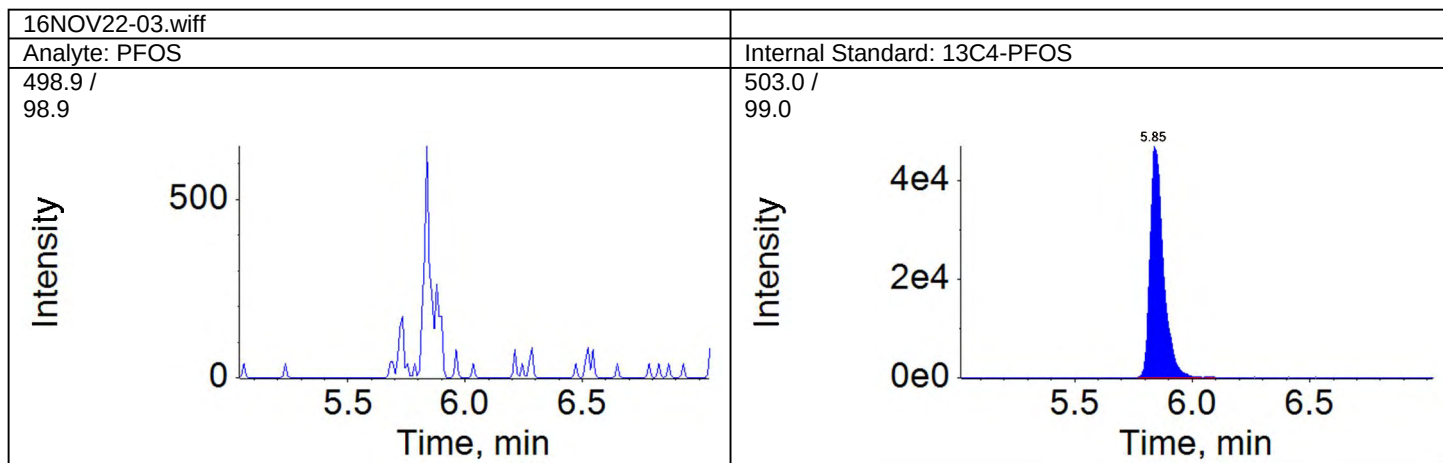
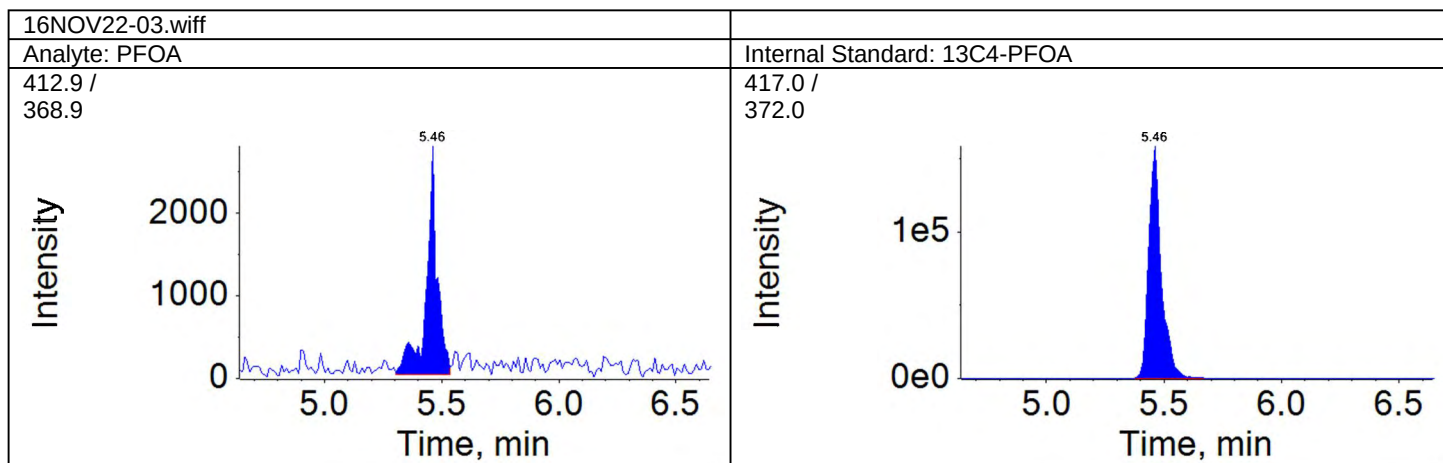
<u>Component Name</u>	<u>RT</u>	<u>RRT</u>	<u>Analyte Area Response</u>	<u>Int Typ</u>	<u>IS Name</u>	<u>IS RT</u>	<u>IS Area Response</u>	<u>Area Ratio</u>	<u>Sample Result (ng/L)</u>
PFOA	5.46	1.000	8925.3	M	13C4-PFOA	5.46	590081.5	0.015	0.590
PFOS	N/A	N/A	N/A	A	13C4-PFOS	5.85	186226.3	N/A	N/A

Total Ion Chromatogram

EPA 537 Rev. 1.1 modified 16326003 16MC-PW021-P10-1110 Grab Groundwater

TIC from 16NOV22-03.wiff (sample 1) - 8702099BKG

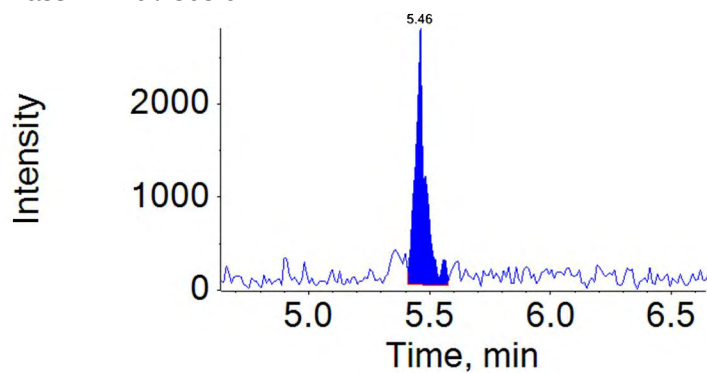




Auto Integrations prior to Manual Integration

<u>File Name</u>	<u>Acquis Date</u>	<u>Sample Name</u>	<u>Component</u>	<u>RT</u>	<u>Peak Area</u>
16NOV22-03.wiff	2016-11-22T15:53:03	8702099BKG	PFOA	5.46	7702.1

Component: PFOA
Mass: 412.9 / 368.9



Sample Name:	8702102			Data File:	16NOV22-14.wiff
Sample ID:	EPA 537 Rev. 1.1 modified 16326003 16MC-PW055-P4-1111 Grab Groundwater			Acquis Date:	2016-11-22T18:53:58
Sample Type:	Unknown			Instrument:	Triple Quad 4500, 0, LM24743
Vial Position:	24			Acquis Method:	PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00			Result Table:	MQ16326003
				ICAL Name:	16NOV22ICAL
Batch Number:	16326003			Operator:	US19INS00015\4500TRIPLE
Sample Wt.:	0.09980			Dilution Factor:	1.00
Sample Vol.:	1.000			Prep Factor:	1.000

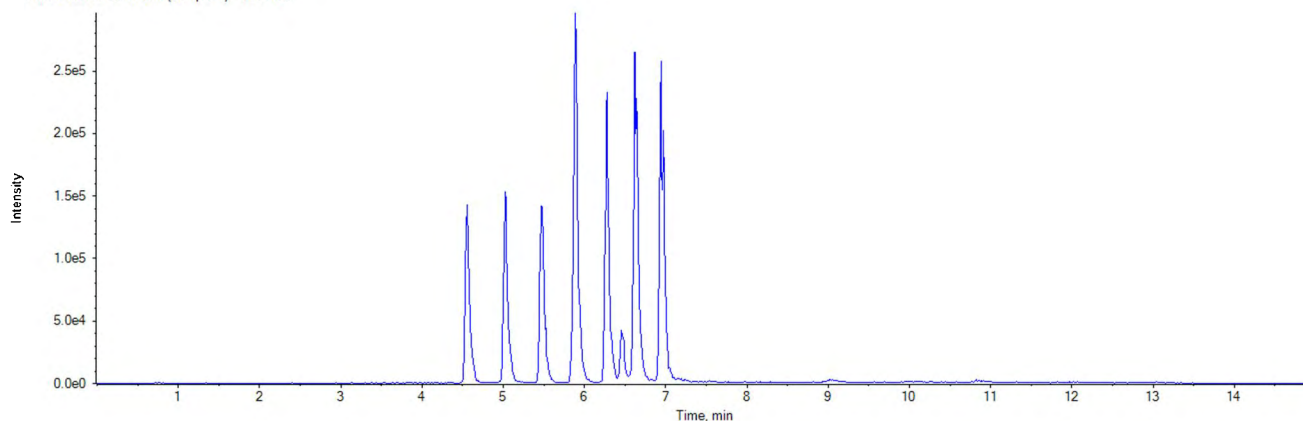
Quantitation Peak Table

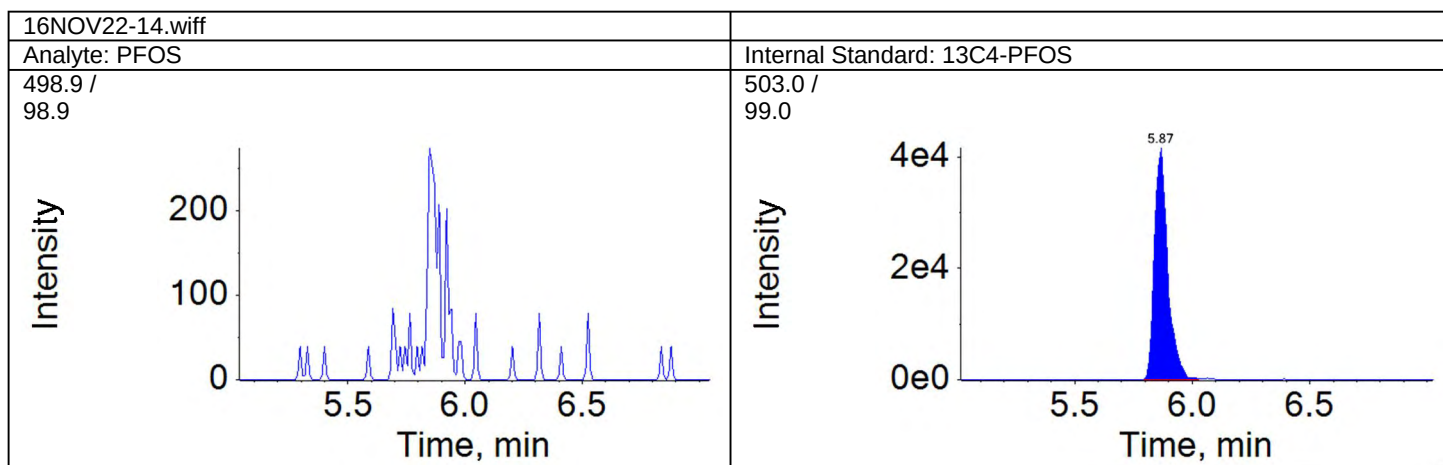
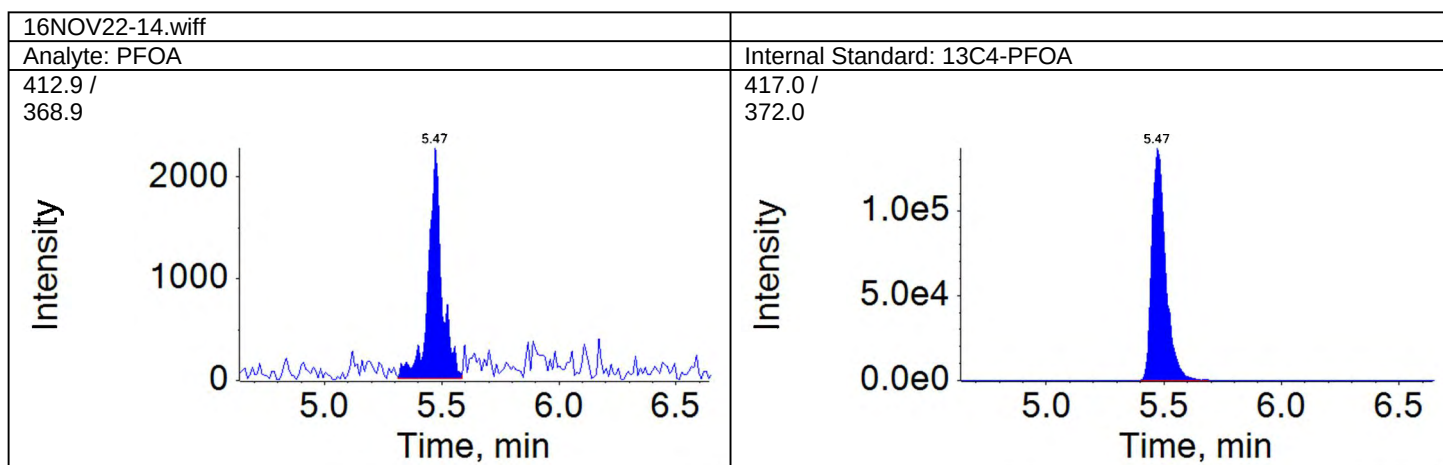
Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	5.47	1.000	9035.5	M	13C4-PFOA	5.47	562138.4	0.016	0.629
PFOS	N/A	N/A	N/A	A	13C4-PFOS	5.87	163783.1	N/A	N/A

Total Ion Chromatogram

EPA 537 Rev. 1.1 modified 16326003 16MC-PW055-P4-1111 Grab Groundwater

TIC from 16NOV22-14.wiff (sample 1) - 8702102

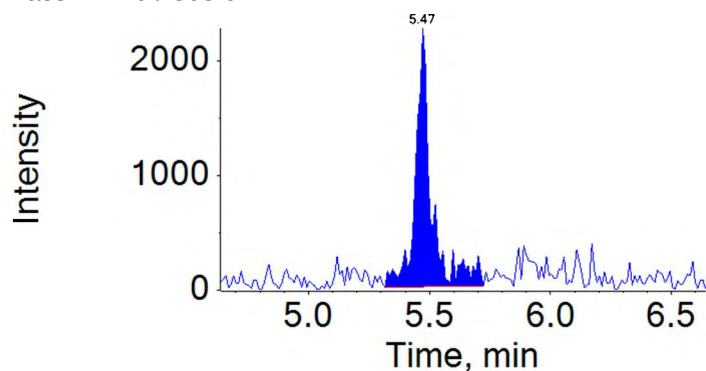




Auto Integrations prior to Manual Integration

<u>File Name</u>	<u>Acquis Date</u>	<u>Sample Name</u>	<u>Component</u>	<u>RT</u>	<u>Peak Area</u>
16NOV22-14.wiff	2016-11-22T18:53:58	8702102	PFOA	5.47	10129.6

Component: PFOA
Mass: 412.9 / 368.9



Sample Name:	8702103		Data File:	16NOV22-15.wiff
Sample ID:	EPA 537 Rev. 1.1 modified 16326003 16MC-PW130-P3-1114 Grab Groundwater		Acquis Date:	2016-11-22T19:10:28
Sample Type:	Unknown		Instrument:	Triple Quad 4500, 0, LM24743
Vial Position:	25		Acquis Method:	PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00		Result Table:	MQ16326003
			ICAL Name:	16NOV22ICAL
Batch Number:	16326003		Operator:	US19INS00015\4500TRIPLE
Sample Wt.:	0.10020		Dilution Factor:	1.00
Sample Vol.:	1.000		Prep Factor:	1.000

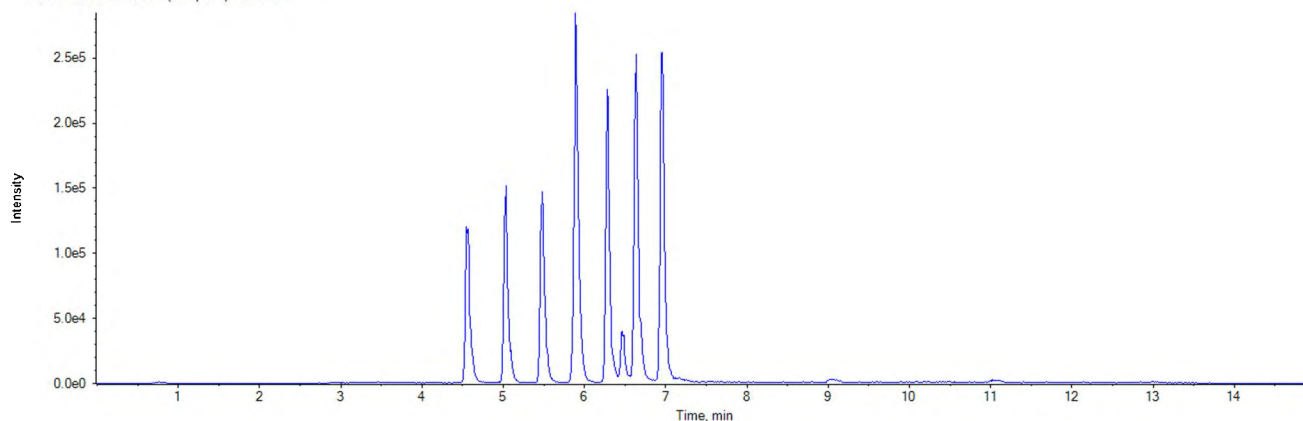
Quantitation Peak Table

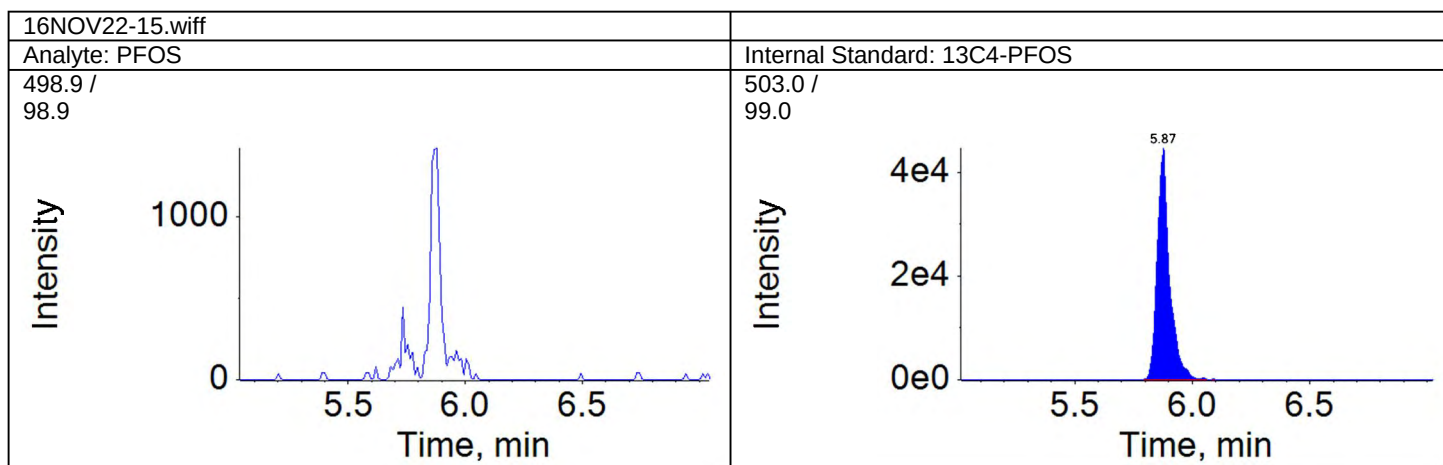
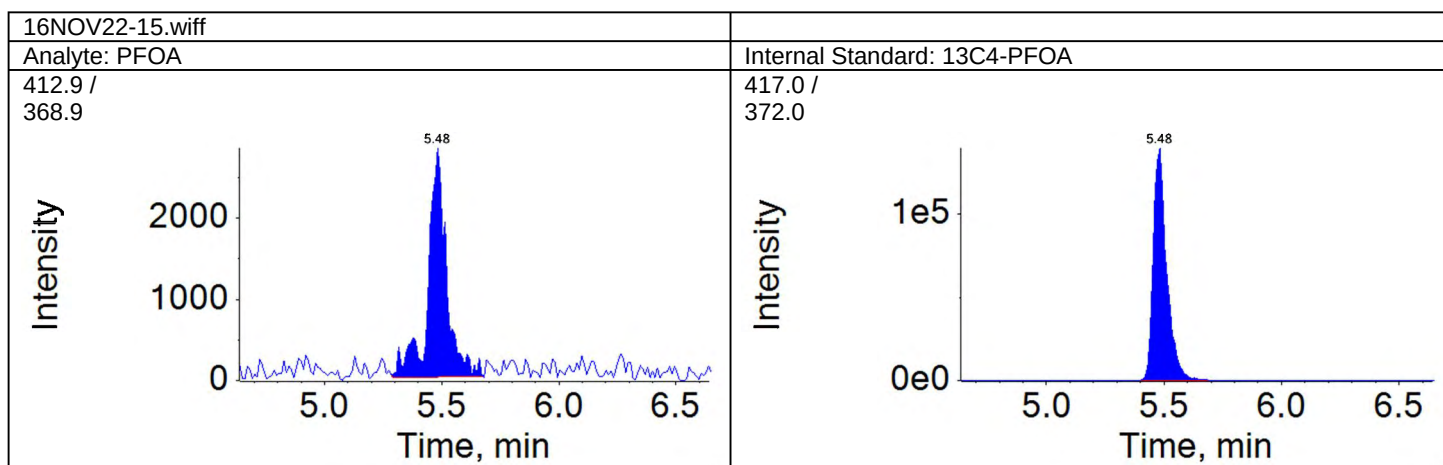
Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	5.48	1.000	15538.9	M	13C4-PFOA	5.48	557414.7	0.028	1.087
PFOS	N/A	N/A	N/A	A	13C4-PFOS	5.87	162830.7	N/A	N/A

Total Ion Chromatogram

EPA 537 Rev. 1.1 modified 16326003 16MC-PW130-P3-1114 Grab Groundwater

TIC from 16NOV22-15.wiff (sample 1) - 8702103

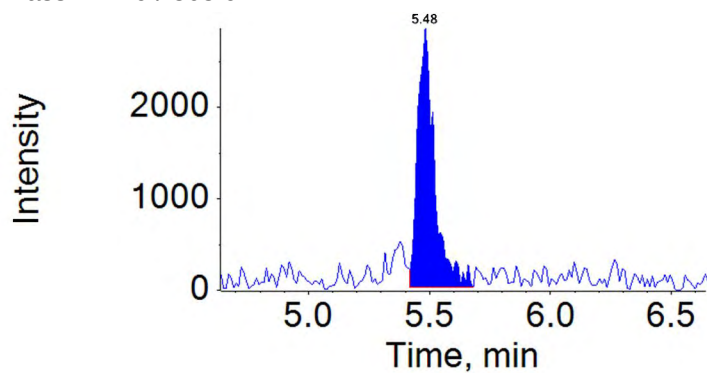




Auto Integrations prior to Manual Integration

<u>File Name</u>	<u>Acquis Date</u>	<u>Sample Name</u>	<u>Component</u>	<u>RT</u>	<u>Peak Area</u>
16NOV22-15.wiff	2016-11-22T19:10:28	8702103	PFOA	5.48	13619.8

Component: PFOA
Mass: 412.9 / 368.9



Sample Name:	8702104		Data File:	16NOV22-16.wiff
Sample ID:	EPA 537 Rev. 1.1 modified 16326003 16MC-PW052-P3-1114 Grab Groundwater		Acquis Date:	2016-11-22T19:26:52
Sample Type:	Unknown		Instrument:	Triple Quad 4500, 0, LM24743
Vial Position:	26		Acquis Method:	PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00		Result Table:	MQ16326003
			ICAL Name:	16NOV22ICAL
Batch Number:	16326003		Operator:	US19INS00015\4500TRIPLE
Sample Wt.:	0.10049		Dilution Factor:	1.00
Sample Vol.:	1.000		Prep Factor:	1.000

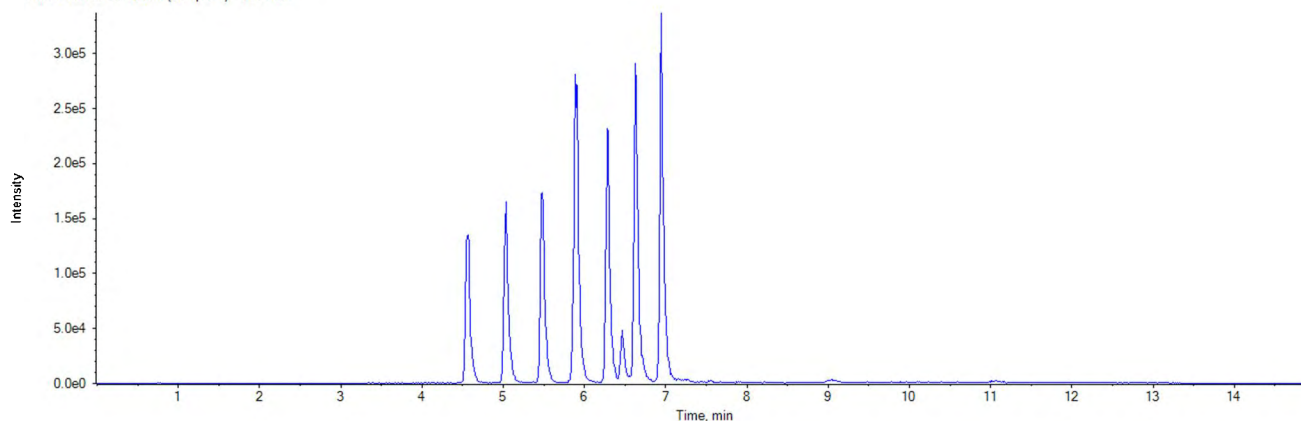
Quantitation Peak Table

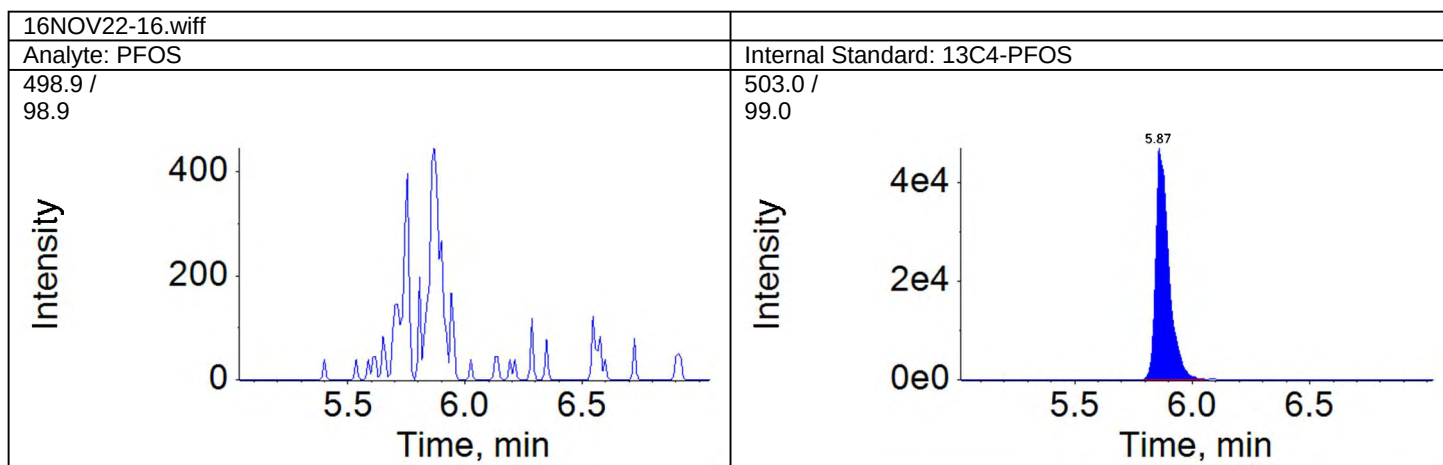
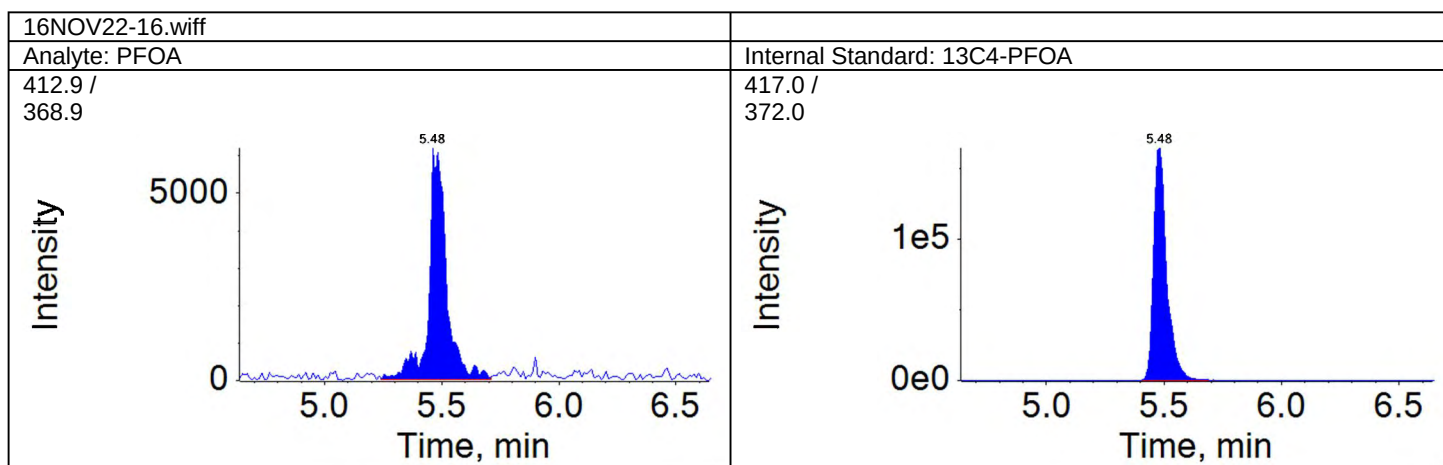
Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	5.48	1.000	32339.1	M	13C4-PFOA	5.48	641713.5	0.050	1.959
PFOS	N/A	N/A	N/A	A	13C4-PFOS	5.87	182481.4	N/A	N/A

