NAVFAC
Naval Facilities Engineering Command

Groundwater Sample Results, Combined Level 2 and Level 4 Laboratory Report, Electronic Data Deliverable, Data Validation Report, and the Sample Location Report, SDG 320-19198-1

Naval Weapons Station Earle
Colts Neck, New Jersey

July 2019

N60478.SF.001862
NWS EARLE
5090.3c

LABORATORY DATA PACKAGE, 320-19198-1, NWS EARLE, NJ
06/06/2016
TESTAMERICA LABORATORIES, INC

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

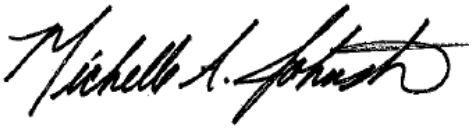
ANALYTICAL REPORT

Job Number: 320-19198-1

Job Description: Ensafe-NWS-Earle, NJ PFCs Potable Water

For:
Earth Toxics, Inc
PO BOX 3382
Logan, UT 84321

Attention: Mike Dryden



Approved for release.
Michelle A Johnston
Project Manager II
6/6/2016 2:26 PM

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06/06/2016

cc: Tina Cantwell
Ms. Nicole Loos
Ms. Jennifer O'Keefe

The Lab Certification ID# is 4025.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

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Qualifiers

LCMS

Qualifier	Qualifier Description
M	Manual integrated compound.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

CASE NARRATIVE
Client: Earth Toxics, Inc.
Project: Ensafe-NWS Earle, NJ PFCs Potable Water
Report Number: 320-19198-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

Sample Receipt

The samples were received on 5/28/2016 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.6º C.

The sample collection time on the container labels for sample FB-DW-57 (320-19198-2) do not match the information on the chain of custody. The container labels list a collection time of 1128 while the chain of custody lists a collection time of 1105. The laboratory logged the sample collection time per the chain of custody. The client was notified on 5/31/2016.

The analyses were revised to a 4 business day turn around time per client request on 6/2/2016 and approval by TestAmerica Sacramento Operations.

No other anomalies were encountered during sample receipt.

Perfluorinated Hydrocarbons (PFAS)

Samples DW-57 (320-19198-1), FB-DW-57 (320-19198-2), DW-95 (320-19198-3), FB-DW-95 (320-19198-4) and DUP-052616 (320-19198-5) were analyzed for Perfluorinated Hydrocarbons (PFC) in accordance with WS-LC-0025. The samples were prepared on 06/01/2016 and analyzed on 06/03/2016 and 06/04/2016.

Reporting limits and method detection limits have been adjusted accordingly for the initial volumes extracted.

The MS/MSD associated with prep batch 320-112069 was performed on sample DW-57 (320-19198-1). The MS/MSD spike compound recoveries and RPD data could not be reliably calculated for Perfluorooctanesulfonic acid (PFOS) because the sample concentration was greater than four times the spike amounts. The acceptable LCS analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary. The associated data in the parent sample has been flagged “J” in accordance with the DOD QSM.

The level 1 standard from the ICAL (ICV 320-112504/12) is used to evaluate the tune criteria. The instrument mass windows are set at +/ -0.5 amu. Detection of the analyte serves as verification that the assigned mass is within +/-0.5 amu of the true value, which meets the DOD tune criterion.

No other analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Earth Toxics, Inc
Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

TestAmerica Job ID: 320-19198-1

Client Sample ID: DW-57 — Lab Sample ID: 320-19198-1

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	2.9		2.4	1.9	0.88	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	4.5		2.4	1.9	0.77	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	35	M	2.4	1.9	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	2.0	J	2.4	1.9	0.63	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	150	M J	3.8	2.9	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	17	M	2.4	1.9	0.72	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: FB-DW-57 — Lab Sample ID: 320-19198-2

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	1.5	J	2.4	1.9	0.87	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.83	J M	2.4	1.9	0.82	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	7.5	M	3.8	2.8	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	0.71	J	2.4	1.9	0.71	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: DW-95 — Lab Sample ID: 320-19198-3

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	3.3		2.3	1.9	0.85	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	13		2.3	1.9	0.75	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.6	M	2.3	1.9	0.81	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	1.4	J	2.3	1.9	0.61	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	37	M	3.7	2.8	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	55	M	2.3	1.9	0.70	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: FB-DW-95 — Lab Sample ID: 320-19198-4

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	1.2	J	2.3	1.9	0.86	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.64	J	2.3	1.9	0.61	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	13	M	3.7	2.8	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	0.75	J	2.3	1.9	0.70	ng/L	1		WS-LC-0025	Total/NA

Client Sample ID: DUP-052616 — Lab Sample ID: 320-19198-5

This Detection Summary does not include radiochemical test results.

Client Sample ID: DUP-052616 (Continued)

Lab Sample ID: 320-19198-5

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	3.1		2.4	1.9	0.88	ng/L	1		WS-LC-0025	Total/NA
Perfluoroheptanoic acid (PFHpA)	13		2.4	1.9	0.77	ng/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.9	M	2.4	1.9	0.83	ng/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	1.8	J	2.4	1.9	0.63	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	46	M	3.8	2.9	1.2	ng/L	1		WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	58	M	2.4	1.9	0.72	ng/L	1		WS-LC-0025	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: DW-57
Lab Sample ID: 320-19198-1

Date Collected: 05/26/16 11:01
Matrix: Water

Date Received: 05/28/16 09:00

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	2.9		2.4	1.9	0.88	ng/L		06/03/16 22:09	1
Perfluoroheptanoic acid (PFHpA)	4.5		2.4	1.9	0.77	ng/L		06/03/16 22:09	1
Perfluorohexanesulfonic acid (PFHxS)	35	M	2.4	1.9	0.83	ng/L		06/03/16 22:09	1
Perfluorononanoic acid (PFNA)	2.0	J	2.4	1.9	0.63	ng/L		06/03/16 22:09	1
Perfluorooctanesulfonic acid (PFOS)	150	M J	3.8	2.9	1.2	ng/L		06/03/16 22:09	1
Perfluorooctanoic acid (PFOA)	17	M	2.4	1.9	0.72	ng/L		06/03/16 22:09	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*87*		*25 - 150*	*06/01/16 11:06*	*06/03/16 22:09*	*1*
13C4 PFOA	*70*		*25 - 150*	*06/01/16 11:06*	*06/03/16 22:09*	*1*
13C4 PFOS	*112*		*25 - 150*	*06/01/16 11:06*	*06/03/16 22:09*	*1*
13C4-PFHpA	*80*		*25 - 150*	*06/01/16 11:06*	*06/03/16 22:09*	*1*
13C5 PFNA	*51*		*25 - 150*	*06/01/16 11:06*	*06/03/16 22:09*	*1*
18O2 PFHxS	*128*		*25 - 150*	*06/01/16 11:06*	*06/03/16 22:09*	*1*

Client Sample ID: FB-DW-57
Lab Sample ID: 320-19198-2

Date Collected: 05/26/16 11:05
Matrix: Water

Date Received: 05/28/16 09:00

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**1.5**	**J**	2.4	1.9	0.87	ng/L		06/03/16 23:13	1
Perfluoroheptanoic acid (PFHpA)	1.9	U	2.4	1.9	0.76	ng/L		06/03/16 23:13	1
Perfluorohexanesulfonic acid (PFHxS)	**0.83**	**J M**	2.4	1.9	0.82	ng/L		06/03/16 23:13	1
Perfluorononanoic acid (PFNA)	1.9	U	2.4	1.9	0.62	ng/L		06/03/16 23:13	1
Perfluorooctanesulfonic acid (PFOS)	**7.5**	**M**	3.8	2.8	1.2	ng/L		06/03/16 23:13	1
Perfluorooctanoic acid (PFOA)	**0.71**	**J**	2.4	1.9	0.71	ng/L		06/03/16 23:13	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*112*		*25 - 150*	*06/01/16 11:06*	*06/03/16 23:13*	*1*
13C4 PFOA	*123*		*25 - 150*	*06/01/16 11:06*	*06/03/16 23:13*	*1*
13C4 PFOS	*121*		*25 - 150*	*06/01/16 11:06*	*06/03/16 23:13*	*1*
13C4-PFHpA	*113*		*25 - 150*	*06/01/16 11:06*	*06/03/16 23:13*	*1*
13C5 PFNA	*117*		*25 - 150*	*06/01/16 11:06*	*06/03/16 23:13*	*1*
18O2 PFHxS	*120*		*25 - 150*	*06/01/16 11:06*	*06/03/16 23:13*	*1*

Client Sample ID: DW-95
Lab Sample ID: 320-19198-3

Date Collected: 05/26/16 11:26
Matrix: Water

Date Received: 05/28/16 09:00

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	3.3		2.3	1.9	0.85	ng/L		06/03/16 23:34	1
Perfluoroheptanoic acid (PFHpA)	13		2.3	1.9	0.75	ng/L		06/03/16 23:34	1
Perfluorohexanesulfonic acid (PFHxS)	6.6	M	2.3	1.9	0.81	ng/L		06/03/16 23:34	1
Perfluorononanoic acid (PFNA)	1.4	J	2.3	1.9	0.61	ng/L		06/03/16 23:34	1
Perfluorooctanesulfonic acid (PFOS)	37	M	3.7	2.8	1.2	ng/L		06/03/16 23:34	1
Perfluorooctanoic acid (PFOA)	55	M	2.3	1.9	0.70	ng/L		06/03/16 23:34	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*94*		*25 - 150*	*06/01/16 11:06*	*06/03/16 23:34*	*1*
13C4 PFOA	*59*		*25 - 150*	*06/01/16 11:06*	*06/03/16 23:34*	*1*
13C4 PFOS	*99*		*25 - 150*	*06/01/16 11:06*	*06/03/16 23:34*	*1*
13C4-PFHpA	*88*		*25 - 150*	*06/01/16 11:06*	*06/03/16 23:34*	*1*
13C5 PFNA	*35*		*25 - 150*	*06/01/16 11:06*	*06/03/16 23:34*	*1*
18O2 PFHxS	*120*		*25 - 150*	*06/01/16 11:06*	*06/03/16 23:34*	*1*

Client Sample ID: FB-DW-95
Lab Sample ID: 320-19198-4

Date Collected: 05/26/16 11:28
Matrix: Water

Date Received: 05/28/16 09:00

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**1.2**	**J**	2.3	1.9	0.86	ng/L		06/03/16 23:55	1
Perfluoroheptanoic acid (PFHpA)	1.9	U	2.3	1.9	0.75	ng/L		06/03/16 23:55	1
Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.3	1.9	0.81	ng/L		06/03/16 23:55	1
Perfluorononanoic acid (PFNA)	**0.64**	**J**	2.3	1.9	0.61	ng/L		06/03/16 23:55	1
Perfluorooctanesulfonic acid (PFOS)	**13**	**M**	3.7	2.8	1.2	ng/L		06/03/16 23:55	1
Perfluorooctanoic acid (PFOA)	**0.75**	**J**	2.3	1.9	0.70	ng/L		06/03/16 23:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*108*		*25 - 150*	*06/01/16 11:06*	*06/03/16 23:55*	*1*
13C4 PFOA	*123*		*25 - 150*	*06/01/16 11:06*	*06/03/16 23:55*	*1*
13C4 PFOS	*117*		*25 - 150*	*06/01/16 11:06*	*06/03/16 23:55*	*1*
13C4-PFHpA	*109*		*25 - 150*	*06/01/16 11:06*	*06/03/16 23:55*	*1*
13C5 PFNA	*112*		*25 - 150*	*06/01/16 11:06*	*06/03/16 23:55*	*1*
18O2 PFHxS	*115*		*25 - 150*	*06/01/16 11:06*	*06/03/16 23:55*	*1*

Client Sample ID: DUP-052616
Lab Sample ID: 320-19198-5

Date Collected: 05/26/16 11:26
Matrix: Water

Date Received: 05/28/16 09:00

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	3.1		2.4	1.9	0.88	ng/L		06/04/16 00:17	1
Perfluoroheptanoic acid (PFHpA)	13		2.4	1.9	0.77	ng/L		06/04/16 00:17	1
Perfluorohexanesulfonic acid (PFHxS)	6.9	M	2.4	1.9	0.83	ng/L		06/04/16 00:17	1
Perfluorononanoic acid (PFNA)	1.8	J	2.4	1.9	0.63	ng/L		06/04/16 00:17	1
Perfluorooctanesulfonic acid (PFOS)	46	M	3.8	2.9	1.2	ng/L		06/04/16 00:17	1
Perfluorooctanoic acid (PFOA)	58	M	2.4	1.9	0.72	ng/L		06/04/16 00:17	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*80*		*25 - 150*	*06/01/16 11:06*	*06/04/16 00:17*	*1*
13C4 PFOA	*57*		*25 - 150*	*06/01/16 11:06*	*06/04/16 00:17*	*1*
13C4 PFOS	*98*		*25 - 150*	*06/01/16 11:06*	*06/04/16 00:17*	*1*
13C4-PFHpA	*77*		*25 - 150*	*06/01/16 11:06*	*06/04/16 00:17*	*1*
13C5 PFNA	*46*		*25 - 150*	*06/01/16 11:06*	*06/04/16 00:17*	*1*
18O2 PFHxS	*116*		*25 - 150*	*06/01/16 11:06*	*06/04/16 00:17*	*1*

Default Detection Limits

Client: Earth Toxics, Inc
Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

TestAmerica Job ID: 320-19198-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Prep: 3535

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	2.5	0.92	ng/L	WS-LC-0025
Perfluoroheptanoic acid (PFHpA)	2.5	0.80	ng/L	WS-LC-0025
Perfluorohexanesulfonic acid (PFHxS)	2.5	0.87	ng/L	WS-LC-0025
Perfluorononanoic acid (PFNA)	2.5	0.65	ng/L	WS-LC-0025
Perfluorooctanesulfonic acid (PFOS)	4.0	1.3	ng/L	WS-LC-0025
Perfluorooctanoic acid (PFOA)	2.5	0.75	ng/L	WS-LC-0025

Isotope Dilution Summary

Client: Earth Toxics, Inc
Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

TestAmerica Job ID: 320-19198-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	3C2 PFHx (25-150)	3C4 PFOA (25-150)	3C4 PFOS (25-150)	3C4-PFHp (25-150)	3C5 PFNA (25-150)	3O2 PFHx (25-150)		
320-19198-1	DW-57	87	70	112	80	51	128		
320-19198-1 MS	DW-57	79	61	102	72	49	117		
320-19198-1 MSD	DW-57	83	69	107	79	55	121		
320-19198-2	FB-DW-57	112	123	121	113	117	120		
320-19198-3	DW-95	94	59	99	88	35	120		
320-19198-4	FB-DW-95	108	123	117	109	112	115		
320-19198-5	DUP-052616	80	57	98	77	46	116		
LCS 320-112069/2-A	Lab Control Sample	108	116	117	111	104	115		
MB 320-112069/1-A	Method Blank	107	116	112	116	117	116		

Surrogate Legend

13C2 PFHxA = 13C2 PFHxA
13C4 PFOA = 13C4 PFOA
13C4 PFOS = 13C4 PFOS
13C4-PFHpA = 13C4-PFHpA
13C5 PFNA = 13C5 PFNA
18O2 PFHxS = 18O2 PFHxS

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-112069/1-A
Matrix: Water
Analysis Batch: 112504

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 112069

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	2.0	U	2.5	2.0	0.92	ng/L		06/03/16 21:26	1
Perfluoroheptanoic acid (PFHpA)	2.0	U	2.5	2.0	0.80	ng/L		06/03/16 21:26	1
Perfluorohexanesulfonic acid (PFHxS)	2.0	U	2.5	2.0	0.87	ng/L		06/03/16 21:26	1
Perfluorononanoic acid (PFNA)	2.0	U	2.5	2.0	0.65	ng/L		06/03/16 21:26	1
Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	3.0	1.3	ng/L		06/03/16 21:26	1
Perfluorooctanoic acid (PFOA)	2.0	U	2.5	2.0	0.75	ng/L		06/03/16 21:26	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*107*		*25 - 150*	*06/01/16 11:06*	*06/03/16 21:26*	*1*
13C4 PFOA	*116*		*25 - 150*	*06/01/16 11:06*	*06/03/16 21:26*	*1*
13C4 PFOS	*112*		*25 - 150*	*06/01/16 11:06*	*06/03/16 21:26*	*1*
13C4-PFHpA	*116*		*25 - 150*	*06/01/16 11:06*	*06/03/16 21:26*	*1*
13C5 PFNA	*117*		*25 - 150*	*06/01/16 11:06*	*06/03/16 21:26*	*1*
18O2 PFHxS	*116*		*25 - 150*	*06/01/16 11:06*	*06/03/16 21:26*	*1*

Lab Sample ID: LCS 320-112069/2-A
Matrix: Water
Analysis Batch: 112504

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 112069

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanesulfonic acid (PFBS)	35.4	35.9		ng/L		101	50 - 150
Perfluoroheptanoic acid (PFHpA)	40.0	44.8		ng/L		112	60 - 140
Perfluorohexanesulfonic acid (PFHxS)	36.4	37.5	M	ng/L		103	60 - 140
Perfluorononanoic acid (PFNA)	40.0	45.3		ng/L		113	60 - 140
Perfluorooctanesulfonic acid (PFOS)	37.1	38.5	M	ng/L		104	60 - 140
Perfluorooctanoic acid (PFOA)	40.0	39.7		ng/L		99	60 - 140

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*108*		*25 - 150*
13C4 PFOA	*116*		*25 - 150*
13C4 PFOS	*117*		*25 - 150*
13C4-PFHpA	*111*		*25 - 150*
13C5 PFNA	*104*		*25 - 150*
18O2 PFHxS	*115*		*25 - 150*

Lab Sample ID: 320-19198-1 MS
Matrix: Water
Analysis Batch: 112504

Client Sample ID: DW-57
Prep Type: Total/NA
Prep Batch: 112069

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanesulfonic acid (PFBS)	2.9		33.2	34.8		ng/L		96	50 - 150
Perfluoroheptanoic acid (PFHpA)	4.5		37.6	45.1		ng/L		108	60 - 140
Perfluorohexanesulfonic acid (PFHxS)	35	M	34.2	72.4	M	ng/L		110	60 - 140
Perfluorononanoic acid (PFNA)	2.0	J	37.6	44.0		ng/L		112	60 - 140

Method: WS-LC-0025 - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: 320-19198-1 MS
Matrix: Water
Analysis Batch: 112504

Client Sample ID: DW-57
Prep Type: Total/NA
Prep Batch: 112069

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorooctanesulfonic acid (PFOS)	150	M J	34.9	189	M 4	ng/L		120	60 - 140
Perfluorooctanoic acid (PFOA)	17	M	37.6	59.6	M	ng/L		113	60 - 140

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C2 PFHxA	*79*		*25 - 150*
13C4 PFOA	*61*		*25 - 150*
13C4 PFOS	*102*		*25 - 150*
13C4-PFHpA	*72*		*25 - 150*
13C5 PFNA	*49*		*25 - 150*
18O2 PFHxS	*117*		*25 - 150*

Lab Sample ID: 320-19198-1 MSD
Matrix: Water
Analysis Batch: 112504

Client Sample ID: DW-57
Prep Type: Total/NA
Prep Batch: 112069

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanesulfonic acid (PFBS)	2.9		33.6	38.0		ng/L		104	50 - 150	9	30
Perfluoroheptanoic acid (PFHpA)	4.5		38.0	46.4		ng/L		110	60 - 140	3	30
Perfluorohexanesulfonic acid (PFHxS)	35	M	34.6	73.8	M	ng/L		113	60 - 140	2	30
Perfluorononanoic acid (PFNA)	2.0	J	38.0	41.9		ng/L		105	60 - 140	5	30
Perfluorooctanesulfonic acid (PFOS)	150	M J	35.3	198	M 4	ng/L		142	60 - 140	4	30
Perfluorooctanoic acid (PFOA)	17	M	38.0	54.8	M	ng/L		99	60 - 140	9	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C2 PFHxA	*83*		*25 - 150*
13C4 PFOA	*69*		*25 - 150*
13C4 PFOS	*107*		*25 - 150*
13C4-PFHpA	*79*		*25 - 150*
13C5 PFNA	*55*		*25 - 150*
18O2 PFHxS	*121*		*25 - 150*

QC Association Summary

Client: Earth Toxics, Inc
Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

TestAmerica Job ID: 320-19198-1

LCMS

Prep Batch: 112069

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19198-1	DW-57	Total/NA	Water	3535	
320-19198-1 MS	DW-57	Total/NA	Water	3535	
320-19198-1 MSD	DW-57	Total/NA	Water	3535	
320-19198-2	FB-DW-57	Total/NA	Water	3535	
320-19198-3	DW-95	Total/NA	Water	3535	
320-19198-4	FB-DW-95	Total/NA	Water	3535	
320-19198-5	DUP-052616	Total/NA	Water	3535	
LCS 320-112069/2-A	Lab Control Sample	Total/NA	Water	3535	
MB 320-112069/1-A	Method Blank	Total/NA	Water	3535	

Analysis Batch: 112504

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-19198-1	DW-57	Total/NA	Water	WS-LC-0025	112069
320-19198-1 MS	DW-57	Total/NA	Water	WS-LC-0025	112069
320-19198-1 MSD	DW-57	Total/NA	Water	WS-LC-0025	112069
320-19198-2	FB-DW-57	Total/NA	Water	WS-LC-0025	112069
320-19198-3	DW-95	Total/NA	Water	WS-LC-0025	112069
320-19198-4	FB-DW-95	Total/NA	Water	WS-LC-0025	112069
320-19198-5	DUP-052616	Total/NA	Water	WS-LC-0025	112069
LCS 320-112069/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	112069
MB 320-112069/1-A	Method Blank	Total/NA	Water	WS-LC-0025	112069

Lab Chronicle

Client: Earth Toxics, Inc
Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

TestAmerica Job ID: 320-19198-1

Client Sample ID: DW-57
Date Collected: 05/26/16 11:01
Date Received: 05/28/16 09:00

Lab Sample ID: 320-19198-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			523 mL	1.00 mL	112069	06/01/16 11:06	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	523 mL	1.00 mL	112504	06/03/16 22:09	JRB	TAL SAC
	Instrument ID: A6									

Client Sample ID: FB-DW-57
Date Collected: 05/26/16 11:05
Date Received: 05/28/16 09:00

Lab Sample ID: 320-19198-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			530.2 mL	1.00 mL	112069	06/01/16 11:06	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	530.2 mL	1.00 mL	112504	06/03/16 23:13	JRB	TAL SAC
	Instrument ID: A6									

Client Sample ID: DW-95
Date Collected: 05/26/16 11:26
Date Received: 05/28/16 09:00

Lab Sample ID: 320-19198-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			537.1 mL	1.00 mL	112069	06/01/16 11:06	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	537.1 mL	1.00 mL	112504	06/03/16 23:34	JRB	TAL SAC
	Instrument ID: A6									

Client Sample ID: FB-DW-95
Date Collected: 05/26/16 11:28
Date Received: 05/28/16 09:00

Lab Sample ID: 320-19198-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			535.7 mL	1.00 mL	112069	06/01/16 11:06	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	535.7 mL	1.00 mL	112504	06/03/16 23:55	JRB	TAL SAC
	Instrument ID: A6									

Client Sample ID: DUP-052616
Date Collected: 05/26/16 11:26
Date Received: 05/28/16 09:00

Lab Sample ID: 320-19198-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			521.1 mL	1.00 mL	112069	06/01/16 11:06	SNE	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	521.1 mL	1.00 mL	112504	06/04/16 00:17	JRB	TAL SAC
	Instrument ID: A6									

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Certification Summary

Client: Earth Toxics, Inc
Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

TestAmerica Job ID: 320-19198-1

Laboratory: TestAmerica Sacramento

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17
New Jersey	NELAP	2	CA005	06-30-16

Laboratory: TestAmerica Denver

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-17
New Jersey	NELAP	2	CO004	06-30-16

Method Summary

Client: Earth Toxics, Inc
Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

TestAmerica Job ID: 320-19198-1

Method	Method Description	Protocol	Laboratory
WS-LC-0025	Perfluorinated Hydrocarbons	TAL SOP	TAL SAC

Protocol References:

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Earth Toxics, Inc
Project/Site: Ensafe-NWS-Earle, NJ PFCs Potable Water

TestAmerica Job ID: 320-19198-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-19198-1	DW-57	Water	05/26/16 11:01	05/28/16 09:00
320-19198-2	FB-DW-57	Water	05/26/16 11:05	05/28/16 09:00
320-19198-3	DW-95	Water	05/26/16 11:26	05/28/16 09:00
320-19198-4	FB-DW-95	Water	05/26/16 11:28	05/28/16 09:00
320-19198-5	DUP-052616	Water	05/26/16 11:26	05/28/16 09:00

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 112504

Lab Sample ID: STD 320-112504/4 IC Client Sample ID:

Date Analyzed: 06/03/16 17:32 Lab File ID: 03JUN2016A6A_004.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	barnettj	06/06/16 11:28

Lab Sample ID: STD 320-112504/5 IC Client Sample ID:

Date Analyzed: 06/03/16 17:54 Lab File ID: 03JUN2016A6A_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	westendorfc	06/04/16 11:01
Perfluorooctanesulfonic acid (PFOS)	11.52	Isomers	westendorfc	06/04/16 11:01

Lab Sample ID: STD 320-112504/6 IC Client Sample ID:

Date Analyzed: 06/03/16 18:15 Lab File ID: 03JUN2016A6A_006.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	westendorfc	06/04/16 11:02
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendorfc	06/04/16 11:02

Lab Sample ID: STD 320-112504/7 IC Client Sample ID:

Date Analyzed: 06/03/16 18:36 Lab File ID: 03JUN2016A6A_007.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.49	Assigned Peak	westendorfc	06/04/16 11:33
Perfluorooctanesulfonic acid (PFOS)	11.54	Isomers	westendorfc	06/04/16 11:02

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 112504

Lab Sample ID: STD 320-112504/8 IC Client Sample ID:

Date Analyzed: 06/03/16 18:57 Lab File ID: 03JUN2016A6A_008.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	westendorfc	06/04/16 11:03
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendorfc	06/04/16 11:03

Lab Sample ID: STD 320-112504/9 IC Client Sample ID:

Date Analyzed: 06/03/16 19:19 Lab File ID: 03JUN2016A6A_009.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	westendorfc	06/04/16 11:04
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendorfc	06/04/16 11:04

Lab Sample ID: STD 320-112504/10 IC Client Sample ID:

Date Analyzed: 06/03/16 19:40 Lab File ID: 03JUN2016A6A_010.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.50	Isomers	westendorfc	06/04/16 11:05
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendorfc	06/04/16 11:05

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 112504

Lab Sample ID: LCS 320-112069/2-A Client Sample ID:

Date Analyzed: 06/03/16 21:48 Lab File ID: 03JUN2016A6A_016.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	westendorfc	06/04/16 11:18
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendorfc	06/04/16 11:18

Lab Sample ID: 320-19198-1 Client Sample ID: DW-57

Date Analyzed: 06/03/16 22:09 Lab File ID: 03JUN2016A6A_017.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	barnettj	06/06/16 11:29
Perfluorooctanoic acid (PFOA)	10.57	Isomers	westendorfc	06/04/16 11:19
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendorfc	06/04/16 11:19