Total Ion Chromatogram

EPA 537 Rev. 1.1 modified 16326003 16MC-PW052-P3-1114 Grab Groundwater

TIC from 16NOV22-16.wiff (sample 1) - 8702104



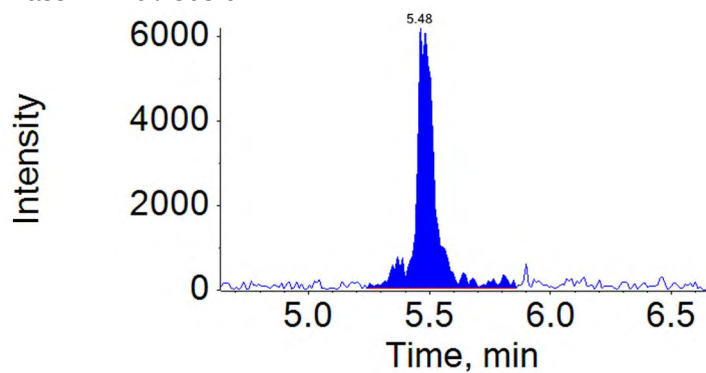


Auto Integrations prior to Manual Integration

<u>File Name</u>	<u>Acquis Date</u>	<u>Sample Name</u>	<u>Component</u>	<u>RT</u>	<u>Peak Area</u>
16NOV22-16.wiff	2016-11-22T19:26:52	8702104	PFOA	5.48	33444.5

Component: PFOA

Mass: 412.9 / 368.9



Sample Name:	8702105		Data File:	16NOV22-17.wiff
Sample ID:	EPA 537 Rev. 1.1 modified 16326003 16MC-PW152-P3-1114 Grab Groundwater		Acquis Date:	2016-11-22T19:43:22
Sample Type:	Unknown		Instrument:	Triple Quad 4500, 0, LM24743
Vial Position:	27		Acquis Method:	PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00		Result Table:	MQ16326003
			ICAL Name:	16NOV22ICAL
Batch Number:	16326003		Operator:	US19INS00015\4500TRIPLE
Sample Wt.:	0.10046		Dilution Factor:	1.00
Sample Vol.:	1.000		Prep Factor:	1.000

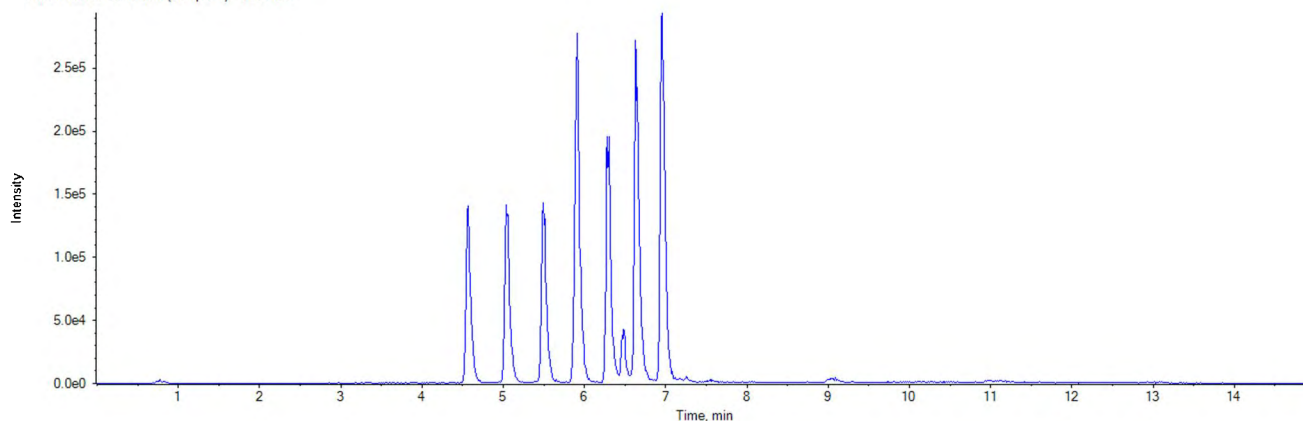
Quantitation Peak Table

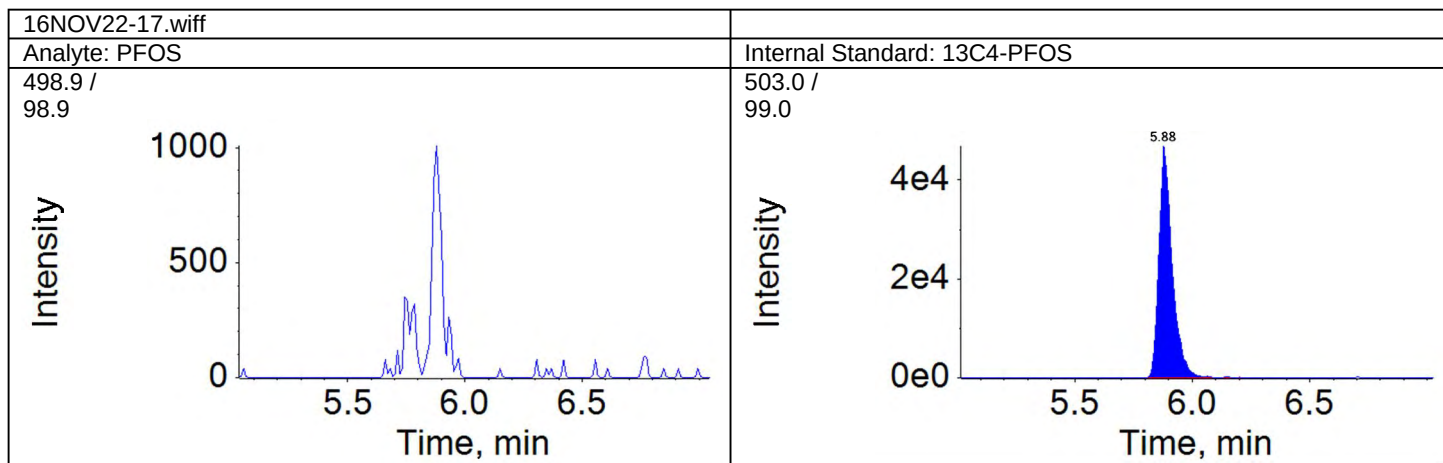
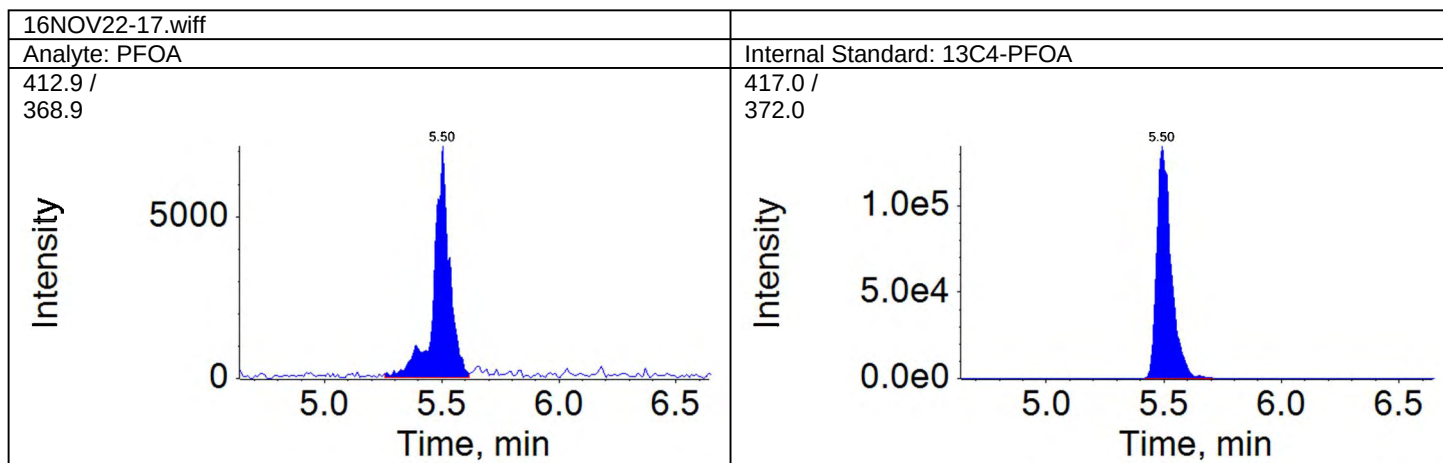
Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	5.50	1.000	33124.5	M	13C4-PFOA	5.50	576910.8	0.057	2.232
PFOS	N/A	N/A	N/A	A	13C4-PFOS	5.88	183715.2	N/A	N/A

Total Ion Chromatogram

EPA 537 Rev. 1.1 modified 16326003 16MC-PW152-P3-1114 Grab Groundwater

TIC from 16NOV22-17.wiff (sample 1) - 8702105

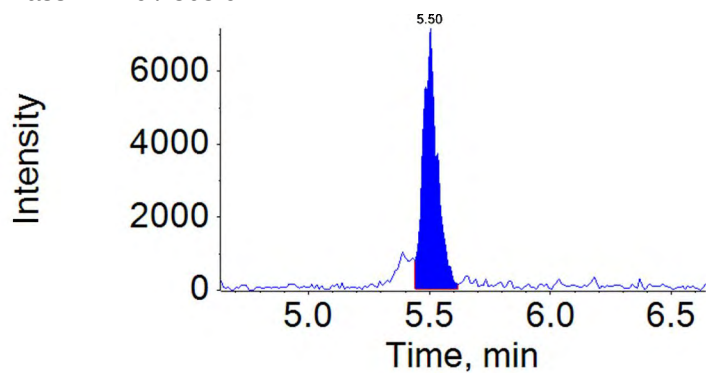




Auto Integrations prior to Manual Integration

<u>File Name</u>	<u>Acquis Date</u>	<u>Sample Name</u>	<u>Component</u>	<u>RT</u>	<u>Peak Area</u>
16NOV22-17.wiff	2016-11-22T19:43:22	8702105	PFOA	5.50	28301.8

Component: PFOA
Mass: 412.9 / 368.9



Sample Name:	8702106		Data File:	16NOV22-18.wiff
Sample ID:	EPA 537 Rev. 1.1 modified 16326003 16MC-PW101-WT- 1115 Grab Groundwater		Acquis Date:	2016-11-22T19:59:46
Sample Type:	Unknown		Instrument:	Triple Quad 4500, 0, LM24743
Vial Position:	28		Acquis Method:	PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00		Result Table:	MQ16326003
			ICAL Name:	16NOV22ICAL
Batch Number:	16326003		Operator:	US19INS00015\4500TRIPLE
Sample Wt.:	0.09964		Dilution Factor:	1.00
Sample Vol.:	1.000		Prep Factor:	1.000

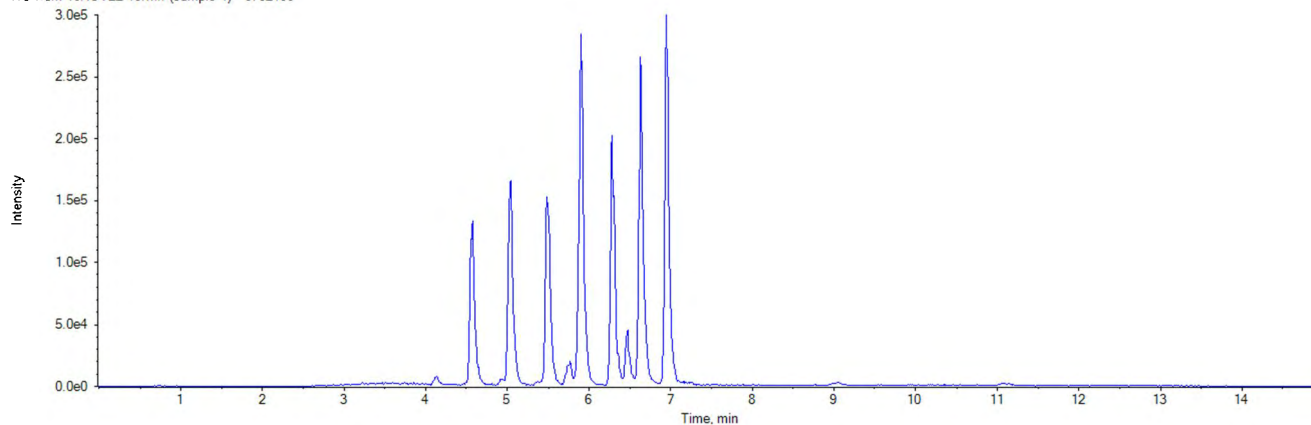
Quantitation Peak Table

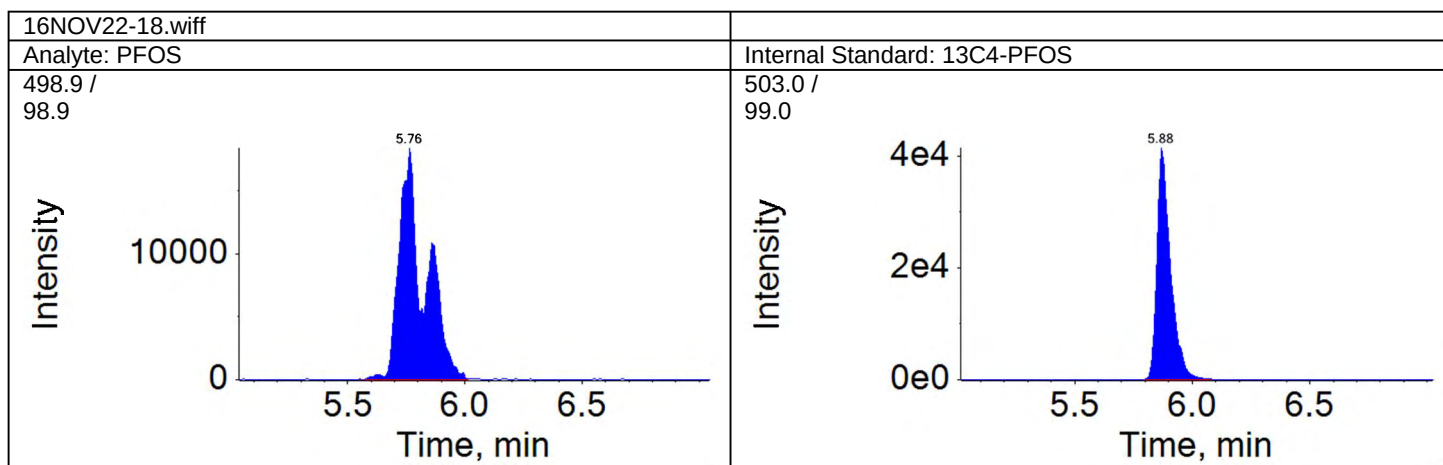
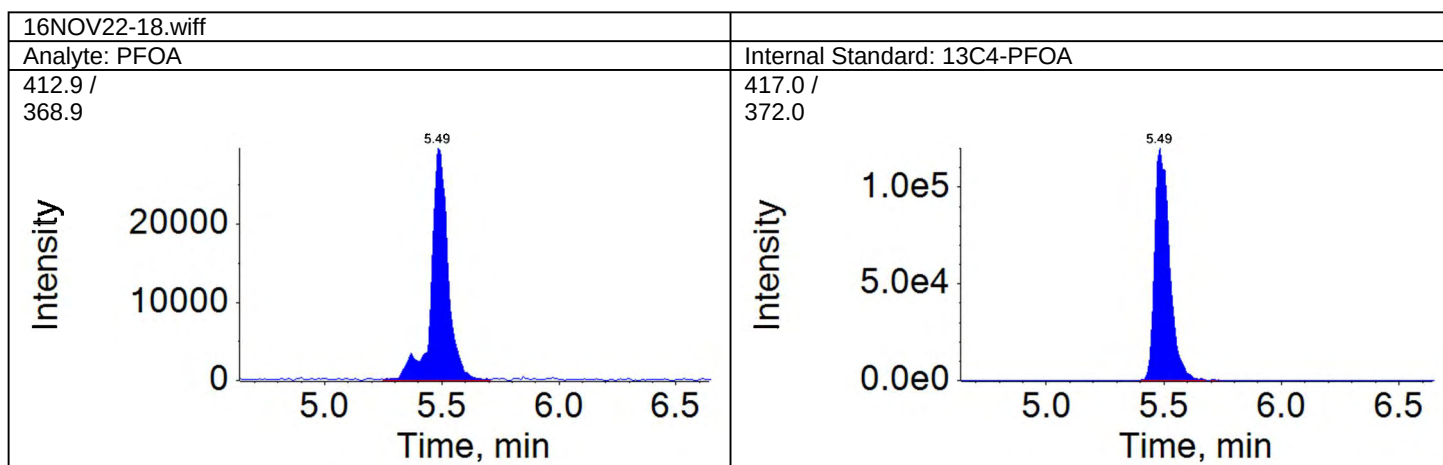
<u>Component Name</u>	<u>RT</u>	<u>RRT</u>	<u>Analyte Area Response</u>	<u>Int Typ</u>	<u>IS Name</u>	<u>IS RT</u>	<u>IS Area Response</u>	<u>Area Ratio</u>	<u>Sample Result (ng/L)</u>
PFOA	5.49	1.000	149338.2	M	13C4-PFOA	5.49	534913.1	0.279	10.944
PFOS	5.76	0.980	139979.7	M	13C4-PFOS	5.88	165828.3	0.844	36.861

Total Ion Chromatogram

EPA 537 Rev. 1.1 modified 16326003 16MC-PW101-WT-1115 Grab Groundwater

TIC from 16NOV22-18.wiff (sample 1) - 8702106

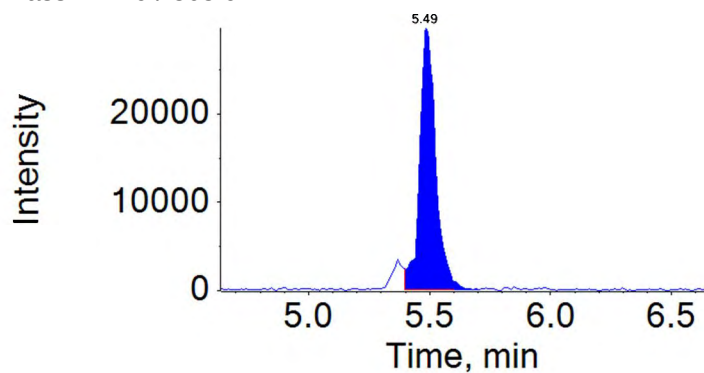




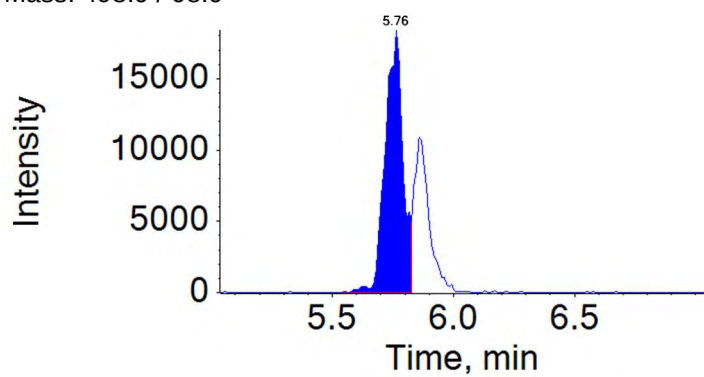
Auto Integrations prior to Manual Integration

<u>File Name</u>	<u>Acquis Date</u>	<u>Sample Name</u>	<u>Component</u>	<u>RT</u>	<u>Peak Area</u>
16NOV22-18.wiff	2016-11-22T19:59:46	8702106	PFOA	5.49	137880.0
16NOV22-18.wiff	2016-11-22T19:59:46	8702106	PFOS	5.76	93252.8

Component: PFOA
Mass: 412.9 / 368.9



Component: PFOS
Mass: 498.9 / 98.9



Standards Data

PFAs by LC/MS/MS

Instrument	Acquisition Date	File Name	Sample ID	Vial Position	Samp Wt	Samp Vol	DF
Triple Quad 4500, 0, LM24743	11/22/2016 12:19:06 PM	16NOV22ICAL-06.wiff	MDL	2	1.00	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 12:35:36 PM	16NOV22ICAL-07.wiff	CAL1	3	1.00	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 12:52:00 PM	16NOV22ICAL-08.wiff	CAL2	4	1.00	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 1:08:30 PM	16NOV22ICAL-09.wiff	CAL3	5	1.00	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 1:24:54 PM	16NOV22ICAL-10.wiff	CAL4	6	1.00	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 1:41:27 PM	16NOV22ICAL-11.wiff	CAL5	7	1.00	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 1:57:48 PM	16NOV22ICAL-12.wiff	CAL6	8	1.00	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 2:30:42 PM	16NOV22ICAL-14.wiff	LB CAL3	10	1.00	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 2:47:15 PM	16NOV22ICAL-15.wiff	ICV	9	1.00	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 3:03:39 PM	16NOV22ICAL-16.wiff	CCV1	5	1.00	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 3:20:09 PM	16NOV22-01.wiff	BLK326003	12	0.10	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 3:36:33 PM	16NOV22-02.wiff	LCS326003	13	0.10	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 3:53:03 PM	16NOV22-03.wiff	8702099BKG	14	0.10	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 4:09:27 PM	16NOV22-04.wiff	8702100MS	15	0.10	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 4:25:58 PM	16NOV22-05.wiff	8702101MSD	16	0.10	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 4:42:21 PM	16NOV22-06.wiff	8703901	17	0.10	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 4:58:52 PM	16NOV22-07.wiff	8703902	18	0.10	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 5:15:15 PM	16NOV22-08.wiff	8703903	19	0.10	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 5:31:46 PM	16NOV22-09.wiff	8703904	20	0.10	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 5:48:10 PM	16NOV22-10.wiff	CCV2	5	1.00	1.00	1.00

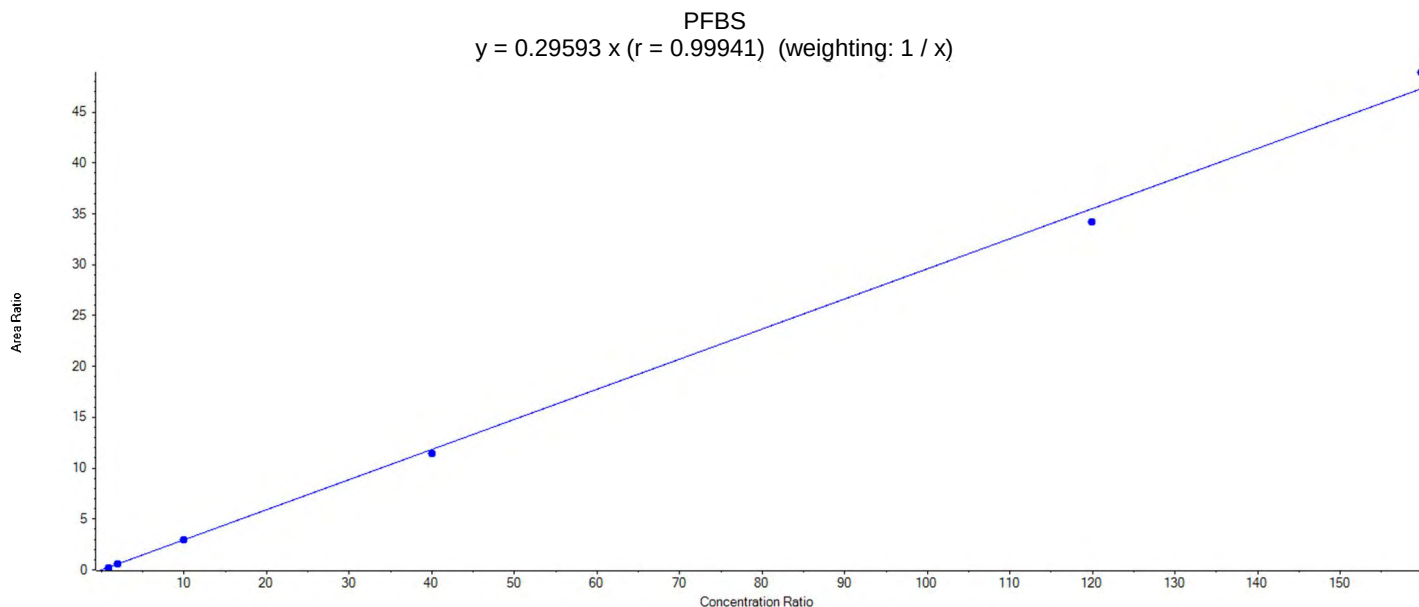
LM24743							
Triple Quad 4500, 0, LM24743	11/22/2016 6:04:39 PM	16NOV22-11.wiff	8702096	21	0.10	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 6:21:04 PM	16NOV22-12.wiff	8702097	22	0.10	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 6:37:34 PM	16NOV22-13.wiff	8702098	23	0.10	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 6:53:58 PM	16NOV22-14.wiff	8702102	24	0.10	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 7:10:28 PM	16NOV22-15.wiff	8702103	25	0.10	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 7:26:52 PM	16NOV22-16.wiff	8702104	26	0.10	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 7:43:22 PM	16NOV22-17.wiff	8702105	27	0.10	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 7:59:46 PM	16NOV22-18.wiff	8702106	28	0.10	1.00	1.00
Triple Quad 4500, 0, LM24743	11/22/2016 8:16:16 PM	16NOV22-19.wiff	CCV3	5	1.00	1.00	1.00

Results Table Name: MQ16326003 11/23/2016 8:37:44 AM

Initial Calibration

Results Table Name: MQ 16NOV22ICAL 11/23/2016 7:44:48 AM

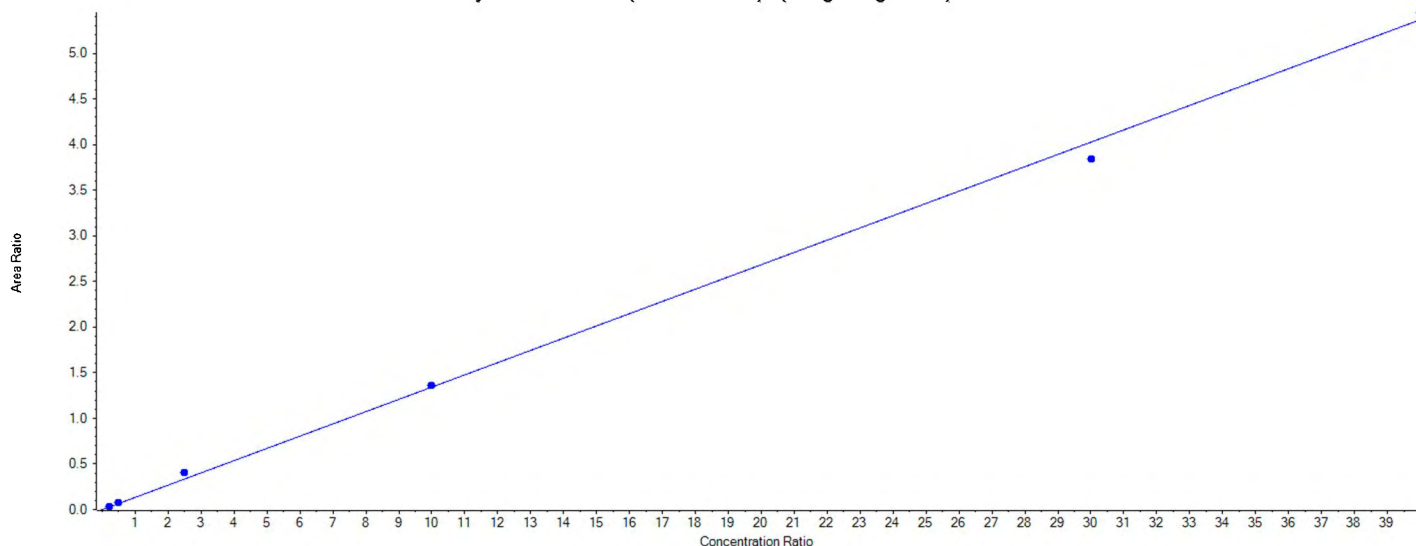
ICAL Name: 16NOV22ICAL



Calibration Verification

File Name	Sample Name	PFBS Area	18O2-PFHxS Area	IS Conc	Area Ratio	RT (min)	RRT	Specified Amount	Calculated Amount	% Diff
16NOV22ICAL-07.wiff	CAL1	40213.6	174090.4	1.00	0.231	4.15	0.820	0.800	0.780	-2.3
16NOV22ICAL-08.wiff	CAL2	102598.1	182777.0	1.00	0.561	4.11	0.820	2.000	1.900	-5.2
16NOV22ICAL-09.wiff	CAL3	492595.9	165199.9	1.00	2.982	4.12	0.820	9.990	10.080	0.9
16NOV22ICAL-10.wiff	CAL4	1687872.8	147068.5	1.00	11.477	4.11	0.820	39.960	38.780	-2.9
16NOV22ICAL-11.wiff	CAL5	4128322.1	120582.7	1.00	34.236	4.12	0.820	119.900	115.690	-3.5
16NOV22ICAL-12.wiff	CAL6	4579376.2	93657.0	1.00	48.895	4.13	0.820	159.800	165.220	3.4

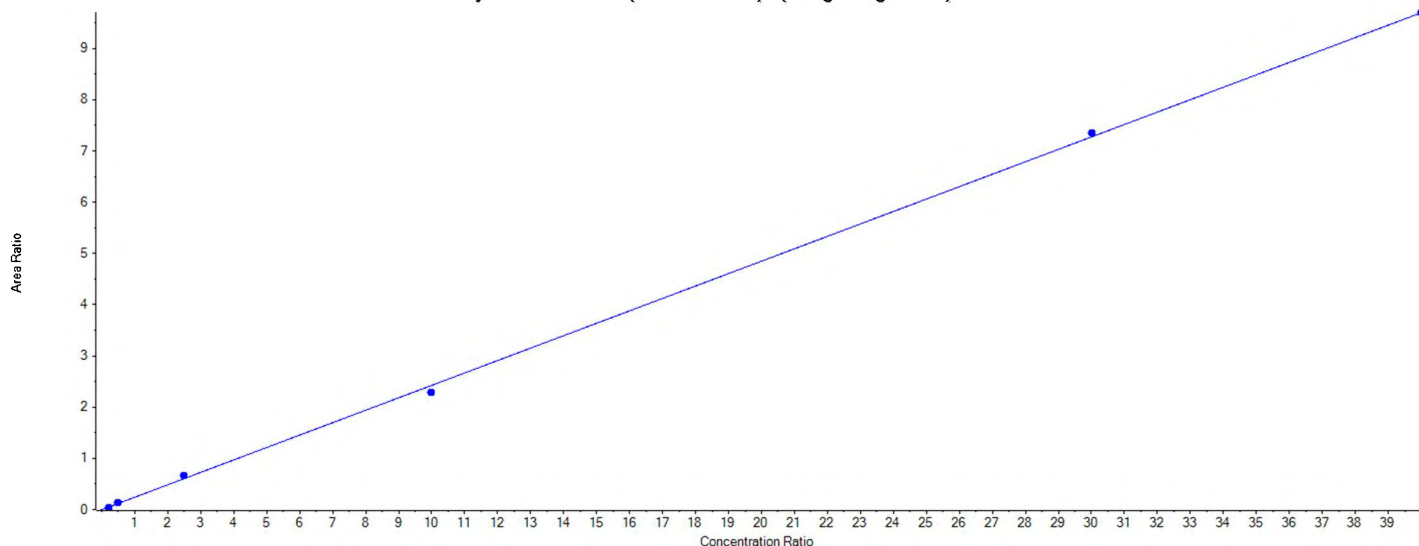
PFHxA
 $y = 0.13420 x$ ($r = 0.99884$) (weighting: $1 / x$)



Calibration Verification

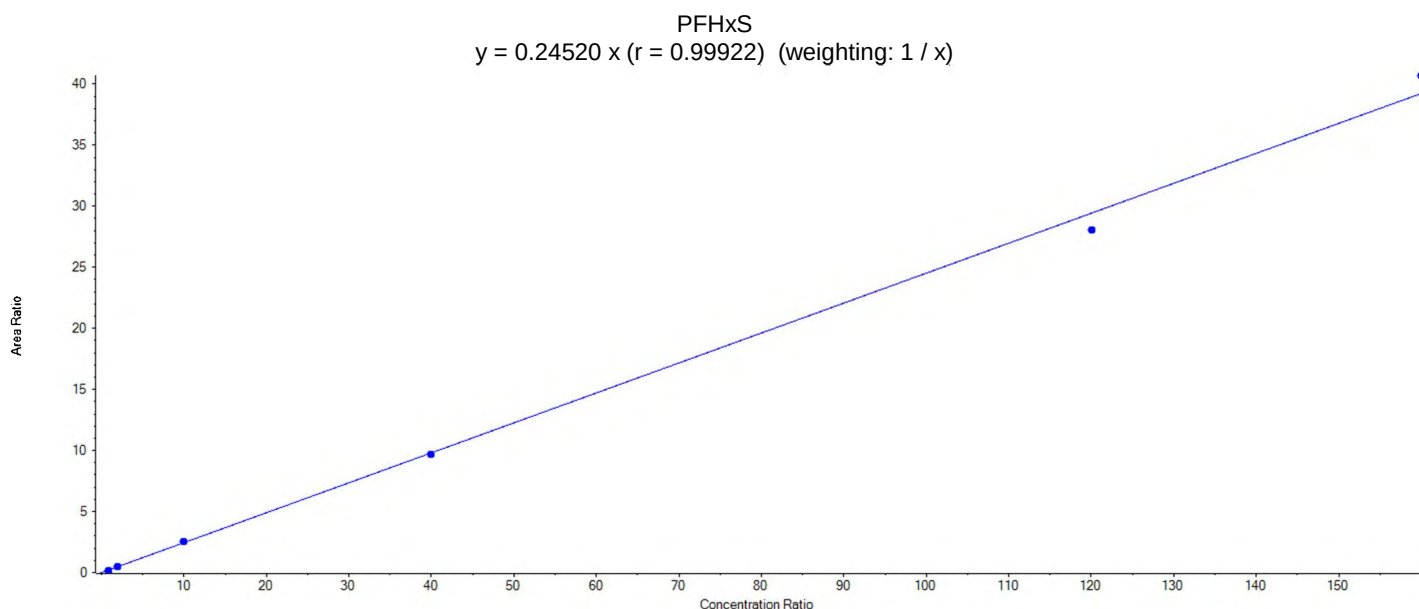
File Name	Sample Name	PFHxA Area	13C2-PFHxA Area	IS Conc	Area Ratio	RT (min)	RRT	Specified Amount	Calculated Amount	% Diff
16NOV22ICAL-07.wiff	CAL1	16649.0	597404.4	1.00	0.028	4.59	1.000	0.200	0.210	3.8
16NOV22ICAL-08.wiff	CAL2	46059.3	616901.1	1.00	0.075	4.57	1.000	0.500	0.560	11.3
16NOV22ICAL-09.wiff	CAL3	217870.9	532868.2	1.00	0.409	4.56	1.000	2.500	3.050	21.9
16NOV22ICAL-10.wiff	CAL4	807452.4	591079.2	1.00	1.366	4.56	1.000	10.000	10.180	1.8
16NOV22ICAL-11.wiff	CAL5	2235260.8	581604.1	1.00	3.843	4.56	1.000	30.000	28.640	-4.5
16NOV22ICAL-12.wiff	CAL6	2564848.4	471035.9	1.00	5.445	4.57	1.000	40.000	40.570	1.4

PFHpA
 $y = 0.24239 x$ ($r = 0.99954$) (weighting: $1 / x$)



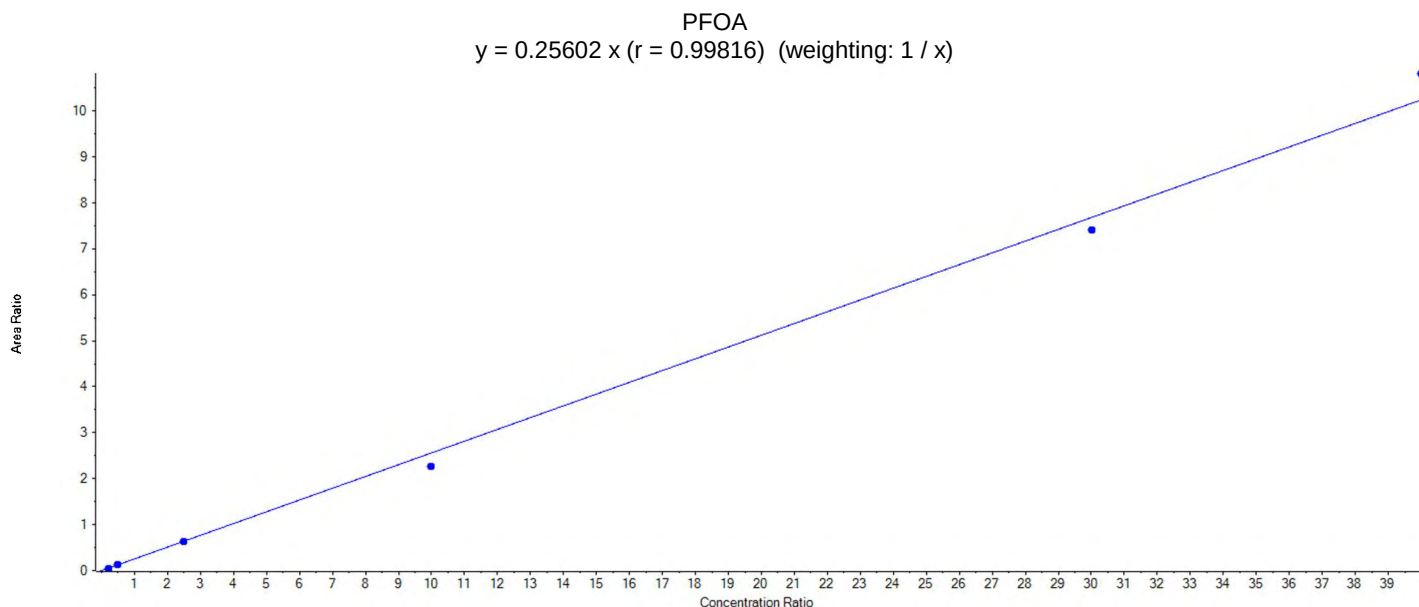
Calibration Verification

File Name	Sample Name	PFHpA Area	13C4-PFHpA Area	IS Conc	Area Ratio	RT (min)	RRT	Specified Amount	Calculated Amount	% Diff
16NOV22ICAL-07.wiff	CAL1	20399.5	479681.5	1.00	0.043	5.07	1.000	0.200	0.180	-12.3
16NOV22ICAL-08.wiff	CAL2	62638.6	477945.2	1.00	0.131	5.04	1.000	0.500	0.540	8.1
16NOV22ICAL-09.wiff	CAL3	260947.6	388380.0	1.00	0.672	5.04	1.000	2.500	2.770	10.9
16NOV22ICAL-10.wiff	CAL4	827052.9	362353.6	1.00	2.282	5.04	1.000	10.000	9.420	-5.8
16NOV22ICAL-11.wiff	CAL5	1758637.5	239507.5	1.00	7.343	5.04	1.000	30.000	30.290	1.0
16NOV22ICAL-12.wiff	CAL6	1998547.3	206112.5	1.00	9.696	5.06	1.000	40.000	40.000	0.0



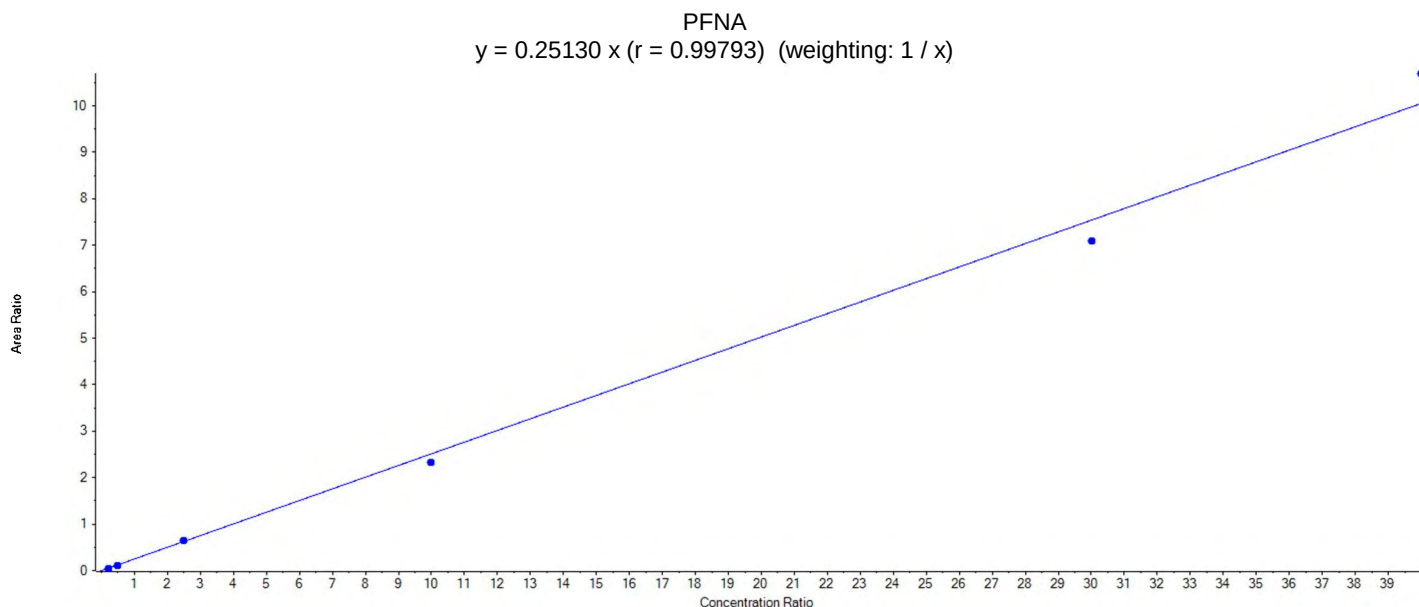
Calibration Verification

File Name	Sample Name	PFHxS Area	18O2-PFHxS Area	IS Conc	Area Ratio	RT (min)	RRT	Specified Amount	Calculated Amount	% Diff
16NOV22ICAL-07.wiff	CAL1	32450.0	174090.4	1.00	0.186	5.06	1.000	0.800	0.760	-5.0
16NOV22ICAL-08.wiff	CAL2	85775.5	182777.0	1.00	0.469	5.04	1.000	2.000	1.910	-4.3
16NOV22ICAL-09.wiff	CAL3	417182.9	165199.9	1.00	2.525	5.03	1.000	10.000	10.300	3.0
16NOV22ICAL-10.wiff	CAL4	1421354.1	147068.5	1.00	9.665	5.02	1.000	40.000	39.420	-1.5
16NOV22ICAL-11.wiff	CAL5	3384859.5	120582.7	1.00	28.071	5.03	1.000	120.000	114.480	-4.6
16NOV22ICAL-12.wiff	CAL6	3810524.1	93657.0	1.00	40.686	5.04	1.000	160.000	165.930	3.7



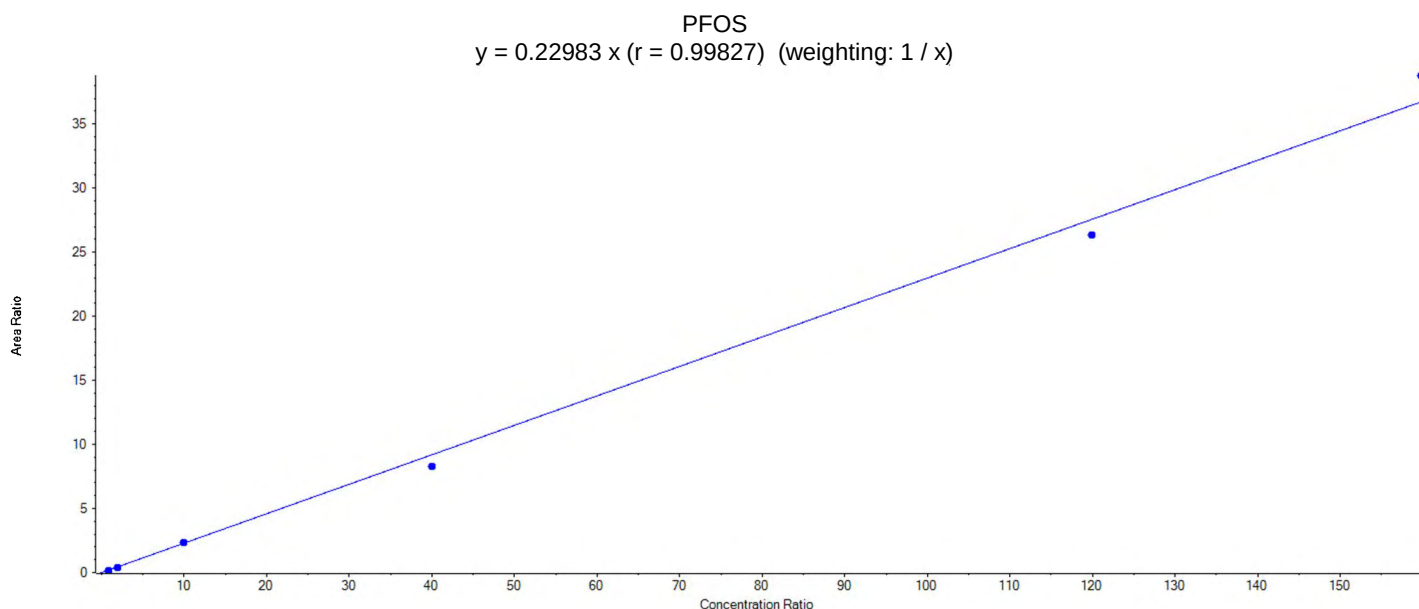
Calibration Verification

File Name	Sample Name	PFOA Area	13C4-PFOA Area	IS Conc	Area Ratio	RT (min)	RRT	Specified Amount	Calculated Amount	% Diff
16NOV22ICAL-07.wiff	CAL1	29929.5	630784.5	1.00	0.047	5.53	1.000	0.200	0.190	-7.3
16NOV22ICAL-08.wiff	CAL2	85539.4	630488.4	1.00	0.136	5.50	1.000	0.500	0.530	6.0
16NOV22ICAL-09.wiff	CAL3	404191.9	640650.6	1.00	0.631	5.49	1.000	2.500	2.460	-1.4
16NOV22ICAL-10.wiff	CAL4	1444870.0	635408.4	1.00	2.274	5.49	1.000	10.000	8.880	-11.2
16NOV22ICAL-11.wiff	CAL5	4116812.5	556149.0	1.00	7.402	5.49	1.000	30.000	28.910	-3.6
16NOV22ICAL-12.wiff	CAL6	5038528.9	466089.1	1.00	10.810	5.51	1.000	40.000	42.220	5.6



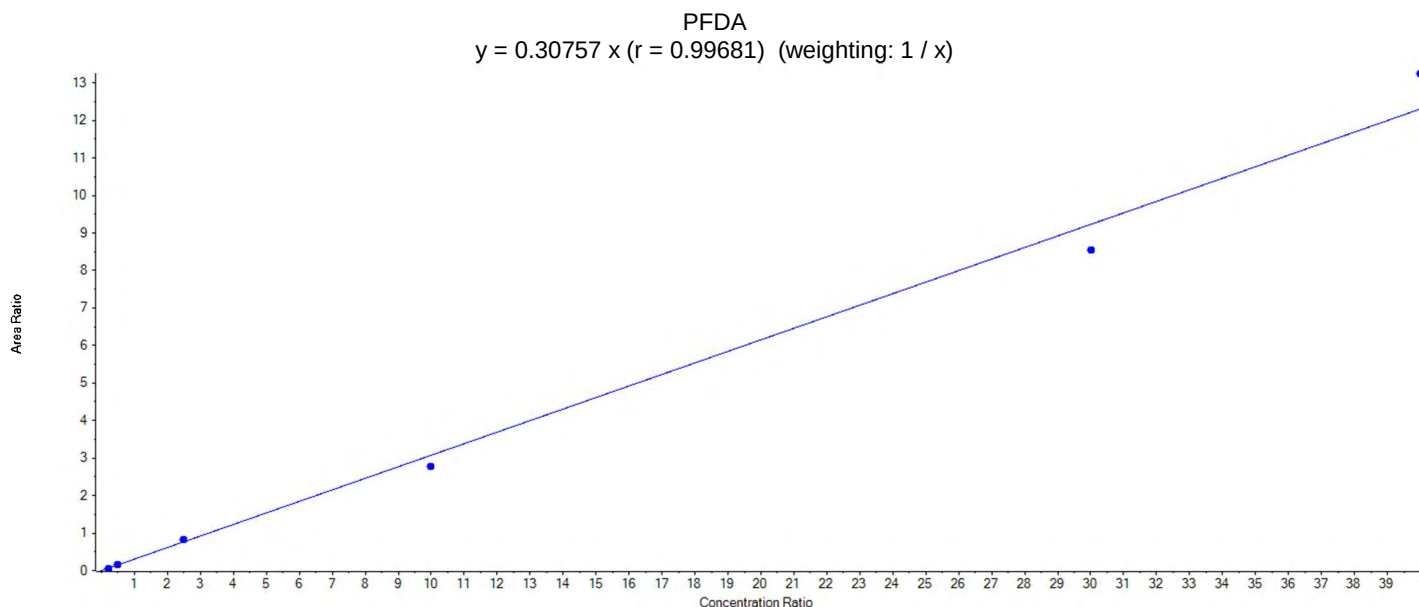
Calibration Verification

File Name	Sample Name	PFNA Area	13C5-PFNA Area	IS Conc	Area Ratio	RT (min)	RRT	Specified Amount	Calculated Amount	% Diff
16NOV22ICAL-07.wiff	CAL1	46367.7	990244.4	1.00	0.047	5.96	1.000	0.200	0.190	-6.8
16NOV22ICAL-08.wiff	CAL2	128395.5	1090176.4	1.00	0.118	5.93	1.000	0.500	0.470	-6.3
16NOV22ICAL-09.wiff	CAL3	583288.3	907094.7	1.00	0.643	5.92	1.000	2.500	2.560	2.4
16NOV22ICAL-10.wiff	CAL4	1888362.6	814227.2	1.00	2.319	5.92	1.000	10.000	9.230	-7.7
16NOV22ICAL-11.wiff	CAL5	3969963.1	559975.5	1.00	7.090	5.92	1.000	30.000	28.210	-6.0
16NOV22ICAL-12.wiff	CAL6	4710902.8	440621.5	1.00	10.691	5.94	1.000	40.000	42.550	6.4



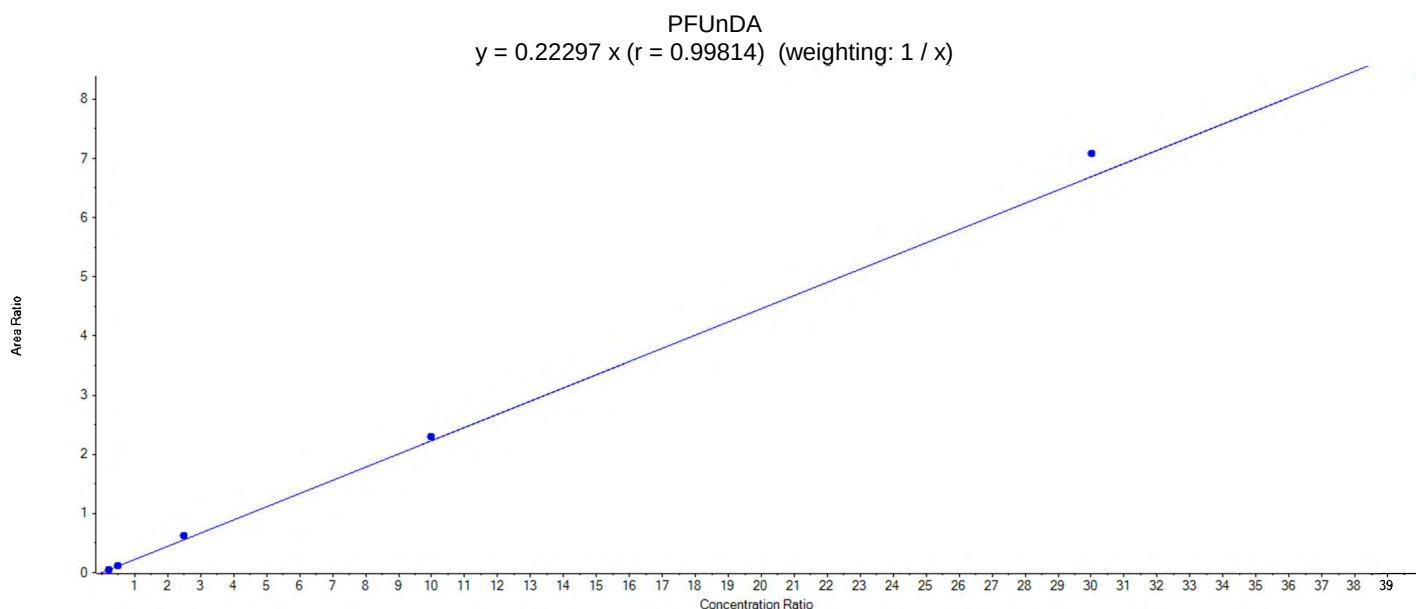
Calibration Verification

File Name	Sample Name	PFOS Area	13C4-PFOS Area	IS Conc	Area Ratio	RT (min)	RRT	Specified Amount	Calculated Amount	% Diff
16NOV22ICAL-07.wiff	CAL1	37558.1	193042.3	1.00	0.195	5.93	1.000	0.800	0.850	5.9
16NOV22ICAL-08.wiff	CAL2	90183.7	215638.1	1.00	0.418	5.90	1.000	2.000	1.820	-9.0
16NOV22ICAL-09.wiff	CAL3	444944.9	190248.9	1.00	2.339	5.89	1.000	9.990	10.180	1.9
16NOV22ICAL-10.wiff	CAL4	1446650.8	173928.3	1.00	8.318	5.89	1.000	39.960	36.190	-9.4
16NOV22ICAL-11.wiff	CAL5	3441546.9	130525.8	1.00	26.367	5.88	1.000	119.900	114.720	-4.3
16NOV22ICAL-12.wiff	CAL6	3850521.8	99316.0	1.00	38.770	5.90	1.000	159.800	168.690	5.6



Calibration Verification

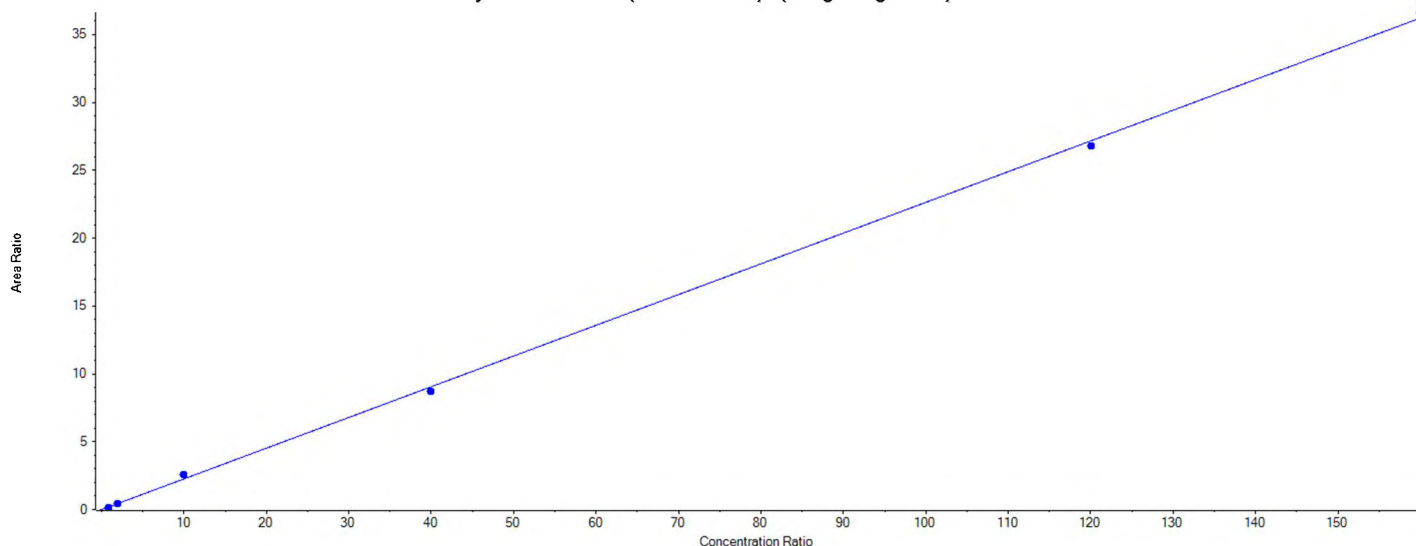
File Name	Sample Name	PFDA Area	13C2-PFDA Area	IS Conc	Area Ratio	RT (min)	RRT	Specified Amount	Calculated Amount	% Diff
16NOV22ICAL-07.wiff	CAL1	46337.4	829235.5	1.00	0.056	6.35	1.000	0.200	0.180	-9.2
16NOV22ICAL-08.wiff	CAL2	122613.1	816591.5	1.00	0.150	6.32	1.000	0.500	0.490	-2.4
16NOV22ICAL-09.wiff	CAL3	591290.3	720056.9	1.00	0.821	6.31	1.000	2.500	2.670	6.8
16NOV22ICAL-10.wiff	CAL4	2079267.2	746886.8	1.00	2.784	6.31	1.000	10.000	9.050	-9.5
16NOV22ICAL-11.wiff	CAL5	5293620.5	620311.8	1.00	8.534	6.30	1.000	30.000	27.750	-7.5
16NOV22ICAL-12.wiff	CAL6	6222969.1	469833.5	1.00	13.245	6.31	1.000	40.000	43.060	7.7



Calibration Verification

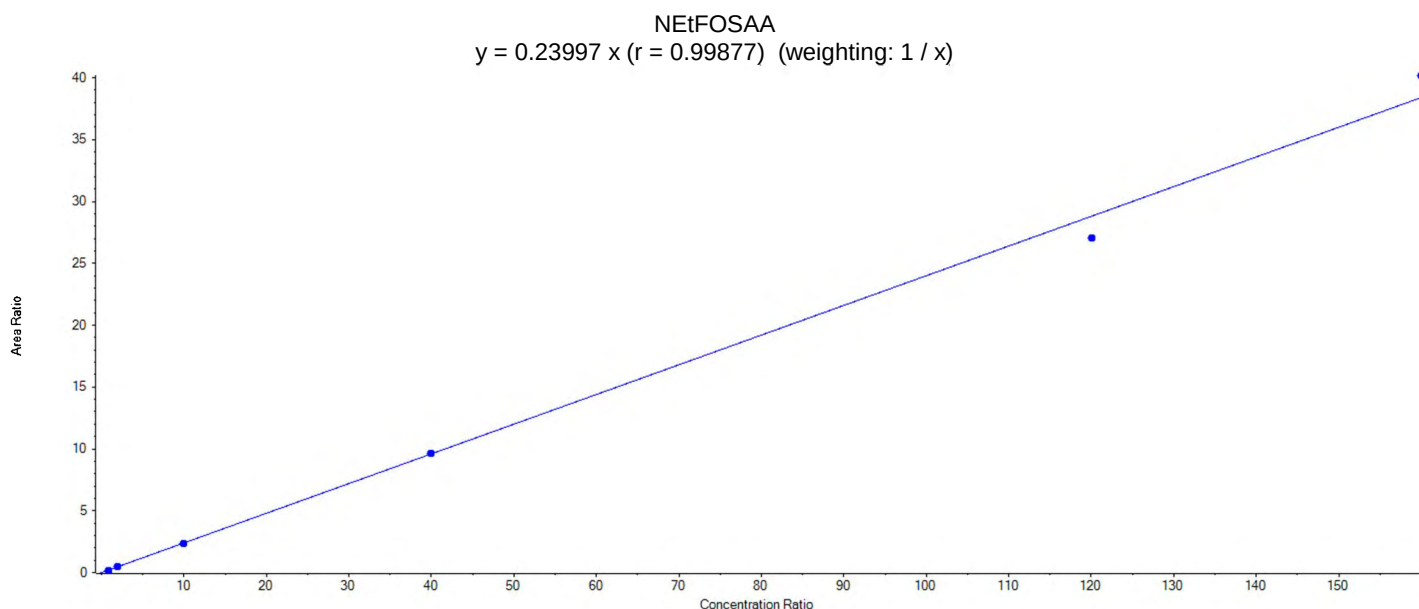
File Name	Sample Name	PFUnDA Area	13C2-PFUnDA Area	IS Conc	Area Ratio	RT (min)	RRT	Specified Amount	Calculated Amount	% Diff
16NOV22ICAL-07.wiff	CAL1	44532.0	972010.1	1.00	0.046	6.70	1.000	0.200	0.210	2.7
16NOV22ICAL-08.wiff	CAL2	120506.3	1014624.1	1.00	0.119	6.68	1.000	0.500	0.530	6.5
16NOV22ICAL-09.wiff	CAL3	562326.8	888768.9	1.00	0.633	6.68	1.000	2.500	2.840	13.5
16NOV22ICAL-10.wiff	CAL4	2024471.7	882582.7	1.00	2.294	6.66	1.000	10.000	10.290	2.9
16NOV22ICAL-11.wiff	CAL5	5296568.7	748575.7	1.00	7.076	6.64	1.000	30.000	31.730	5.8
16NOV22ICAL-12.wiff	CAL6	5251018.2	626263.8	1.00	8.385	6.66	1.000	40.000	37.600	-6.0