Lab Sample ID: 320-19198-1 MS Client Sample ID: DW-57 MS

Date Analyzed: 06/03/16 22:30 Lab File ID: 03JUN2016A6A_018.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	barnettj	06/06/16 11:30
Perfluorooctanoic acid (PFOA)	10.58	Isomers	westendorfc	06/04/16 11:20
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendorfc	06/04/16 11:20

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 112504

Lab Sample ID: 320-19198-1 MSD Client Sample ID: DW-57 MSD

Date Analyzed: 06/03/16 22:51 Lab File ID: 03JUN2016A6A_019.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	barnettj	06/06/16 11:30
Perfluorooctanoic acid (PFOA)	10.57	Isomers	westendorfc	06/04/16 11:21
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendorfc	06/04/16 11:21

Lab Sample ID: 320-19198-2 Client Sample ID: FB-DW-57

Date Analyzed: 06/03/16 23:13 Lab File ID: 03JUN2016A6A_020.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.51	Isomers	westendorfc	06/04/16 11:22
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendorfc	06/04/16 11:22

Lab Sample ID: 320-19198-3 Client Sample ID: DW-95

Date Analyzed: 06/03/16 23:34 Lab File ID: 03JUN2016A6A_021.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	westendorfc	06/04/16 11:23
Perfluorooctanoic acid (PFOA)	10.58	Isomers	westendorfc	06/04/16 11:23
Perfluorooctanesulfonic acid (PFOS)	11.54	Isomers	westendorfc	06/04/16 11:23

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 112504

Lab Sample ID: 320-19198-4 Client Sample ID: FB-DW-95

Date Analyzed: 06/03/16 23:55 Lab File ID: 03JUN2016A6A_022.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendorfc	06/04/16 11:25

Lab Sample ID: 320-19198-5 Client Sample ID: DUP-052616

Date Analyzed: 06/04/16 00:17 Lab File ID: 03JUN2016A6A_023.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.49	Isomers	barnettj	06/06/16 11:32
Perfluorooctanoic acid (PFOA)	10.57	Isomers	westendorfc	06/04/16 11:26
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendorfc	06/04/16 11:26

Lab Sample ID: CCV 320-112504/25 Client Sample ID:

Date Analyzed: 06/04/16 00:59 Lab File ID: 03JUN2016A6A_025.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.50	Isomers	westendorfc	06/04/16 11:27
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	westendorfc	06/04/16 11:27

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCMPFCSU_00042	11/23/16	05/27/16	Methanol, Lot Baker 115935	5000 uL	LCM2PFHxDA_00005	100 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00005	100 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00005	100 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00006	100 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00009	100 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00006	100 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00007	100 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00006	100 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00008	100 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00006	100 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00005	100 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00010	100 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00012	100 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00007	100 uL	13C2 PFUnA	1 ug/mL
.LCM2PFHxDA_00005	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA_00005	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
.LCM4PFHPA_00005	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
.LCM5PFPEA_00006	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
.LCM8FOSA_00009	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
.LCMPFBA_00006	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
.LCMPFDA_00007	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFDoA_00006	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
.LCMPFHxA_00008	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00006	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
.LCMPFNA_00005	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
.LCMPFOA_00010	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
.LCMPFOS_00012	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00007	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC-L1_00020	11/05/16	05/18/16	MeOH/H2O, Lot 90285	5 mL	LCMPFCSU_00040	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00050	25 uL	Perfluorobutyric acid	0.5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.442 ng/mL
							Perfluorodecanoic acid	0.5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorododecanoic acid	0.5 ng/mL
							Perfluorodecane Sulfonic acid	0.482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.5 ng/mL
							Perfluoroheptanesulfonic Acid	0.476 ng/mL
							Perfluorohexanoic acid	0.5 ng/mL
							Perfluorohexadecanoic acid	0.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.455 ng/mL
							Perfluorononanoic acid (PFNA)	0.5 ng/mL
							Perfluorooctanoic acid (PFOA)	0.5 ng/mL
							Perfluorooctandecanoic acid	0.5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.464 ng/mL
							Perfluorooctane Sulfonamide	0.5 ng/mL
							Perfluoropentanoic acid	0.5 ng/mL
							Perfluorotetradecanoic acid	0.5 ng/mL
							Perfluorotridecanoic acid	0.5 ng/mL
							Perfluoroundecanoic acid	0.5 ng/mL
.LCMPFCSU_00040	11/05/16	05/11/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00005	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00005	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00005	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00006	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00009	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00006	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00006	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00006	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00010	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00012	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00007	200 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00005	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00005	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00005	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00006	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00009	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00006	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00007	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00006	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00008	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00006	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00005	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00010	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00012	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00007	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFCSP_00050	11/17/16	05/18/16	Methanol, Lot 090285	10000 uL	LCPFCSP_00049	1000 uL	Perfluorobutyric acid	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctandecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
..LCPFCSP_00049	11/17/16	05/17/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005	200 uL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
...LCPFBA_00004	01/30/20	Wellington Laboratories, Lot PFBA0115			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFDA_00004	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00004	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpS_00008	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00004	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00001	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00005	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
...LCPFOS-br_00001	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00004	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA_00004	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L2_00021	11/05/16	05/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00040	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00050	50 uL	Perfluorobutyric acid	1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL
							Perfluorodecanoic acid	1 ng/mL
							Perfluorododecanoic acid	1 ng/mL
							Perfluorodecane Sulfonic acid	0.964 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1 ng/mL
							Perfluoroheptanesulfonic Acid	0.952 ng/mL
							Perfluorohexanoic acid	1 ng/mL
							Perfluorohexadecanoic acid	1 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctandecanoic acid	1 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.928 ng/mL
							Perfluorooctane Sulfonamide	1 ng/mL
							Perfluoropentanoic acid	1 ng/mL
							Perfluorotetradecanoic acid	1 ng/mL
							Perfluorotridecanoic acid	1 ng/mL
							Perfluoroundecanoic acid	1 ng/mL
.LCMPFCSU_00040	11/05/16	05/11/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00005	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00005	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00005	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00006	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00009	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00006	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00006	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00006	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00010	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00012	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00007	200 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00005	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00005	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00005	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00006	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00009	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00006	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00007	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00006	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00008	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00006	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00005	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00010	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00012	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00007	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00050	11/17/16	05/18/16	Methanol, Lot 090285	10000 uL	LCPFCSP_00049	1000 uL	Perfluorobutyric acid	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctandecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
..LCPFCSP_00049	11/17/16	05/17/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005	200 uL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
...LCPFBA_00004	01/30/20	Wellington Laboratories, Lot PFBA0115			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00004	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00004	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpS_00008	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00004	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00001	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00005	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
...LCPFOS-br_00001	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00004	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA_00004	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L3_00018	11/05/16	05/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00040	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00050	250 uL	Perfluorobutyric acid	5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL
							Perfluorodecanoic acid	5 ng/mL
							Perfluorododecanoic acid	5 ng/mL
							Perfluorodecane Sulfonic acid	4.82 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5 ng/mL
							Perfluoroheptanesulfonic Acid	4.76 ng/mL
							Perfluorohexanoic acid	5 ng/mL
							Perfluorohexadecanoic acid	5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	4.55 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5 ng/mL
							Perfluorooctandecanoic acid	5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.64 ng/mL
							Perfluorooctane Sulfonamide	5 ng/mL
							Perfluoropentanoic acid	5 ng/mL
							Perfluorotetradecanoic acid	5 ng/mL
							Perfluorotridecanoic acid	5 ng/mL
							Perfluoroundecanoic acid	5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCMPFCSU_00040	11/05/16	05/11/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00005	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00005	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00005	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00006	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00009	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00006	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00006	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00006	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00010	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00012	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00007	200 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00005	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00005	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00005	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00006	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00009	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00006	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00007	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00006	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00008	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00006	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00005	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00010	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00012	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00007	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00050	11/17/16	05/18/16	Methanol, Lot 090285	10000 uL	LCPFCSP_00049	1000 uL	Perfluorobutyric acid	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctandecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
..LCPFCSP_00049	11/17/16	05/17/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005	200 uL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
...LCPFBA_00004	01/30/20	Wellington Laboratories, Lot PFBA0115			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00004	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00004	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpS_00008	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00004	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxS-br_00001	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
...LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00005	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
...LCPFOS-br_00001	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
...LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00004	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFUdA_00004	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L4_00021	11/05/16	05/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00040	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00049	100 uL	Perfluorobutyric acid	20 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	17.68 ng/mL
							Perfluorodecanoic acid	20 ng/mL
							Perfluorododecanoic acid	20 ng/mL
							Perfluorodecane Sulfonic acid	19.28 ng/mL
							Perfluoroheptanoic acid (PFHpA)	20 ng/mL
							Perfluoroheptanesulfonic Acid	19.04 ng/mL
							Perfluorohexanoic acid	20 ng/mL
							Perfluorohexadecanoic acid	20 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	18.2 ng/mL
							Perfluorononanoic acid (PFNA)	20 ng/mL
							Perfluorooctanoic acid (PFOA)	20 ng/mL
							Perfluorooctandecanoic acid	20 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	18.56 ng/mL
							Perfluorooctane Sulfonamide	20 ng/mL
							Perfluoropentanoic acid	20 ng/mL
							Perfluorotetradecanoic acid	20 ng/mL
							Perfluorotridecanoic acid	20 ng/mL
							Perfluoroundecanoic acid	20 ng/mL
.LCMPFCSU_00040	11/05/16	05/11/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00005	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00005	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00005	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00006	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00009	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00006	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00006	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00008	200 uL	13C2 PFHxA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFHxS_00006	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00010	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00012	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00007	200 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00005	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00005	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00005	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00006	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00009	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00006	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00007	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00006	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00008	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00006	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00005	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00010	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00012	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00007	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00049	11/17/16	05/17/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005	200 uL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00004	01/30/20	Wellington Laboratories, Lot PFBA0115			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00004	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00004	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpS_00008	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00004	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00001	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00005	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS-br_00001	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00004	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00004	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L5_00019	11/05/16	05/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00040	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00049	250 uL	Perfluorobutyric acid	50 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ng/mL
							Perfluorodecanoic acid	50 ng/mL
							Perfluorododecanoic acid	50 ng/mL
							Perfluorodecane Sulfonic acid	48.2 ng/mL
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL
							Perfluoroheptanesulfonic Acid	47.6 ng/mL
							Perfluorohexanoic acid	50 ng/mL
							Perfluorohexadecanoic acid	50 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ng/mL
							Perfluorononanoic acid (PFNA)	50 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
							Perfluorooctandecanoic acid	50 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	46.4 ng/mL
							Perfluorooctane Sulfonamide	50 ng/mL
							Perfluoropentanoic acid	50 ng/mL
							Perfluorotetradecanoic acid	50 ng/mL
							Perfluorotridecanoic acid	50 ng/mL
							Perfluoroundecanoic acid	50 ng/mL
.LCMPFCSU_00040	11/05/16	05/11/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00005	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00005	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00005	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00006	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00009	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00006	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00006	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00006	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00010	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00012	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00007	200 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00005	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00005	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00005	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00006	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00009	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00006	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00007	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00006	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00008	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00006	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00005	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00010	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00012	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00007	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00049	11/17/16	05/17/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005	200 uL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00004	01/30/20	Wellington Laboratories, Lot PFBA0115			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00004	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00004	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpS_00008	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00004	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00001	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00005	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS-br_00001	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00004	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00004	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L6_00018	11/05/16	05/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00040	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00049	1000 uL	Perfluorobutyric acid	200 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	176.8 ng/mL
							Perfluorodecanoic acid	200 ng/mL
							Perfluorododecanoic acid	200 ng/mL
							Perfluorodecane Sulfonic acid	192.8 ng/mL
							Perfluoroheptanoic acid (PFHpA)	200 ng/mL
							Perfluoroheptanesulfonic Acid	190.4 ng/mL
							Perfluorohexanoic acid	200 ng/mL
							Perfluorohexadecanoic acid	200 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	182 ng/mL
							Perfluorononanoic acid (PFNA)	200 ng/mL
							Perfluorooctanoic acid (PFOA)	200 ng/mL
							Perfluorooctandecanoic acid	200 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	185.6 ng/mL
							Perfluorooctane Sulfonamide	200 ng/mL
							Perfluoropentanoic acid	200 ng/mL
							Perfluorotetradecanoic acid	200 ng/mL
							Perfluorotridecanoic acid	200 ng/mL
							Perfluoroundecanoic acid	200 ng/mL
.LCMPFCSU_00040	11/05/16	05/11/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00005	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00005	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00005	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00006	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00009	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00006	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00006	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00006	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00010	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00012	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00007	200 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00005	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00005	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00005	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00006	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00009	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00006	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00007	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00006	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00008	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFHxS_00006	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00005	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00010	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00012	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00007	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00049	11/17/16	05/17/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005	200 uL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00004	01/30/20	Wellington Laboratories, Lot PFBA0115			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00004	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00004	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpS_00008	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00004	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00001	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00005	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS-br_00001	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00004	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00004	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L7_00018	11/05/16	05/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00040	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00049	2000 uL	Perfluorobutyric acid	400 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	353.6 ng/mL
							Perfluorodecanoic acid	400 ng/mL
							Perfluorododecanoic acid	400 ng/mL
							Perfluorodecane Sulfonic acid	385.6 ng/mL
							Perfluoroheptanoic acid (PFHpA)	400 ng/mL
							Perfluoroheptanesulfonic Acid	380.8 ng/mL
							Perfluorohexanoic acid	400 ng/mL
							Perfluorohexadecanoic acid	400 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	364 ng/mL
							Perfluorononanoic acid (PFNA)	400 ng/mL
							Perfluorooctanoic acid (PFOA)	400 ng/mL
							Perfluorooctandecanoic acid	400 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	371.2 ng/mL
							Perfluorooctane Sulfonamide	400 ng/mL
							Perfluoropentanoic acid	400 ng/mL
							Perfluorotetradecanoic acid	400 ng/mL
							Perfluorotridecanoic acid	400 ng/mL
							Perfluoroundecanoic acid	400 ng/mL
.LCMPFCSU_00040	11/05/16	05/11/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00005	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00005	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00005	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00006	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00009	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00006	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00006	200 uL	13C2 PFDoA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFHxA_00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00006	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00010	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00012	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00007	200 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00005	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00005	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00005	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00006	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00009	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00006	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00007	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00006	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00008	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00006	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00005	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00010	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00012	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00007	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00049	11/17/16	05/17/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005	200 uL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00004	01/30/20	Wellington Laboratories, Lot PFBA0115			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00004	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00004	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpS_00008	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00004	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxS-br_00001	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
..LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00005	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS-br_00001	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
..LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00004	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00004	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFCIC_00017	06/16/16	05/14/16	MeOH/H2O, Lot 09285	5 mL	LCMPFCSU_00040	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFACMXB_00007	125 uL	Perfluorobutanesulfonic acid (PFBS)	44.25 ng/mL
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	47.25 ng/mL
							Perfluorononanoic acid (PFNA)	50 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	47.75 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
.LCMPFCSU_00040	11/05/16	05/11/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00005	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00005	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00005	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00006	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00009	200 uL	13C8 FOSA	1 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFBA_00006	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00006	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00006	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00010	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00012	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00007	200 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00005	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00005	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00005	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00006	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00009	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00006	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00007	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00006	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00008	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00006	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00005	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00010	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00012	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00007	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFACMXB_00007	11/06/20	Wellington Laboratories, Lot PFACMXB1115			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1.77 ug/mL
							Perfluoroheptanoic acid (PFHpA)	2 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	1.89 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	1.91 ug/mL
							Perfluorooctanoic acid (PFOA)	2 ug/mL
LCPFCSP_00049	11/17/16	05/17/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00003	200 uL	Perfluorobutane Sulfonate	0.884 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecane Sulfonate	0.964 ug/mL
							Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00008	200 uL	Perfluoroheptane Sulfonate	0.952 ug/mL
							Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexane Sulfonate	0.91 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00002	200 uL	PFNS (Perflouro-1-nonanesulfonate)	0.96 ug/mL
					LCPFOA_00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005	200 uL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFPeS_00002	200 uL	PFPeS (Perflouro-1-pentanesulfonate)	0.938 ug/mL
					LCPFTeDA_00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
.LCPFBA_00004	01/30/20	Wellington Laboratories, Lot PFBA0115			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
.LCPFBS_00003	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutane Sulfonate	44.2 ug/mL
.LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA_00004	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
.LCPFDoA_00004	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
.LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
							Perfluorodecane Sulfonic acid	48.2 ug/mL
.LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpS_00008	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptane Sulfonate	47.6 ug/mL
							Perfluoroheptanesulfonic Acid	47.6 ug/mL
.LCPFHxA_00004	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
.LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00001	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexane Sulfonate	45.5 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
.LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
.LCPFNS_00002	07/04/17	Wellington Laboratories, Lot LPFNS0712			(Purchased Reagent)		PFNS (Perflouro-1-nonanesulfonate)	48 ug/mL
.LCPFOA_00005	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
.LCPFOS-br_00001	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
.LCPFPeA_00004	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
.LCPFPeS_00002	07/04/17	Wellington Laboratories, Lot LPFPeS0712			(Purchased Reagent)		PFPeS (Perflouro-1-pentanesulfonate)	46.9 ug/mL
.LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
.LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
.LCPFUdA_00004	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL

Reagent

LCM2PFHxDA_00005

609709
ID: LCM2PFHxDA_00005
Exp: 01/07/21 Prpd: CBW
13C2-PFHxDA at 50ug/mL

R·4/7/16 CBW

WELLINGTON LABORATORIES

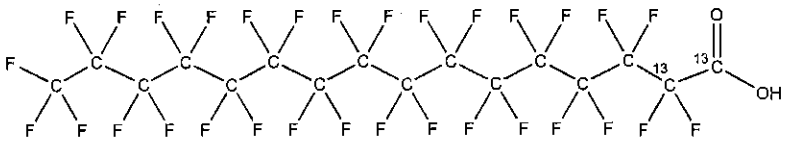
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFHxDA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexadecanoic acid

LOT NUMBER: M2PFHxDA1112

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{14}HF_{31}O_2$	**MOLECULAR WEIGHT:**	816.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	01/07/2016		
EXPIRY DATE: (mm/dd/yyyy)	01/07/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of native perfluoro-n-hexadecanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 01/11/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

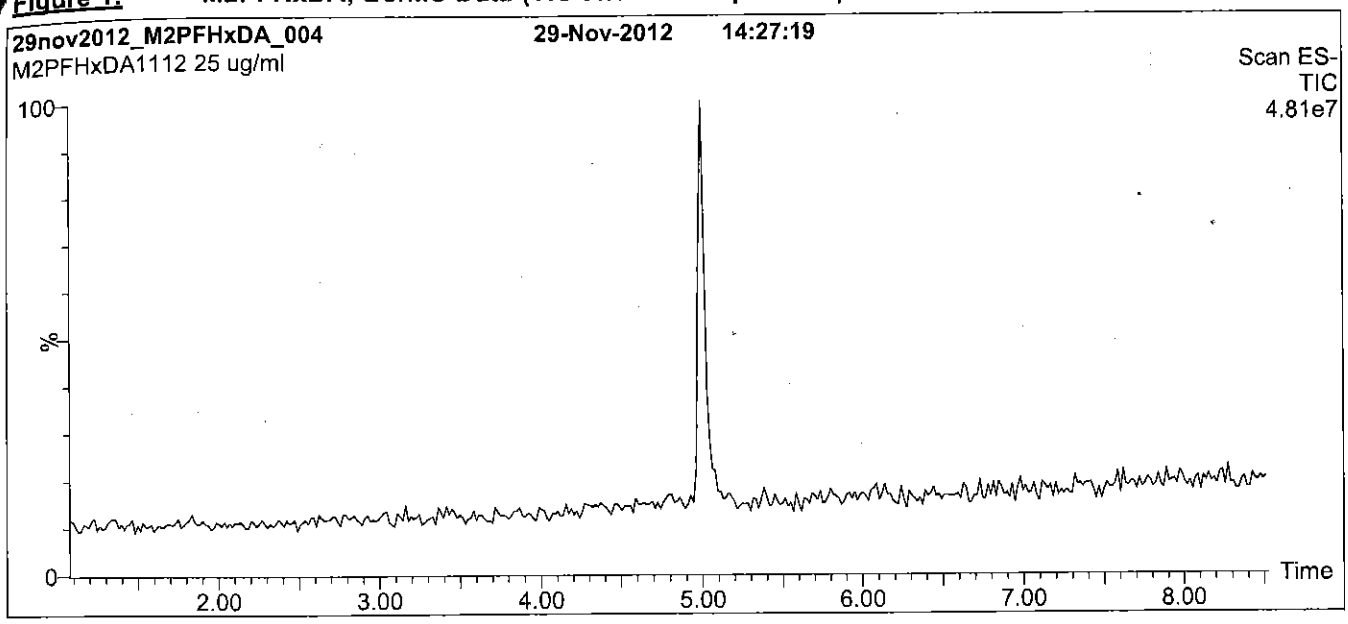
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

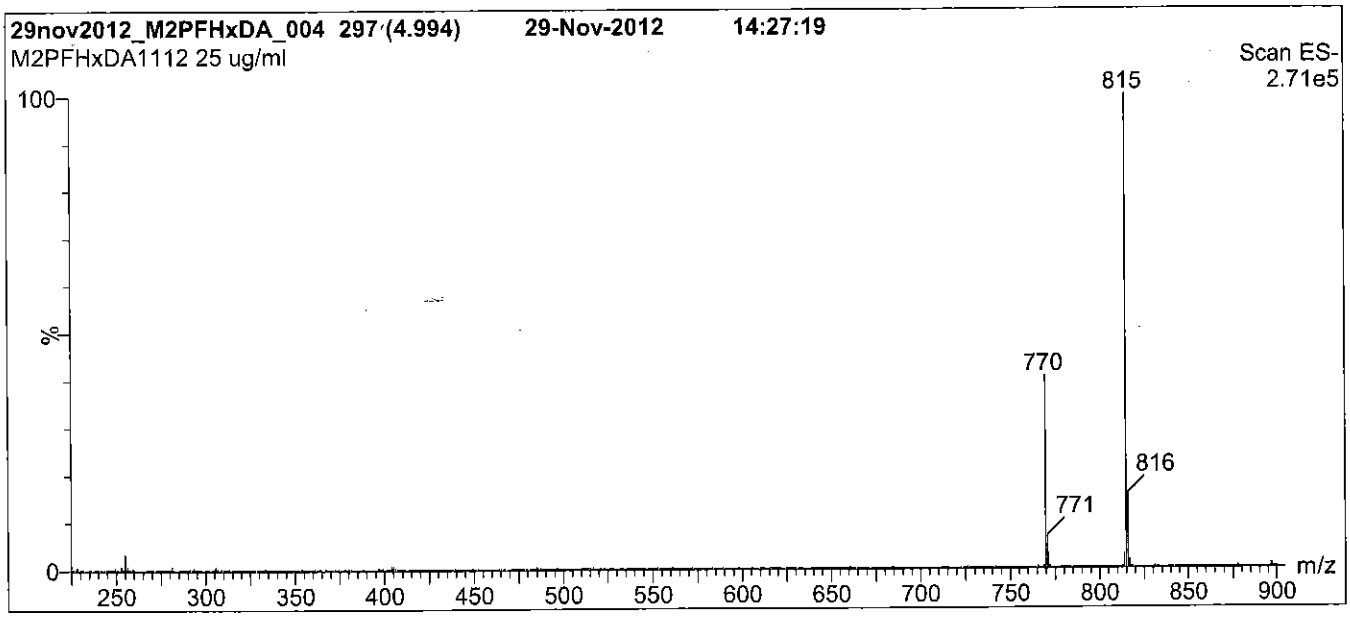
CALA Testing Accreditation No. A1226

ANAB ACCREDITED Reference Material Producer

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 100% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

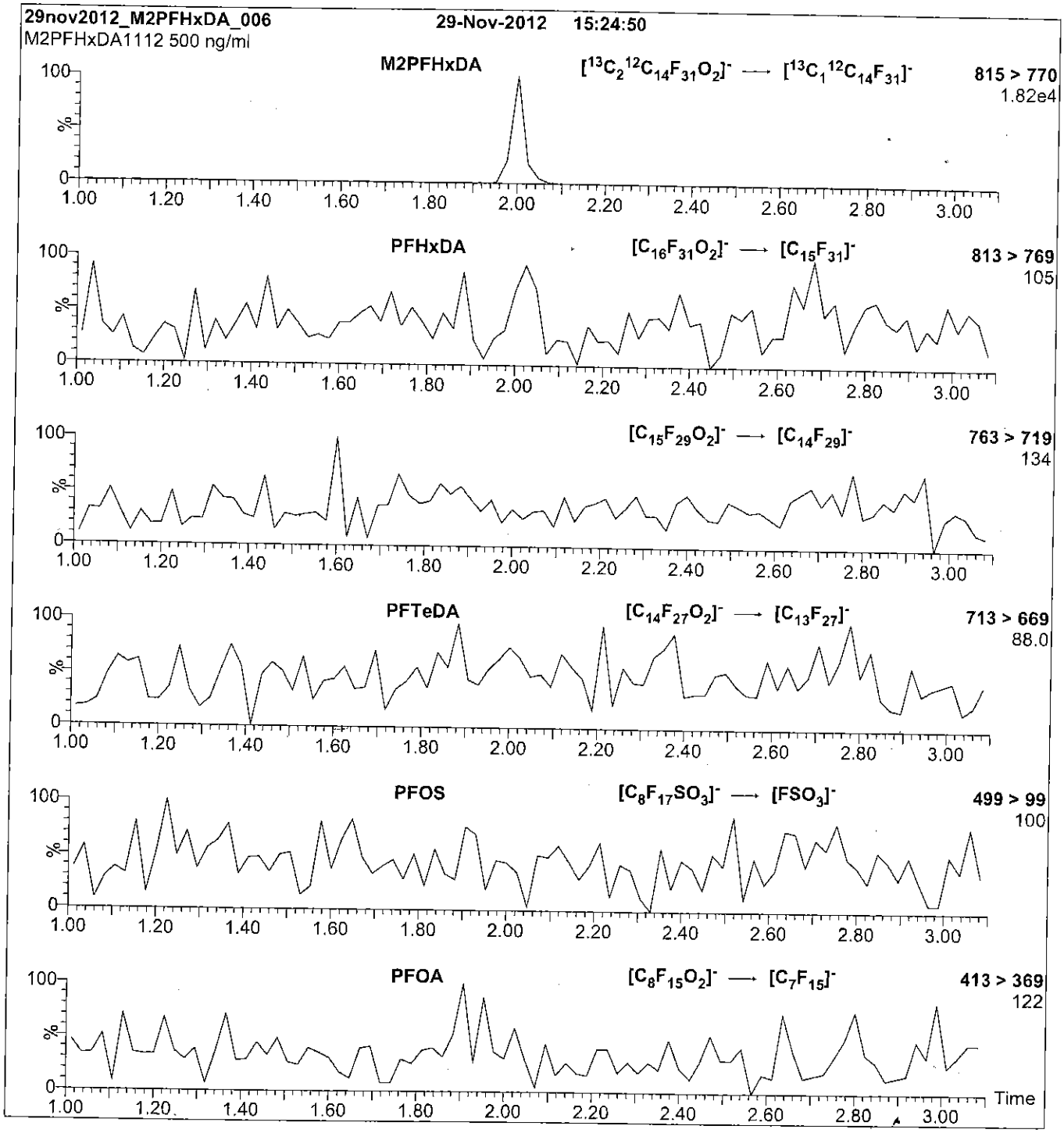
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 1200 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M2PFHxDA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 15