NMeFOSAA
 $y = 0.22637 x$ ($r = 0.99956$) (weighting: $1 / x$)



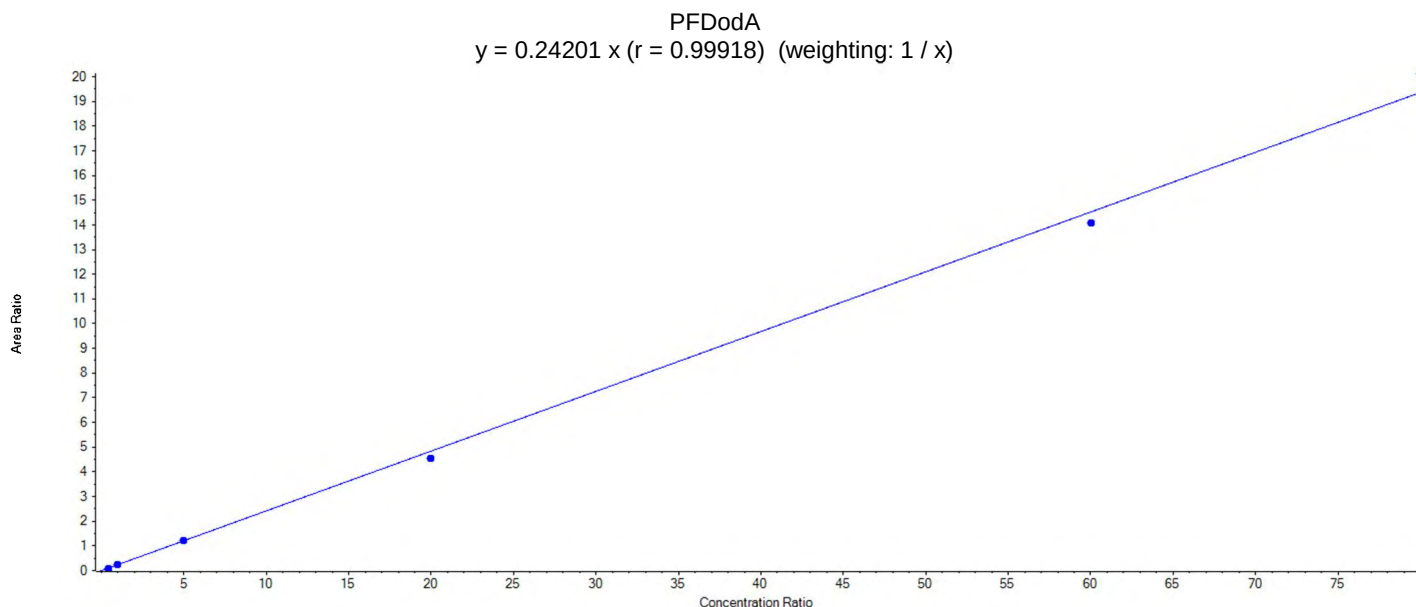
Calibration Verification

File Name	Sample Name	NMeFOSAA Area	d3-NMeFOSAA Area	IS Conc	Area Ratio	RT (min)	RRT	Specified Amount	Calculated Amount	% Diff
16NOV22ICAL-07.wiff	CAL1	31332.2	170674.6	1.00	0.184	6.55	1.000	0.800	0.810	1.4
16NOV22ICAL-08.wiff	CAL2	91517.4	195302.2	1.00	0.469	6.51	1.000	2.000	2.070	3.5
16NOV22ICAL-09.wiff	CAL3	421436.9	164485.5	1.00	2.562	6.52	1.000	10.000	11.320	13.2
16NOV22ICAL-10.wiff	CAL4	1427683.1	164553.0	1.00	8.676	6.50	1.000	40.000	38.330	-4.2
16NOV22ICAL-11.wiff	CAL5	3796797.8	141501.8	1.00	26.832	6.49	1.000	120.000	118.530	-1.2
16NOV22ICAL-12.wiff	CAL6	4358045.5	119027.6	1.00	36.614	6.51	1.000	160.000	161.740	1.1



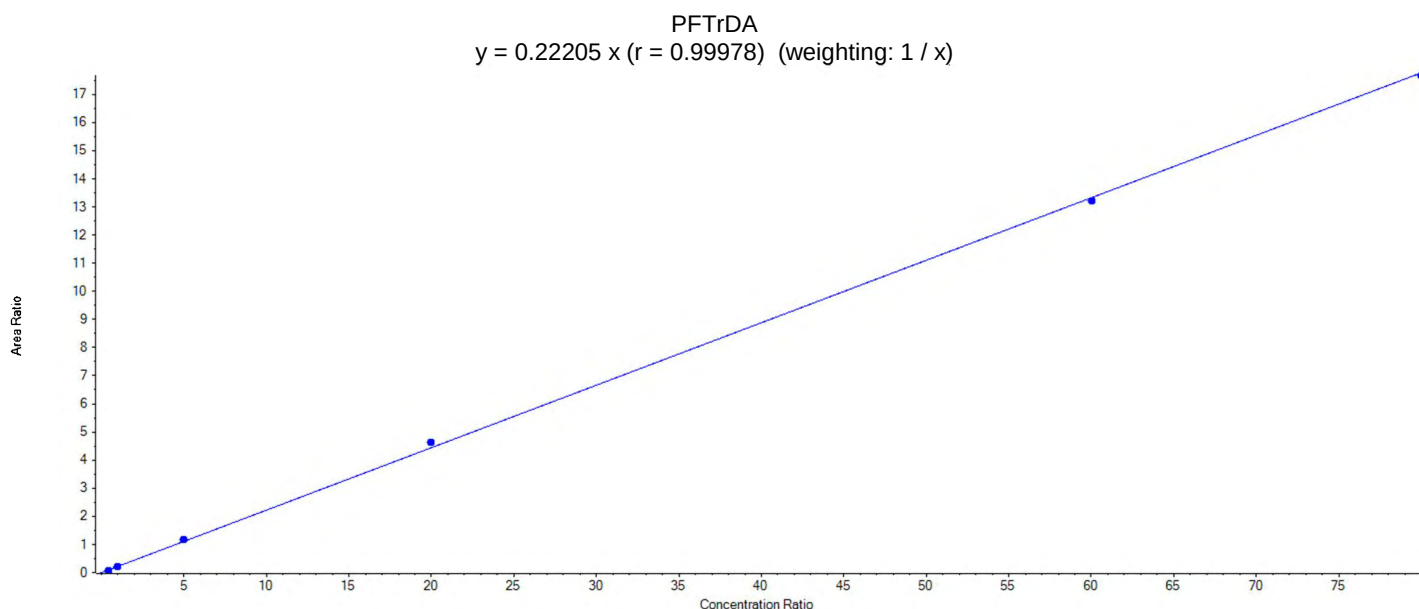
Calibration Verification

File Name	Sample Name	NEtFOSAA Area	d5-NEtFOSA A Area	IS Conc	Area Ratio	RT (min)	RRT	Specified Amount	Calculated Amount	% Diff
16NOV22ICAL-07.wiff	CAL1	26831.3	156620.5	1.00	0.171	6.73	1.000	0.800	0.710	-10.8
16NOV22ICAL-08.wiff	CAL2	75800.8	166173.9	1.00	0.456	6.70	1.000	2.000	1.900	-5.0
16NOV22ICAL-09.wiff	CAL3	340024.2	144585.3	1.00	2.352	6.71	1.000	10.000	9.800	-2.0
16NOV22ICAL-10.wiff	CAL4	1207621.9	124989.0	1.00	9.662	6.69	1.000	40.000	40.260	0.7
16NOV22ICAL-11.wiff	CAL5	2988538.0	110450.0	1.00	27.058	6.68	1.000	120.000	112.760	-6.0
16NOV22ICAL-12.wiff	CAL6	3679833.3	91622.1	1.00	40.163	6.69	1.000	160.000	167.370	4.6



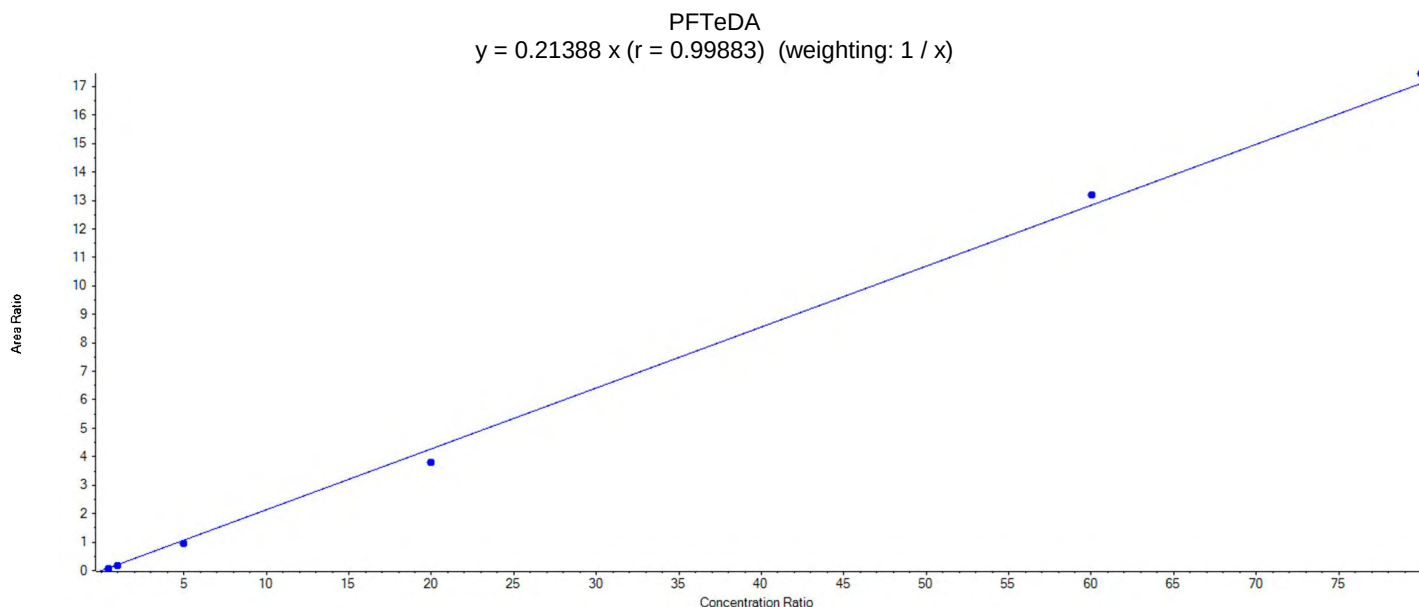
Calibration Verification

File Name	Sample Name	PFDodA Area	13C2-PFDodA Area	IS Conc	Area Ratio	RT (min)	RRT	Specified Amount	Calculated Amount	% Diff
16NOV22ICAL-07.wiff	CAL1	110139.2	1174357.8	1.00	0.094	7.04	1.000	0.400	0.390	-3.1
16NOV22ICAL-08.wiff	CAL2	299604.9	1241603.6	1.00	0.241	7.01	1.000	1.000	1.000	-0.3
16NOV22ICAL-09.wiff	CAL3	1395880.0	1159530.6	1.00	1.204	7.01	1.000	5.000	4.970	-0.5
16NOV22ICAL-10.wiff	CAL4	4821537.3	1063582.4	1.00	4.533	7.00	1.000	20.000	18.730	-6.3
16NOV22ICAL-11.wiff	CAL5	12152076.2	863287.4	1.00	14.077	6.98	1.000	60.000	58.160	-3.1
16NOV22ICAL-12.wiff	CAL6	15210860.6	755937.5	1.00	20.122	6.99	1.000	80.000	83.140	3.9



Calibration Verification

File Name	Sample Name	PFTrDA Area	13C2-PFDoDA Area	IS Conc	Area Ratio	RT (min)	RRT	Specified Amount	Calculated Amount	% Diff
16NOV22ICAL-07.wiff	CAL1	83443.0	1174357.8	1.00	0.071	7.37	1.050	0.400	0.320	-20.0
16NOV22ICAL-08.wiff	CAL2	243629.4	1241603.6	1.00	0.196	7.33	1.050	1.000	0.880	-11.6
16NOV22ICAL-09.wiff	CAL3	1363253.2	1159530.6	1.00	1.176	7.33	1.050	5.000	5.290	5.9
16NOV22ICAL-10.wiff	CAL4	4909620.2	1063582.4	1.00	4.616	7.31	1.050	20.000	20.790	3.9
16NOV22ICAL-11.wiff	CAL5	11416688.6	863287.4	1.00	13.225	7.30	1.050	60.000	59.560	-0.7
16NOV22ICAL-12.wiff	CAL6	13353720.2	755937.5	1.00	17.665	7.30	1.040	80.000	79.560	-0.6



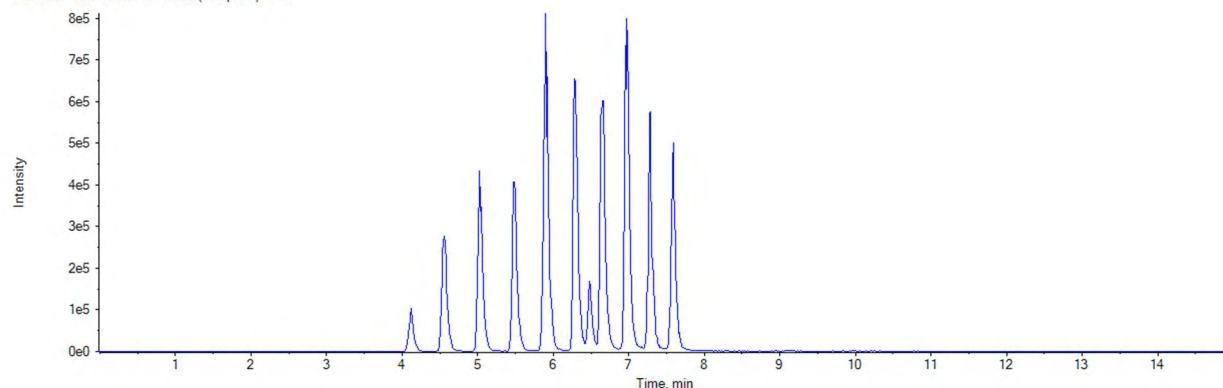
Calibration Verification

File Name	Sample Name	PFTeDA Area	13C2-PFDoDA Area	IS Conc	Area Ratio	RT (min)	RRT	Specified Amount	Calculated Amount	% Diff
16NOV22ICAL-07.wiff	CAL1	79271.4	1174357.8	1.00	0.068	7.69	1.090	0.400	0.320	-21.1
16NOV22ICAL-08.wiff	CAL2	197335.7	1241603.6	1.00	0.159	7.65	1.090	1.000	0.740	-25.7
16NOV22ICAL-09.wiff	CAL3	1101032.4	1159530.6	1.00	0.950	7.65	1.090	5.000	4.440	-11.2
16NOV22ICAL-10.wiff	CAL4	4023047.6	1063582.4	1.00	3.783	7.62	1.090	20.000	17.690	-11.6
16NOV22ICAL-11.wiff	CAL5	11377039.5	863287.4	1.00	13.179	7.61	1.090	60.000	61.620	2.7
16NOV22ICAL-12.wiff	CAL6	13192658.7	755937.5	1.00	17.452	7.60	1.090	80.000	81.600	2.0

Initial Calibration Verification

Sample ID: ICV
Sample File: 16NOV22ICAL-15.wiff

TIC from 16NOV22ICAL-15.wiff (sample 1) - ICV



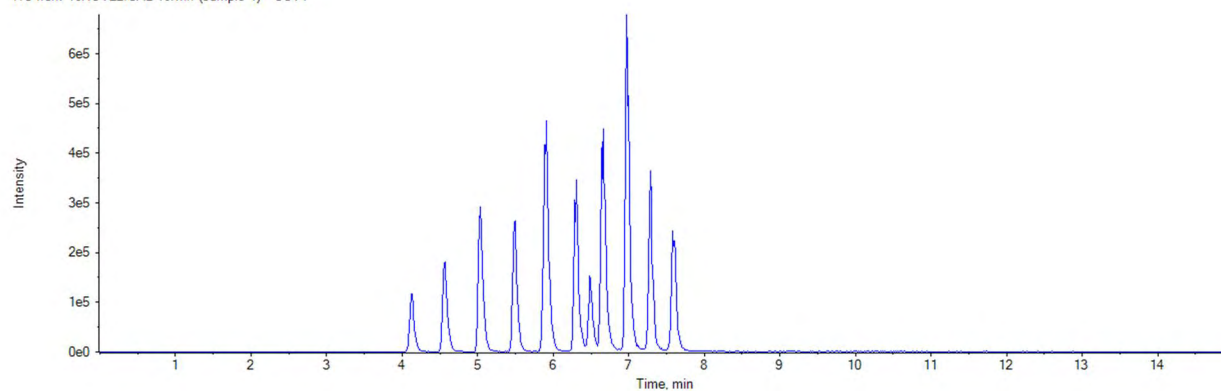
Analyte Name	Analyte Area	IS Name	IS Area	IS Conc	Area Ratio	RT (min)	RRT	Spec Amount	Calc Amount	% Diff
PFBS	422217.9	18O2-PFHxS	169830.8	1.00	2.486	4.12	0.820	8.85	8.40	-5.1
PFHxA	762024.2	13C2-PFHxA	614028.2	1.00	1.241	4.56	1.000	10.00	9.25	-7.5
PFHpA	841463.2	13C4-PFHpA	454489.0	1.00	1.851	5.03	1.000	10.00	7.64	-23.6
PFHxS	379692.0	18O2-PFHxS	169830.8	1.00	2.236	5.02	1.000	9.45	9.12	-3.5
PFOA	1240729.3	13C4-PFOA	600285.6	1.00	2.067	5.48	1.000	10.00	8.07	-19.3
PFNA	1813846.1	13C5-PFNA	983217.3	1.00	1.845	5.90	1.000	10.00	7.34	-26.6
PFOS	390143.8	13C4-PFOS	217308.6	1.00	1.795	5.87	1.000	9.55	7.81	-18.2
PFDA	2165000.8	13C2-PFDA	768856.6	1.00	2.816	6.29	1.000	10.00	9.16	-8.4
PFUnDA	1643236.9	13C2-PFUnDA	866523.0	1.00	1.896	6.65	1.000	10.00	8.50	-15.0
NMeFOSAA	473899.3	d3-NMeFOSAA	181564.8	1.00	2.610	6.49	1.000	10.00	11.53	15.3
NEtFOSAA	330265.4	d5-NEtFOSAA	152726.6	1.00	2.162	6.67	1.000	10.00	9.01	-9.9
PFDodA	2343351.3	13C2-PFDodA	1192354.3	1.00	1.965	6.97	1.000	10.00	8.12	-18.8
PFTTrDA	2031358.1	13C2-PFDodA	1192354.3	1.00	1.704	7.28	1.040	10.00	7.67	-23.3
PFTeDA	1934416.6	13C2-PFDodA	1192354.3	1.00	1.622	7.59	1.090	10.00	7.59	-24.1

Continuing Calibration Verification

ICAL Name: 16NOV22ICAL

Sample ID: CAL3
Sample Name: CCV1
Sample File: 16NOV22ICAL-16.wiff
Acquisition Date: 11/22/2016 3:03:39 PM

TIC from 16NOV22ICAL-16.wiff (sample 1) - CCV1



Analyte Name	Analyte Area	IS Name	IS Area	IS Con	Area Ratio	RT (min)	RRT	Spec Amt	Calc Amt	% Diff	OOS
PFOA	414832.0	13C4-PFOA	678889.0	1.00	0.611	5.49	1.000	2.50	2.390	-4.5	
PFOS	465091.3	13C4-PFOS	188529.9	1.00	2.467	5.88	1.000	9.99	10.730	7.4	

APPROVED

By AKP at 8:49 am, 11/23/16

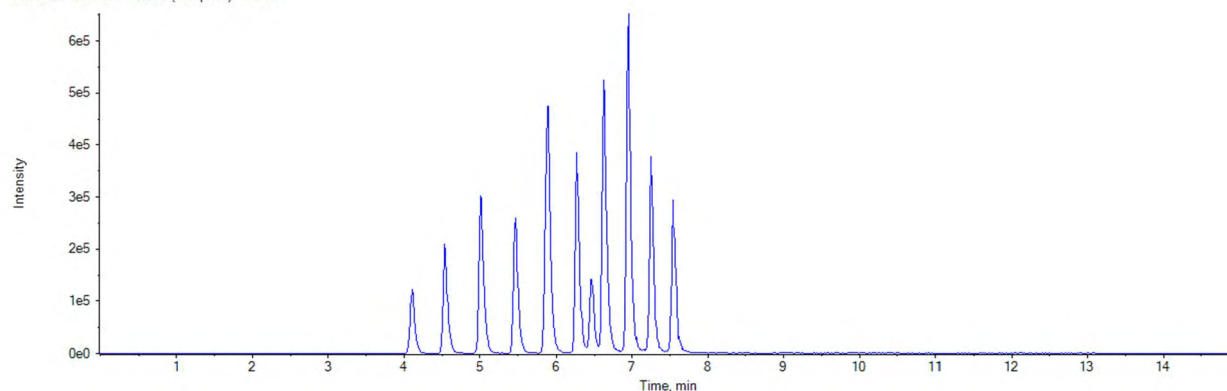
MCR09 Page 86 of 130

REVIEWED

By uild at 10:18 am, 11/23/16

Sample ID: CAL3
Sample Name: CCV2
Sample File: 16NOV22-10.wiff
Acquisition Date: 11/22/2016 5:48:10 PM

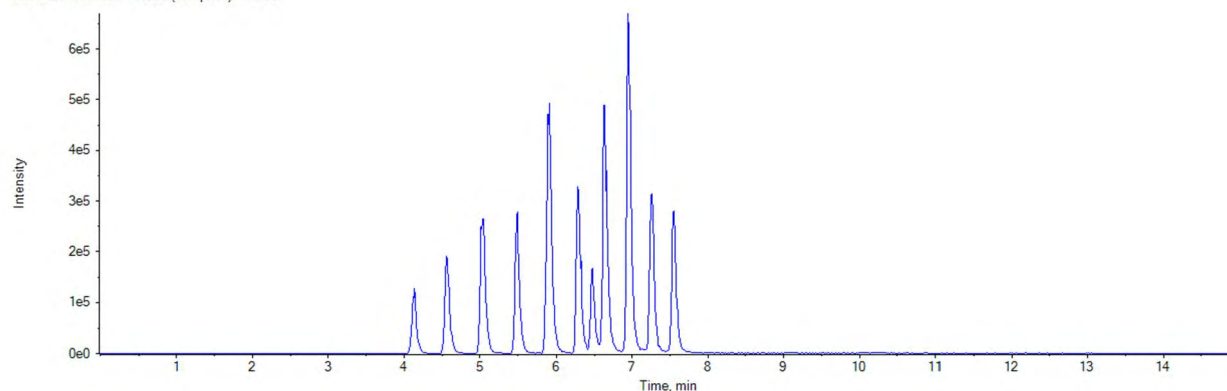
TIC from 16NOV22-10.wiff (sample 1) - CCV2



Analyte Name	Analyte Area	IS Name	IS Area	IS Con	Area Ratio	RT (min)	RRT	Spec Amt	Calc Amt	% Diff	OOS
PFOA	442981.4	13C4-PFOA	662783.5	1.00	0.668	5.47	1.000	2.50	2.610	4.4	
PFOS	471894.4	13C4-PFOS	190573.9	1.00	2.476	5.86	1.000	9.99	10.770	7.8	

Sample ID: CAL3
Sample Name: CCV3
Sample File: 16NOV22-19.wiff
Acquisition Date: 11/22/2016 8:16:16 PM

TIC from 16NOV22-19.wiff (sample 1) - CCV3



Analyte Name	Analyte Area	IS Name	IS Area	IS Con	Area Ratio	RT (min)	RRT	Spec Amt	Calc Amt	% Diff	OOS
PFOA	448200.7	13C4-PFOA	659430.9	1.00	0.680	5.49	1.000	2.50	2.650	6.2	
PFOS	481667.2	13C4-PFOS	197100.9	1.00	2.444	5.88	1.000	9.99	10.630	6.4	

APPROVED
By AKP at 8:49 am, 11/23/16

MCR09 Page 89 of 130

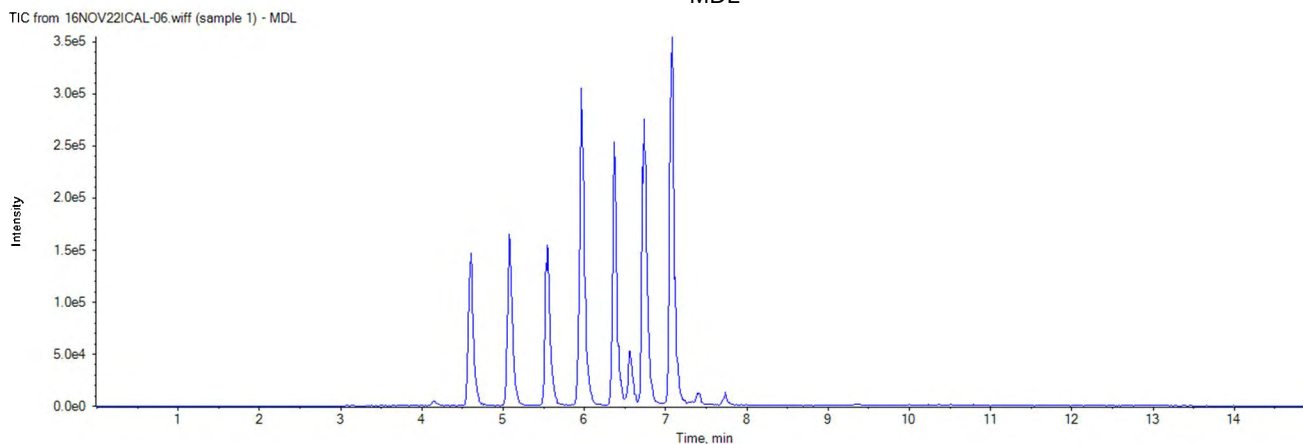
REVIEWED
By uild at 10:18 am, 11/23/16

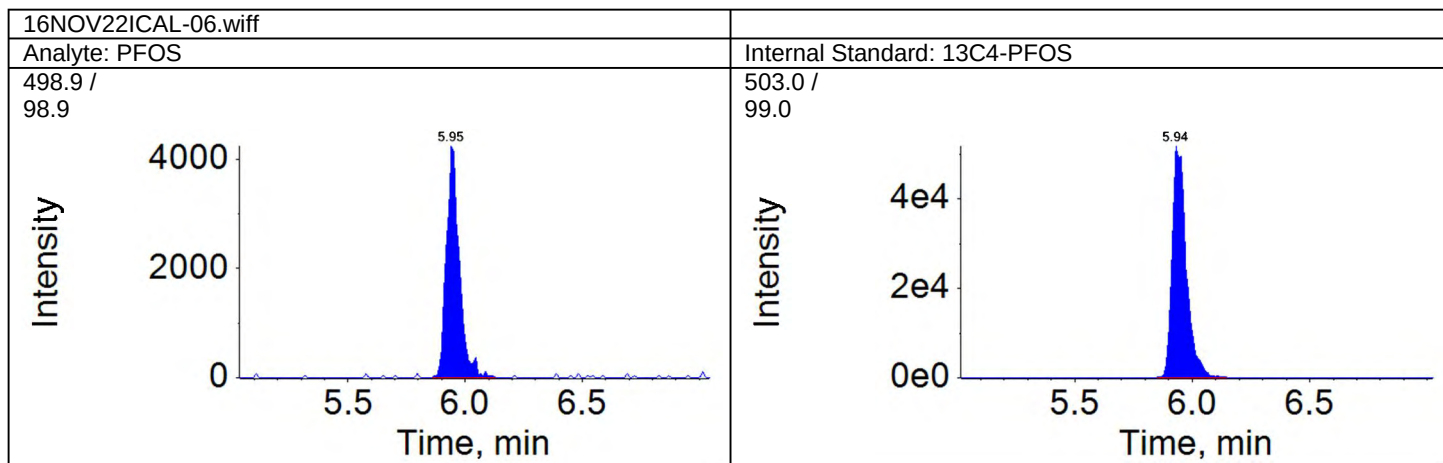
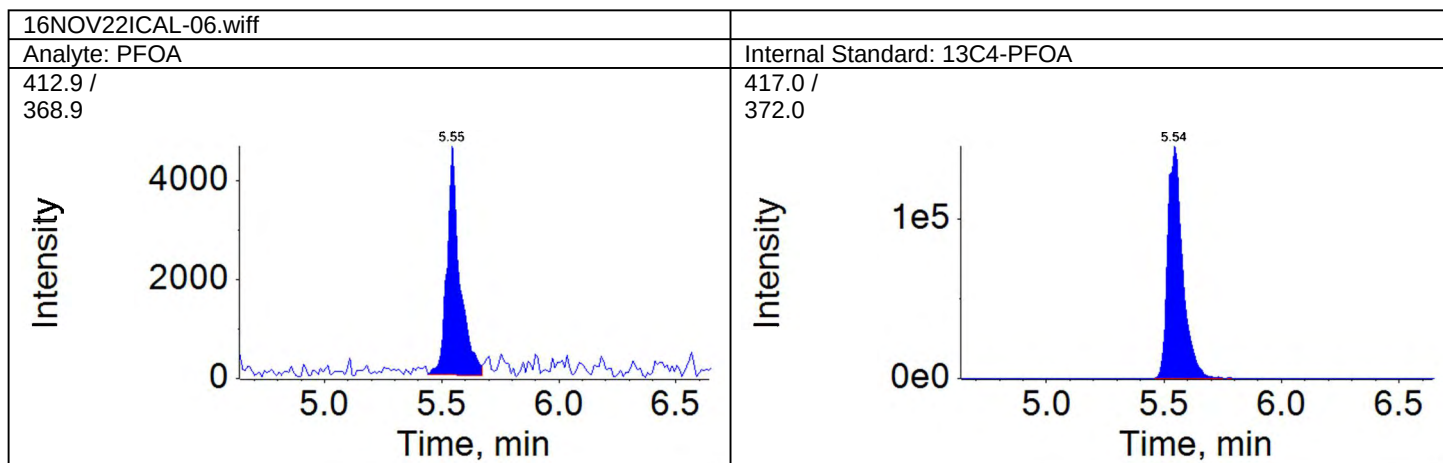
Sample Name:	MDL			Data File:		16NOV22ICAL-06.wiff
Sample ID:	MDL			Acquis Date:		2016-11-22T12:19:06
Sample Type:	Unknown			Instrument:		Triple Quad 4500, 0, LM24743
Vial Position:	2			Acquis Method:		PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00			Result Table:		MQ16326003
				ICAL Name:		16NOV22ICAL
Batch Number:	PFCICAL			Operator:		US19INS00015\4500TRIPLE
Sample Wt.:	1.00000			Dilution Factor:		1.00
Sample Vol.:	1.000			Prep Factor:		1.000