Reagent

LCM2PFTeDA_00005

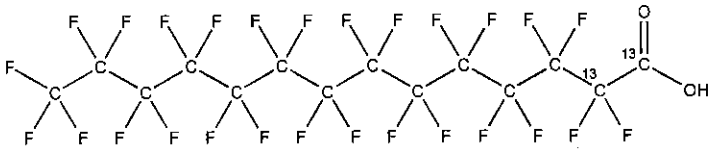
R: 4/7/16 CBW

609710
ID: LCM2PFTeDA_00005
Exp: 12/07/20 Prpd: CBW
13C2-PFTeDA at 50ug/mL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFTeDA
LOT NUMBER: M2PFTeDA1115
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]tetradecanoic acid
STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_{12}HF_{27}O_2$
MOLECULAR WEIGHT: 716.10
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 12/07/2015
EXPIRY DATE: (mm/dd/yyyy) 12/07/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/08/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation

ANAB ACCREDITED ISO 17025 REFERENCE MATERIAL PRODUCER

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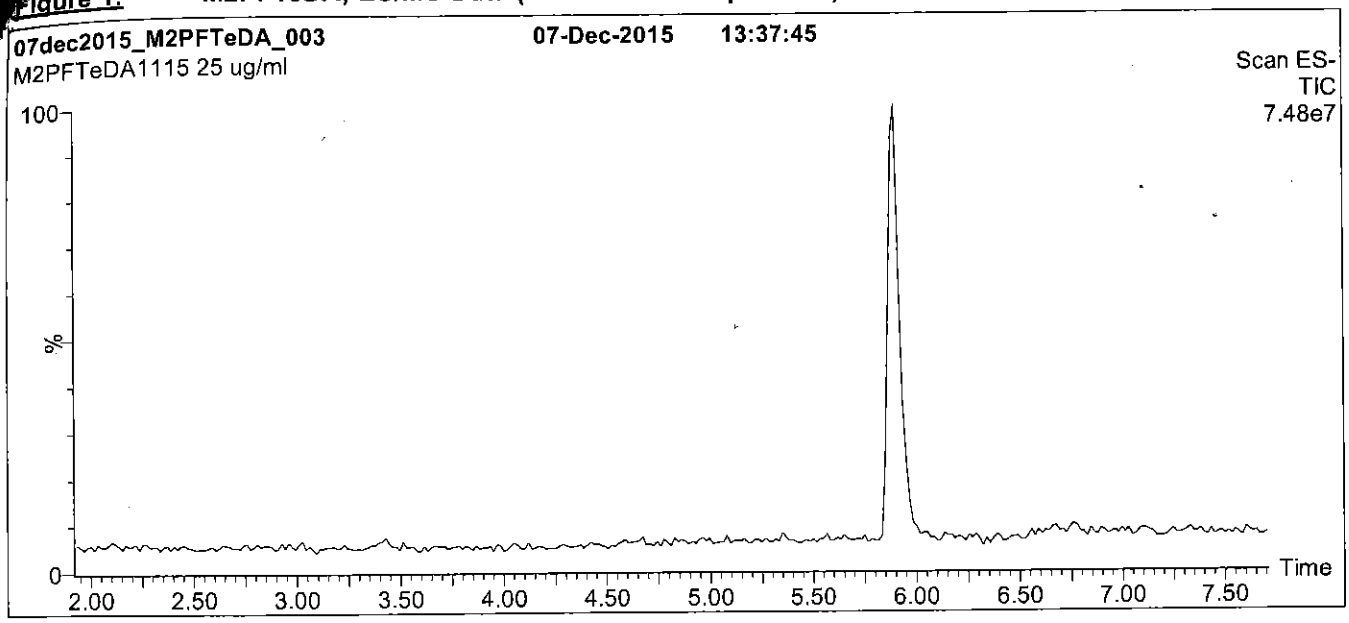
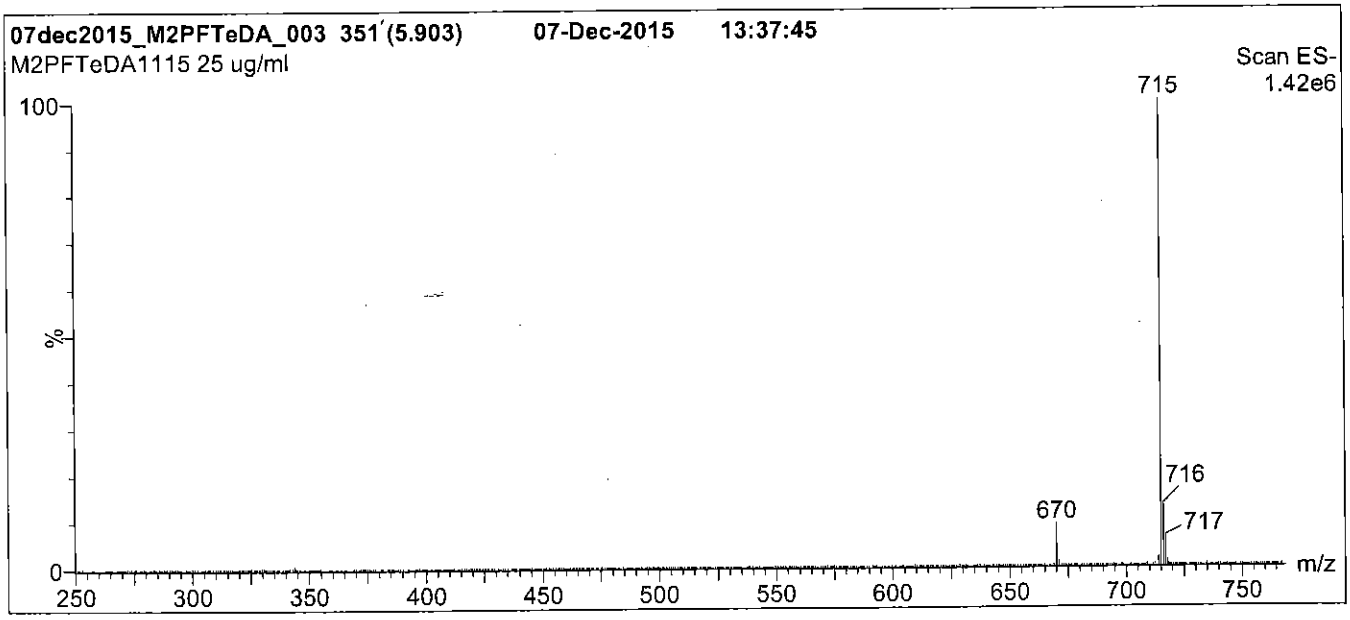
Figure 1: **M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

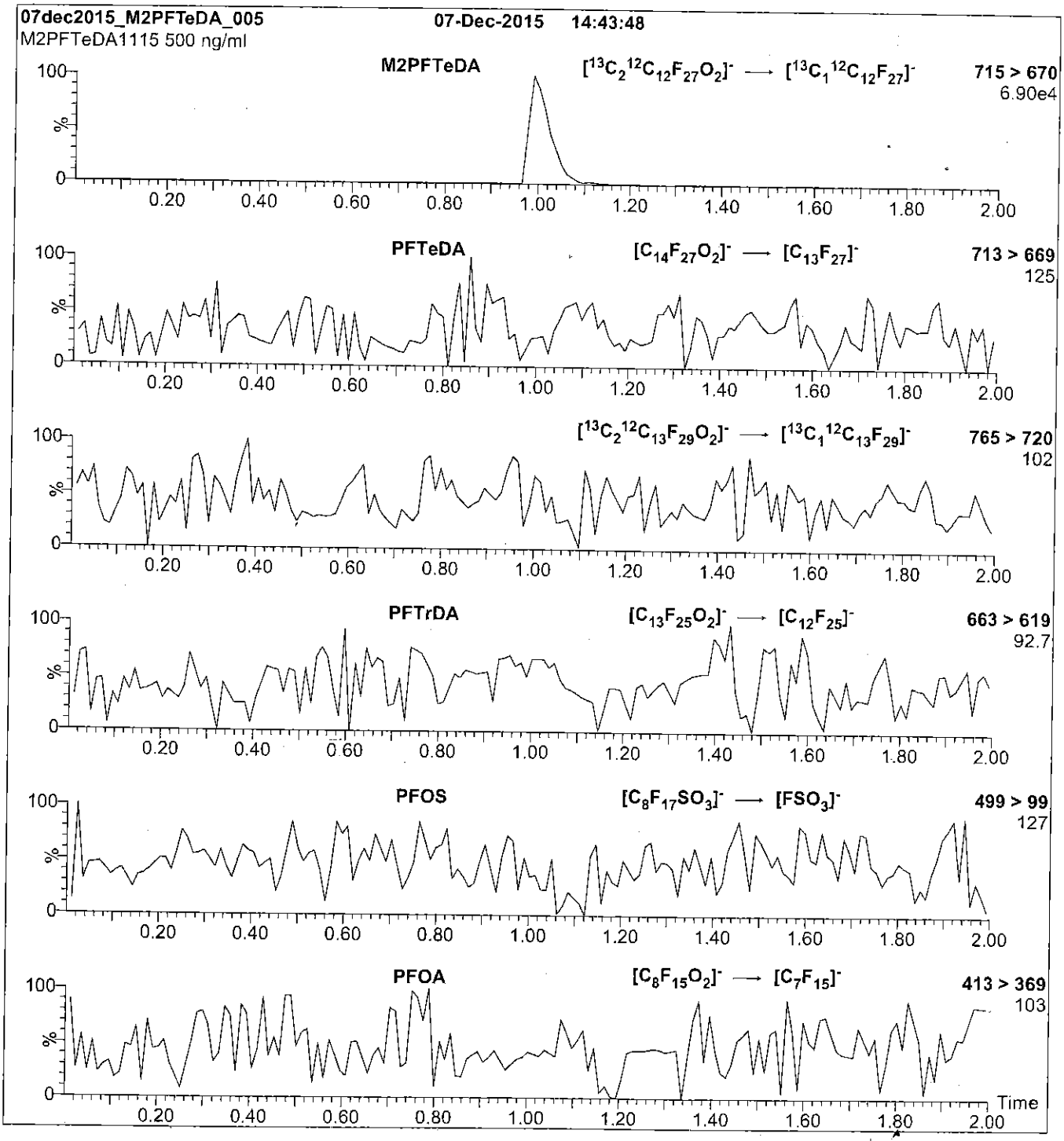
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M2PFTeDA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 14

Reagent

LCM4PFHPA_00005

R 4/7/16 CBW

609711
ID: LCM4PFHPA_00005
Exp: 05/22/20 Prpd: CBW
13C4-Perfluoroheptanoic a

WELLINGTON LABORATORIES

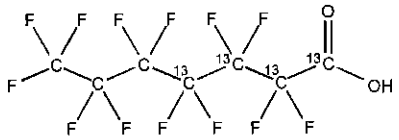
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M4PFHpA
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]heptanoic acid

LOT NUMBER: M4PFHpA0515

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_3HF_{13}O_2$	**MOLECULAR WEIGHT:**	368.03
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4$-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	05/22/2015		
EXPIRY DATE: (mm/dd/yyyy)	05/22/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/25/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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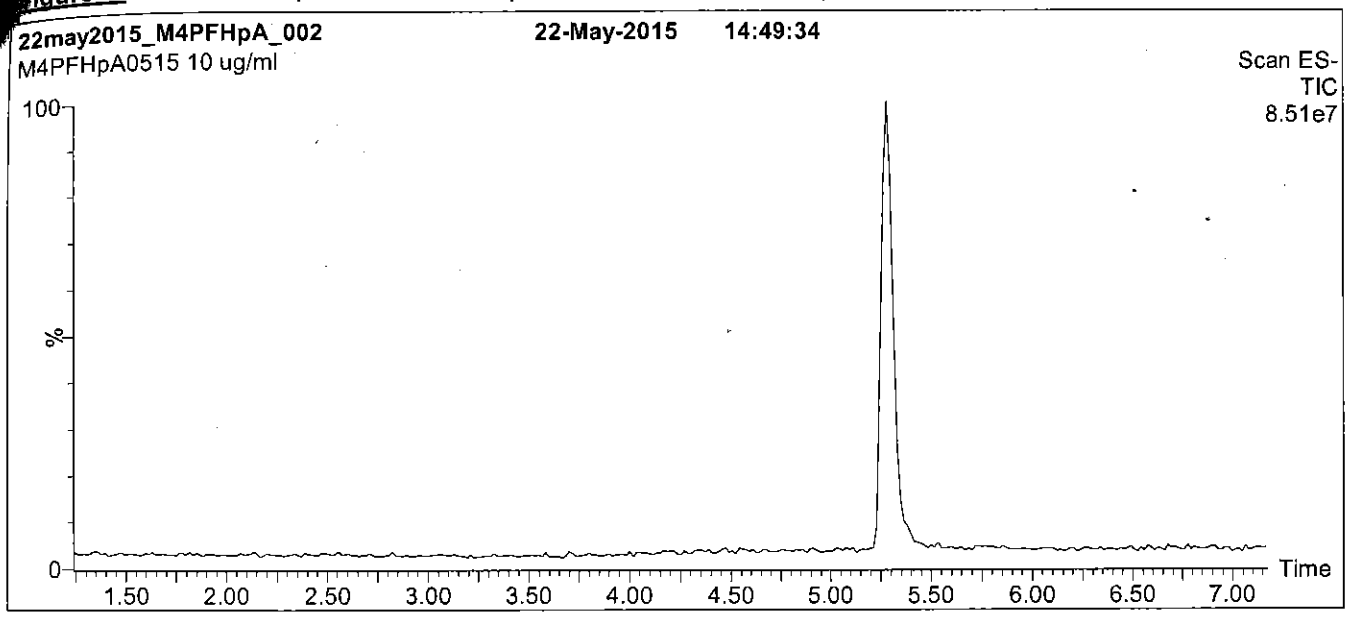
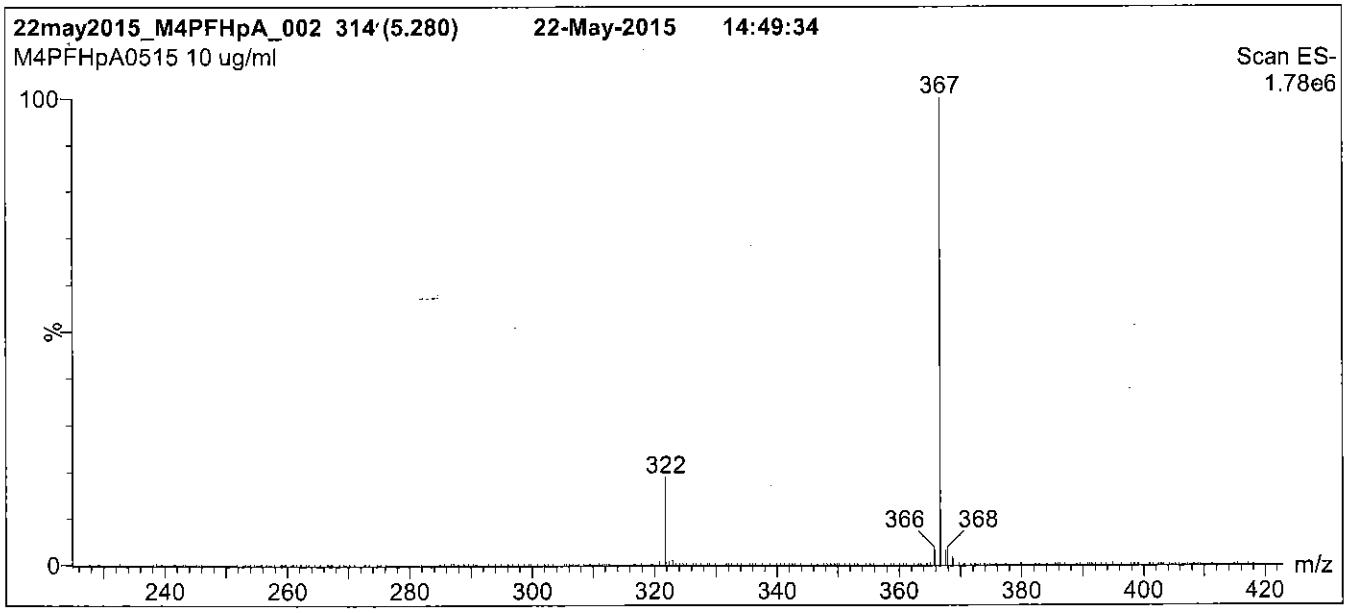
Figure 1: M4PFHpA; LC/MS Data (TIC and Mass Spectrum)





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

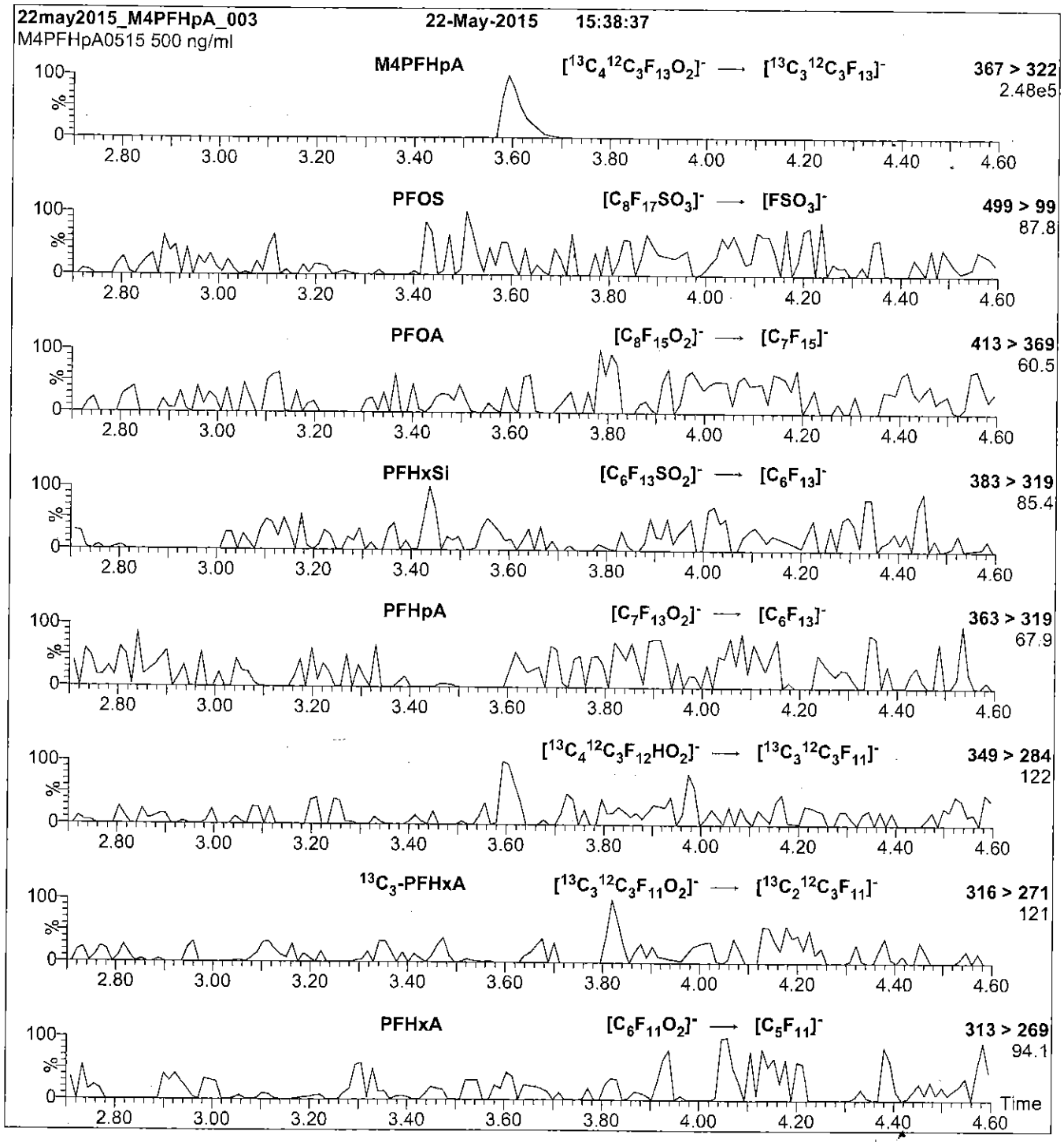
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M4PFHpA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M4PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 11

Reagent

LCM5PFPEA_00006

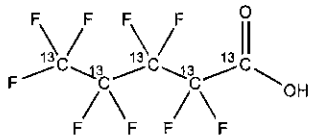
609706
ID: LCM5PFPEA_00006
Exp: 05/22/20 Prpd: CBW
13C5-Perfluoropentanoic a

R: 4/7/16 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M5PFPeA	**LOT NUMBER:**	M5PFPeA0515
COMPOUND:	Perfluoro-n-[$^{13}C_5$]pentanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_5HF_9O_2$	**MOLECULAR WEIGHT:**	269.01
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	05/22/2015		
EXPIRY DATE: (mm/dd/yyyy)	05/22/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of perfluoro-n-pentanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/25/2015 (mm/dd/yyyy)
B.G. Chittim

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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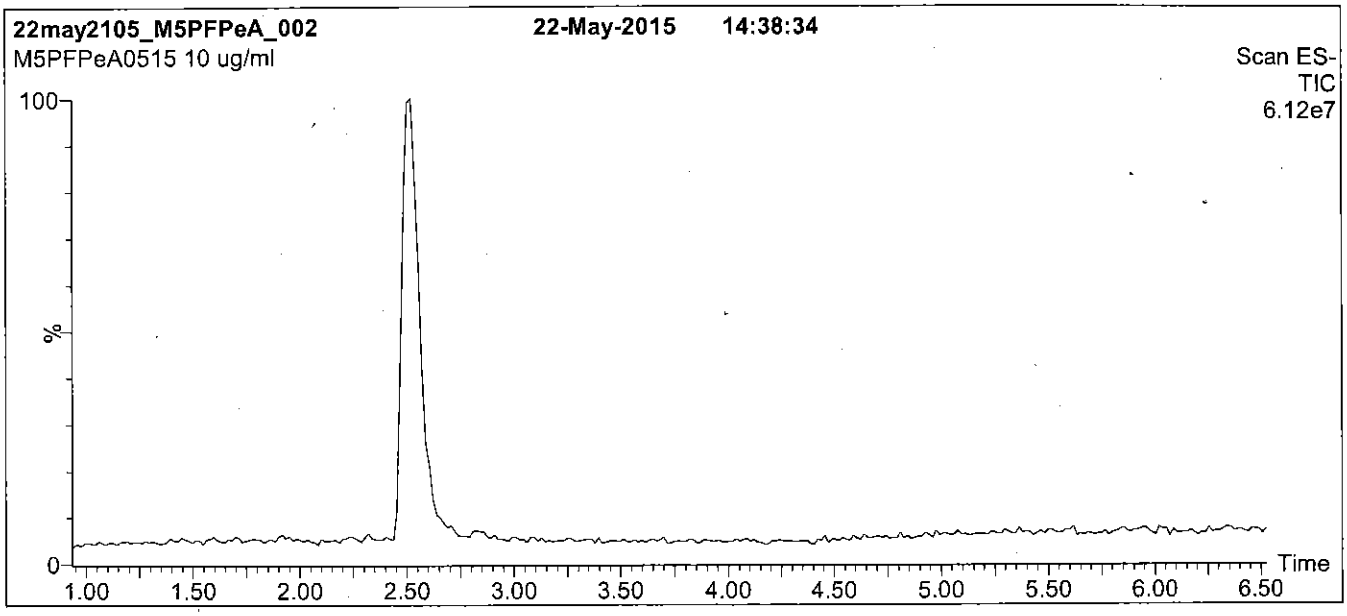
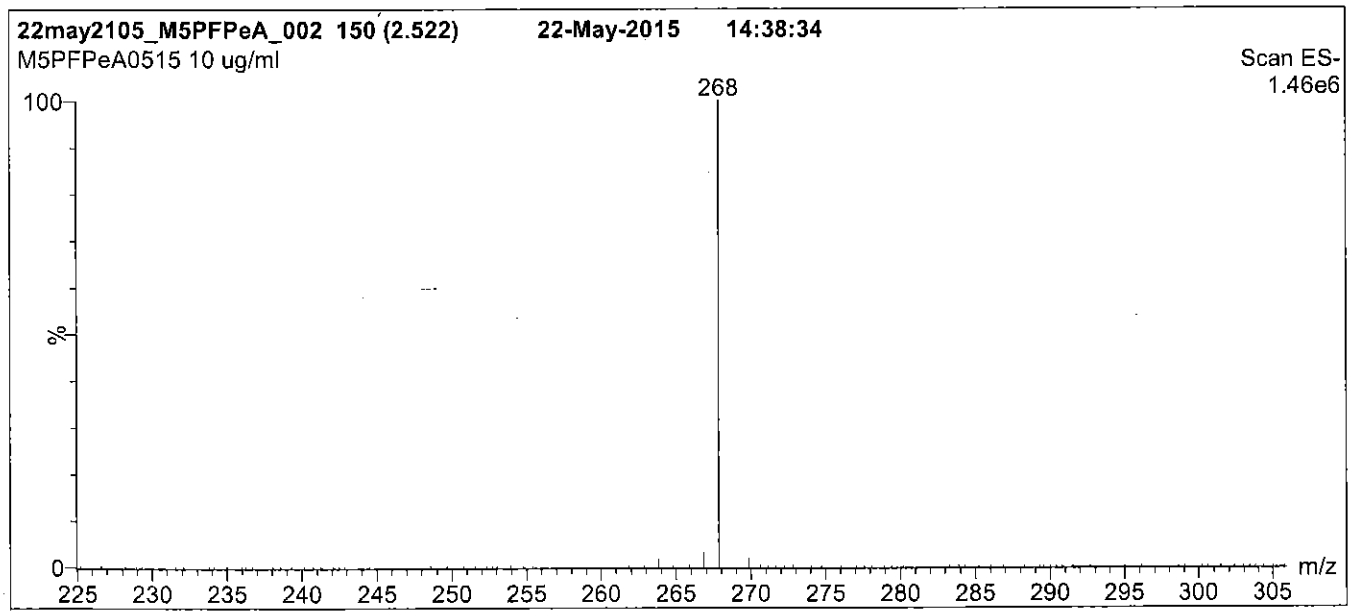
CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **M5PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

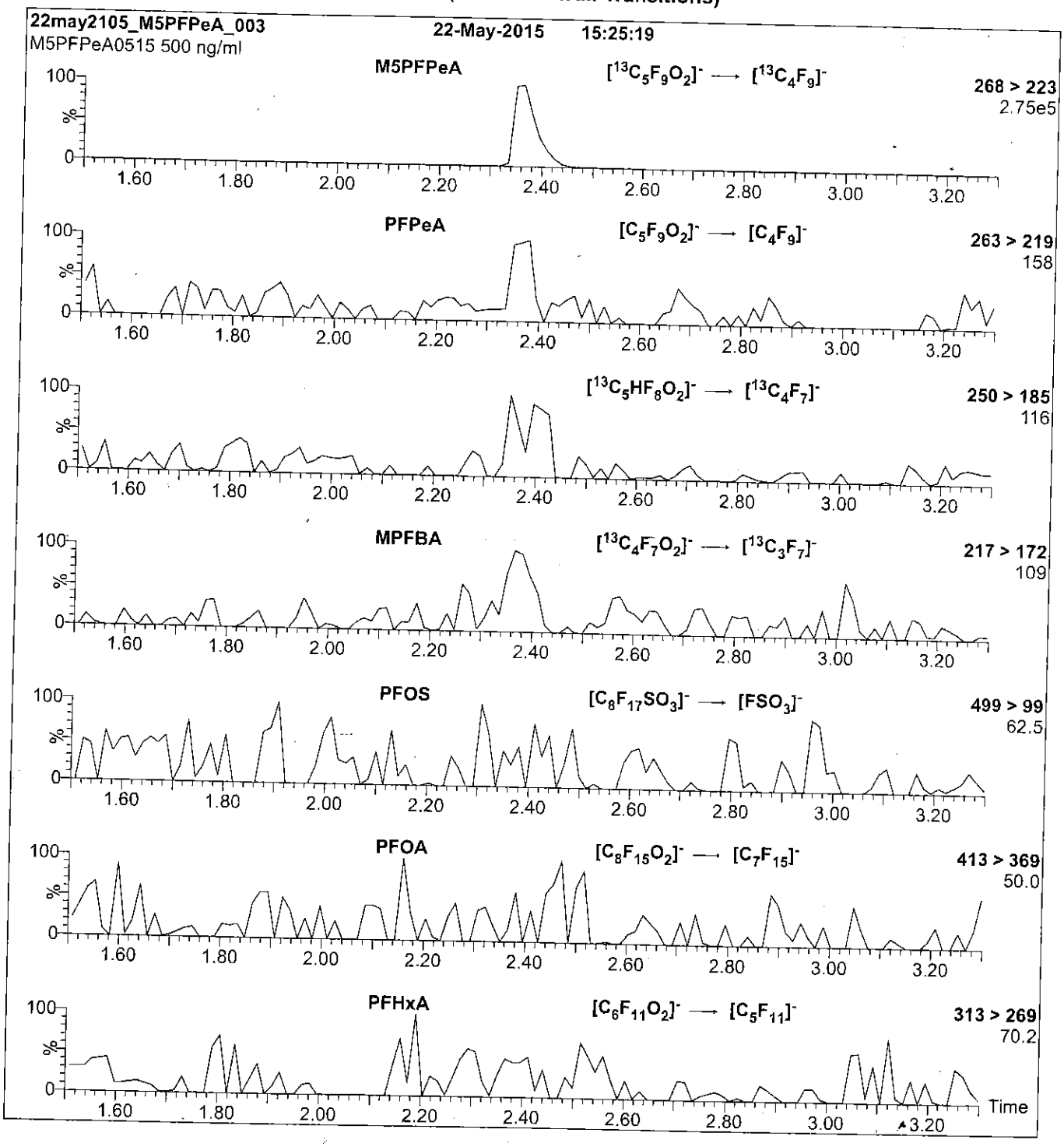
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M5PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M5PFPeA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 9

Reagent

LCM8FOSA_00009

609714
ID: LCM8FOSA_00009
Exp: 12/22/17 Prpd: CBW
13C8-Perfluorooctanesulfo

R=4/7/16 CBW

WELLINGTON LABORATORIES

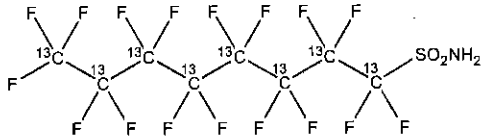
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M8FOSA-I
COMPOUND: Perfluoro-1-[$^{13}C_8$]octanesulfonamide

LOT NUMBER: M8FOSA1215I

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	507.09
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	12/22/2015		
EXPIRY DATE: (mm/dd/yyyy)	12/22/2017		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 01/14/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

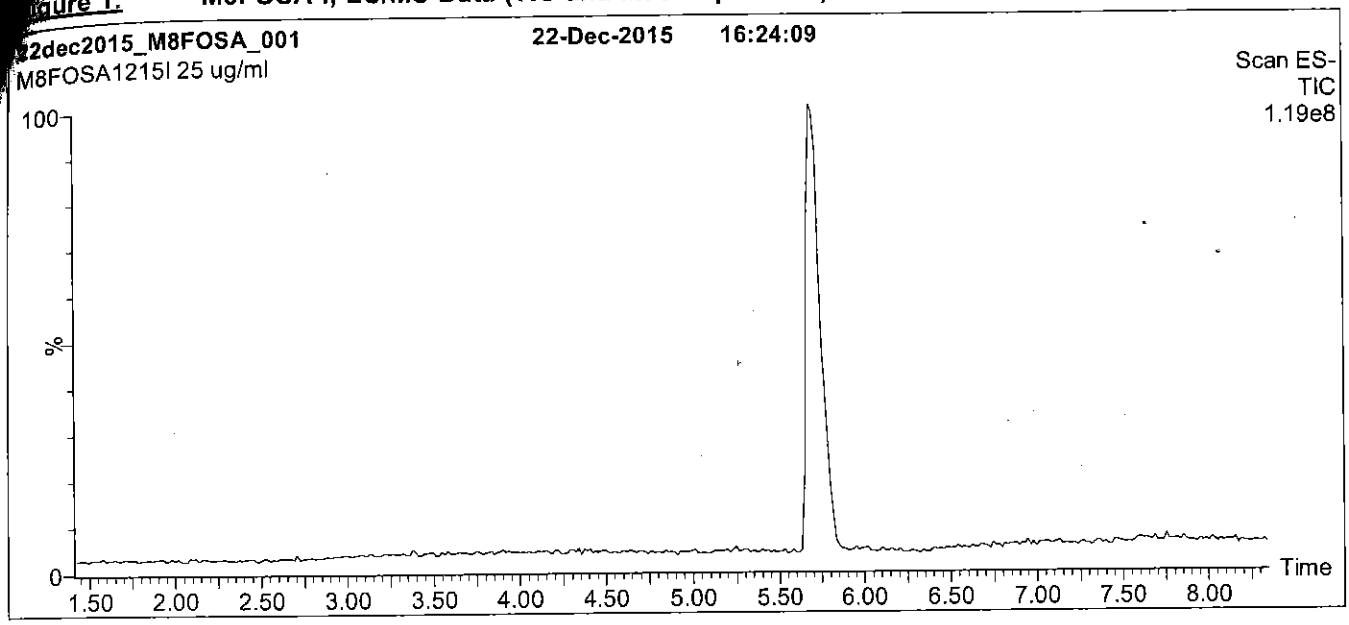
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

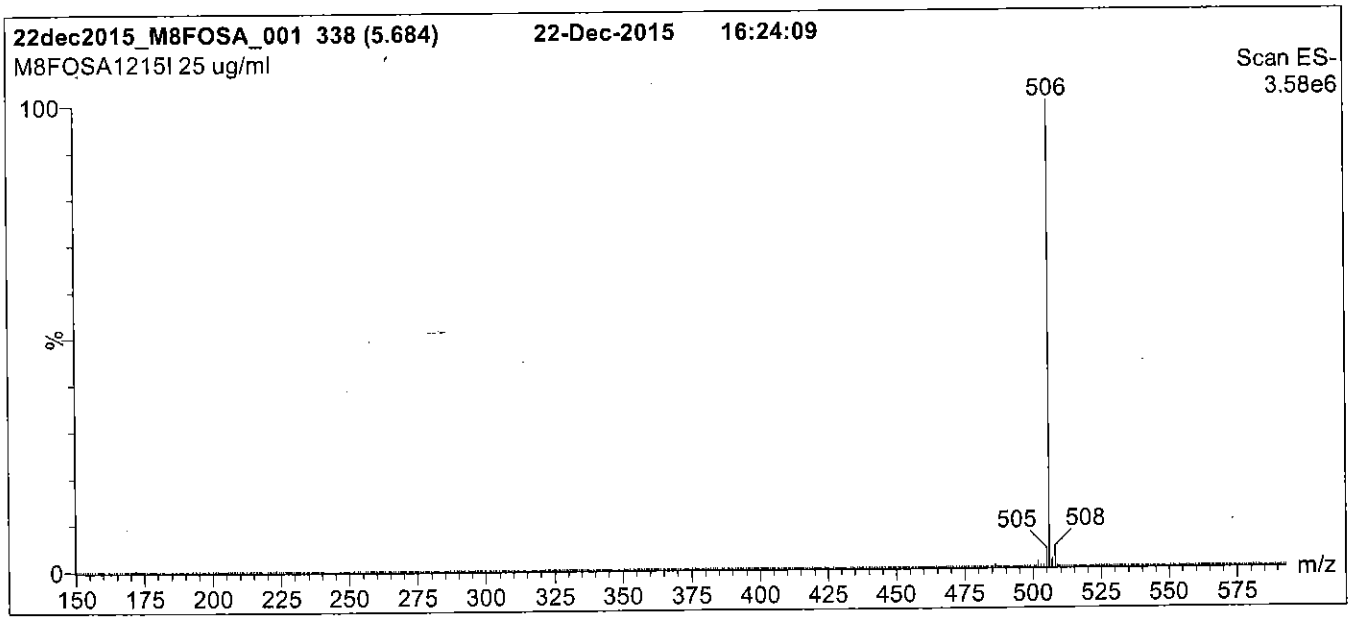
CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

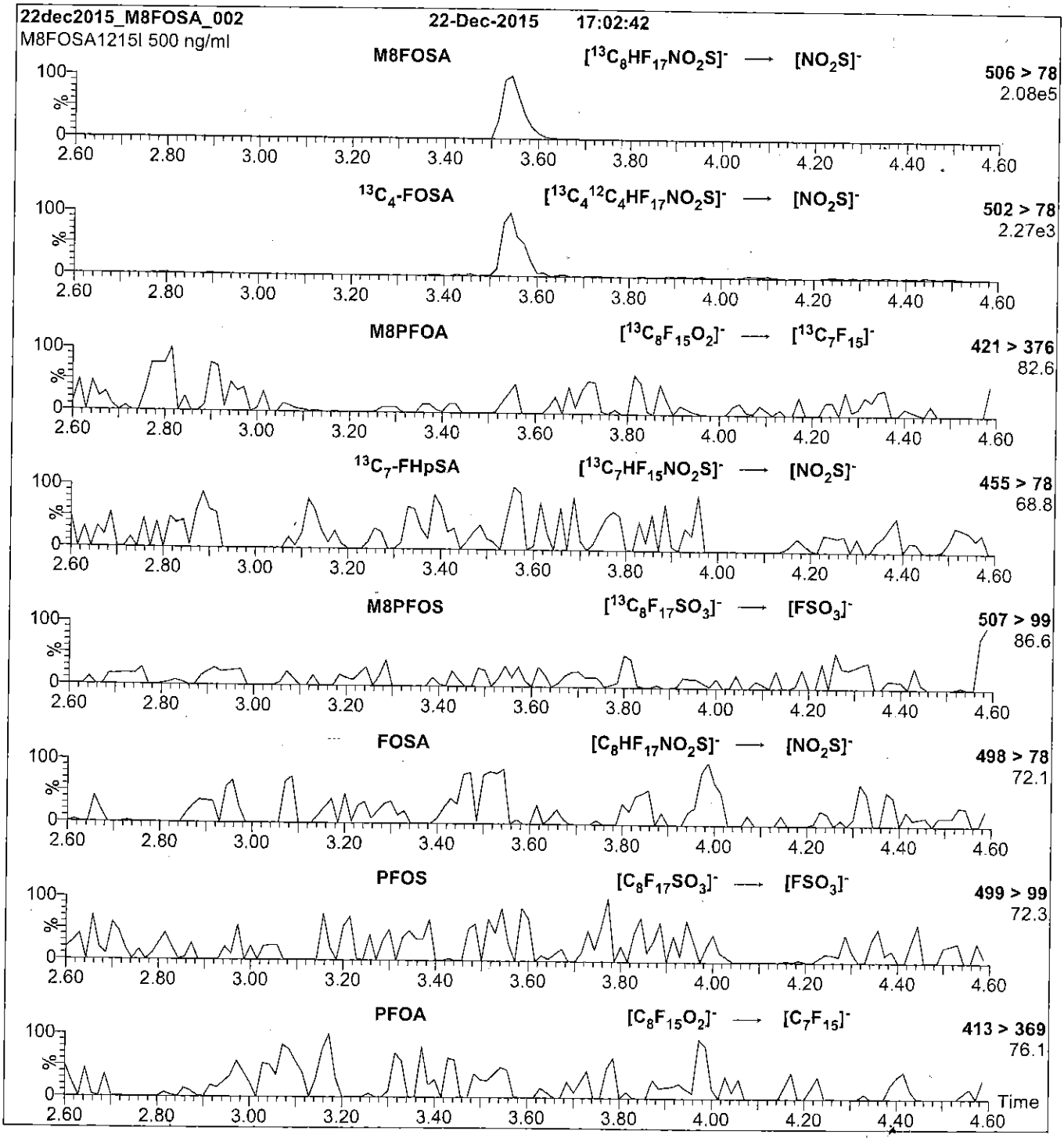
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M8FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 30

Reagent

LCMPFBA_00006

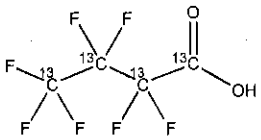
609707
ID: LCMPFBA_00006
Exp: 10/31/19 Prpd: CBW
13C4-Perfluorobutanoic ac

R: 4/7/16 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFBA	**LOT NUMBER:**	MPFBA1014
COMPOUND:	Perfluoro-n-[1,2,3,4-$^{13}C_4$]butanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_4HF_7O_2$	**MOLECULAR WEIGHT:**	218.01
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99%^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	10/31/2014		
EXPIRY DATE: (mm/dd/yyyy)	10/31/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ B.G. Chittim **Date:** 03/31/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

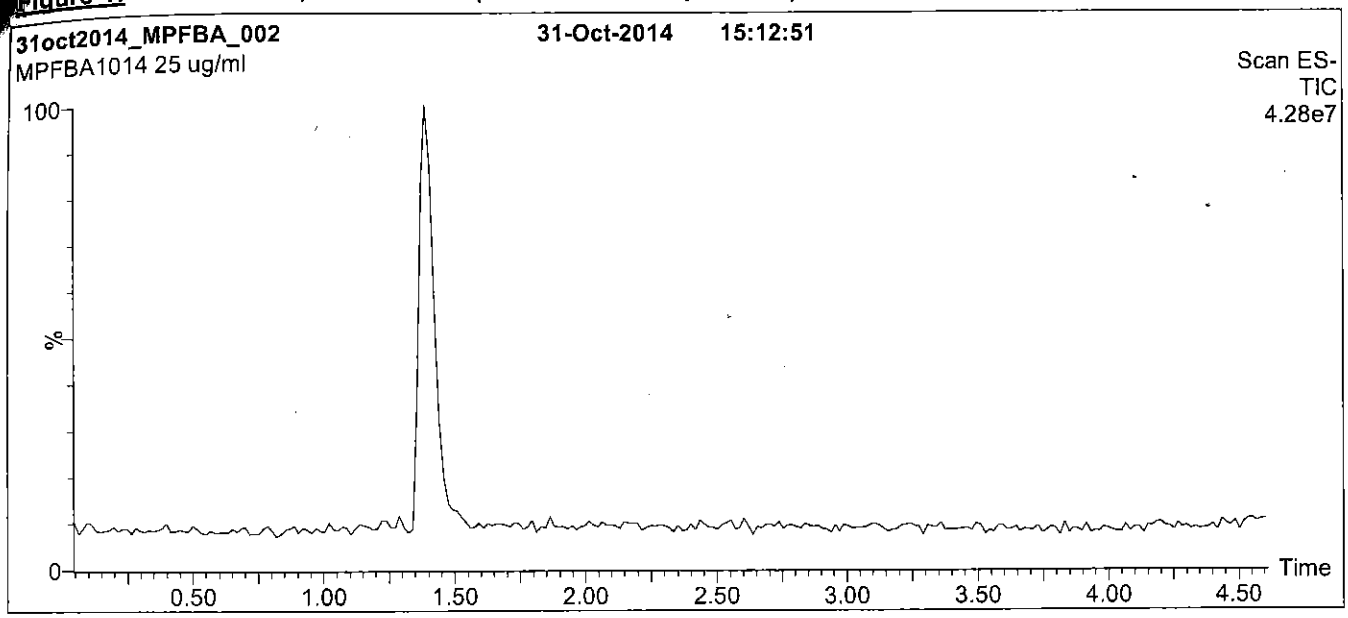
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

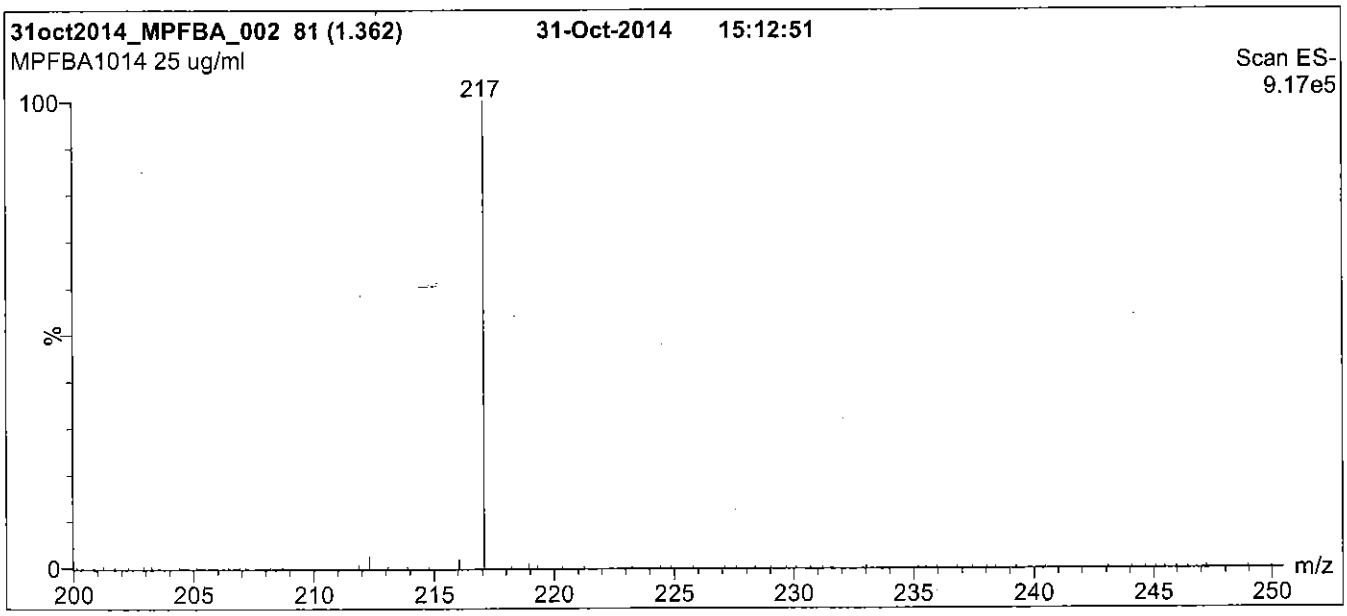
CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **MPFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

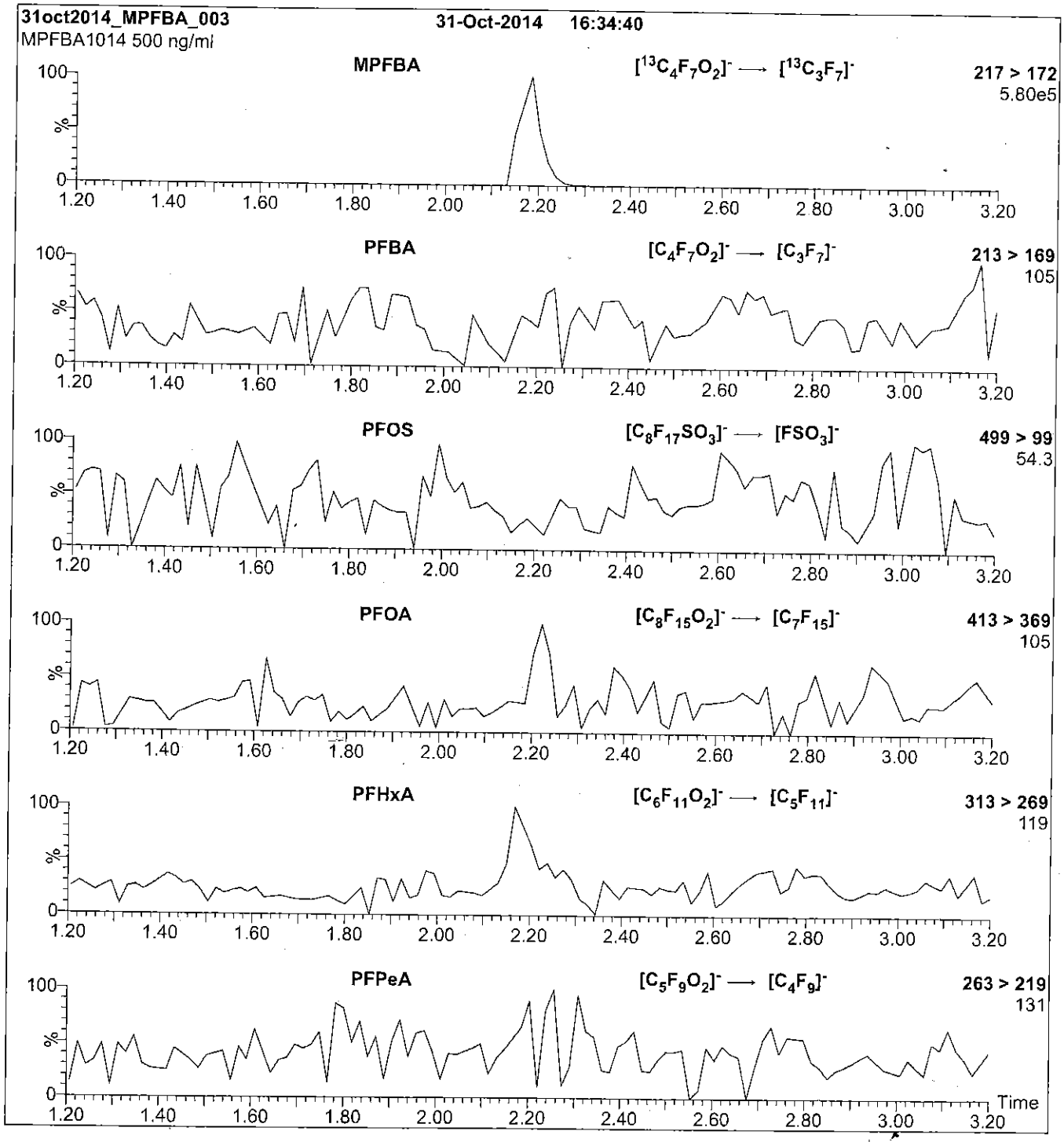
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (200 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 8.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFBA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 10

Reagent

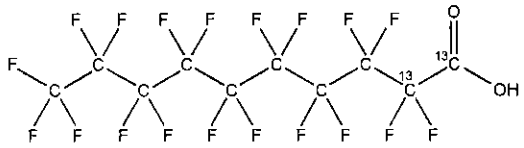
LCMPFDA_00007

Rec. 3/29/16 JRB ✓

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFDA
LOT NUMBER: MPFDA0815
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid
STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{19}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	08/19/2015		
EXPIRY DATE: (mm/dd/yyyy)	08/19/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of $^{13}C_1$-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ B.G. Chittim **Date:** 08/21/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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where x is expressed as a relative standard uncertainty of the individual parameter.