Quantitation Peak Table

Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	5.55	1.000	17432.7	A	13C4-PFOA	5.54	649324.3	0.027	0.105
PFOS	5.95	1.000	16480.2	A	13C4-PFOS	5.94	219432.3	0.075	0.327

Total Ion Chromatogram
MDL





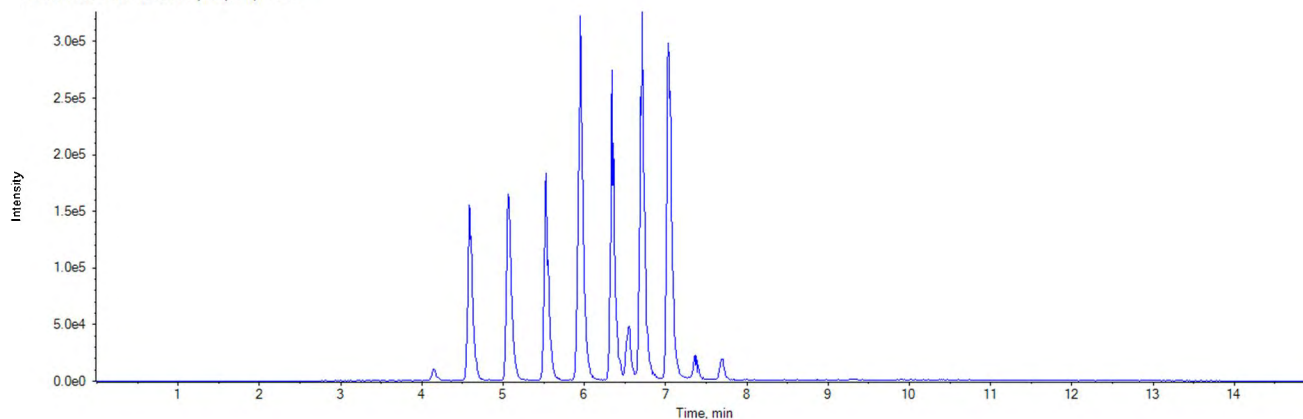
Sample Name:	CAL1			Data File:		16NOV22ICAL-07.wiff
Sample ID:	CAL1			Acquis Date:		2016-11-22T12:35:36
Sample Type:	Standard			Instrument:		Triple Quad 4500, 0, LM24743
Vial Position:	3			Acquis Method:		PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00			Result Table:		MQ16326003
				ICAL Name:		16NOV22ICAL
Batch Number:	PFCICAL			Operator:		US19INS00015\4500TRIPLE
Sample Wt.:	1.00000			Dilution Factor:		1.00
Sample Vol.:	1.000			Prep Factor:		1.000

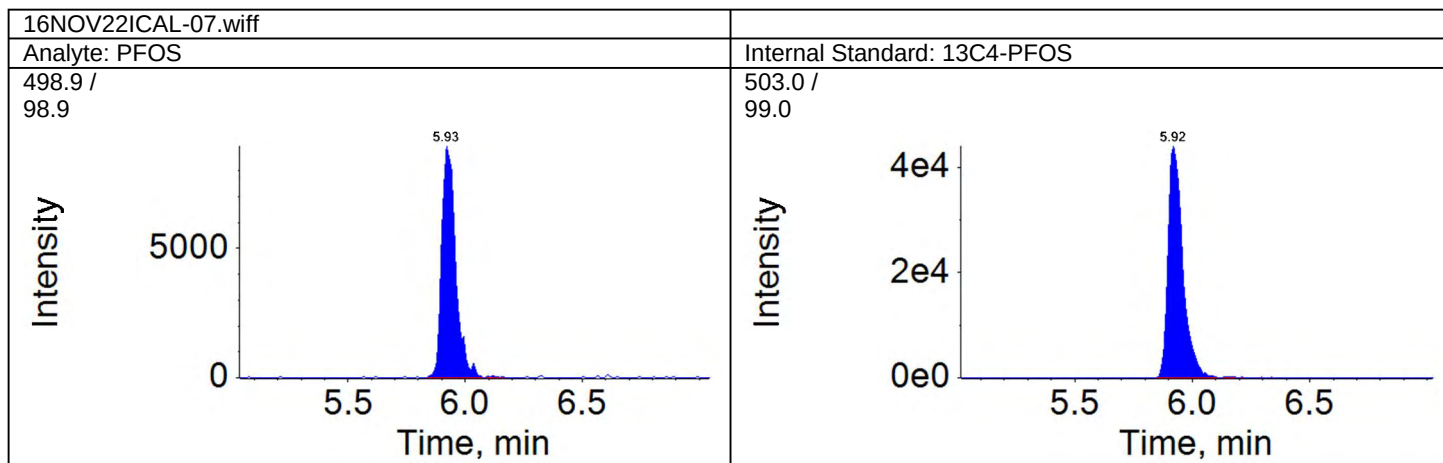
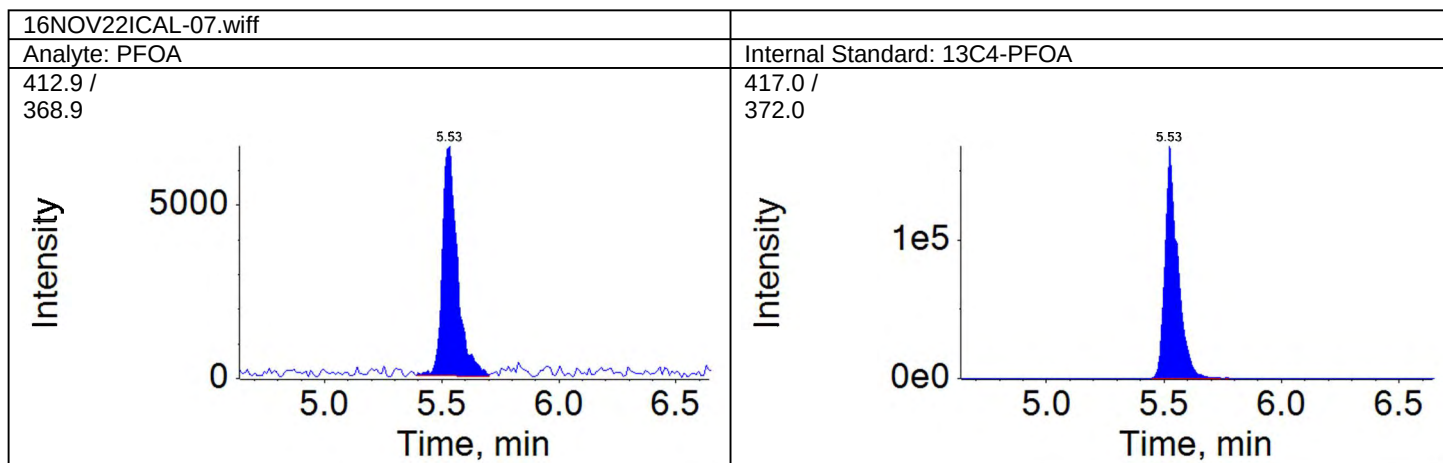
Quantitation Peak Table

Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	5.53	1.000	29929.5	A	13C4-PFOA	5.53	630784.5	0.047	0.185
PFOS	5.93	1.000	37558.1	A	13C4-PFOS	5.92	193042.3	0.195	0.847

Total Ion Chromatogram
CAL1

TIC from 16NOV22ICAL-07.wiff (sample 1) - CAL1





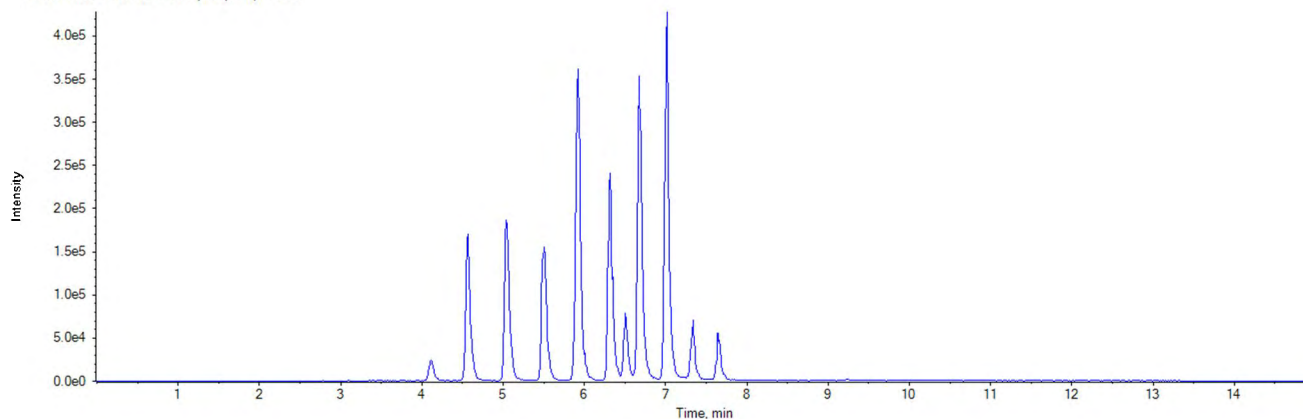
Sample Name:	CAL2			Data File:		16NOV22ICAL-08.wiff
Sample ID:	CAL2			Acquis Date:		2016-11-22T12:52:00
Sample Type:	Standard			Instrument:		Triple Quad 4500, 0, LM24743
Vial Position:	4			Acquis Method:		PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00			Result Table:		MQ16326003
				ICAL Name:		16NOV22ICAL
Batch Number:	PFCICAL			Operator:		US19INS00015\4500TRIPLE
Sample Wt.:	1.00000			Dilution Factor:		1.00
Sample Vol.:	1.000			Prep Factor:		1.000

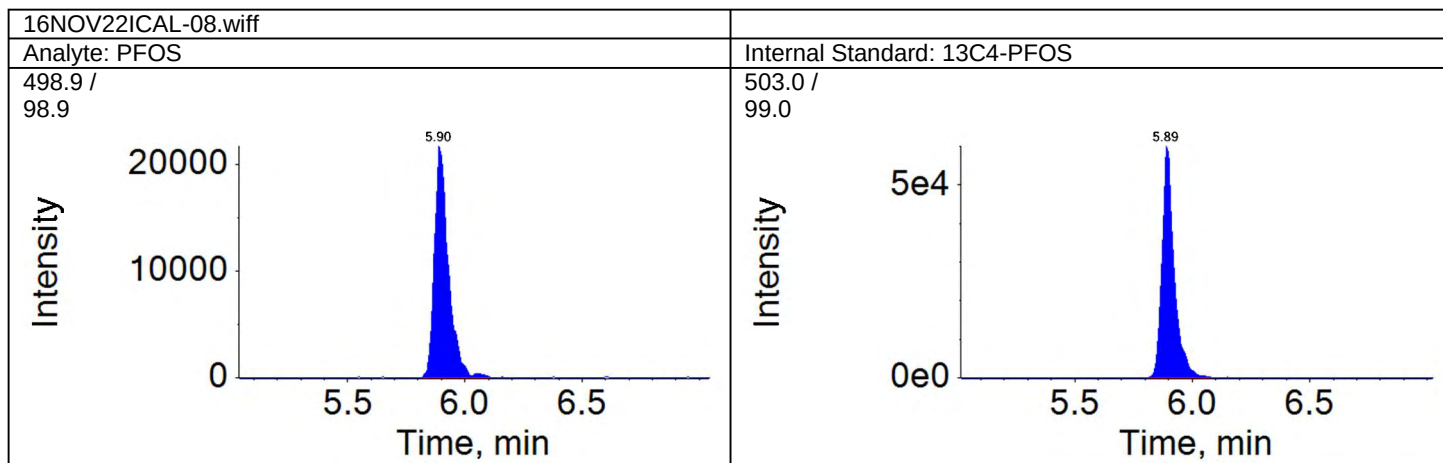
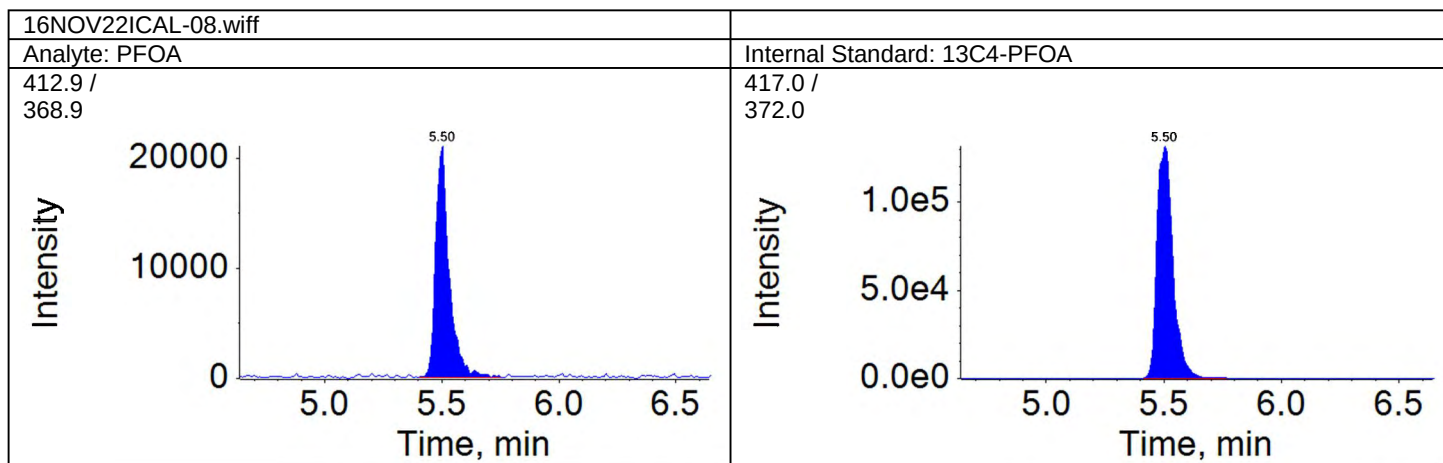
Quantitation Peak Table

Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	5.50	1.000	85539.4	M	13C4-PFOA	5.50	630488.4	0.136	0.530
PFOS	5.90	1.000	90183.7	A	13C4-PFOS	5.89	215638.1	0.418	1.820

Total Ion Chromatogram
CAL2

TIC from 16NOV22ICAL-08.wiff (sample 1) - CAL2

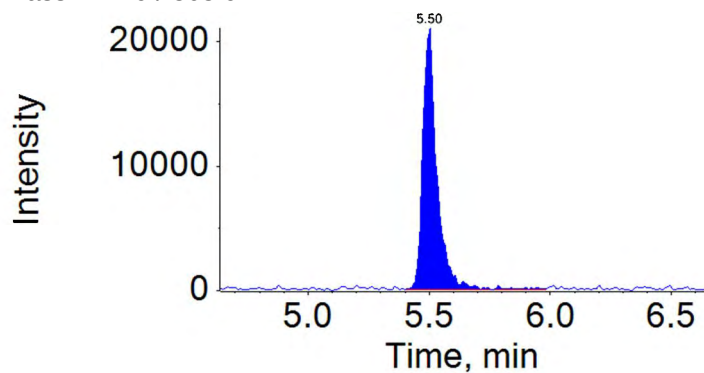




Auto Integrations prior to Manual Integration

<u>File Name</u>	<u>Acquis Date</u>	<u>Sample Name</u>	<u>Component</u>	<u>RT</u>	<u>Peak Area</u>
16NOV22ICAL-08.wiff	2016-11-22T12:52:00	CAL2	PFOA	5.50	86489.8

Component: PFOA
Mass: 412.9 / 368.9



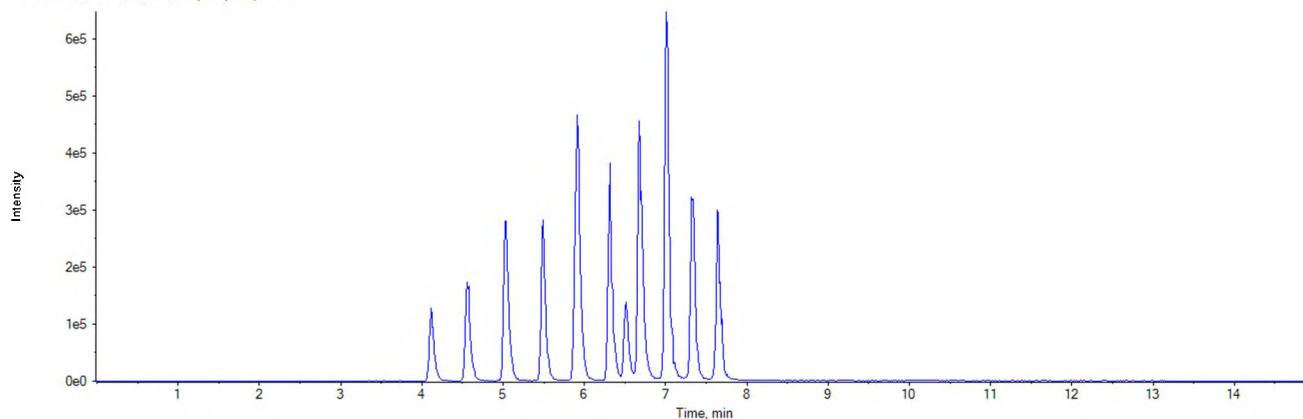
Sample Name:	CAL3			Data File:		16NOV22ICAL-09.wiff
Sample ID:	CAL3			Acquis Date:		2016-11-22T13:08:30
Sample Type:	Standard			Instrument:		Triple Quad 4500, 0, LM24743
Vial Position:	5			Acquis Method:		PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00			Result Table:		MQ16326003
				ICAL Name:		16NOV22ICAL
Batch Number:	PFCICAL			Operator:		US19INS00015\4500TRIPLE
Sample Wt.:	1.00000			Dilution Factor:		1.00
Sample Vol.:	1.000			Prep Factor:		1.000

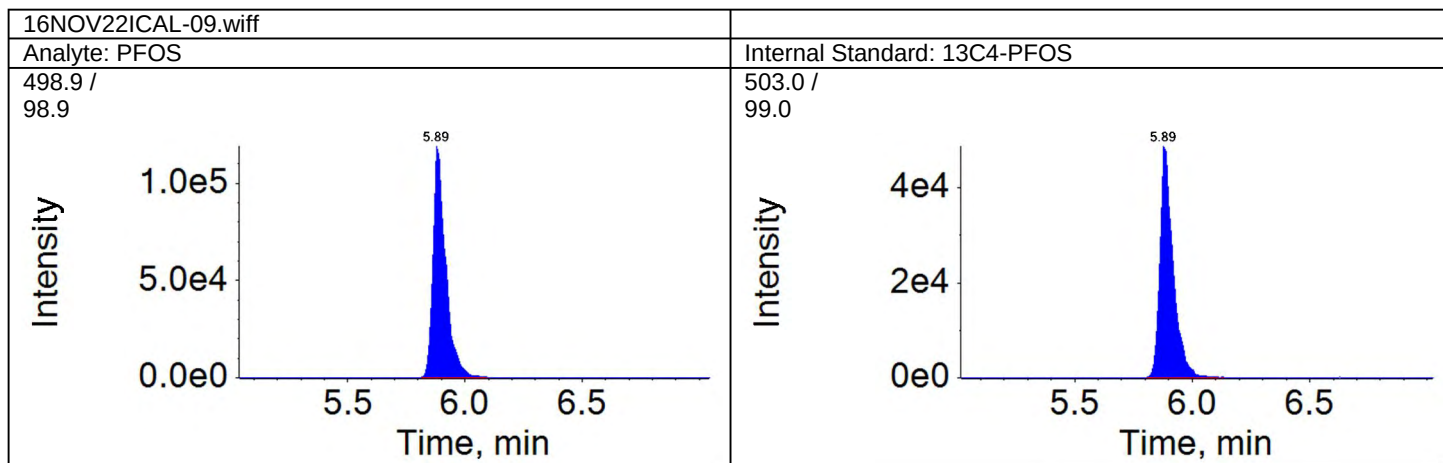
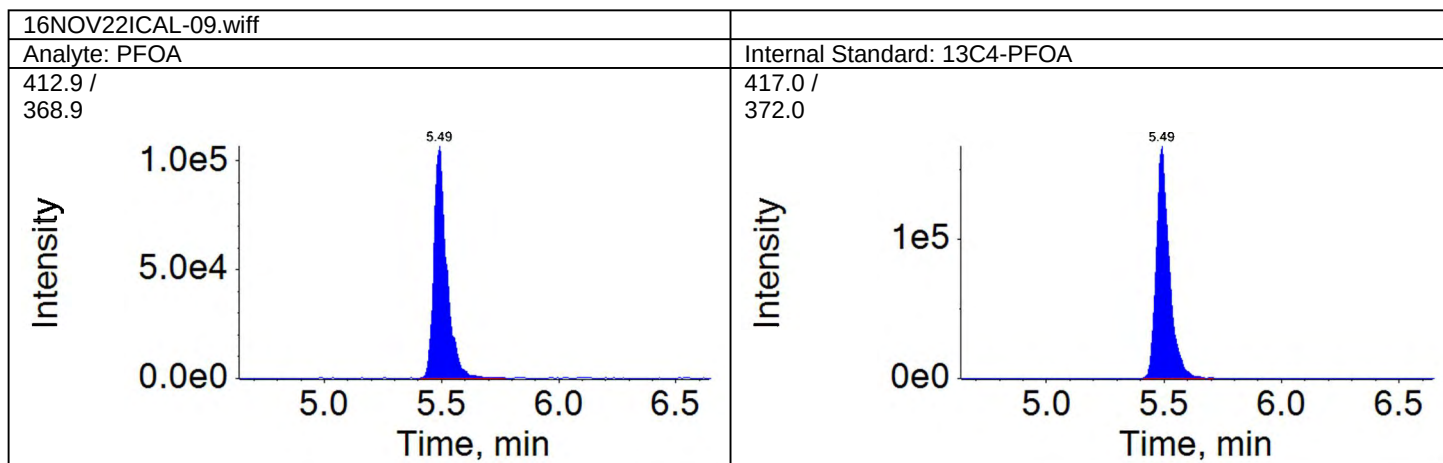
Quantitation Peak Table

Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	5.49	1.000	404191.9	A	13C4-PFOA	5.49	640650.6	0.631	2.464
PFOS	5.89	1.000	444944.9	A	13C4-PFOS	5.89	190248.9	2.339	10.176

Total Ion Chromatogram
CAL3

TIC from 16NOV22ICAL-09.wiff (sample 1) - CAL3





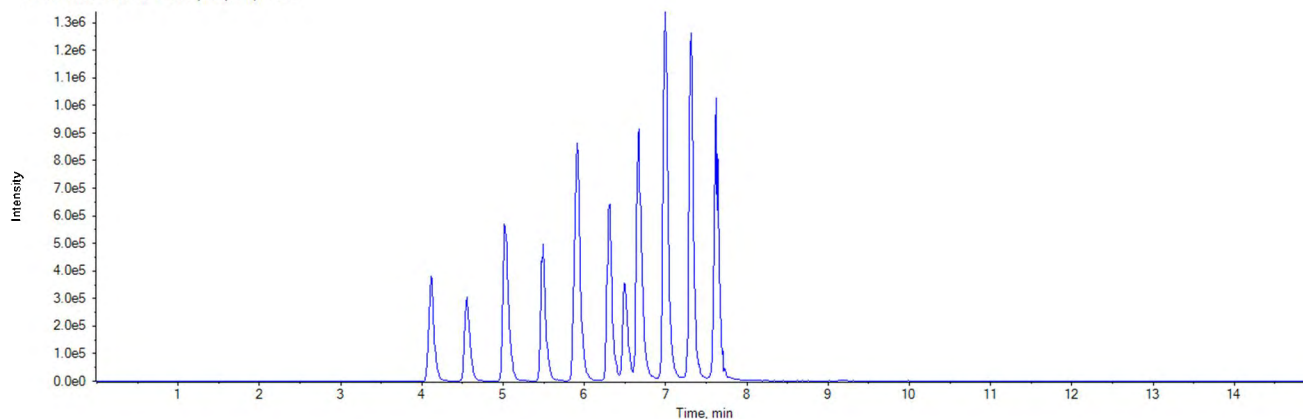
Sample Name:	CAL4			Data File:		16NOV22ICAL-10.wiff
Sample ID:	CAL4			Acquis Date:		2016-11-22T13:24:54
Sample Type:	Standard			Instrument:		Triple Quad 4500, 0, LM24743
Vial Position:	6			Acquis Method:		PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00			Result Table:		MQ16326003
				ICAL Name:		16NOV22ICAL
Batch Number:	PFCICAL			Operator:		US19INS00015\4500TRIPLE
Sample Wt.:	1.00000			Dilution Factor:		1.00
Sample Vol.:	1.000			Prep Factor:		1.000

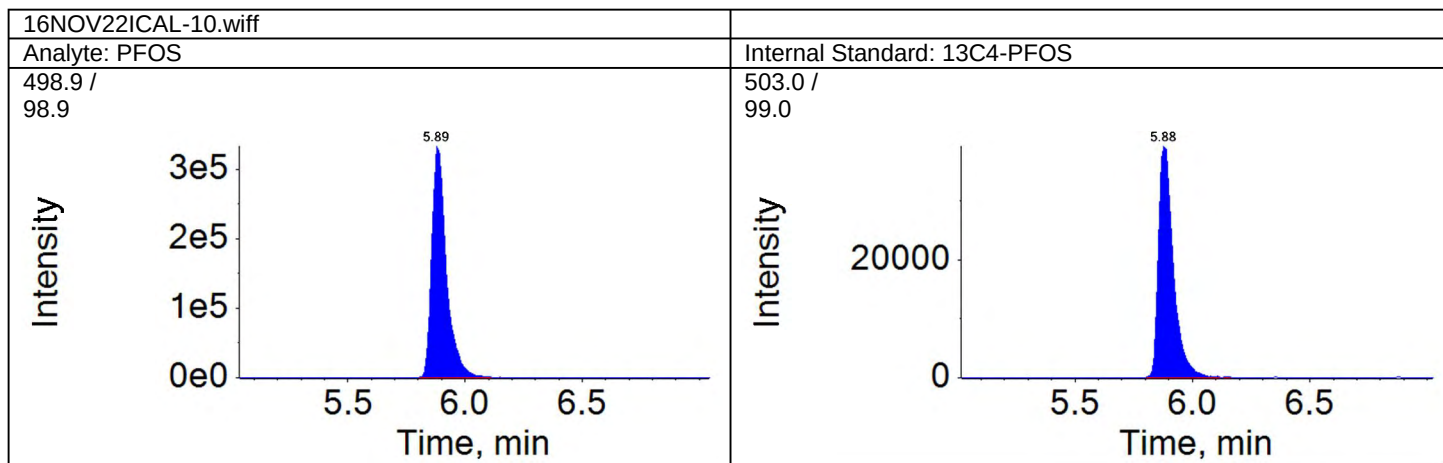
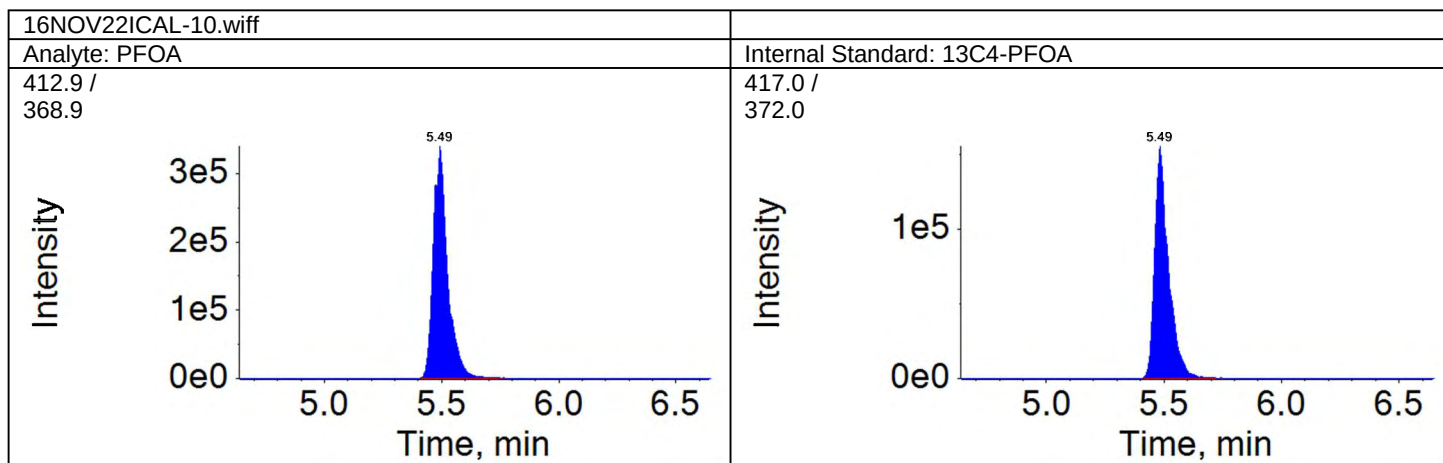
Quantitation Peak Table

Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	5.49	1.000	1444870.0	A	13C4-PFOA	5.49	635408.4	2.274	8.882
PFOS	5.89	1.000	1446650.8	A	13C4-PFOS	5.88	173928.3	8.318	36.190

Total Ion Chromatogram
CAL4

TIC from 16NOV22ICAL-10.wiff (sample 1) - CAL4





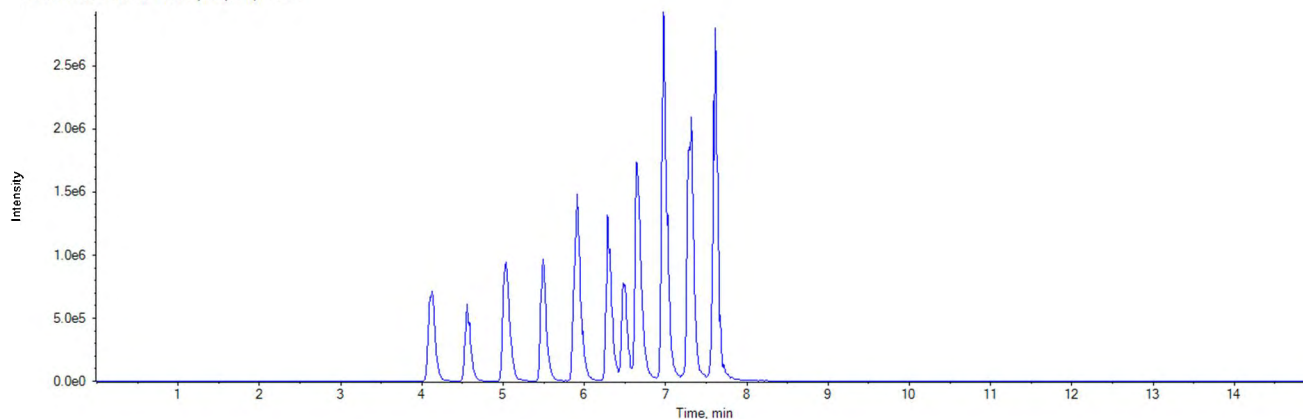
Sample Name:	CAL5			Data File:		16NOV22ICAL-11.wiff
Sample ID:	CAL5			Acquis Date:		2016-11-22T13:41:27
Sample Type:	Standard			Instrument:		Triple Quad 4500, 0, LM24743
Vial Position:	7			Acquis Method:		PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00			Result Table:		MQ16326003
				ICAL Name:		16NOV22ICAL
Batch Number:	PFCICAL			Operator:		US19INS00015\4500TRIPLE
Sample Wt.:	1.00000			Dilution Factor:		1.00
Sample Vol.:	1.000			Prep Factor:		1.000

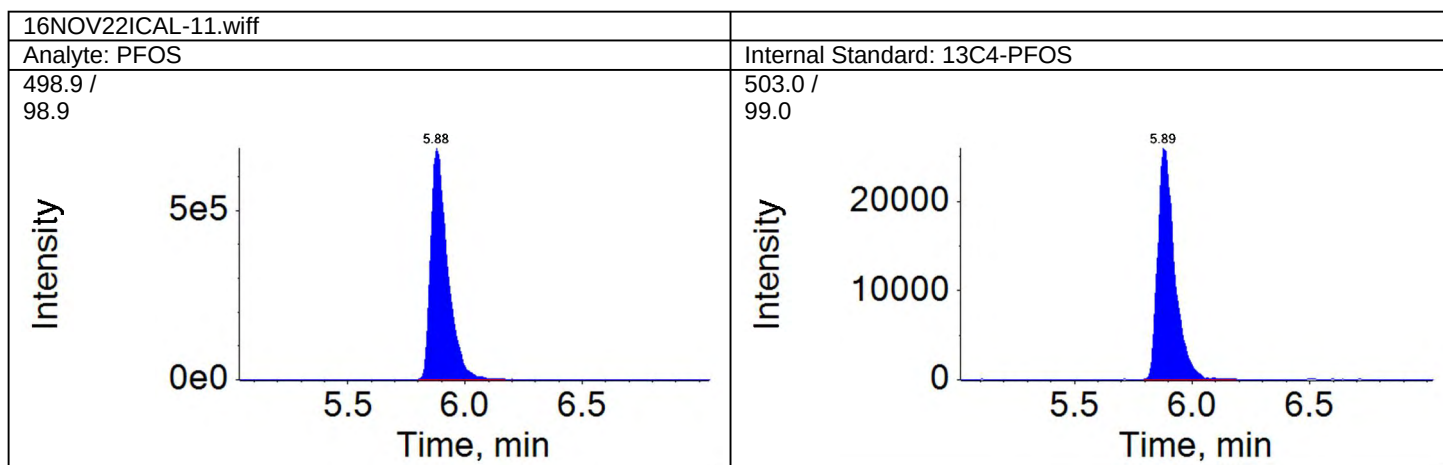
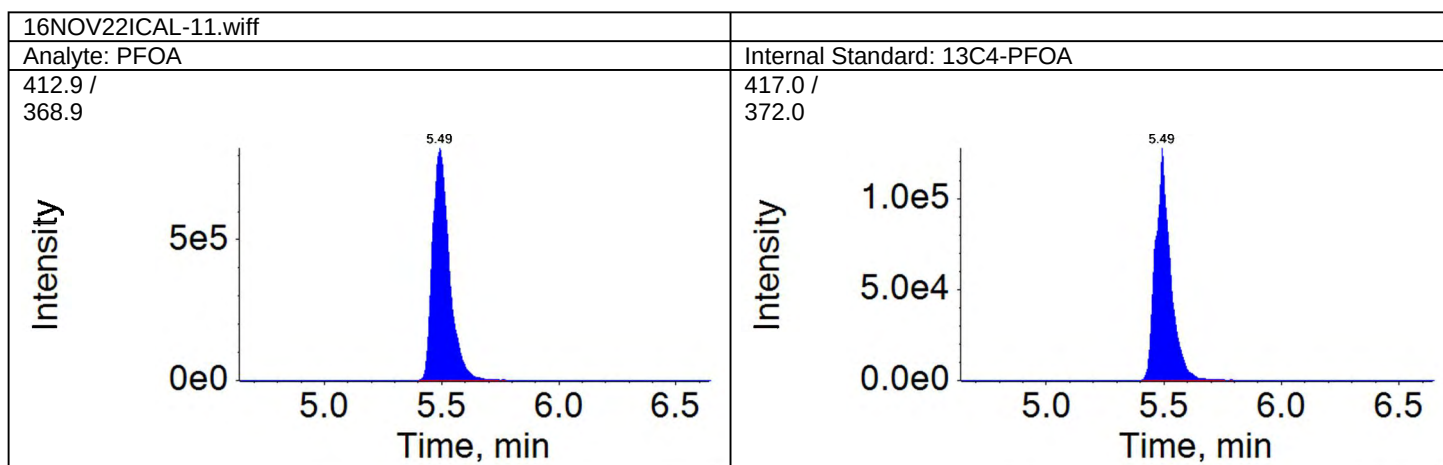
Quantitation Peak Table

Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	5.49	1.000	4116812.5	A	13C4-PFOA	5.49	556149.0	7.402	28.914
PFOS	5.88	1.000	3441546.9	A	13C4-PFOS	5.89	130525.8	26.367	114.724

Total Ion Chromatogram
CAL5

TIC from 16NOV22ICAL-11.wiff (sample 1) - CAL5



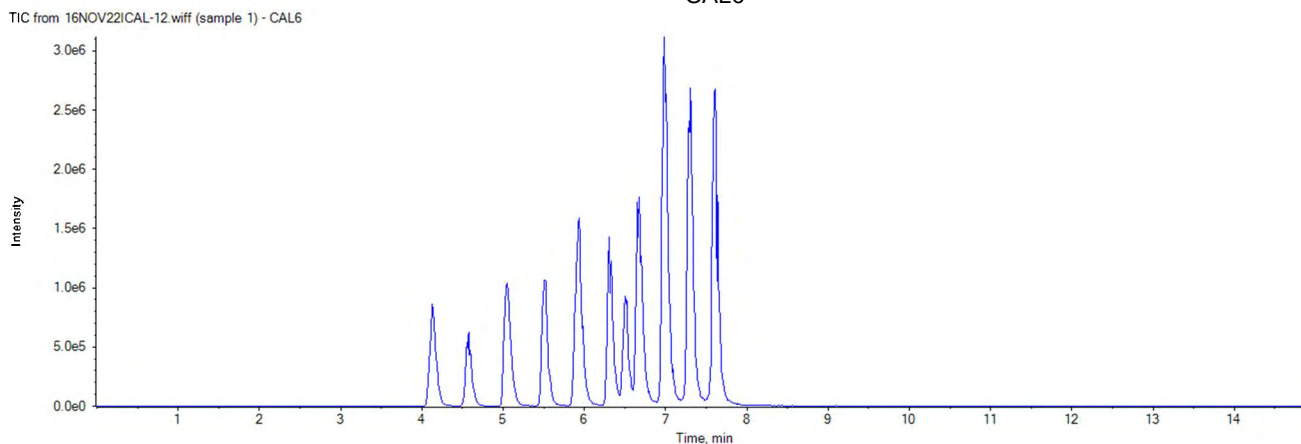


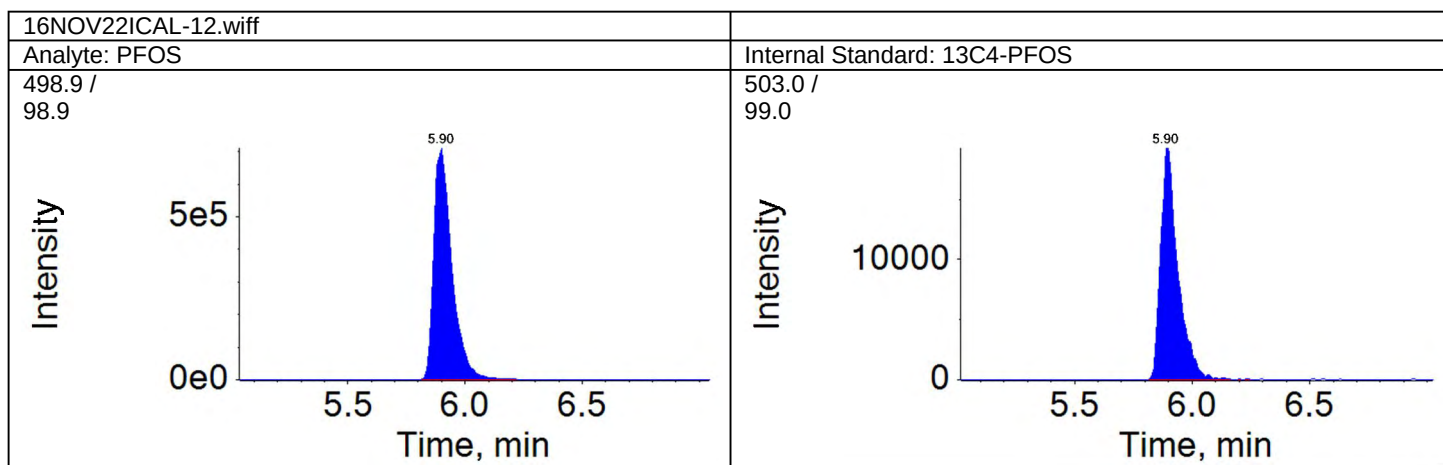
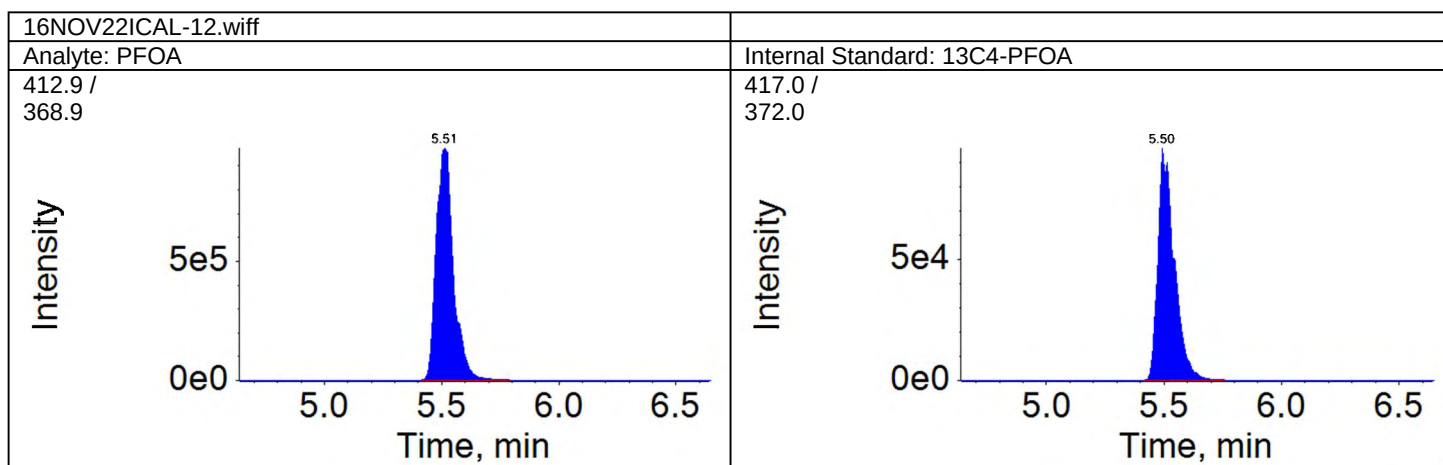
Sample Name:	CAL6			Data File:		16NOV22ICAL-12.wiff
Sample ID:	CAL6			Acquis Date:		2016-11-22T13:57:48
Sample Type:	Standard			Instrument:		Triple Quad 4500, 0, LM24743
Vial Position:	8			Acquis Method:		PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00			Result Table:		MQ16326003
				ICAL Name:		16NOV22ICAL
Batch Number:	PFCICAL			Operator:		US19INS00015\4500TRIPLE
Sample Wt.:	1.00000			Dilution Factor:		1.00
Sample Vol.:	1.000			Prep Factor:		1.000

Quantitation Peak Table

Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	5.51	1.000	5038528.9	A	13C4-PFOA	5.50	466089.1	10.810	42.225
PFOS	5.90	1.000	3850521.8	A	13C4-PFOS	5.90	99316.0	38.770	168.693

Total Ion Chromatogram
CAL6



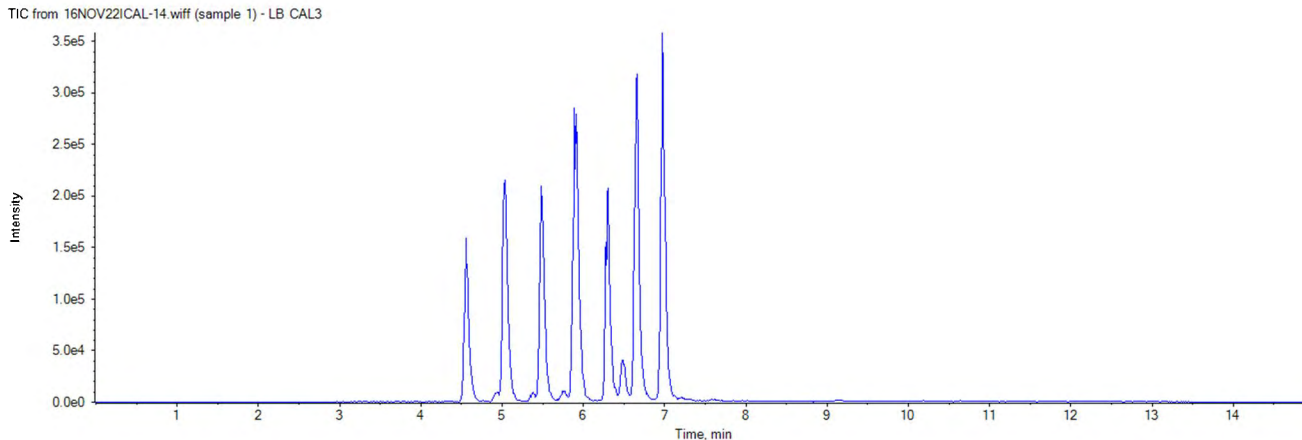


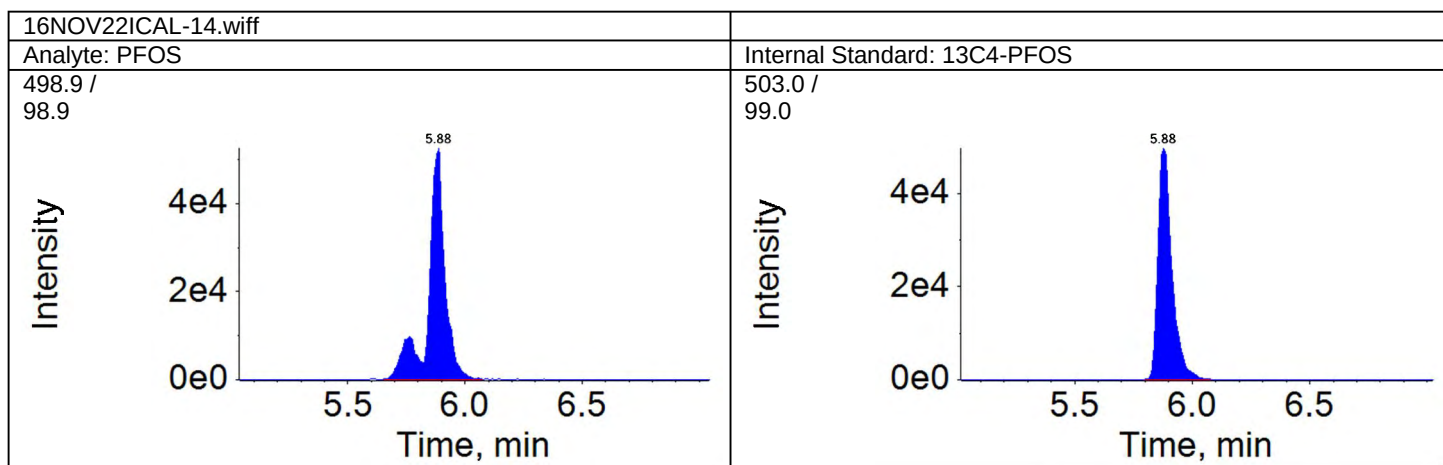
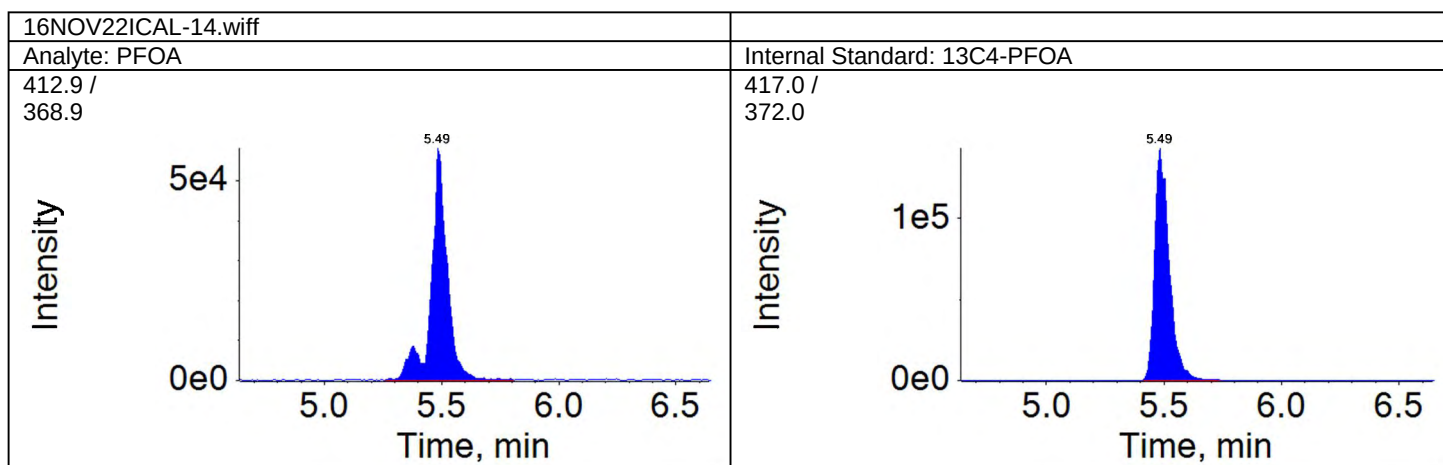
Sample Name:	LB CAL3		Data File:	16NOV22ICAL-14.wiff
Sample ID:	LB CAL3		Acquis Date:	2016-11-22T14:30:42
Sample Type:	Unknown		Instrument:	Triple Quad 4500, 0, LM24743
Vial Position:	10		Acquis Method:	PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00		Result Table:	MQ16326003
			ICAL Name:	16NOV22ICAL
Batch Number:	PFCICAL		Operator:	US19INS00015\4500TRIPLE
Sample Wt.:	1.00000		Dilution Factor:	1.00
Sample Vol.:	1.000		Prep Factor:	1.000

Quantitation Peak Table

Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	5.49	1.000	279692.5	M	13C4-PFOA	5.49	618202.8	0.452	1.767
PFOS	5.88	1.000	264476.8	M	13C4-PFOS	5.88	208139.0	1.271	5.529

Total Ion Chromatogram
LB CAL3

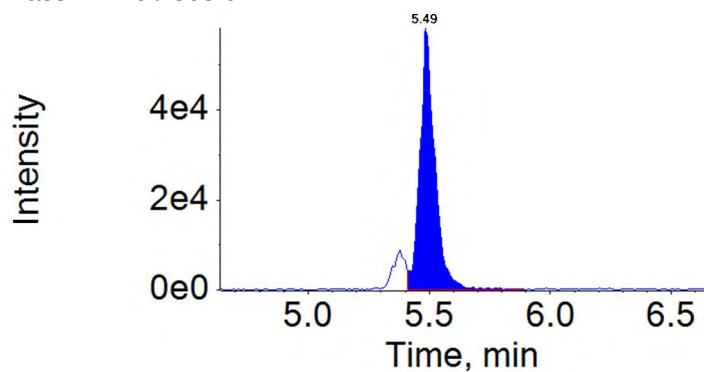




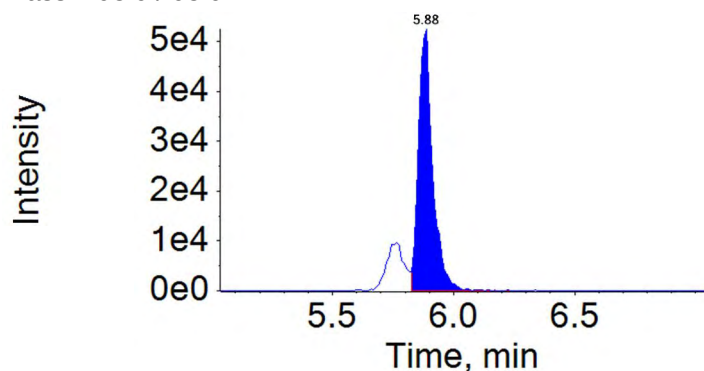
Auto Integrations prior to Manual Integration

<u>File Name</u>	<u>Acquis Date</u>	<u>Sample Name</u>	<u>Component</u>	<u>RT</u>	<u>Peak Area</u>
16NOV22ICAL-14.wiff	2016-11-22T14:30:42	LB CAL3	PFOA	5.49	250515.0
16NOV22ICAL-14.wiff	2016-11-22T14:30:42	LB CAL3	PFOS	5.88	215516.8

Component: PFOA
Mass: 412.9 / 368.9



Component: PFOS
Mass: 498.9 / 98.9

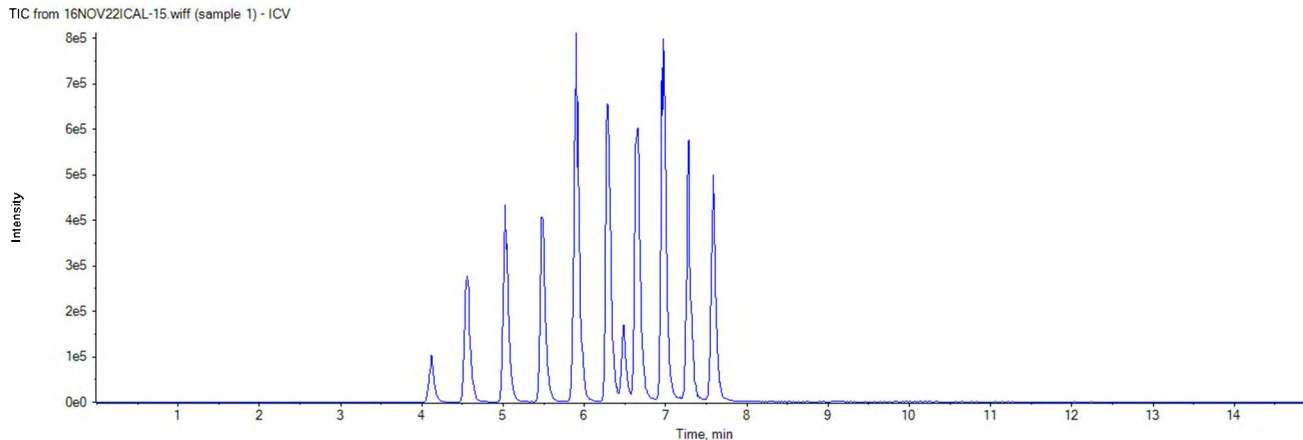


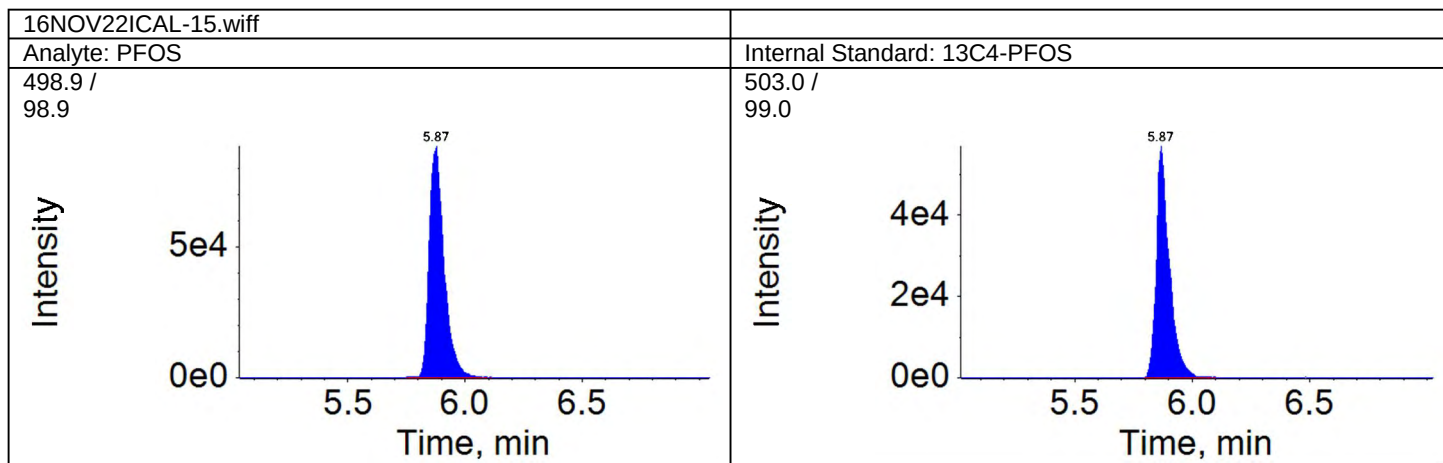
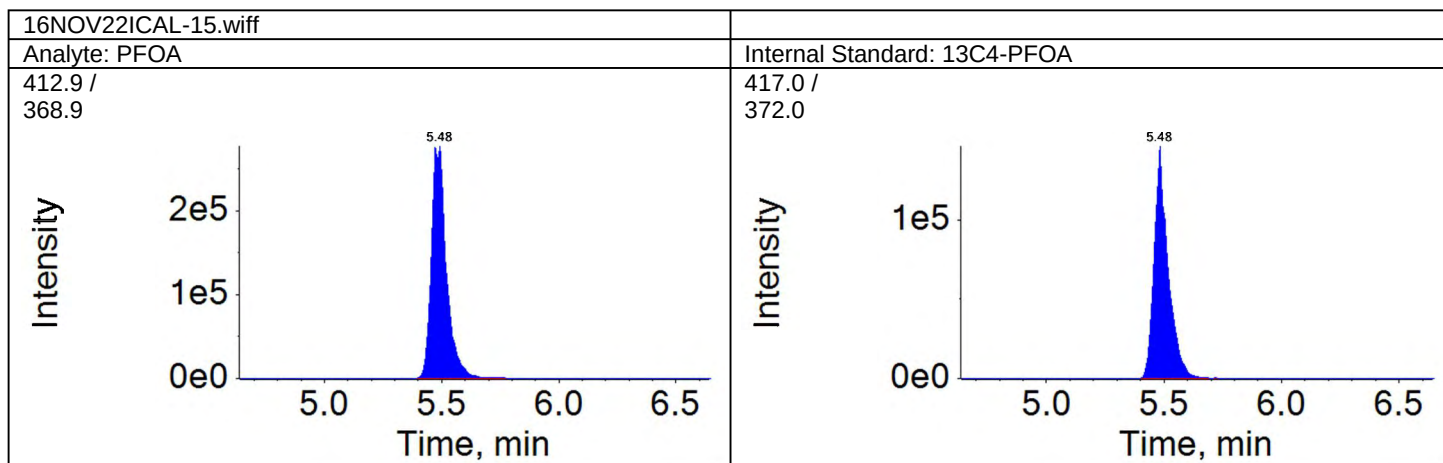
Sample Name:	ICV		Data File:	16NOV22ICAL-15.wiff
Sample ID:	ICV		Acquis Date:	2016-11-22T14:47:15
Sample Type:	Quality Control		Instrument:	Triple Quad 4500, 0, LM24743
Vial Position:	9		Acquis Method:	PFC-14compd-16OCT07.dam
Injection Vol:	10.00		Result Table:	MQ16326003
			ICAL Name:	16NOV22ICAL
Batch Number:	PFCICAL		Operator:	US19INS00015\4500TRIPLE
Sample Wt.:	1.00000		Dilution Factor:	1.00
Sample Vol.:	1.000		Prep Factor:	1.000