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TRACEABILITY:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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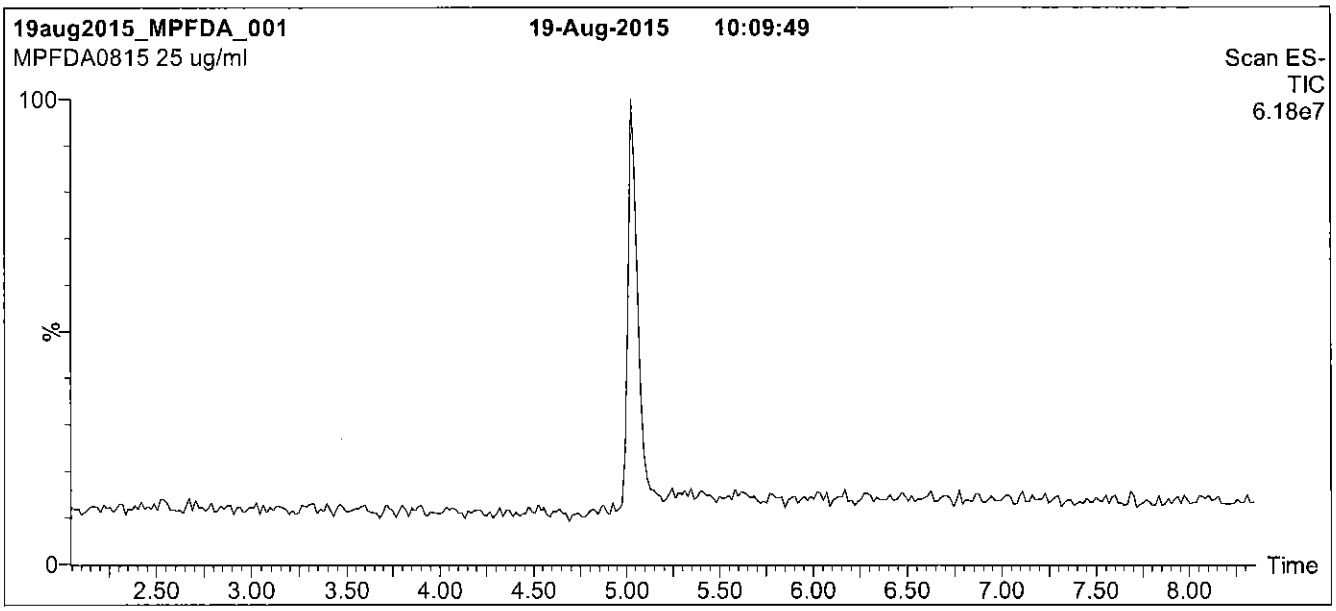
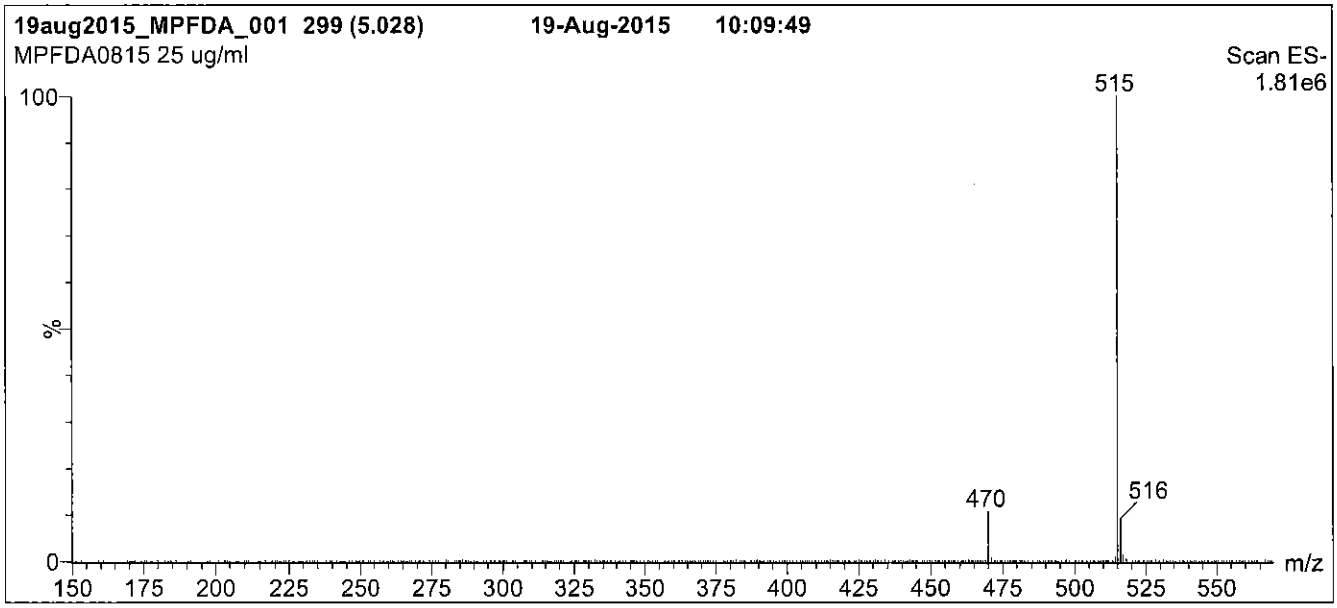
Figure 1: **MPFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

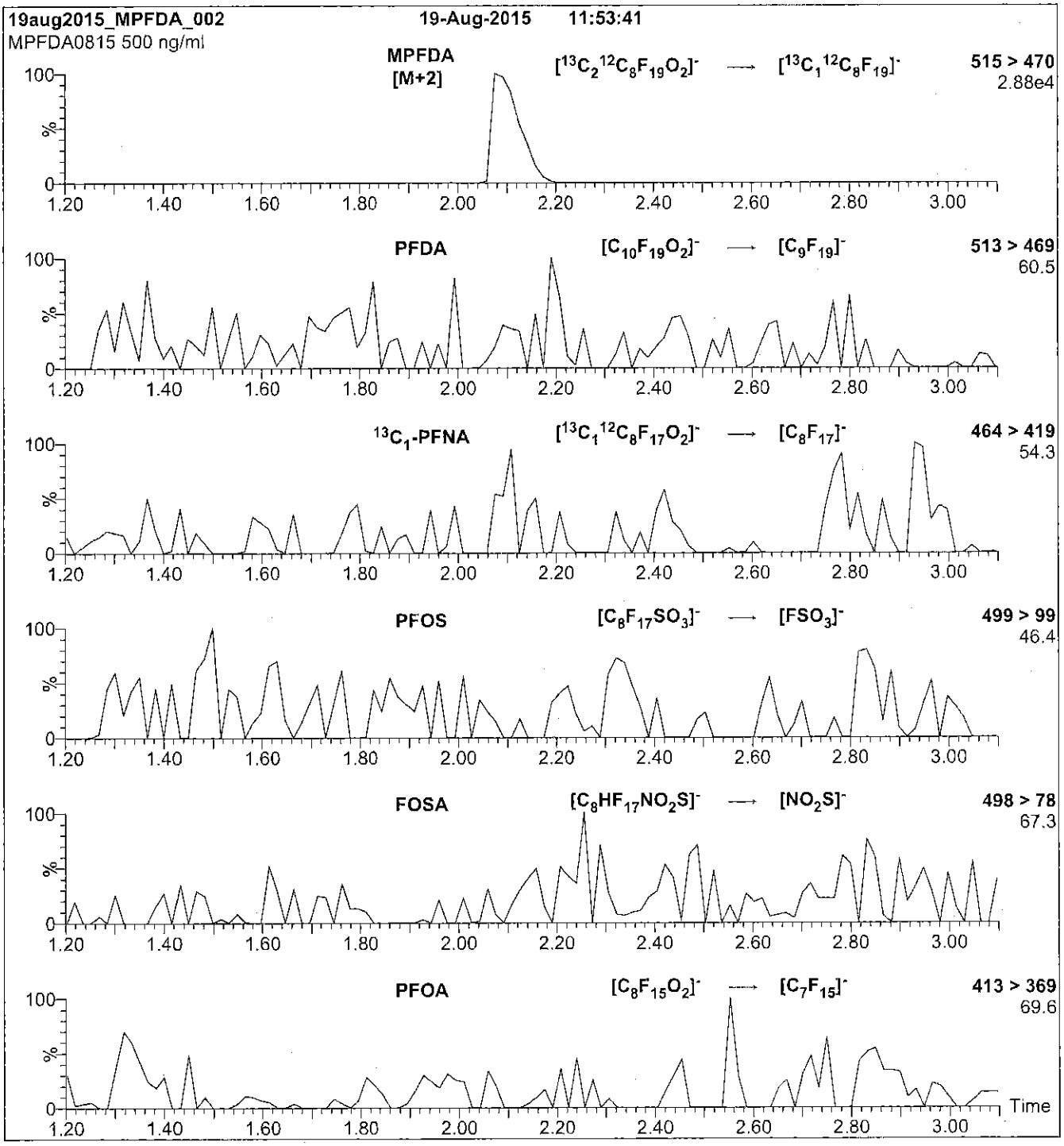
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 13

Reagent

LCMPFDoA_00006

609708
ID: LCMPFDoA_00006
Exp: 07/17/19 Prpd: CBW
13C2-Perfluorododecanoic

R: 4/7/16 CBW

WELLINGTON LABORATORIES

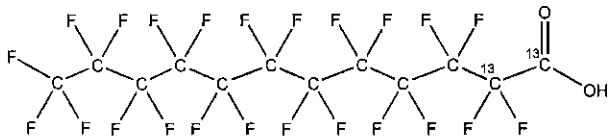
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFDoA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]dodecanoic acid

LOT NUMBER: MPFDoA0714

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{10}HF_{23}O_2$	**MOLECULAR WEIGHT:**	616.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	07/17/2014		
EXPIRY DATE: (mm/dd/yyyy)	07/17/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/01/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation Inc. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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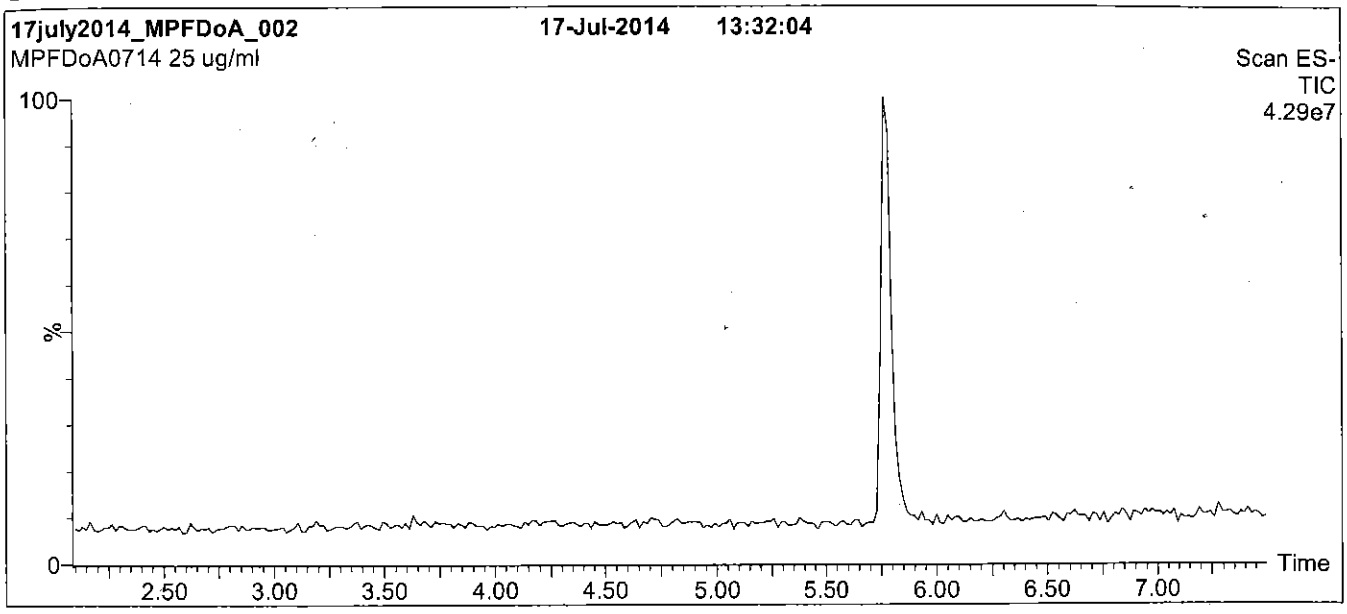
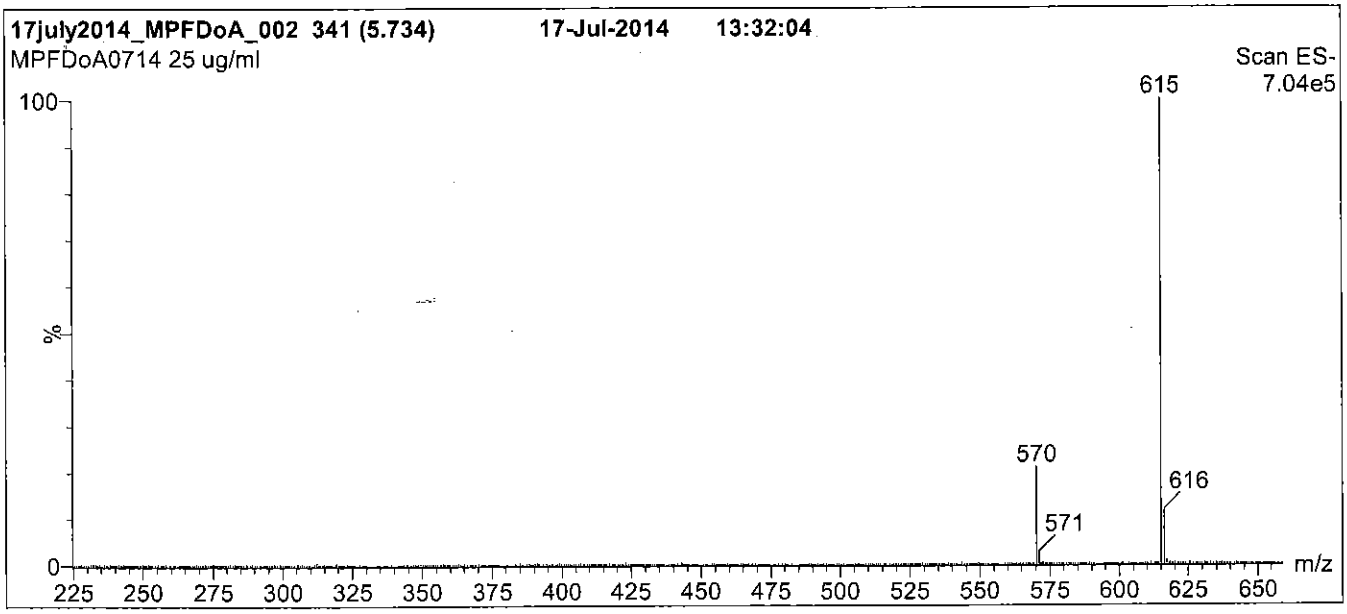
Figure 1: **MPFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

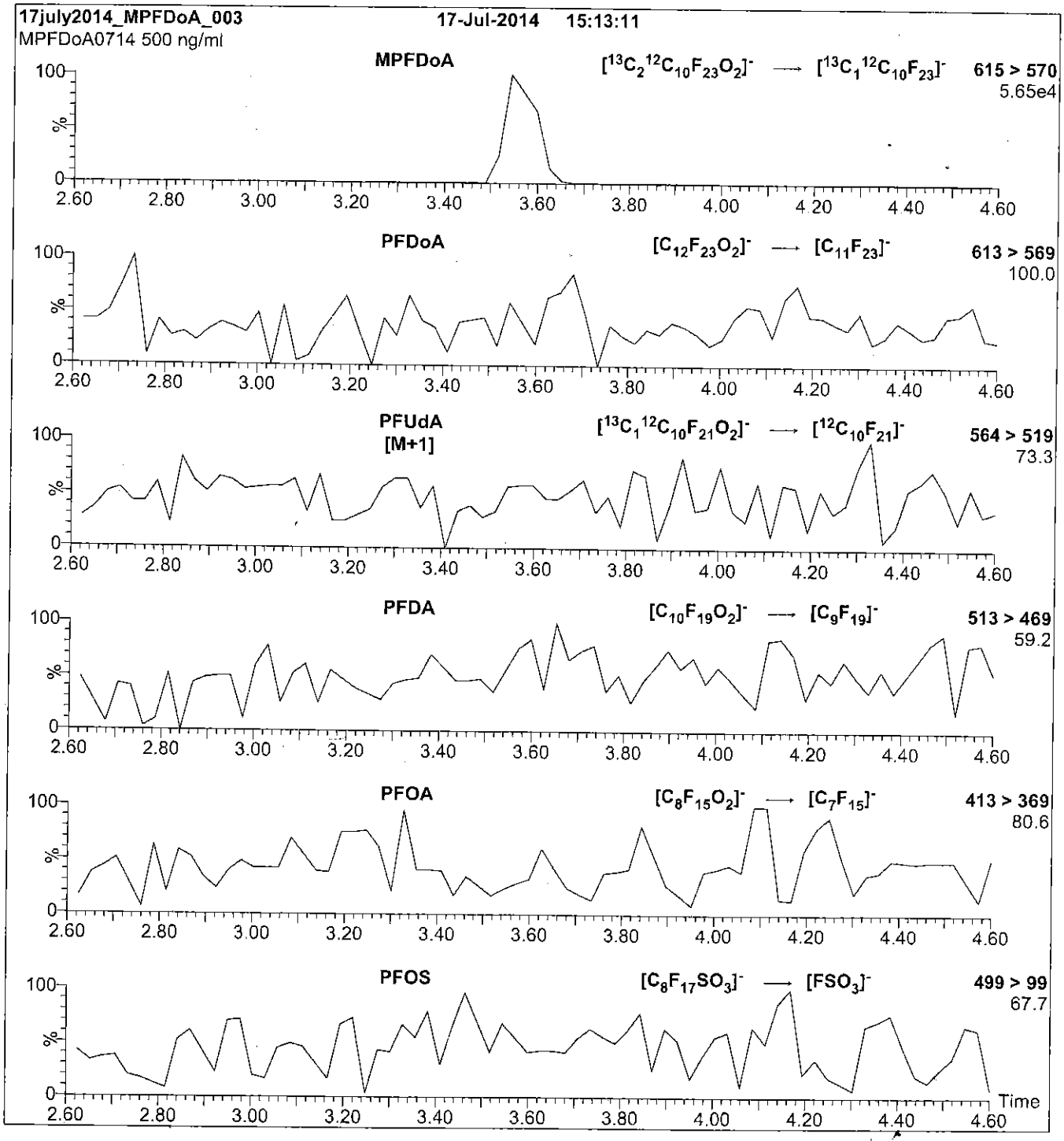
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Condltions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 13

Reagent

LCMPFHxA_00008

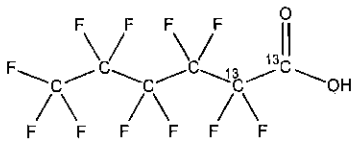
605233
ID: LCMPFHxA_00008
Exp: 04/09/20 Prpd: CBW
13C2-Perfluorohexanoic ac

Rec. 3/29/16 JRB ✓

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFHxA
LOT NUMBER: MPFHxA0415
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexanoic acid
STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_4HF_{11}O_2$
MOLECULAR WEIGHT: 316.04
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 04/09/2015
EXPIRY DATE: (mm/dd/yyyy) 04/09/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of perfluoro-n-hexanoic acid and ~ 0.3% of perfluoro-n-octanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/14/2015 (mm/dd/yyyy)

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CALA Testing Accredited Test: A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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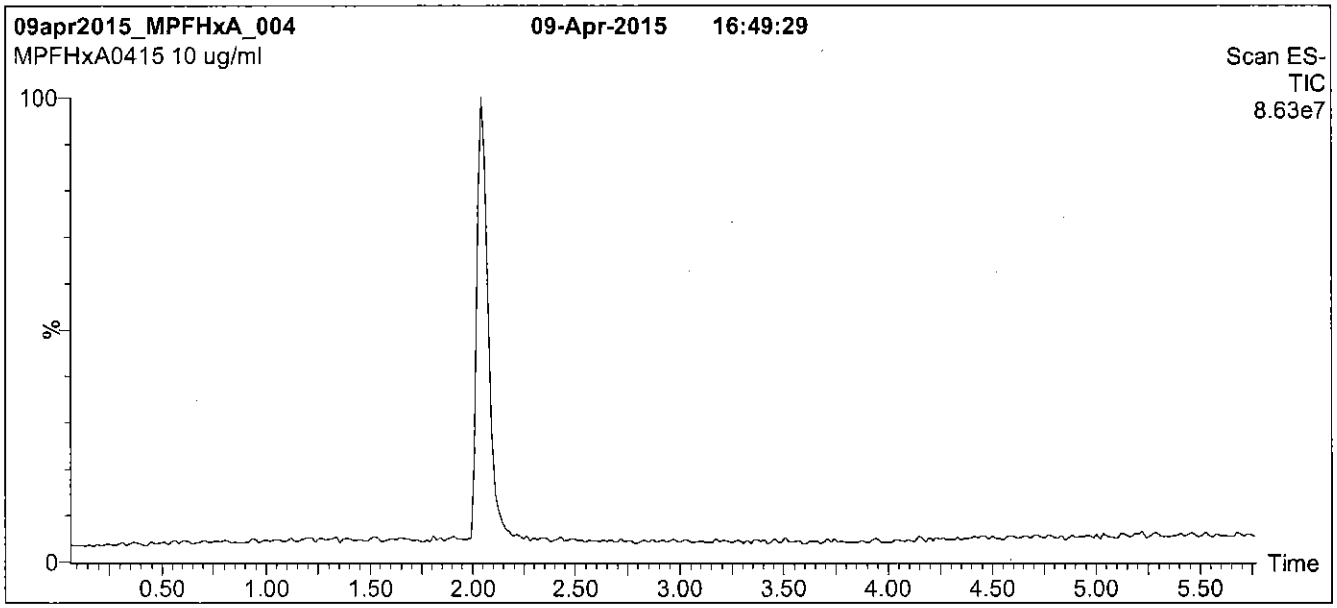
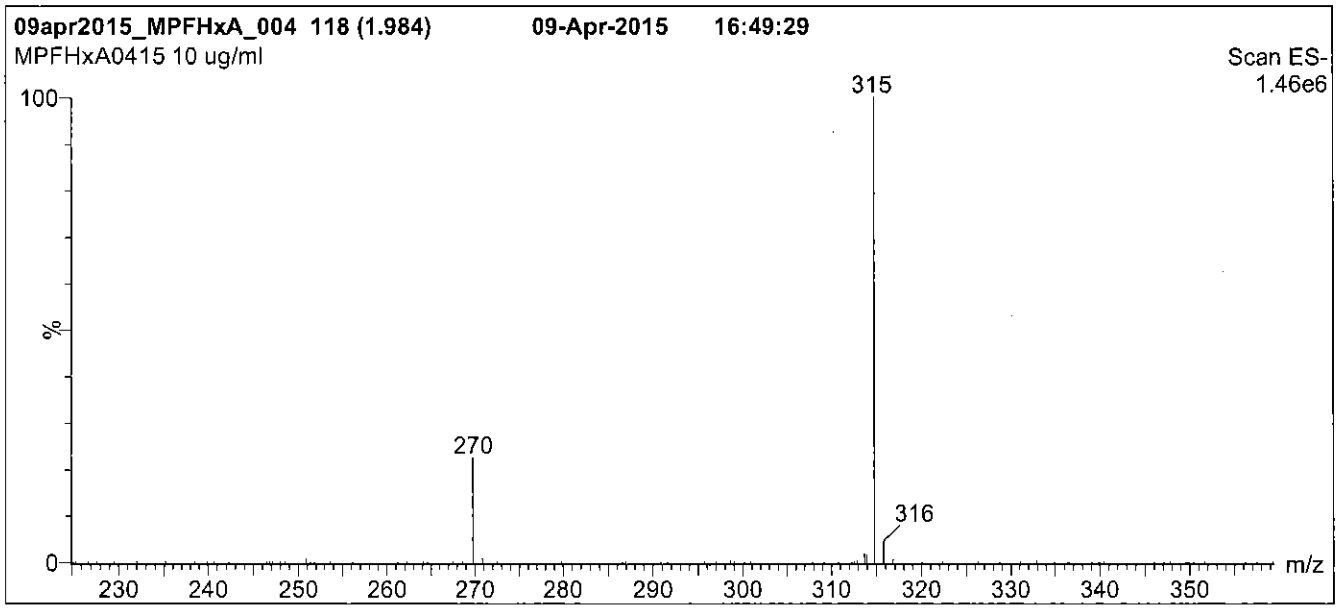




Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions over 0.5 min.
Time: 10 min

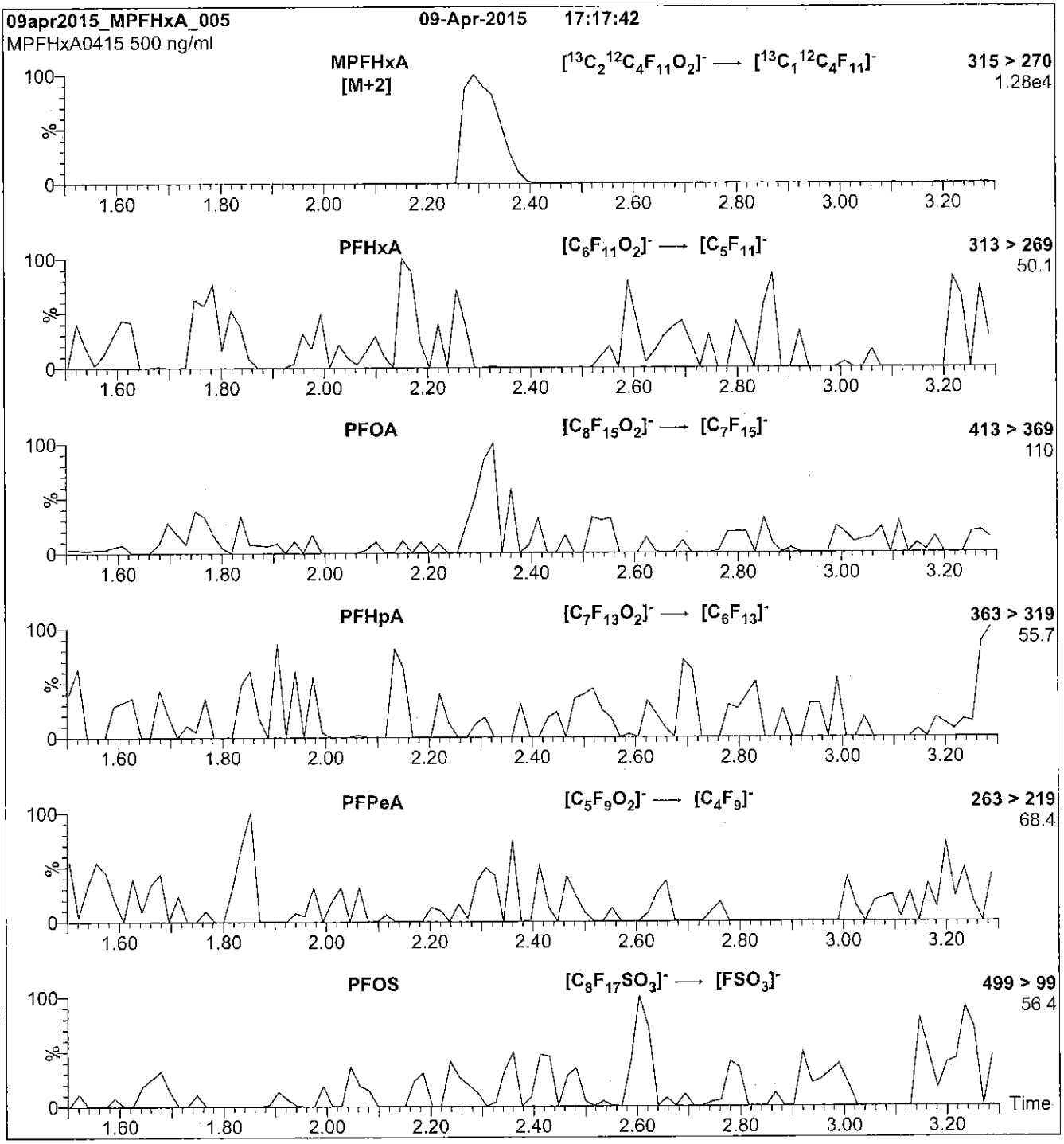
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 10

Reagent

LCMPFHxS_00006

609705
ID: LCMPFHxS_00006
Exp: 10/23/20 Prpd: CBW
18O2-Perfluorohexanesulfo

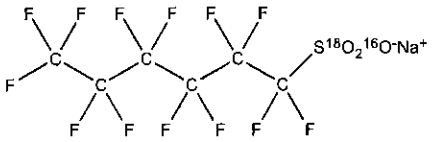
R: 4/7/16 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFHxS
LOT NUMBER: MPFHxS1015
COMPOUND: Sodium perfluoro-1-hexane[$^{18}O_2$]sulfonate

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$C_6F_{13}S^{18}O_2{}^{16}ONa$	**MOLECULAR WEIGHT:**	426.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.3 ± 2.4 µg/ml (MPFHxS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	>94% ($^{18}O_2$)
LAST TESTED: (mm/dd/yyyy)	10/23/2015		
EXPIRY DATE: (mm/dd/yyyy)	10/23/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The response factor for MPFHxS ($C_6F_{13}S^{18}O_2{}^{16}O^-$) has been observed to be up to 10% lower than for PFHxS ($C_6F_{13}S^{18}O_3^-$) when both compounds are injected together. This difference may vary between instruments.
- Due to the isotopic purity of the starting material ($^{18}O_2$ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/28/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

ANAB ACCREDITED ISO 17025 REFERENCE MATERIAL PRODUCER

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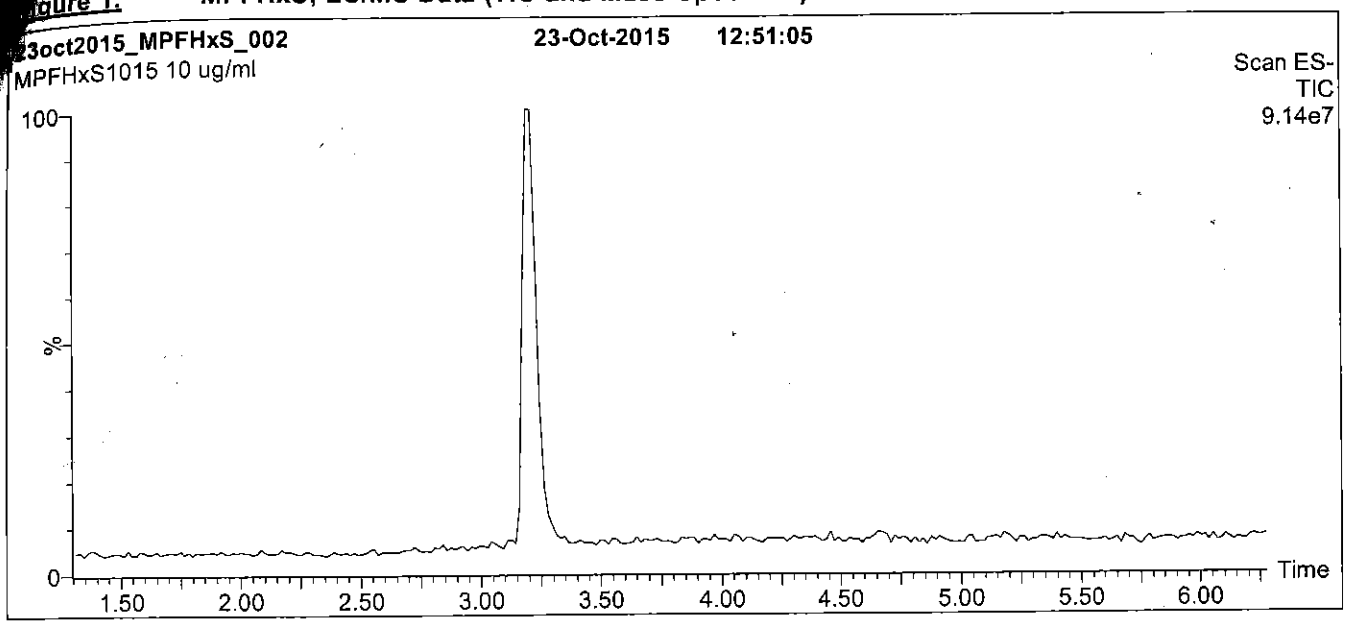
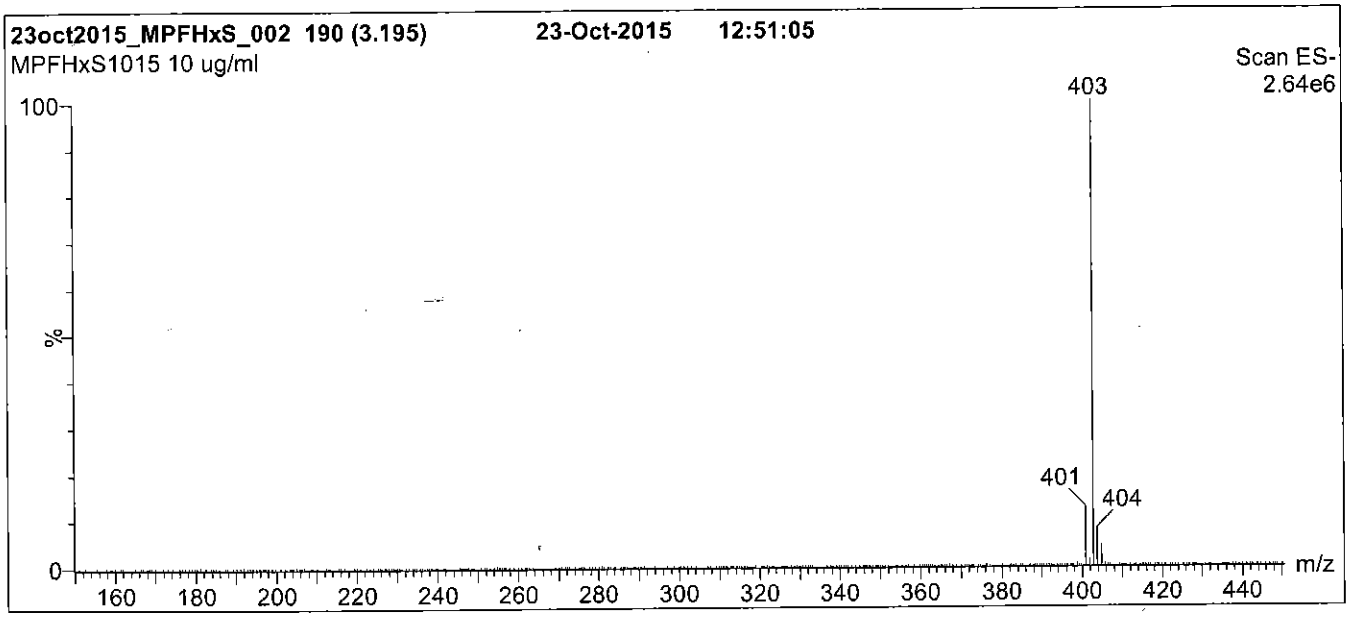




Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

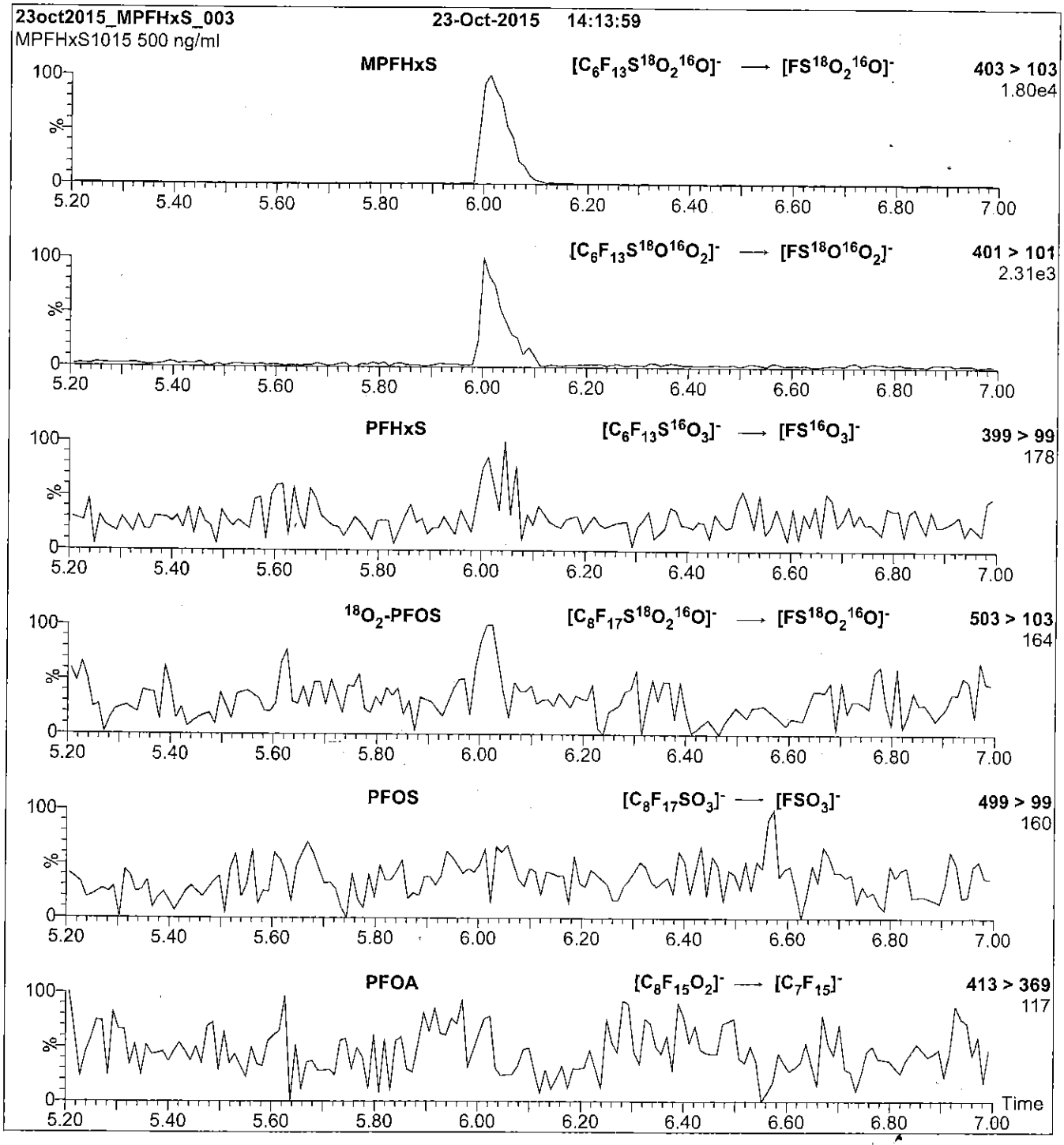
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFHxS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFHxS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 30

Reagent

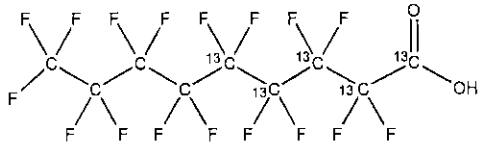
LCMPFNA_00005

Rec. 3/24/16 JEB V

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFNA	**LOT NUMBER:**	MPFNA0414
COMPOUND:	Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]nonanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_5{}^{12}C_4HF_{17}O_2$	**MOLECULAR WEIGHT:**	469.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4,5-$^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	04/13/2014		
EXPIRY DATE: (mm/dd/yyyy)	04/13/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
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ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

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$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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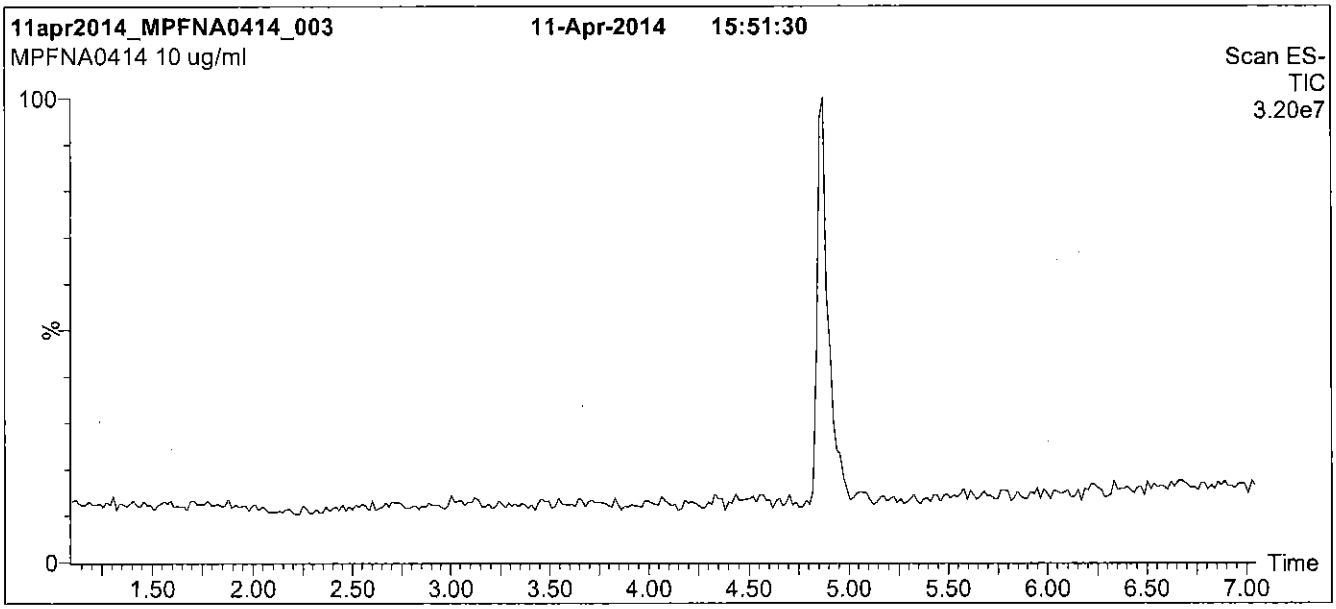
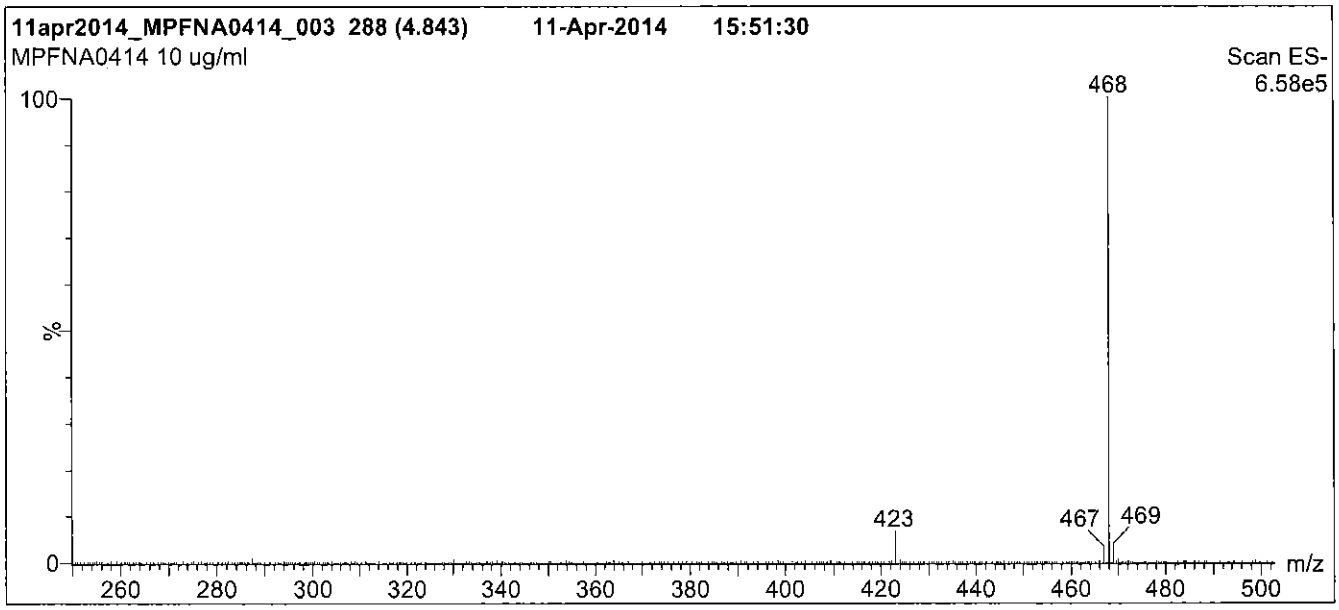
CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **MPFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

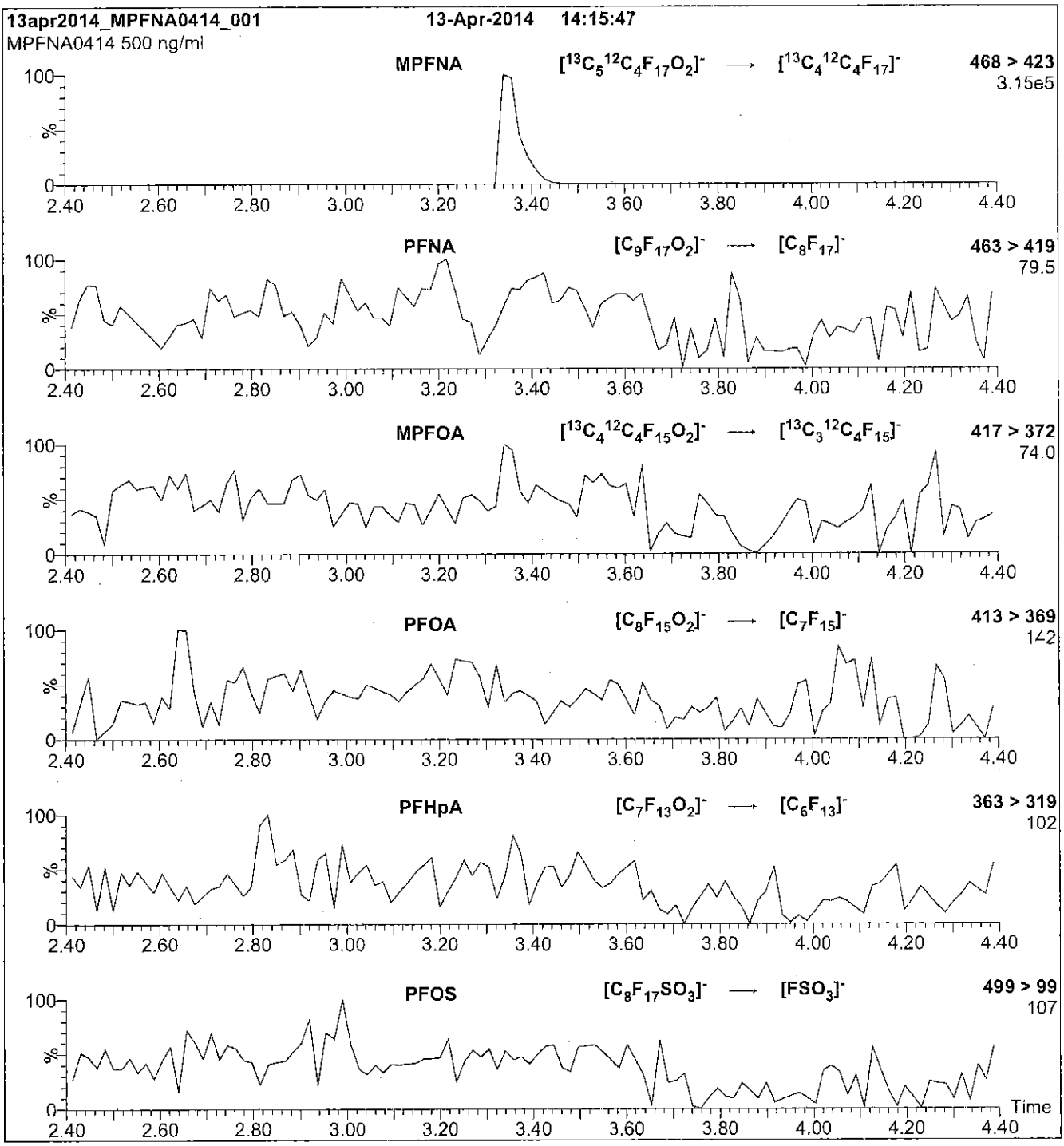
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCMPFOA_00010

609713
ID: LCMPFOA_00010
Exp: 01/22/21 Prpd: CBW
13C4-Perfluorooctanoic ac

R: 4/7/16 CBW

WELLINGTON LABORATORIES

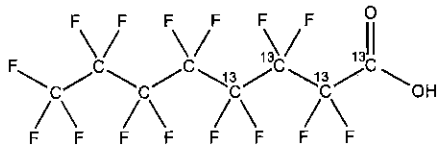
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOA
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]octanoic acid

LOT NUMBER: MPFOA0116

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_4HF_{15}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 418.04
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/22/2016
EXPIRY DATE: (mm/dd/yyyy) 01/22/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C ($1,2,3,4$-$^{13}C_4$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of native perfluoro-n-octanoic acid (PFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/01/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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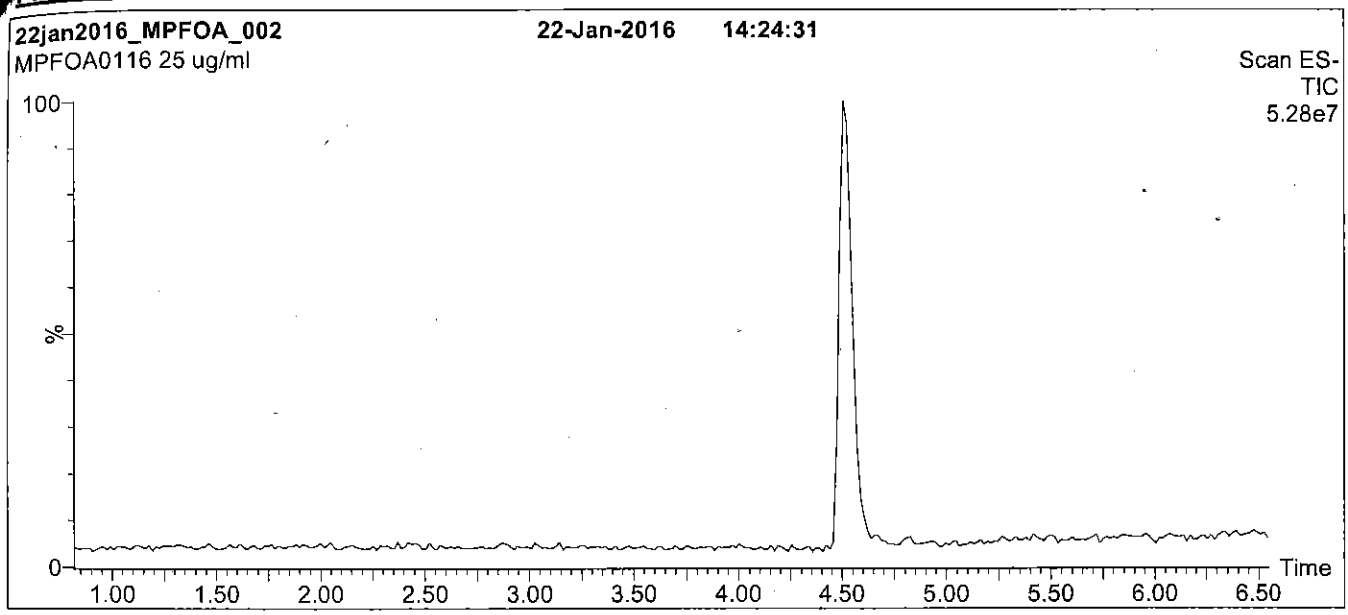
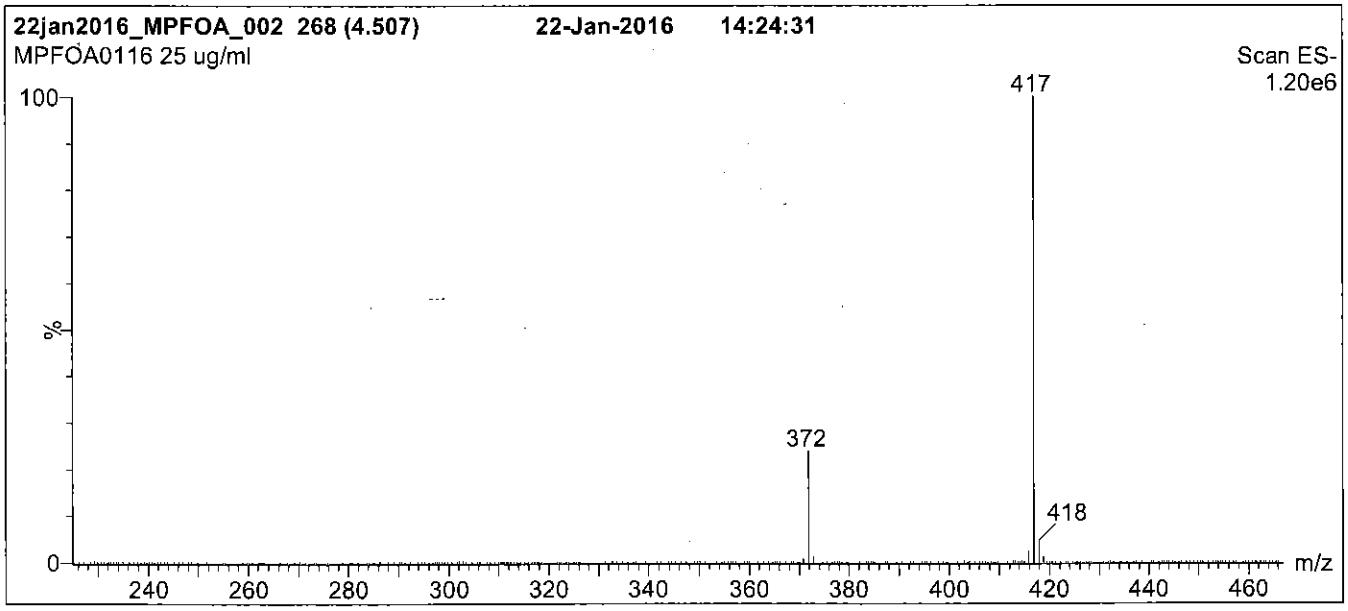




Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP$_{18}$
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

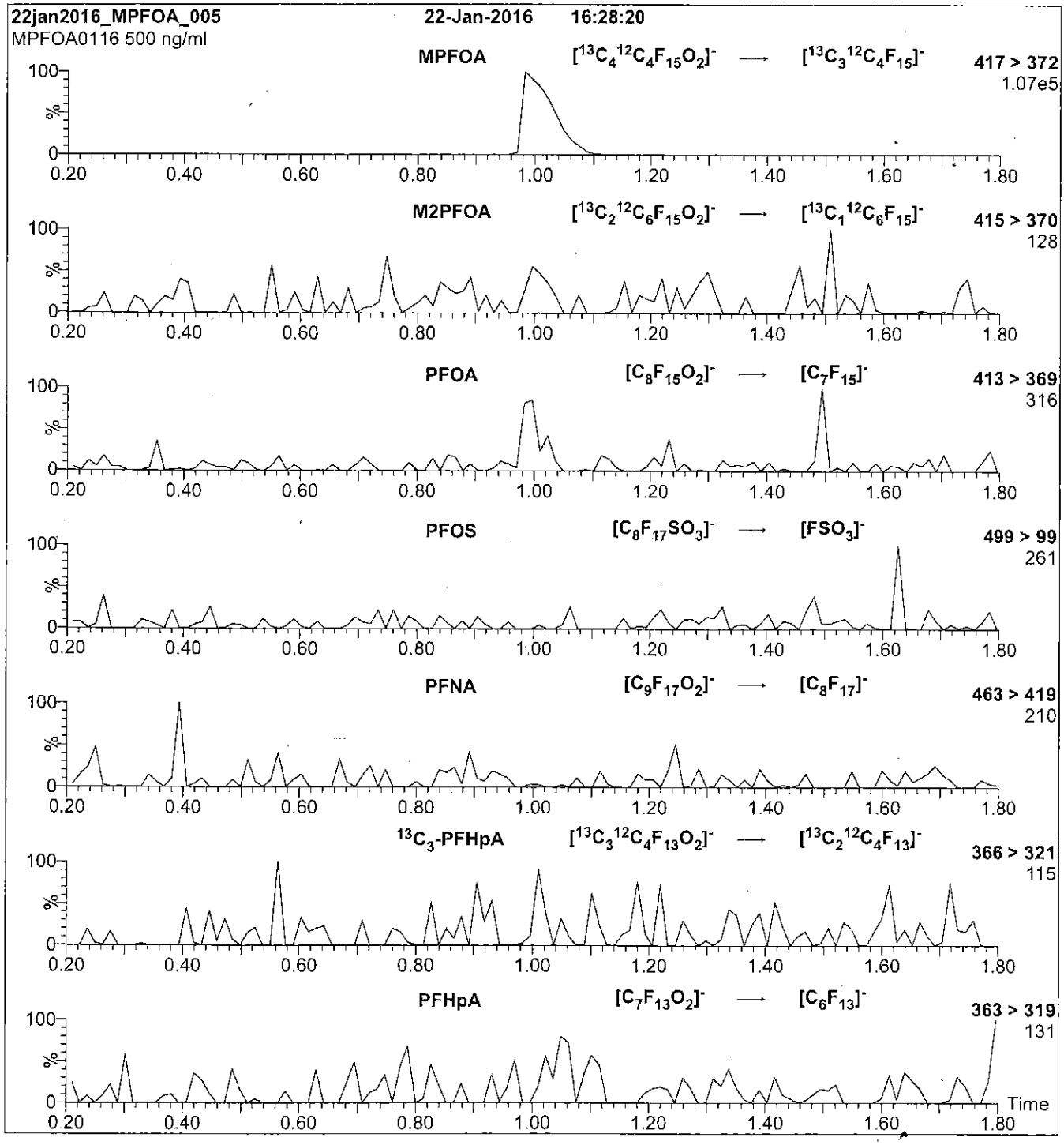
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.58e-3
Collision Energy (eV) = 10