Quantitation Peak Table

Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	5.48	1.000	1240729.3	A	13C4-PFOA	5.48	600285.6	2.067	8.073
PFOS	5.87	1.000	390143.8	A	13C4-PFOS	5.87	217308.6	1.795	7.812

Total Ion Chromatogram
ICV





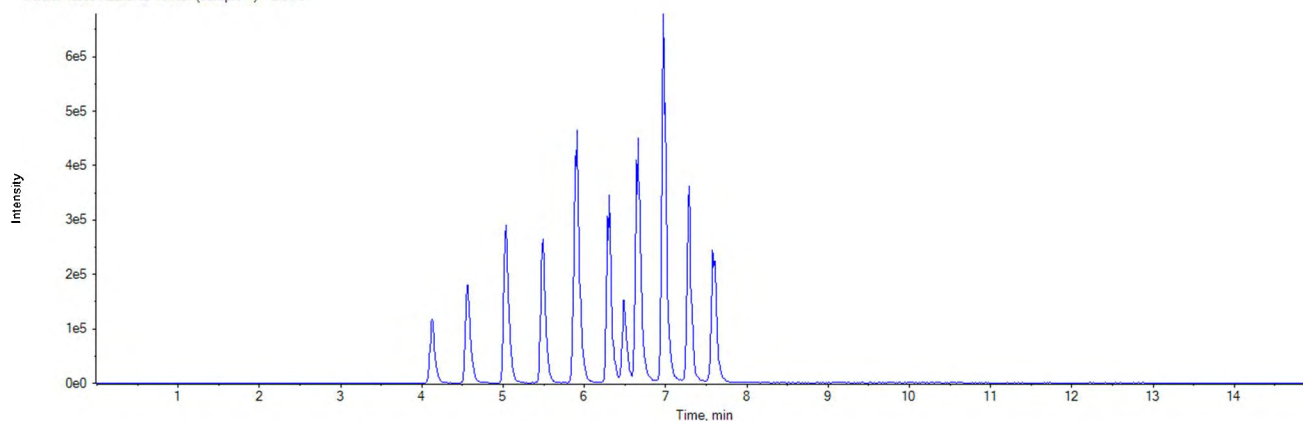
Sample Name:	CCV1			Data File:		16NOV22ICAL-16.wiff
Sample ID:	CAL3			Acquis Date:		2016-11-22T15:03:39
Sample Type:	Quality Control			Instrument:		Triple Quad 4500, 0, LM24743
Vial Position:	5			Acquis Method:		PFC-14compd-16OCT07.dam
Injection Vol:	10.00			Result Table:		MQ16326003
				ICAL Name:		16NOV22ICAL
Batch Number:	PFCICAL			Operator:		US19INS00015\4500TRIPLE
Sample Wt.:	1.00000			Dilution Factor:		1.00
Sample Vol.:	1.000			Prep Factor:		1.000

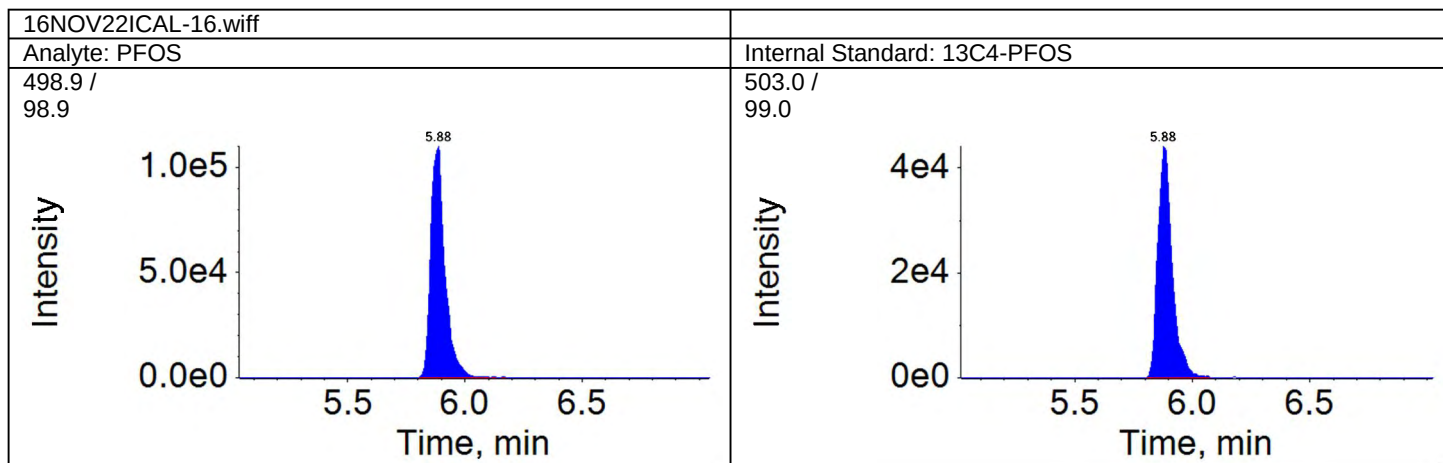
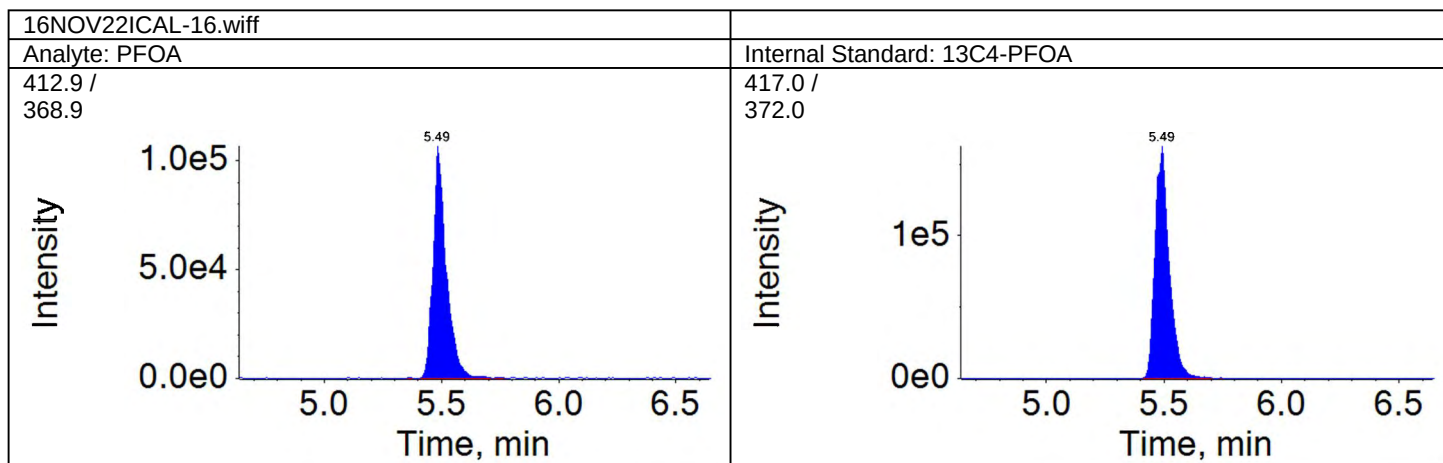
Quantitation Peak Table

Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	5.49	1.000	414832.0	A	13C4-PFOA	5.49	678889.0	0.611	2.387
PFOS	5.88	1.000	465091.3	A	13C4-PFOS	5.88	188529.9	2.467	10.734

Total Ion Chromatogram
CAL3

TIC from 16NOV22ICAL-16.wiff (sample 1) - CCV1





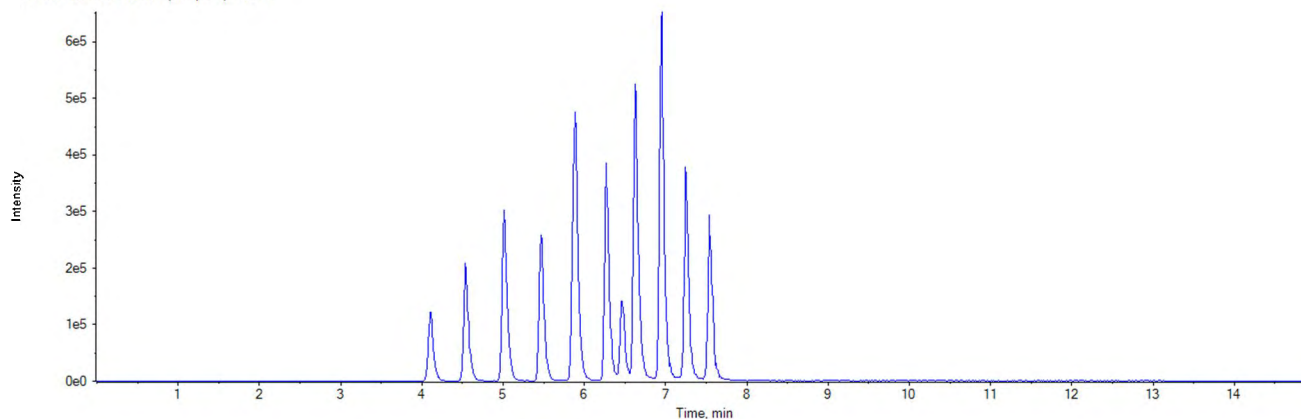
Sample Name:	CCV2			Data File:		16NOV22-10.wiff
Sample ID:	CAL3			Acquis Date:		2016-11-22T17:48:10
Sample Type:	Quality Control			Instrument:		Triple Quad 4500, 0, LM24743
Vial Position:	5			Acquis Method:		PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00			Result Table:		MQ16326003
				ICAL Name:		16NOV22ICAL
Batch Number:	16326003			Operator:		US19INS00015\4500TRIPLE
Sample Wt.:	1.00000			Dilution Factor:		1.00
Sample Vol.:	1.000			Prep Factor:		1.000

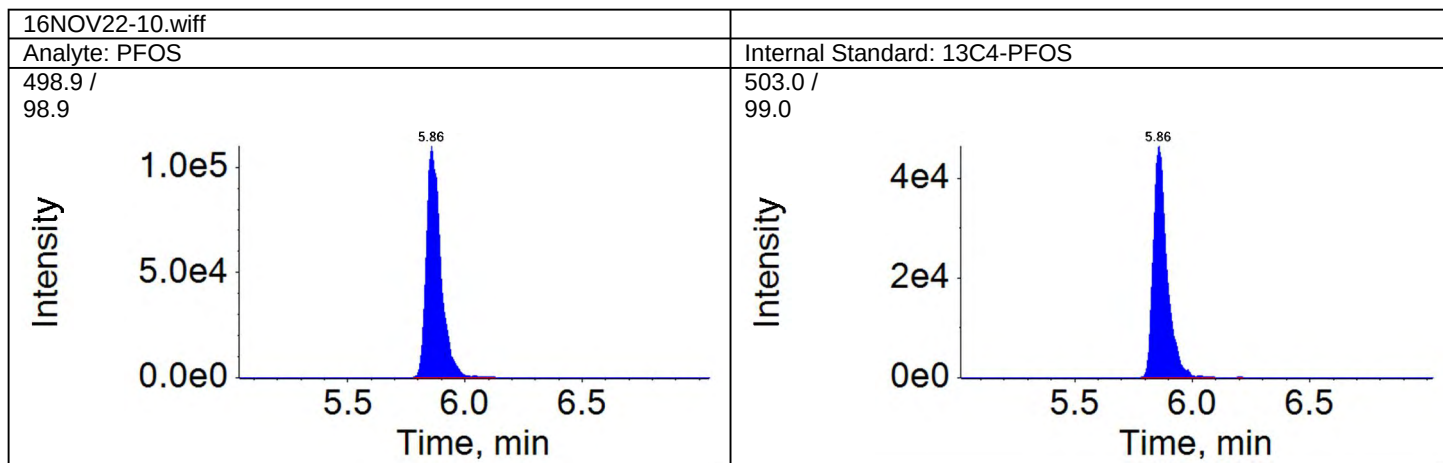
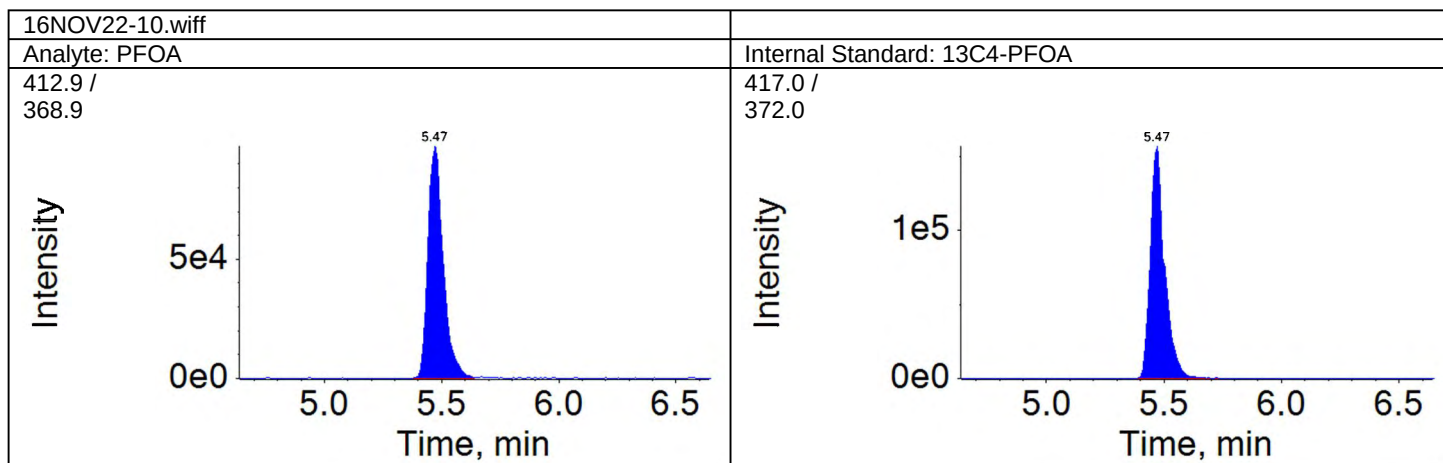
Quantitation Peak Table

Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	5.47	1.000	442981.4	A	13C4-PFOA	5.47	662783.5	0.668	2.611
PFOS	5.86	1.000	471894.4	A	13C4-PFOS	5.86	190573.9	2.476	10.774

Total Ion Chromatogram
CAL3

TIC from 16NOV22-10.wiff (sample 1) - CCV2





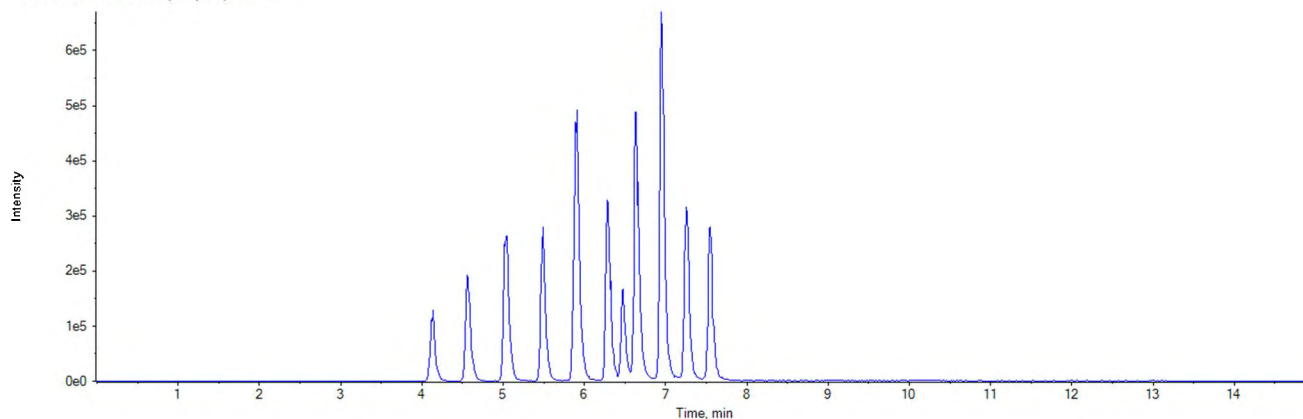
Sample Name:	CCV3		Data File:	16NOV22-19.wiff
Sample ID:	CAL3		Acquis Date:	2016-11-22T20:16:16
Sample Type:	Quality Control		Instrument:	Triple Quad 4500, 0, LM24743
Vial Position:	5		Acquis Method:	PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00		Result Table:	MQ16326003
			ICAL Name:	16NOV22ICAL
Batch Number:	16326003		Operator:	US19INS00015\4500TRIPLE
Sample Wt.:	1.00000		Dilution Factor:	1.00
Sample Vol.:	1.000		Prep Factor:	1.000

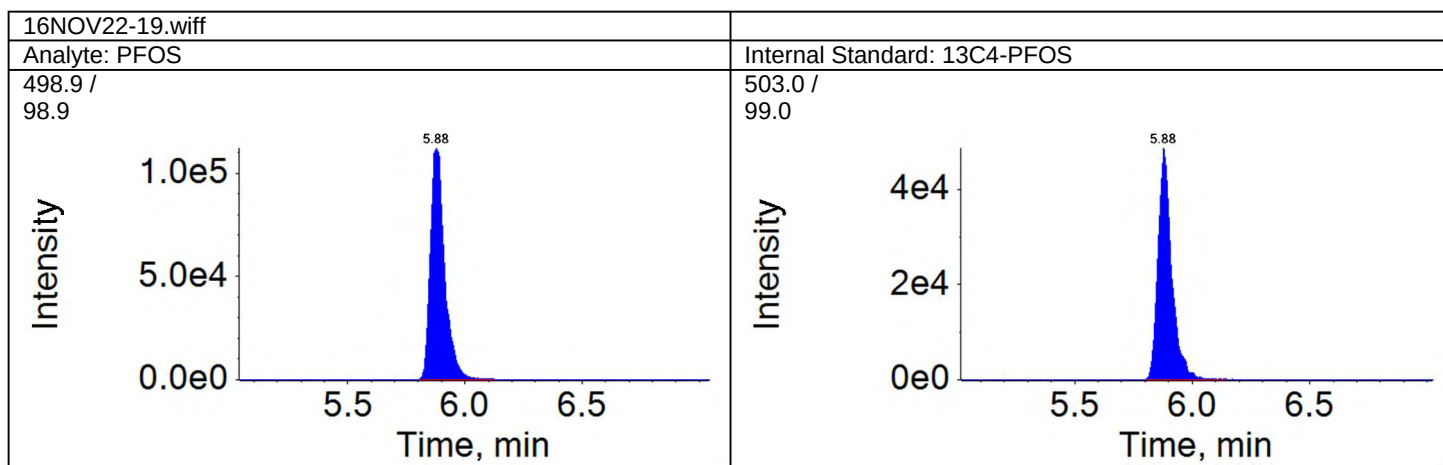
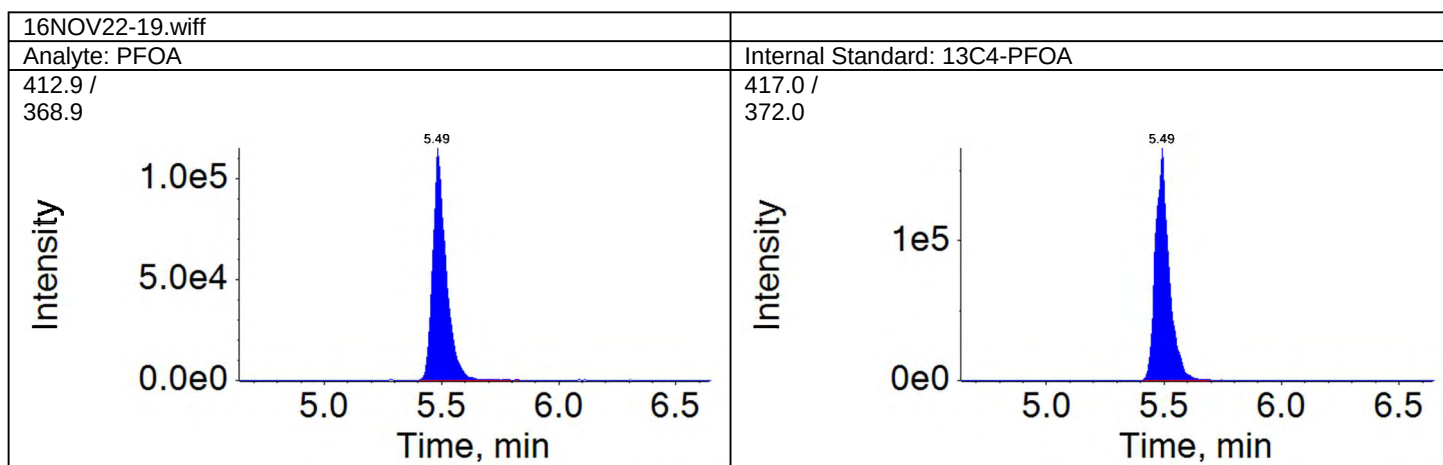
Quantitation Peak Table

Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	5.49	1.000	448200.7	A	13C4-PFOA	5.49	659430.9	0.680	2.655
PFOS	5.88	1.000	481667.2	A	13C4-PFOS	5.88	197100.9	2.444	10.633

Total Ion Chromatogram
CAL3

TIC from 16NOV22-19.wiff (sample 1) - CCV3





Department 4037 Free Form Notebook

Title: PFC calibration standardsFrom Page No.: N/A

11/14/16 MCD 7824

PFC Calibration std soln in MeOH / H₂O 96:4

Actual conc (ng/mL)

	A	B	C
Sys(MDL)	0.1	0.2	0.4
CAL1	0.2	0.4	0.8
CAL2	0.5	1	2
CAL3	2.5	5	10
CAL4	10	20	40
CAL5	30	60	120
CAL6	40	80	160
ICV1	10	10	20
ICV2	20	20	40

PFC multi Cal std: 235002-69

A (500 ng/mL)	B (1000 ng/mL)	C (2000 ng/mL)
PFHxA (1)	PFTTrDA (7)	PFBS (11)
PFHpA (2)	PFTeDA (8)	PFHxS (12)
PFOA (3)	PFDaA (9)	PFOS (13)
PFNA (4)	8.2 FtS (10)	NMeFOSAA (14)
PFDA (5)		NetFOSAA (15)
PFUnDA (6)		

NOTE: Equiv Conc ng/L is based on 100 mL of water to final vol of 1 mL
 NOTE: The ICV is spiked with 2nd Source SPK STD (LCSPFCX1637X)

Level	conc ng/mL	conc ng/mL	Prep Vol. mL	Final Vol. tot (mL)	MeOH / Water	WIS/SS
Sys(MDL)	0.10	5	0.020	1	0.955	0.025
CAL1(LOQ)	0.20	5	0.040	1	0.935	0.025
CAL2	0.50	5	0.100	1	0.875	0.025
CAL3	2.50	50	0.050	1	0.925	0.025
CAL4	10.0	500	0.020	1	0.955	0.025
CAL5	30.0	500	0.060	1	0.915	0.025
CAL6	40.0	500	0.080	1	0.895	0.025
ICV	10.0	500	0.020	1	0.955	0.025

NOTE: All samples are spiked with labeled compound surrogate spike (SS1631937A)

Pipette ID's P1000-2
P100-1

	Wellington Labs Lot#	Expiration Date
PFHxA (1)	PFxA0514	5/9/2019
PFHpA (2)	PFHpA0514	5/9/2019
PFOA (3)	PFOA1214	12/9/2019
PFNA (4)	PFNA0514	5/9/2019
PFDA (5)	PFDA0615	7/2/2020
PFUnDA (6)	PFUnDA0613	6/19/2018
PFTTrDA (7)	PFTTrDA1213	12/10/2018
PFTeDA (8)	PFTeDA0613	6/19/2018
PFDaA (9)	PFDaA0115	1/30/2020
8.2 FtS (10)	82FtS1014	10/3/2017
PFBS (11)	LPFBS1014	10/9/2019
PFHxS (12)	LPFHxS0514	5/9/2019
PFOS (13)	LPFOS0614	6/20/2019
NMeFOSAA (14)	NMeFOSAA0116	1/20/2021
NetFOSAA (15)	NetFOSAA0116	1/20/2021

Prep Date: 11/14/2016
 Analyst: MCD7824
 Expiration Date: 5/14/2017

MCD 7824
 ③ MCD 7824
 11/15/16 11/14/16
 11/14/16

made Linear + Branched PFOA/PFOS/PFHxS
 std. @ the CAL3 level using stock
 solution 238344-100

MCD 7824 11/14/16

To Page No.: N/A

REVIEWED:

PAGES:

DATE:

Department 4037 Free Form Notebook

Title: PFC LINEAR & BRANCHED INT.

From Page No.: _____

10/05/16

PFC Linear and Branched Intermediate Std in MeOH / H₂O 96:4

	STD Conc ng/mL	Stock Conc ng/mL	Prep Vol.	Final Vol.
A				
T-PFOS (1)	2000.00	50000	0.400	10
br-PFHxSK (2)	2000.00	50000	0.400	10
T-PFOA (3)	500.00	50000	0.100	10

B				
T-PFOS (1)	200.00	50000	0.040	10
br-PFHxSK (2)	200.00	50000	0.040	10
T-PFOA (3)	50.00	50000	0.010	10

C				
T-PFOS (1)	20.00	50000	0.004	10
br-PFHxSK (2)	20.00	50000	0.004	10
T-PFOA (3)	5.00	50000	0.001	10

	Wellington Labs Lot#	Expiration Date
T-PFOS (1)	TPFOS0805	9/2/2020
br-PFHxSK (2)	brPFHxSK0615	7/3/2020
T-PFOA (3)	TPFOA0216	2/12/2021

Prep Date: 10/5/2016
Analyst: JWK9524
Expiration Date: 4/5/2017

10/05/16 JWK9524

To Page No.: _____

REVIEWED:

PAGES:

DATE:

Department 4037 Free Form Notebook

Title: PFC MULTI-CALIBRATION Std.