Reagent

LCMPFOS_00012

605227
ID: LCMPFOS_00012
Exp: 01/22/21 Prpd: CBW
13C4-Perfluorooctanesulfo

Rec. 3/29/16 JRB ✓

606228
ID: LCMPFOS_00013
Exp: 01/22/21 Prpd: CBW
13C4-Perfluorooctanesulfo

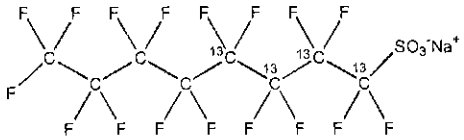
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0116

COMPOUND: Sodium perfluoro-1-[1,2,3,4-$^{13}C_4$]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	526.08
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4\text{-}^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	01/22/2016		
EXPIRY DATE: (mm/dd/yyyy)	01/22/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.8% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/01/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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CALA Testing Accreditation

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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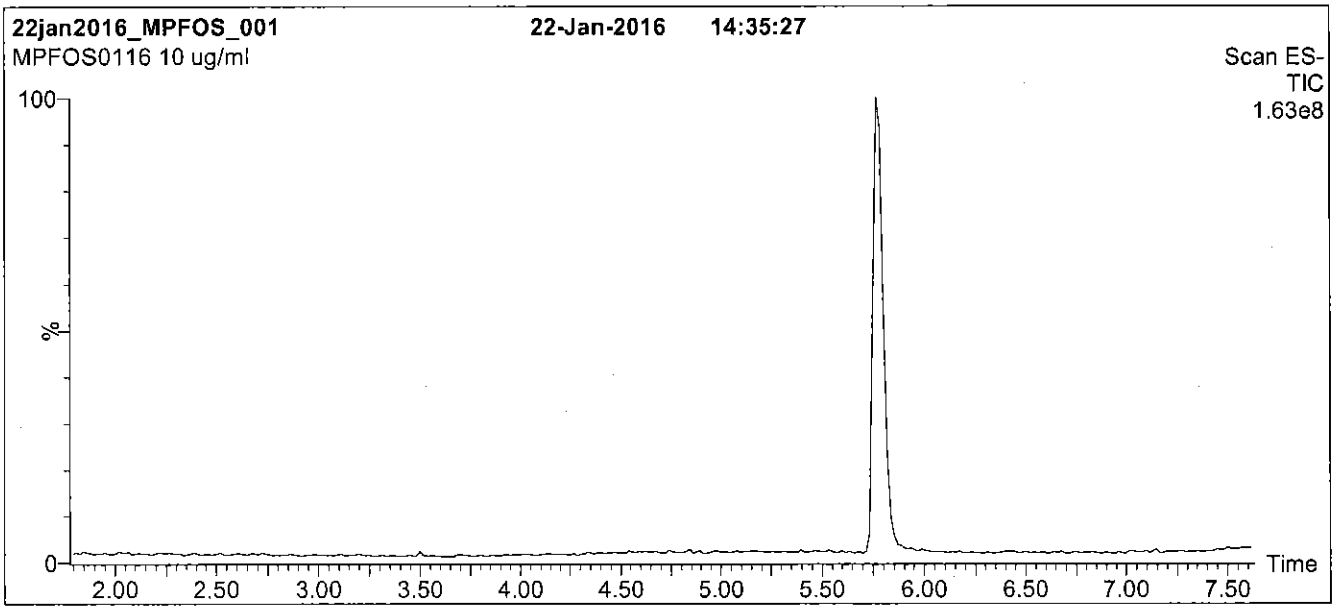
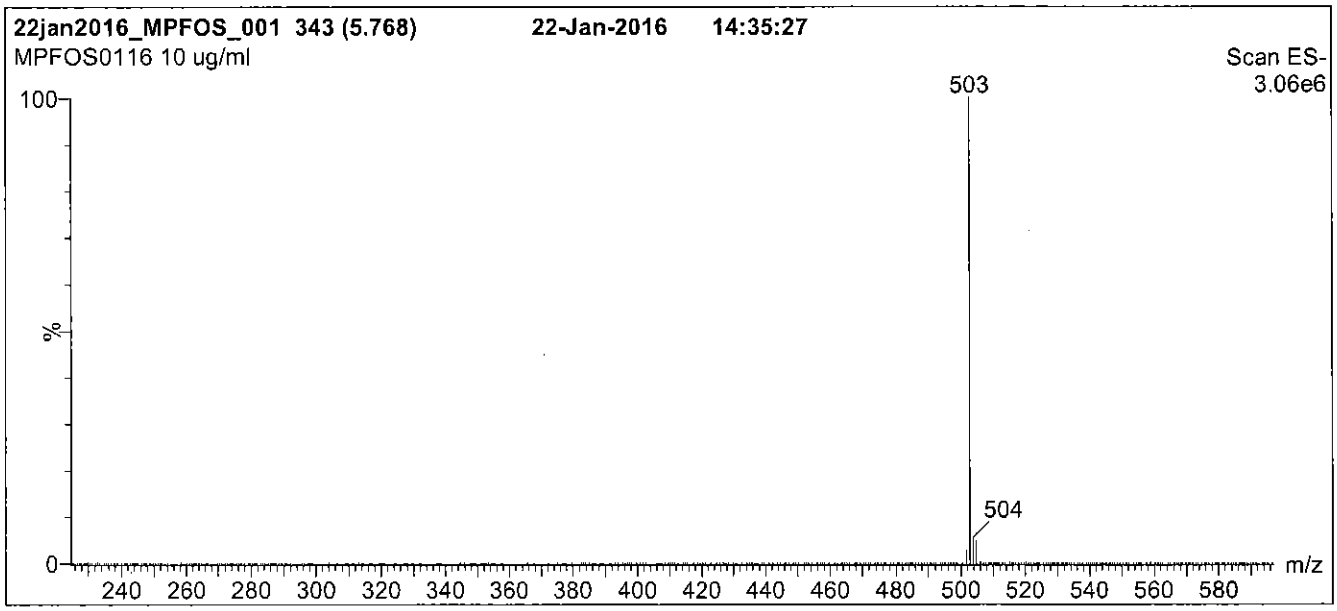




Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

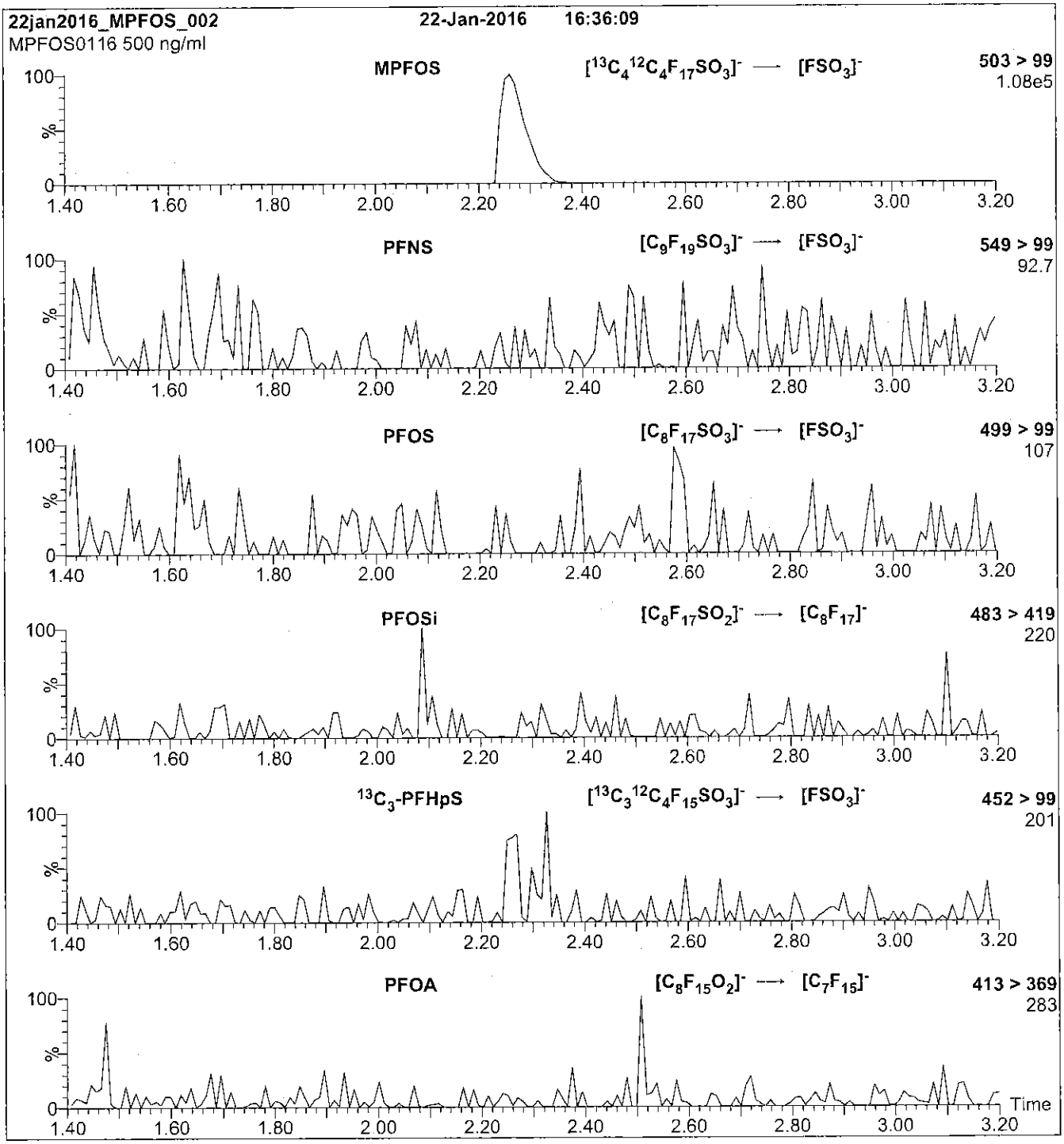
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFOS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFOS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.70e-3
Collision Energy (eV) = 40

Reagent

LCMPFUdA_00007

609704
ID: LCMPFUdA_00007
Exp: 10/31/19 Prpd: CBW
13C2-Perfluoroundecanoic

R: 4/7/16 CBW

WELLINGTON LABORATORIES

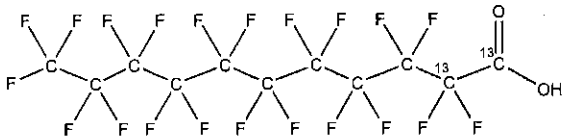
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFUdA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]undecanoic acid

LOT NUMBER: MPFUdA1014

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{21}O_2$	**MOLECULAR WEIGHT:**	566.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	10/31/2014		
EXPIRY DATE: (mm/dd/yyyy)	10/31/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Presence of 1-$^{13}C_1$-PFUdA (~1%; see Figure 2), 2-$^{13}C_1$-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ^{13}C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/01/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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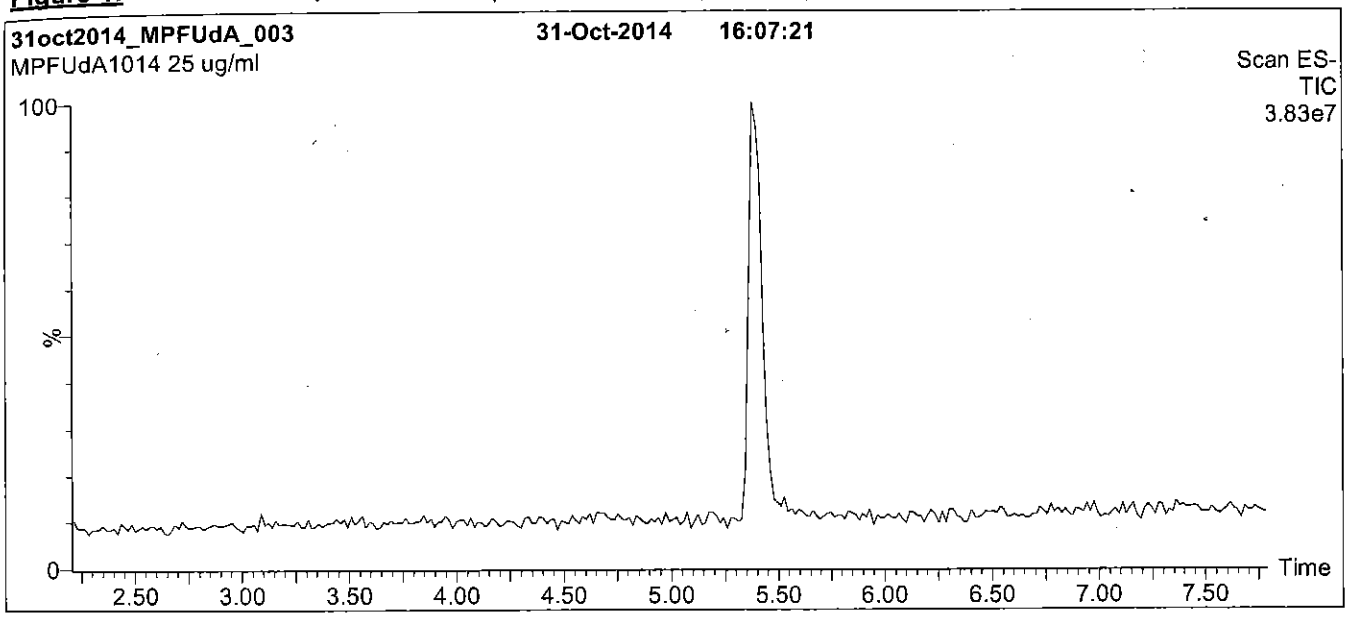
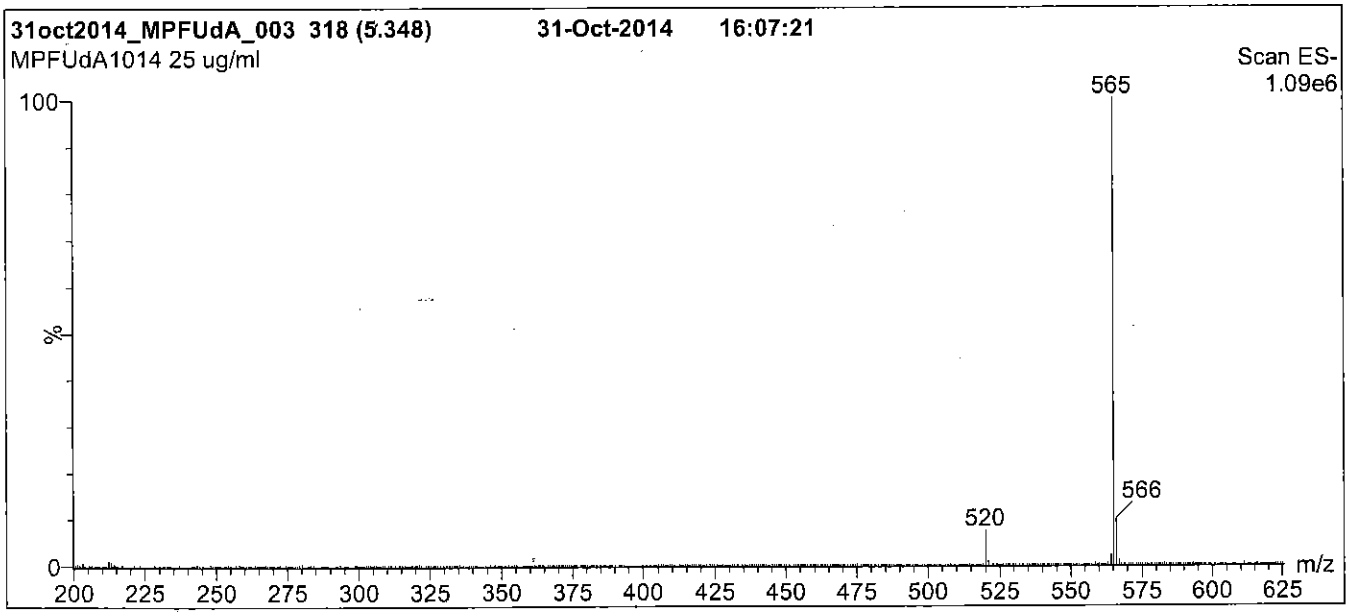
Figure 1: **MPFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

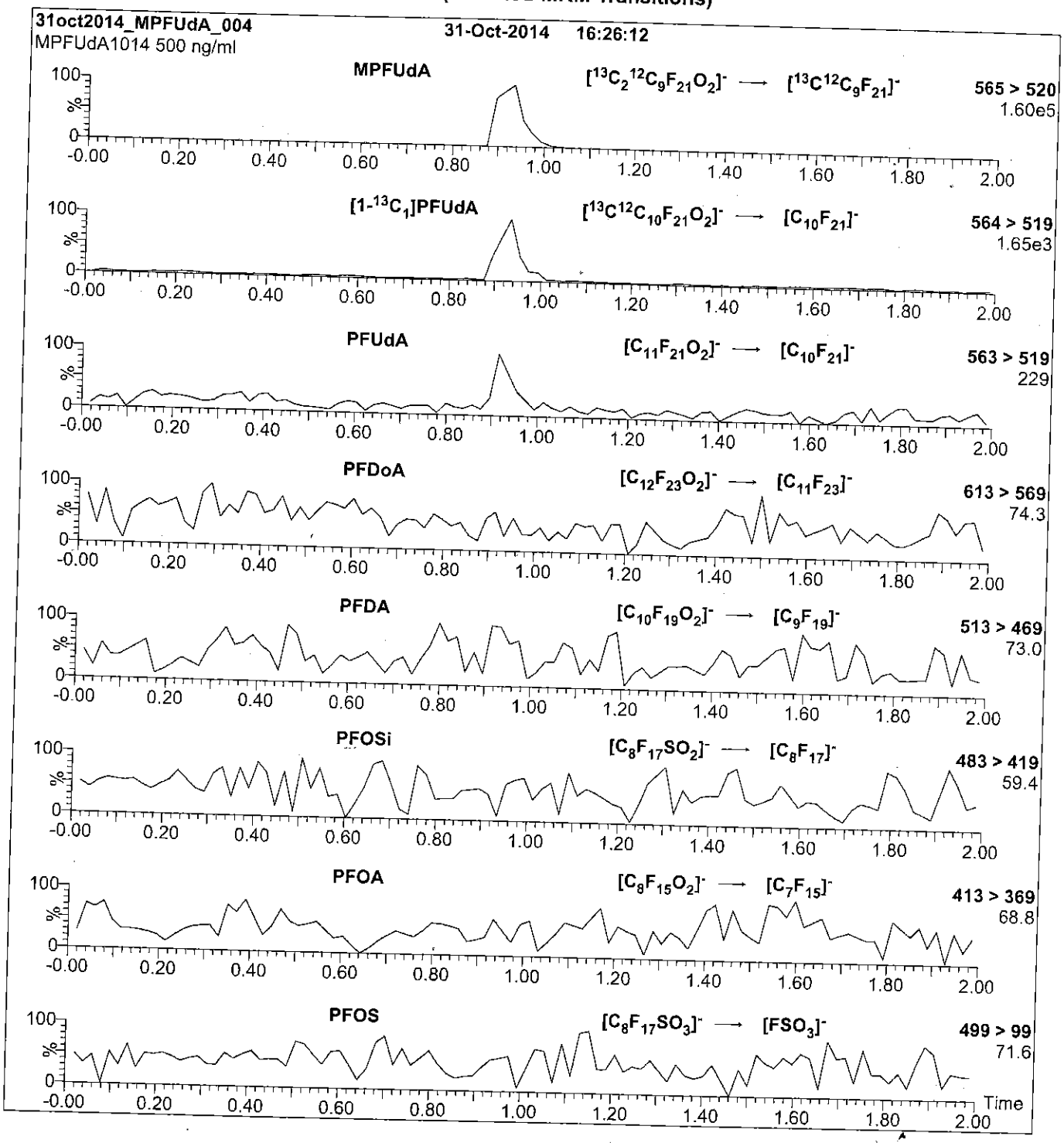
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (200 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 11

Reagent

LCPFACMXB_00007

P: 12/30/15 CW

PFAC-MXB

Solution/Mixture of Native Perfluoroalkylcarboxylic Acids and Native Perfluoroalkylsulfonates

PRODUCT CODE:	PFAC-MXB
LOT NUMBER:	PFACMXB1115
SOLVENT(S):	Methanol / Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	11/04/2015
LAST TESTED: (mm/dd/yyyy)	11/06/2015
EXPIRY DATE: (mm/dd/yyyy)	11/06/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXB is a solution/mixture of thirteen native perfluoroalkylcarboxylic acids (C_4-C_{14}, C_{16}, and C_{18}) and four native perfluoroalkylsulfonates (C_4, C_6, C_8 and C_{10}). The full name, abbreviation and concentration for each of the components are given in Table A.

The individual perfluoroalkylcarboxylic acids and perfluoroalkylsulfonates all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

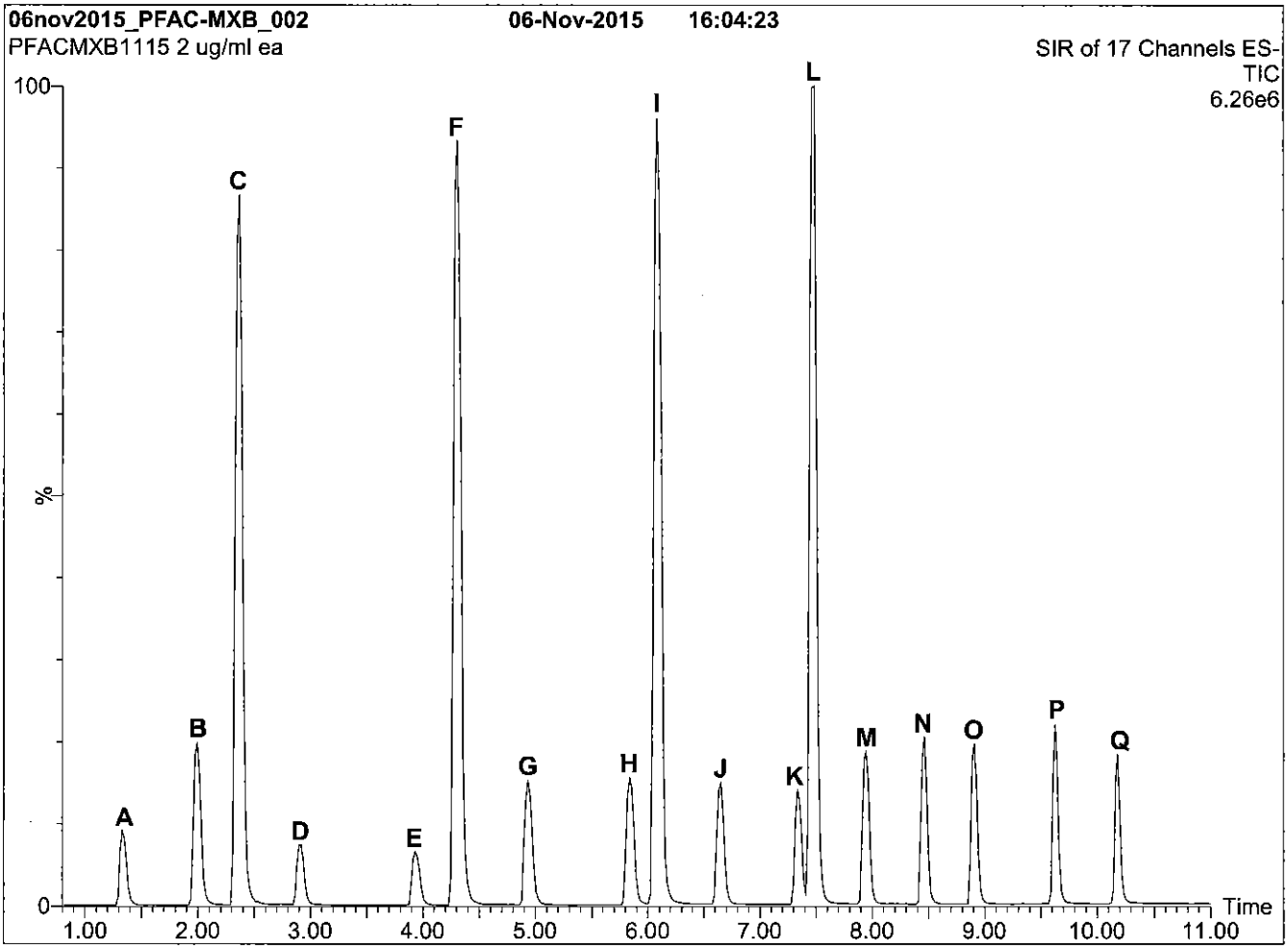
Table A: **PFAC-MXB; Components and Concentrations (ng/ml, ± 5% in Methanol / Water (<1%))**

Name	Abbreviation	Concentration (ng/ml)	Peak Assignment In Figure 1
Perfluoro-n-butanoic acid	PFBA	2000	A
Perfluoro-n-pentanoic acid	PFPeA	2000	B
Perfluoro-n-hexanoic acid	PFHxA	2000	D
Perfluoro-n-heptanoic acid	PFHpA	2000	E
Perfluoro-n-octanoic acid	PFOA	2000	G
Perfluoro-n-nonanoic acid	PFNA	2000	H
Perfluoro-n-decanoic acid	PFDA	2000	J
Perfluoro-n-undecanoic acid	PFUdA	2000	K
Perfluoro-n-dodecanoic acid	PFDoA	2000	M
Perfluoro-n-tridecanoic acid	PFTrDA	2000	N
Perfluoro-n-tetradecanoic acid	PFTeDA	2000	O
Perfluoro-n-hexadecanoic acid	PFHxDA	2000	P
Perfluoro-n-octadecanoic acid	PFODA	2000	Q

Name	Abbreviation	Concentration (ng/ml)		Peak Assignment in Figure 1
		as the salt	as the anion	
Potassium perfluoro-1-butanesulfonate	L-PFBS	2000	1770	C
Sodium perfluoro-1-hexanesulfonate	L-PFHxS	2000	1890	F
Sodium perfluoro-1-octanesulfonate	L-PFOS	2000	1910	I
Sodium perfluoro-1-decanesulfonate	L-PFDS	2000	1930	L

Certified By: B.G. Chittim **Date:** 11/11/2015 (mm/dd/yyyy)

Figure 1: **PFAC-MXB; LC/MS Data (Total Ion Current Chromatogram; SIR)**



Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% H_2O / 45% (80:20 MeOH:ACN)
(both with 10 mM NH_4OAc buffer)
Ramp to 95% organic over 10 min and hold for 1 min
before returning to initial conditions in 0.5 min.