From Page No.: _____

07/26/16PFC Multi-Calibration Stock std soln in MeOH / H₂O 96:4

	STD Conc ng/mL	Stock Conc ng/mL	Prep Vol.	Final Vol.
NEtFOSAA	2000.00	50000	0.400	10
NMeFOSAA	2000.00	50000	0.400	10
PFBS	2000.00	44200	0.452	10
L-PFHxS	2000.00	47300	0.423	10
L-PFOS	2000.0	47800	0.418	10
PFDaA	1000.0	50000	0.200	10
PFTeDA	1000.0	50000	0.200	10
PFTrDA	1000.0	50000	0.200	10
8:2 FTS	1000.0	47900	0.209	10
PFDA	500.0	50000	0.100	10
PFHpA	500.0	50000	0.100	10
PFHxA	500.0	50000	0.100	10
PFNA	500.0	50000	0.100	10
PFOA	500.0	50000	0.100	10
PFUdA	500.0	50000	0.100	10
PFBA	500.0	50000	0.100	10
PFPeA	500.0	50000	0.100	10

Pipette ID's
P100
P1000

	Wellington Labs Lot#	Expiration Date
PFHxA (1)	PFxA0514	5/9/2019
PFHpA (2)	PFHpA0514	5/9/2019
PFOA (3)	PFOA1214	12/9/2019
PFNA (4)	PFNA0514	5/9/2019
PFDA (5)	PFDA0615	7/2/2020
PFUdA (6)	PFUdA0613	6/19/2018
PFTrDA (7)	PFTrDA0216	2/12/2021
PFTeDA (8)	PFTeDA1215	12/9/2020
PFDaA (9)	PFDaA0115	1/30/2020
8:2 Fts (10)	82FTS1014	10/3/2017
PFBS (11)	LPFBS1014	10/9/2019
L-PFHxS (12)	LPFHxS0416	4/20/2021
L-PFOS (13)	LPFOS0615	7/2/2020
NMeFOSAA (14)	NMeFOSAA0116	1/20/2021
NetFOSAA (15)	NetFOSAA0116	1/20/2021
PFBA (16)	PFBA0115	1/30/2020
PFPeA (17)	PFPeA0113	1/3/2018

Prep Date: 7/26/2016
Analyst: JWK9524
Expiration Date: 1/26/2017JWK 9524 07/26/16

To Page No.: _____

REVIEWED: _____	PAGES: _____	DATE: _____
-----------------	--------------	-------------

Raw QC Data

PFAAs by LC/MS/MS

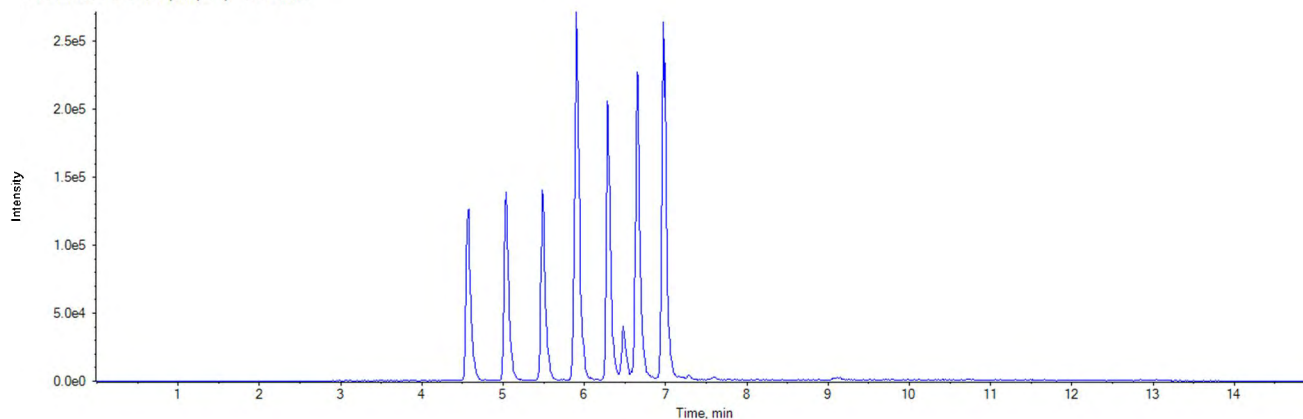
Sample Name:	BLK326003		Data File:	16NOV22-01.wiff
Sample ID:	16326003		Acquis Date:	2016-11-22T15:20:09
Sample Type:	Unknown		Instrument:	Triple Quad 4500, 0, LM24743
Vial Position:	12		Acquis Method:	PFC-14compd-16OCT07.dam
Injection Vol:	10.00		Result Table:	MQ16326003
			ICAL Name:	16NOV22ICAL
Batch Number:	16326003		Operator:	US19INS00015\4500TRIPLE
Sample Wt.:	0.10000		Dilution Factor:	1.00
Sample Vol.:	1.000		Prep Factor:	1.000

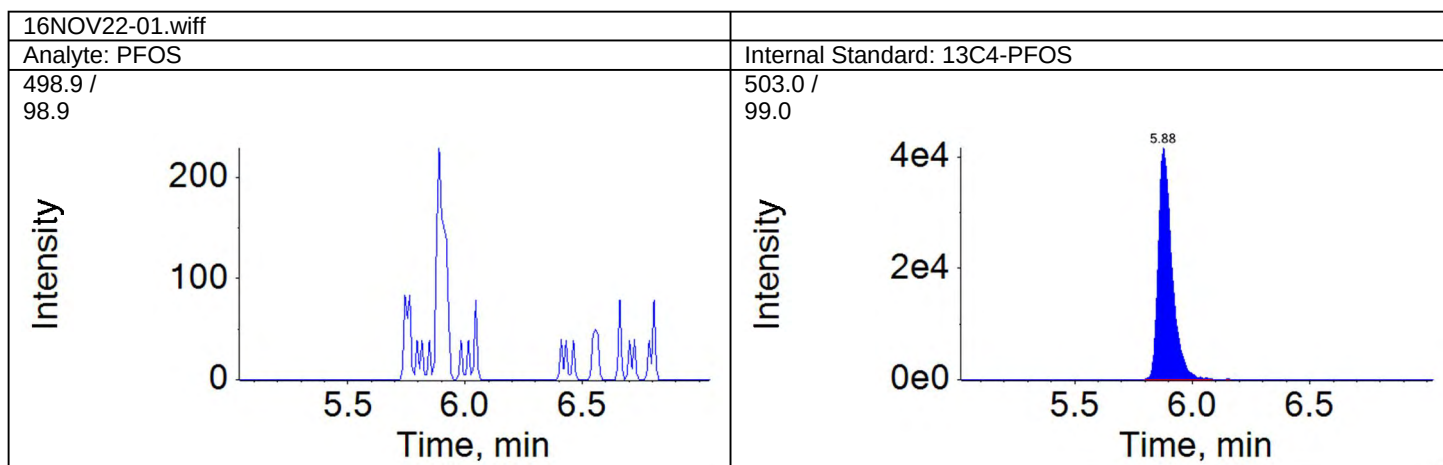
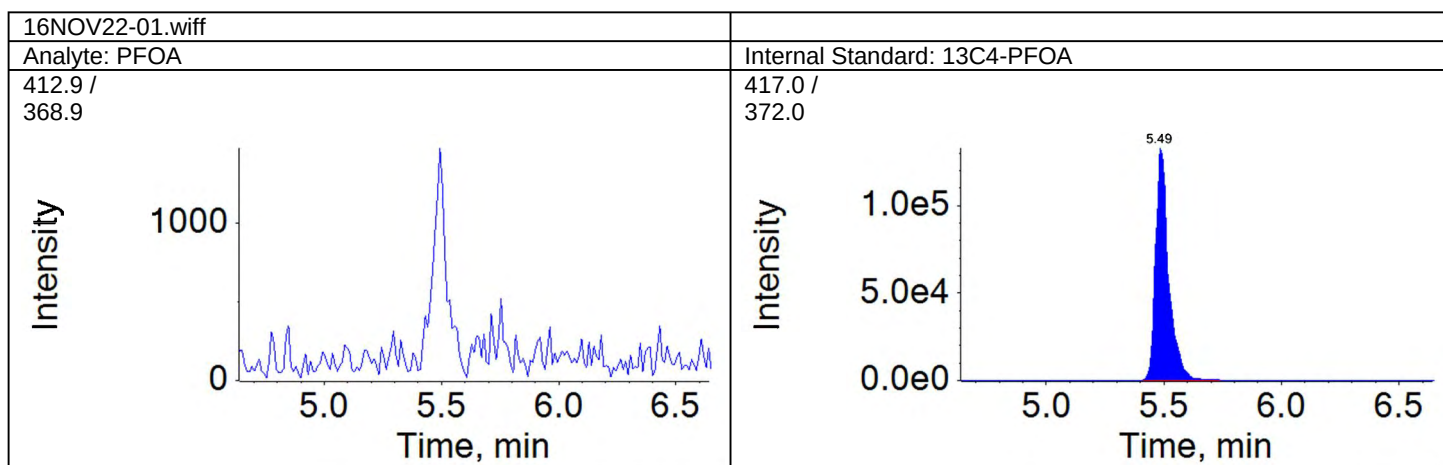
Quantitation Peak Table

Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	N/A	N/A	N/A	A	13C4-PFOA	5.49	518996.5	N/A	N/A
PFOS	N/A	N/A	N/A	A	13C4-PFOS	5.88	168644.5	N/A	N/A

Total Ion Chromatogram
16326003

TIC from 16NOV22-01.wiff (sample 1) - BLK326003





Sample Name:	8702100MS		Data File:	16NOV22-04.wiff
Sample ID:	EPA 537 Rev. 1.1 modified 16326003 16MC-PW021-P10- 1110 MS Grab Groundwater		Acquis Date:	2016-11-22T16:09:27
Sample Type:	Quality Control		Instrument:	Triple Quad 4500, 0, LM24743
Vial Position:	15		Acquis Method:	PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00		Result Table:	MQ16326003
			ICAL Name:	16NOV22ICAL
Batch Number:	16326003		Operator:	US19INS00015\4500TRIPLE
Sample Wt.:	0.09989		Dilution Factor:	1.00
Sample Vol.:	1.000		Prep Factor:	1.000

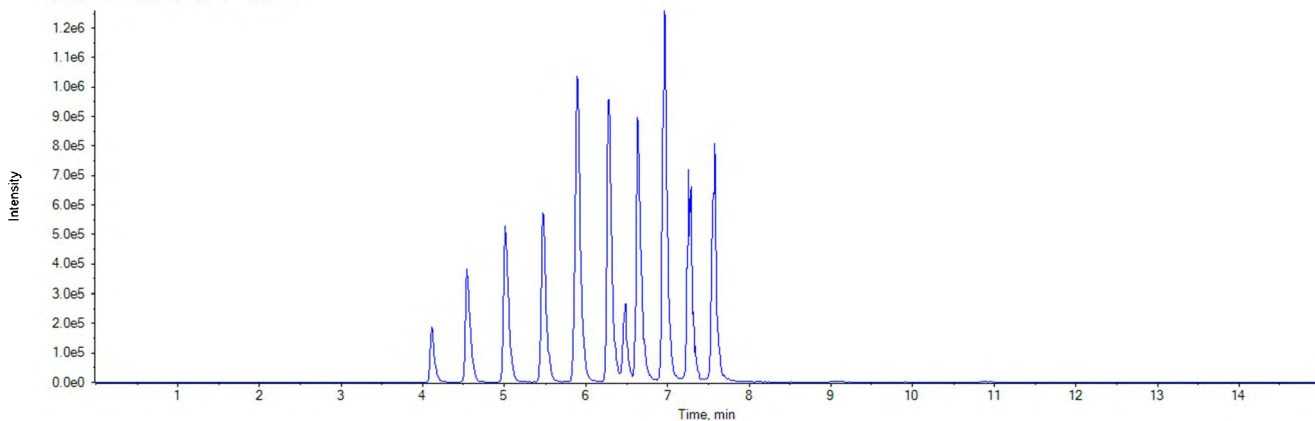
Quantitation Peak Table

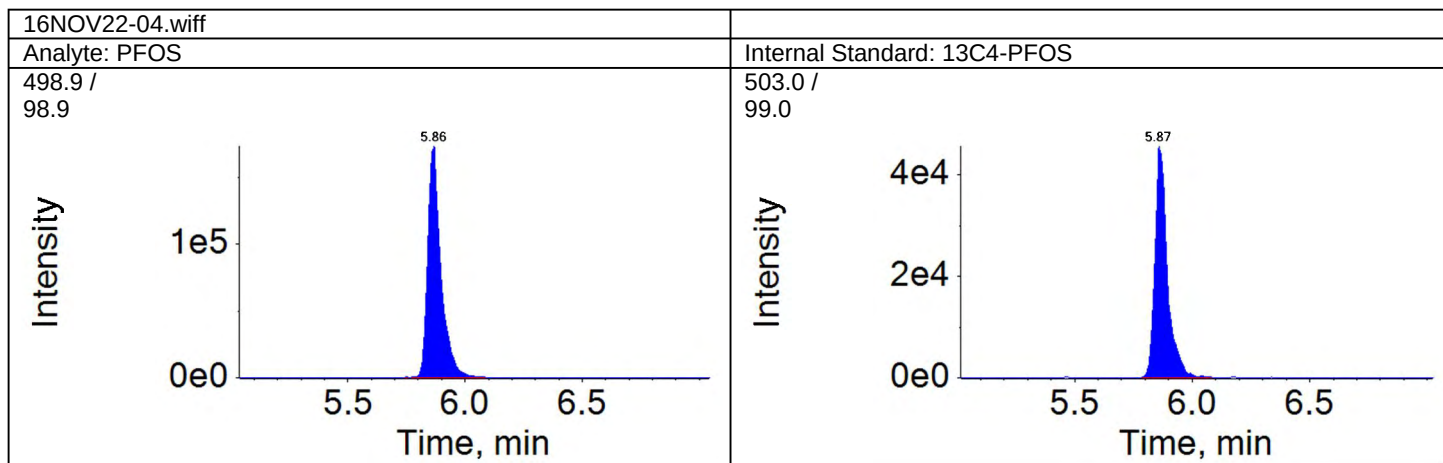
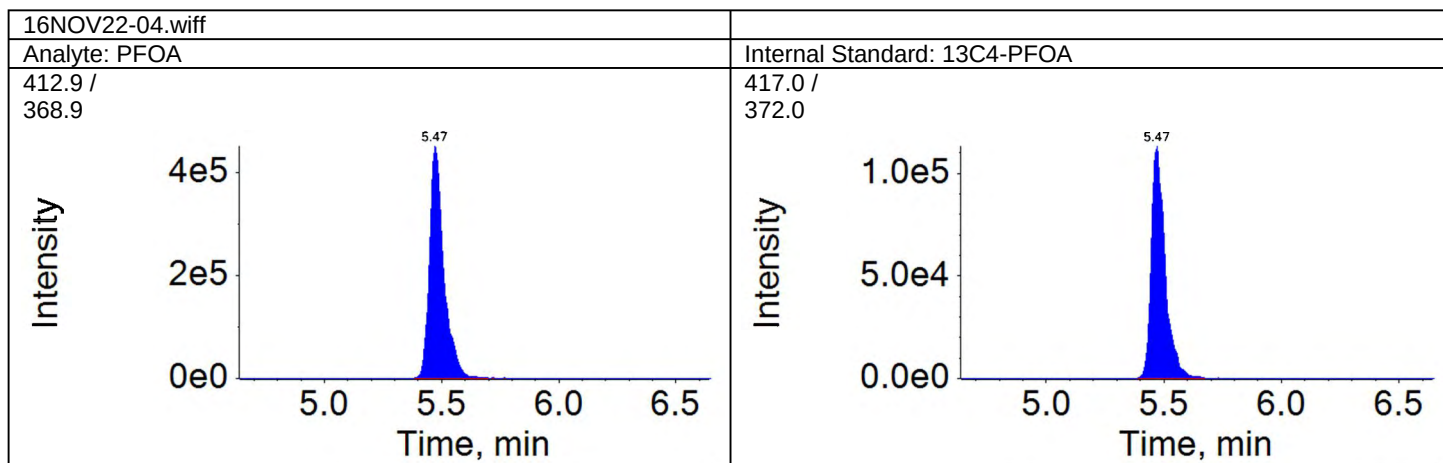
<u>Component Name</u>	<u>RT</u>	<u>RRT</u>	<u>Analyte Area Response</u>	<u>Int Typ</u>	<u>IS Name</u>	<u>IS RT</u>	<u>IS Area Response</u>	<u>Area Ratio</u>	<u>Sample Result (ng/L)</u>
PFOA	5.47	1.000	1931808.7	A	13C4-PFOA	5.47	467417.9	4.133	161.611
PFOS	5.86	1.000	681671.2	A	13C4-PFOS	5.87	168930.6	4.035	175.768

Total Ion Chromatogram

EPA 537 Rev. 1.1 modified 16326003 16MC-PW021-P10-1110 MS Grab Groundwater

TIC from 16NOV22-04.wiff (sample 1) - 8702100MS





Sample Name:	8702101MSD		Data File:	16NOV22-05.wiff
Sample ID:	EPA 537 Rev. 1.1 modified 16326003 16MC-PW021-P10- 1110 MSD Grab Groundwater		Acquis Date:	2016-11-22T16:25:58
Sample Type:	Quality Control		Instrument:	Triple Quad 4500, 0, LM24743
Vial Position:	16		Acquis Method:	PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00		Result Table:	MQ16326003
			ICAL Name:	16NOV22ICAL
Batch Number:	16326003		Operator:	US19INS00015\4500TRIPLE
Sample Wt.:	0.10042		Dilution Factor:	1.00
Sample Vol.:	1.000		Prep Factor:	1.000

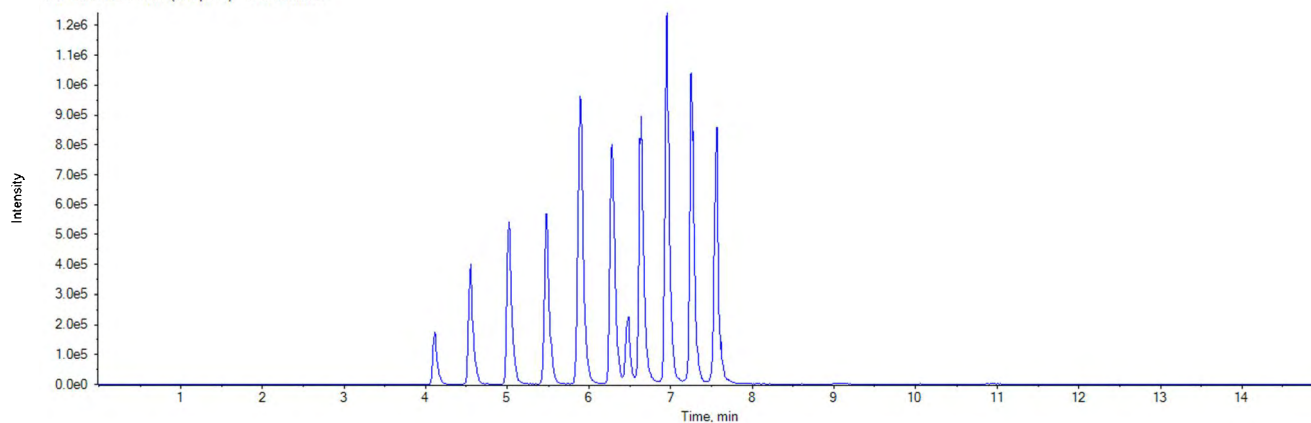
Quantitation Peak Table

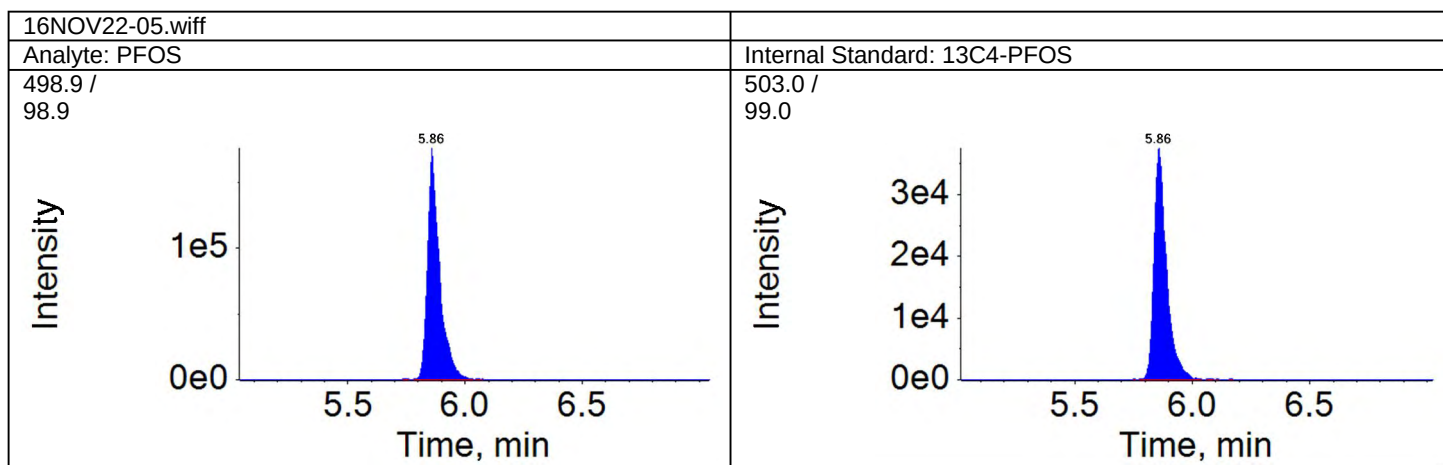
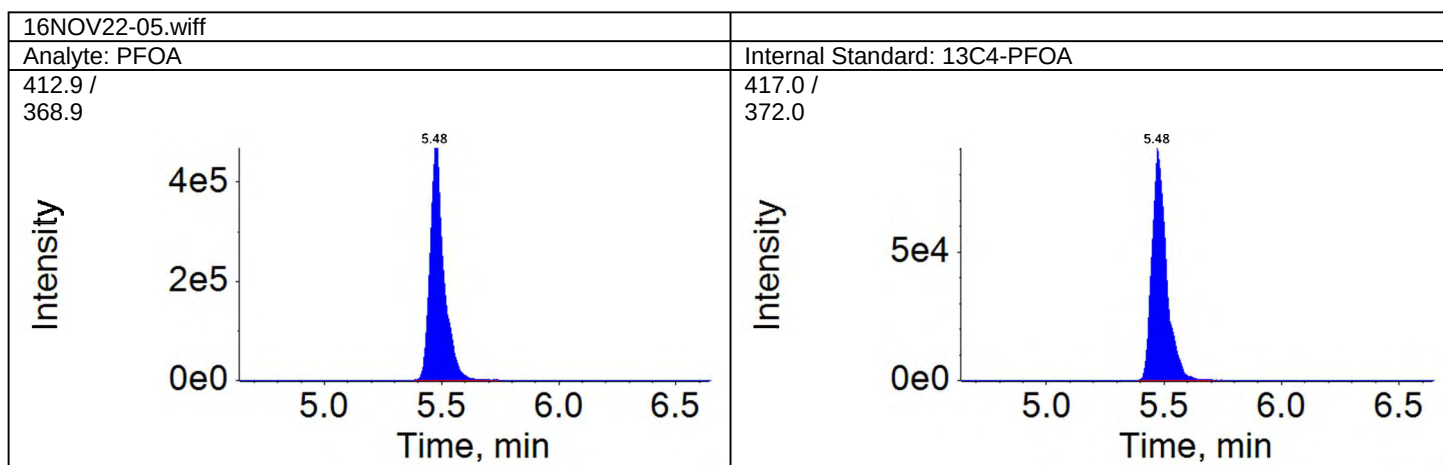
<u>Component Name</u>	<u>RT</u>	<u>RRT</u>	<u>Analyte Area Response</u>	<u>Int Typ</u>	<u>IS Name</u>	<u>IS RT</u>	<u>IS Area Response</u>	<u>Area Ratio</u>	<u>Sample Result (ng/L)</u>
PFOA	5.48	1.000	1948686.4	A	13C4-PFOA	5.48	385421.4	5.056	196.661
PFOS	5.86	1.000	621657.6	A	13C4-PFOS	5.86	139724.3	4.449	192.777

Total Ion Chromatogram

EPA 537 Rev. 1.1 modified 16326003 16MC-PW021-P10-1110 MSD Grab Groundwater

TIC from 16NOV22-05.wiff (sample 1) - 8702101MSD





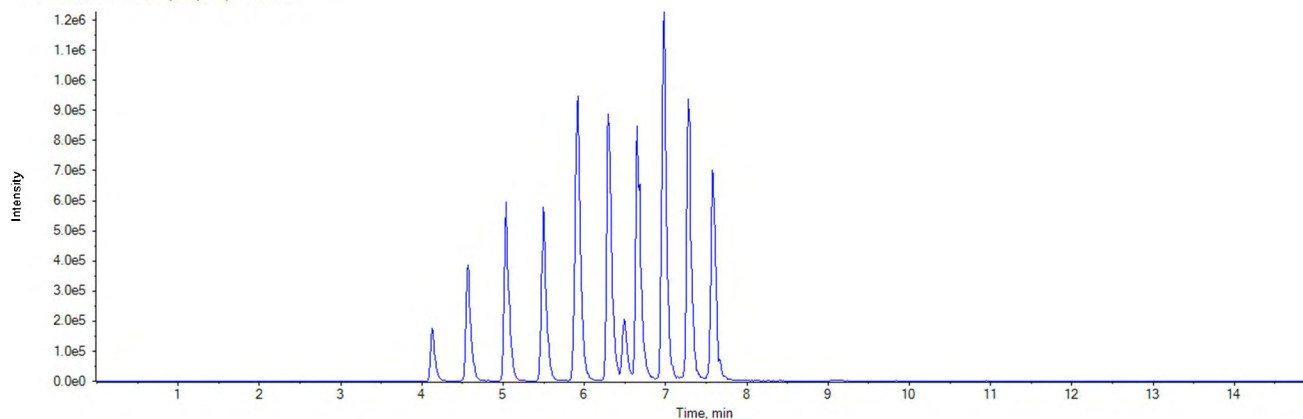
Sample Name:	LCS326003		Data File:	16NOV22-02.wiff
Sample ID:	16326003		Acquis Date:	2016-11-22T15:36:33
Sample Type:	Quality Control		Instrument:	Triple Quad 4500, 0, LM24743
Vial Position:	13		Acquis Method:	PFC-14cmpd-16OCT07.dam
Injection Vol:	10.00		Result Table:	MQ16326003
			ICAL Name:	16NOV22ICAL
Batch Number:	16326003		Operator:	US19INS00015\4500TRIPLE
Sample Wt.:	0.10000		Dilution Factor:	1.00
Sample Vol.:	1.000		Prep Factor:	1.000

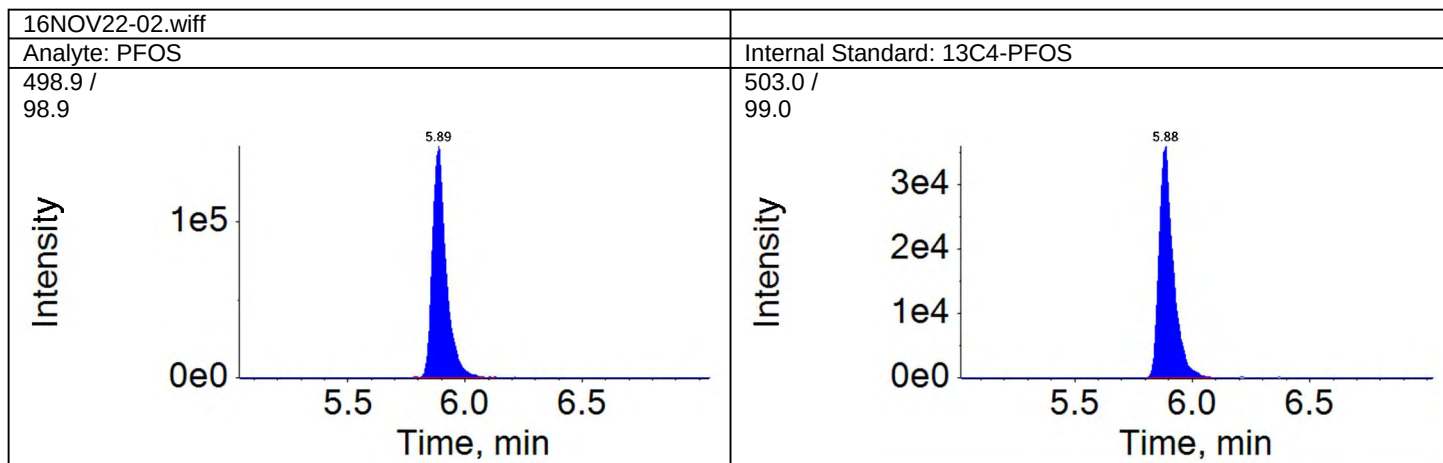
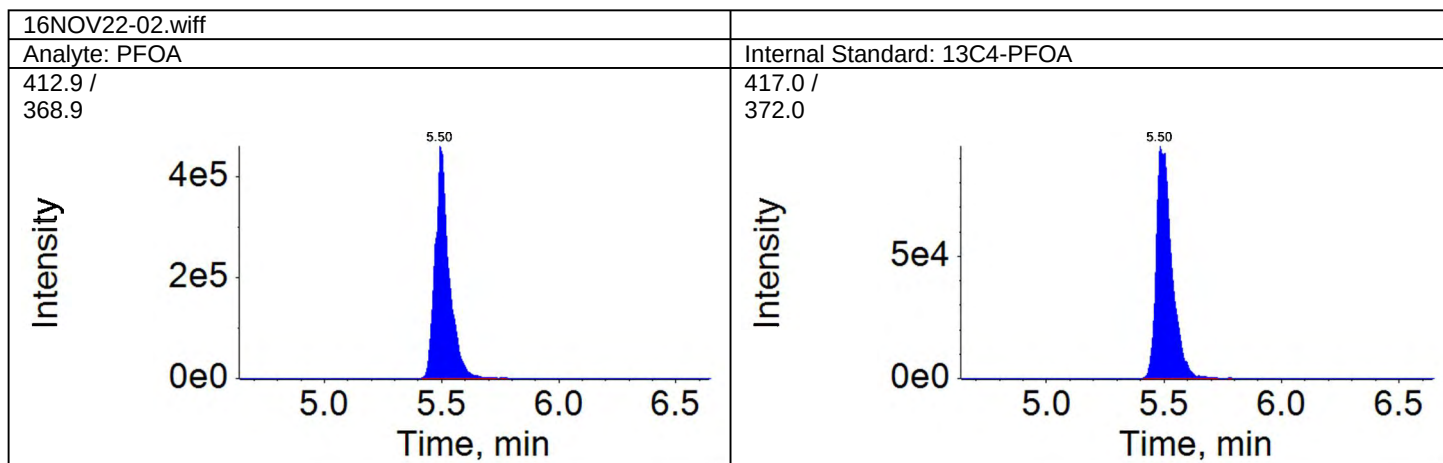
Quantitation Peak Table

Component Name	RT	RRT	Analyte Area Response	Int Typ	IS Name	IS RT	IS Area Response	Area Ratio	Sample Result (ng/L)
PFOA	5.50	1.000	1892792.9	A	13C4-PFOA	5.50	440669.6	4.295	167.773
PFOS	5.89	1.000	604367.9	A	13C4-PFOS	5.88	150318.0	4.021	174.939

Total Ion Chromatogram
16326003

TIC from 16NOV22-02.wiff (sample 1) - LCS326003





Preparation Logs

PFAs by LC/MS/MS

Organic Extraction Batchlog

Assigned to: 10262 Devon Whooley

Reviewed by: MDP 11/23Start Date: 11/21/16Start time: 17:45**16326003**Tech 1: DW 10262

Tech 2: _____

Analyses on Batch: PFAAs in Water by LC/MS/MS

Dept: 37 Prep Analysis: 14091 PFAA Water Prep										
QC	Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	MS Sol.	Amt (mL)	FV (uL)	IS amt (uL)	BC	Comments
8702100MS	21P10	99.89	SS11632637A	.025	LCSPFCX1637Z	.04	1mL		201a	
8702101MSD	21P10	100.42		.025	LCSPFCX1637Z	.04			201a	
BLANKA	BLK326003	100		.025	N/A	N/A				
LCSA	OPR326003	100		.025	LCSPFCX1637Z	.04				

Reagent/Material	Lot No.
96% MeOH:H2O	1163320
Acetate Buffer	
Methanol	1163320
Milli-Q H2O	House 11/21
NH4OH:H2O	
NH4OH:MeOH	
SPE Cartridge	041336287A
Sodium Thiosulfate	114350A
Trizma	

Spike Solutions:

Witness: _____

Instrument:

AB Sciex - LM24743

Sequence:

16NOV22ICAL/16NOV22

Sample #	Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	FV (uL)	IS Amt (uL)	BC	Comments	Analyses	Due Date	Prio
1 8702096	135P1	100.26	SS11632637A	.025	1mL		201a		10954	12/01/2016	N
2 8702097	135P4	100.42		.025			201a		10954	12/01/2016	N
3 8702098	135P5	100.33		.025			201a		10954	12/01/2016	N
4 8702099	BKG 21P10	100.14		.025			201a		10954	12/01/2016	N
5 8702102	055P4	99.80		.025			201a		10954	12/01/2016	N
6 8702103	130P3	100.20		.025			201a		10954	12/01/2016	N
7 8702104	052P3	100.49		.025			201a		10954	12/01/2016	N
8 8702105	152P3	100.46		.025			201a		10954	12/01/2016	N
9 8702106	101WT	99.64		.025			201a		10954	12/01/2016	N
10 8703901	CR101	100.46		.025			201a		10954	11/23/2016	S
11 8703902	CR102	99.68		.025			201a		10954	11/23/2016	S
12 8703903	CR103	100.67		.025			201a		10954	11/23/2016	S

Balance #

B679764122

SPE Manifold

213

Vacuum Port

N-evap

C

16326003



Sample #	Sample Code	Amt (g)	SS/IS Sol.	Amt (mL)	FV (uL)	IS Amt (uL)	BC	Comments	Analyses	Due Date	Prio
13 8703904	CR104	99.1610	SS1632637A	.075	1mL		201a		10954	11/23/2016	S

MCR09 Page 130 of 130

Balance #	B4297641122
-----------	-------------

SPE Manifold	2/3	Vacuum Port		N-evap	C
--------------	-----	-------------	--	--------	---

16326003