Time: 12 min

Flow: 300 µl/min

MS Parameters

Experiment: SIR of 17 Channels

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = variable (10-70)
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFAC-MXB; LC/MS/MS Data (Selected MRM Transitions)**

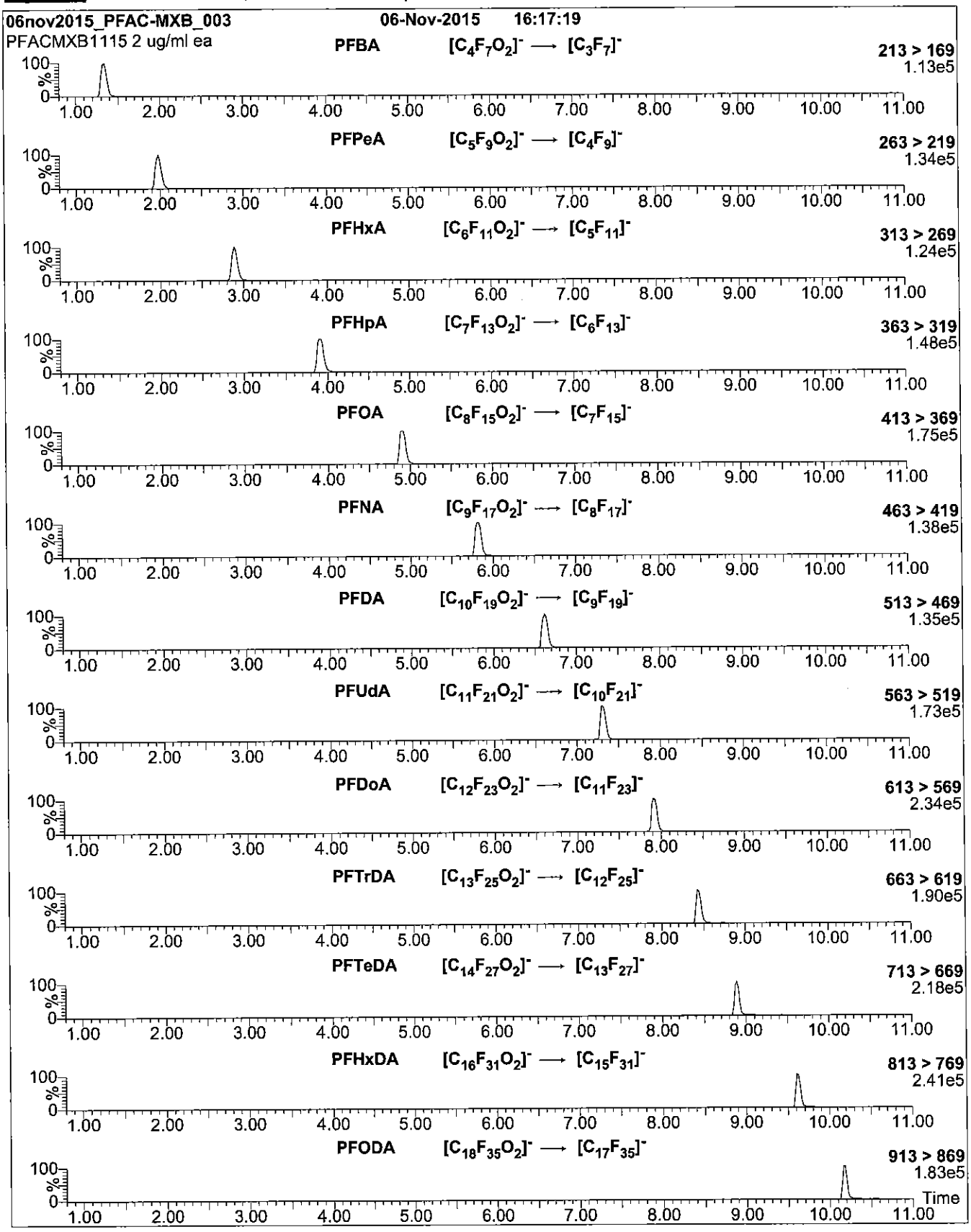
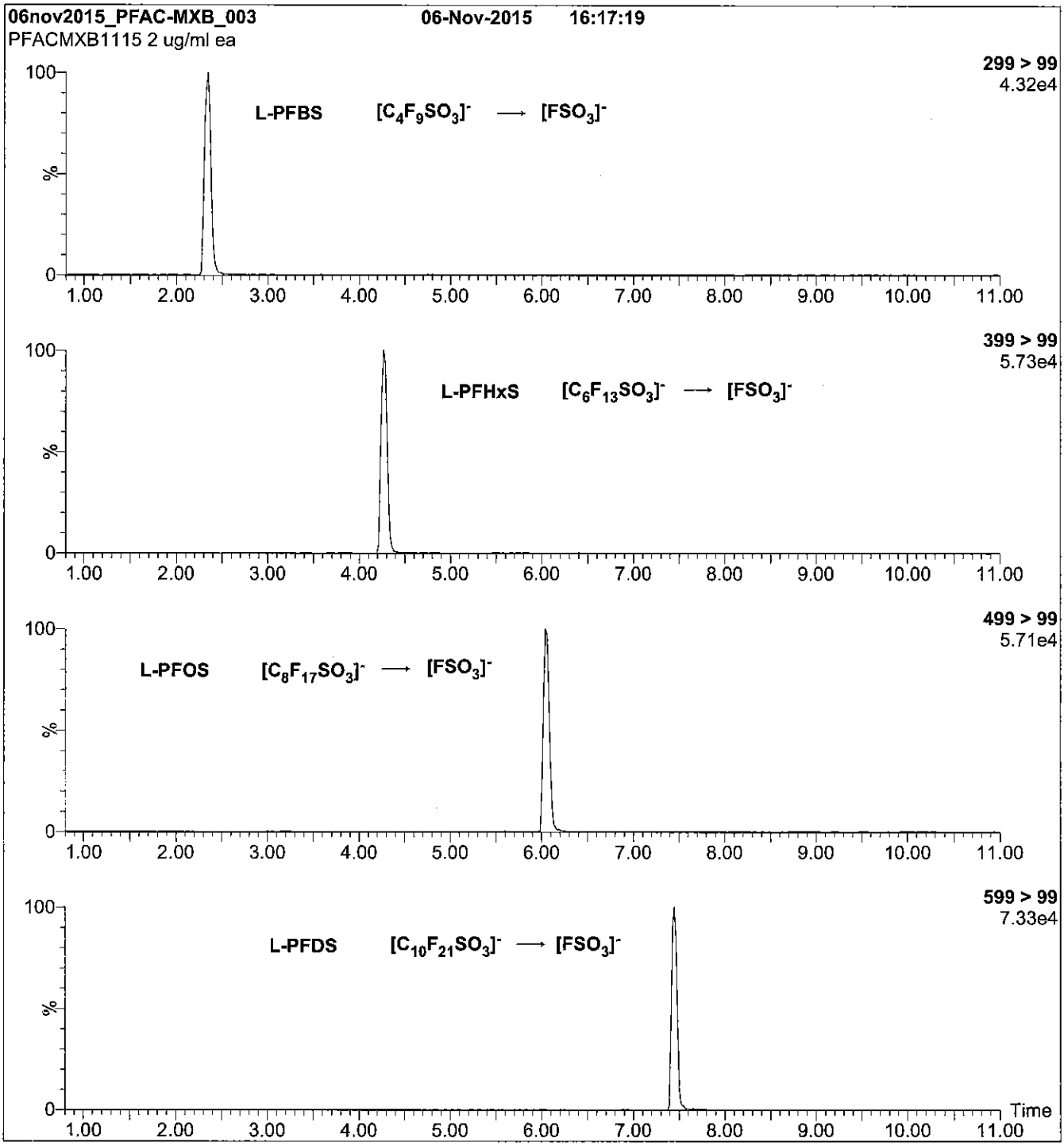


Figure 3: **PFAC-MXB; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figures 2 and 3:

Injection: on-column (PFAC-MXB)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters
Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 8-50 (variable)

Reagent

LCPFBA_00004

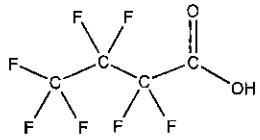
R: 2/25/16 CBW

587895
ID: LCPFBA_00004
Exp: 01/30/20 Prpd: CBW
PF-n-butanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFBA	**LOT NUMBER:**	PFBA0115
COMPOUND:	Perfluoro-n-butanoic acid		
STRUCTURE:		**CAS #:**	375-22-4



MOLECULAR FORMULA:	$C_4HF_7O_2$	**MOLECULAR WEIGHT:**	214.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	01/30/2015		
EXPIRY DATE: (mm/dd/yyyy)	01/30/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ B.G. Chittim **Date:** 03/25/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

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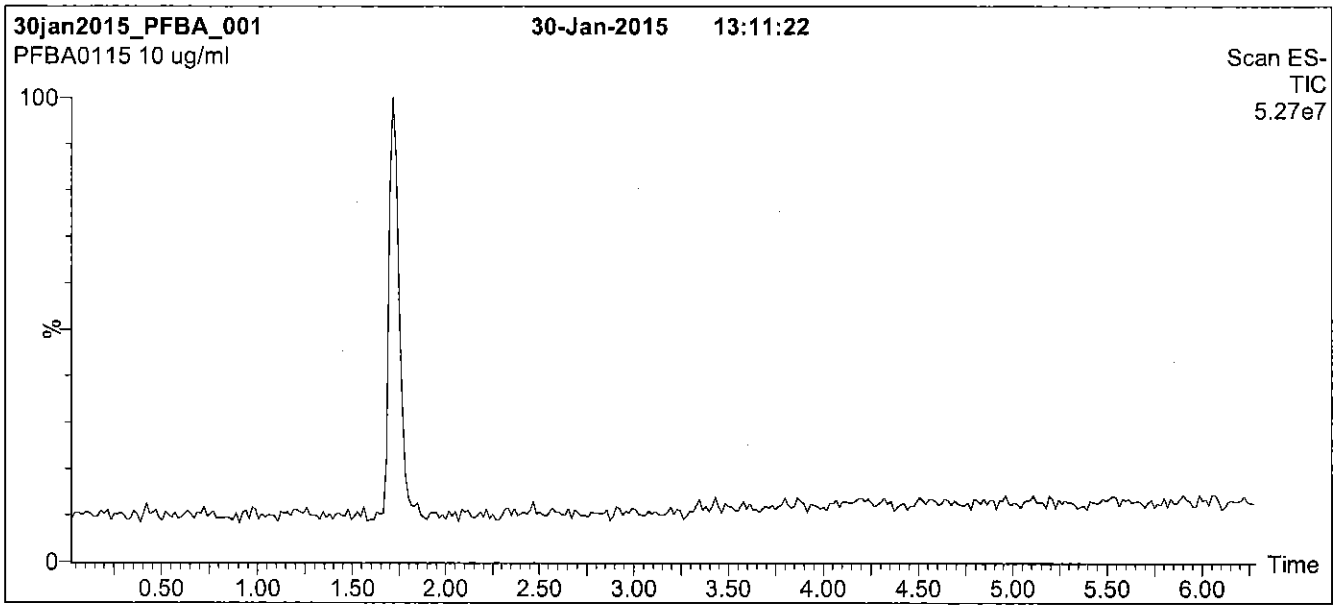
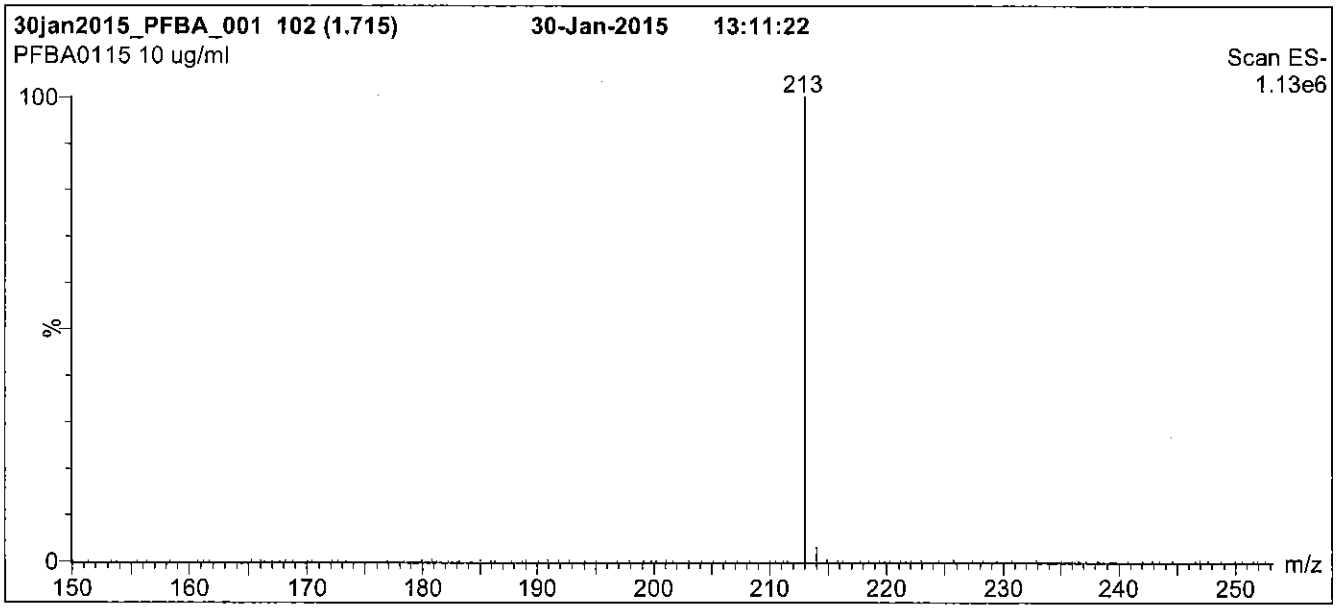
Figure 1: **PFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

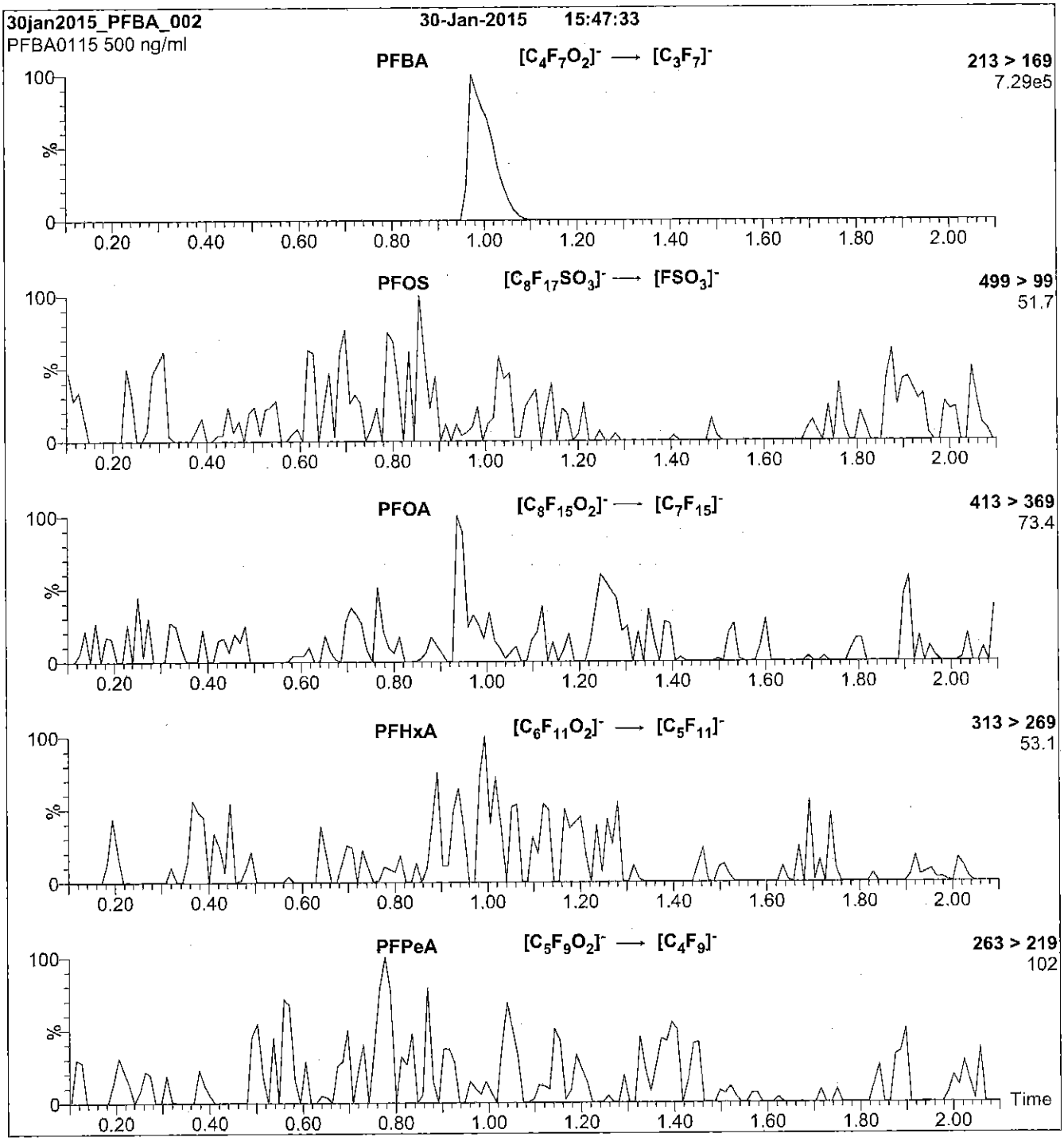
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 8.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFBA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 10

Reagent

LCPFBS_00003

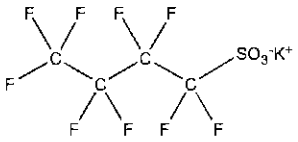
r. 2/11/15

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFBS
LOT NUMBER: LPFBS1014
COMPOUND: Potassium perfluoro-1-butanesulfonate

STRUCTURE:
CAS #: 29420-49-3



MOLECULAR FORMULA: $C_4F_9SO_3K$
MOLECULAR WEIGHT: 338.19
CONCENTRATION: 50.0 ± 2.5 µg/ml (K salt)
44.2 ± 2.2 µg/ml (PFBS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/09/2014
EXPIRY DATE: (mm/dd/yyyy) 10/09/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/17/2014 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS and/or LC/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external, ISO/IEC 17025:2005 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration for the period of time specified by the expiry date in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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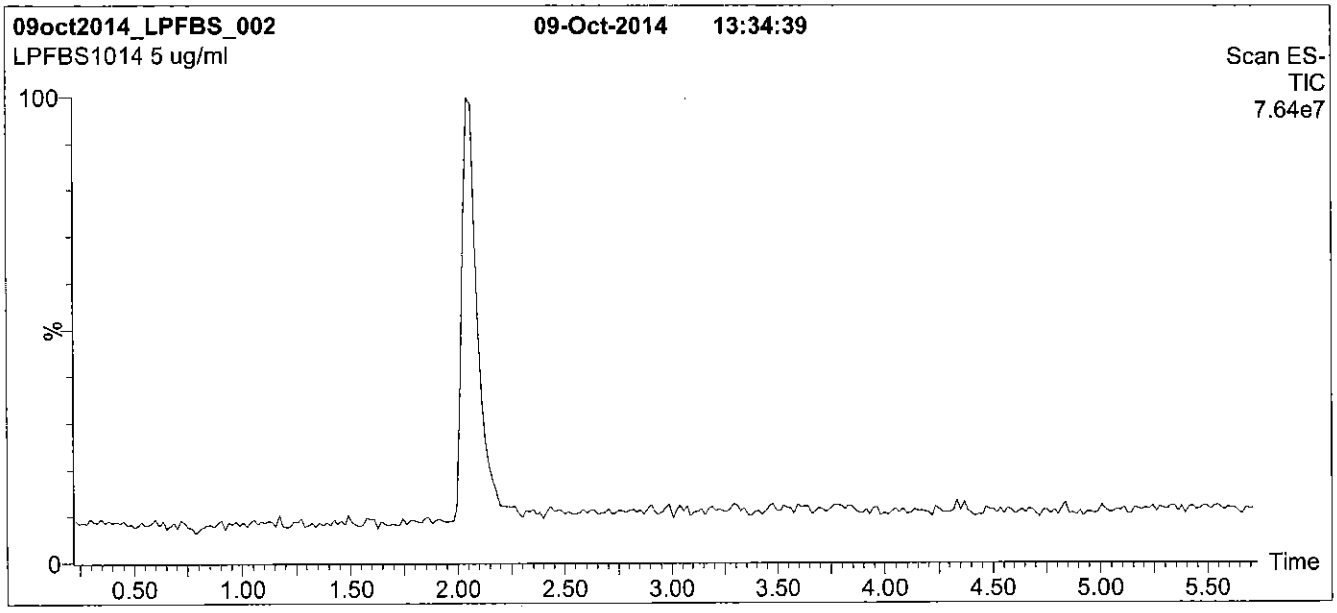
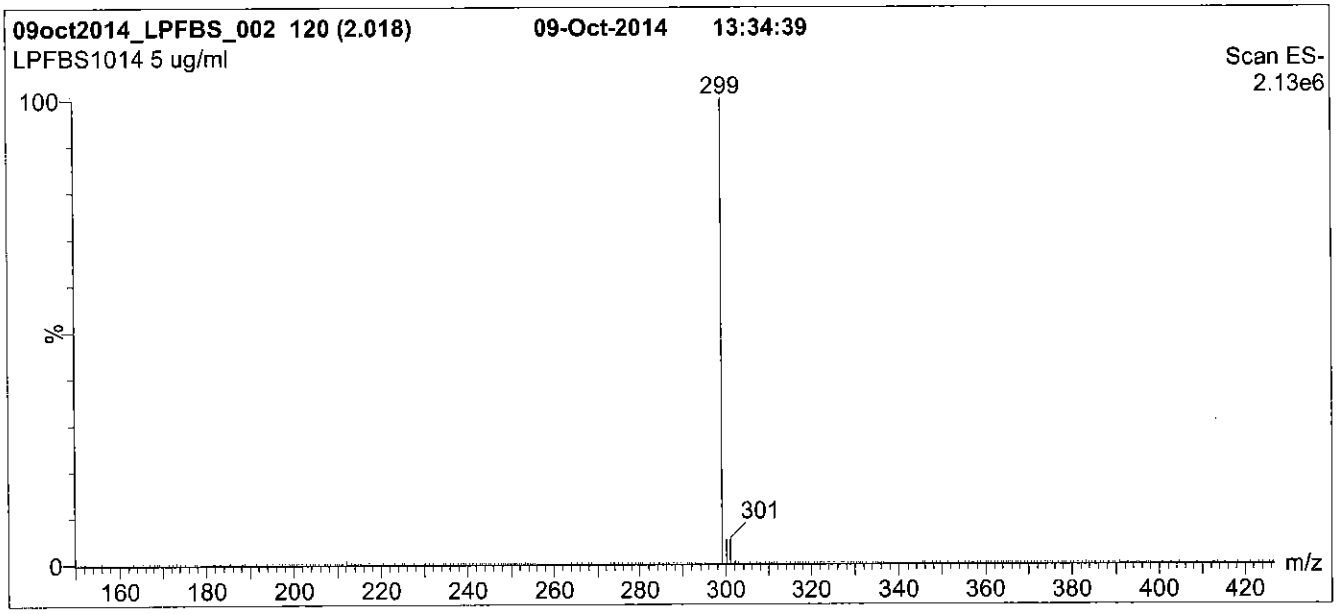
Figure 1: **L-PFBS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

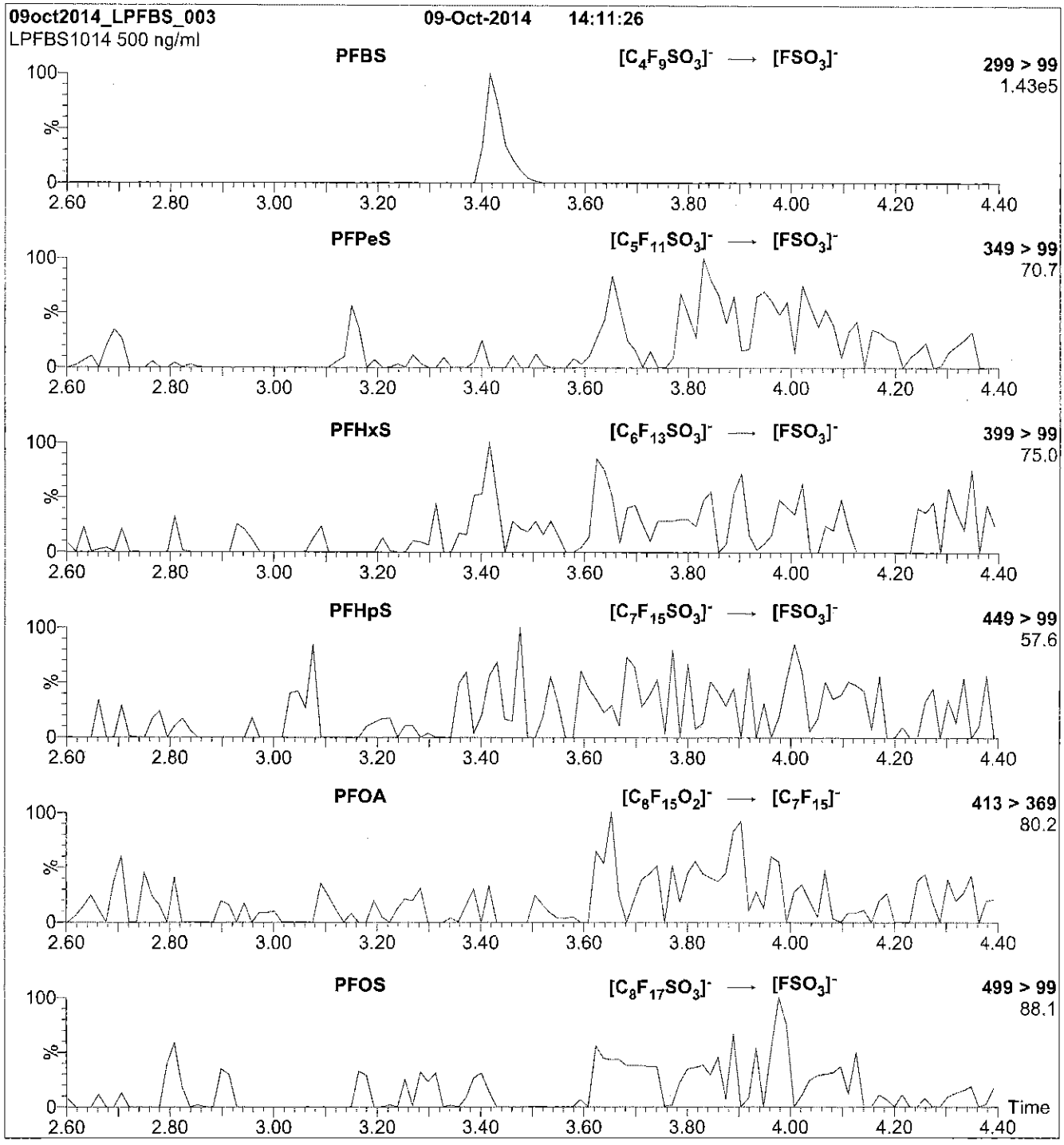
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **L-PFBS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml L-PFBS)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 25

Reagent

LCPFDA_00004

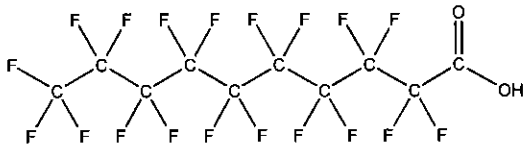
rec: 12/30/15 cw

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFDA
LOT NUMBER: PFDA0615
COMPOUND: Perfluoro-n-decanoic acid

STRUCTURE:
CAS #: 335-76-2



MOLECULAR FORMULA: $C_{10}HF_{19}O_2$
MOLECULAR WEIGHT: 514.08
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/02/2015
EXPIRY DATE: (mm/dd/yyyy) 07/02/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.6% PFNA and ~ 0.3% PFOA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/24/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

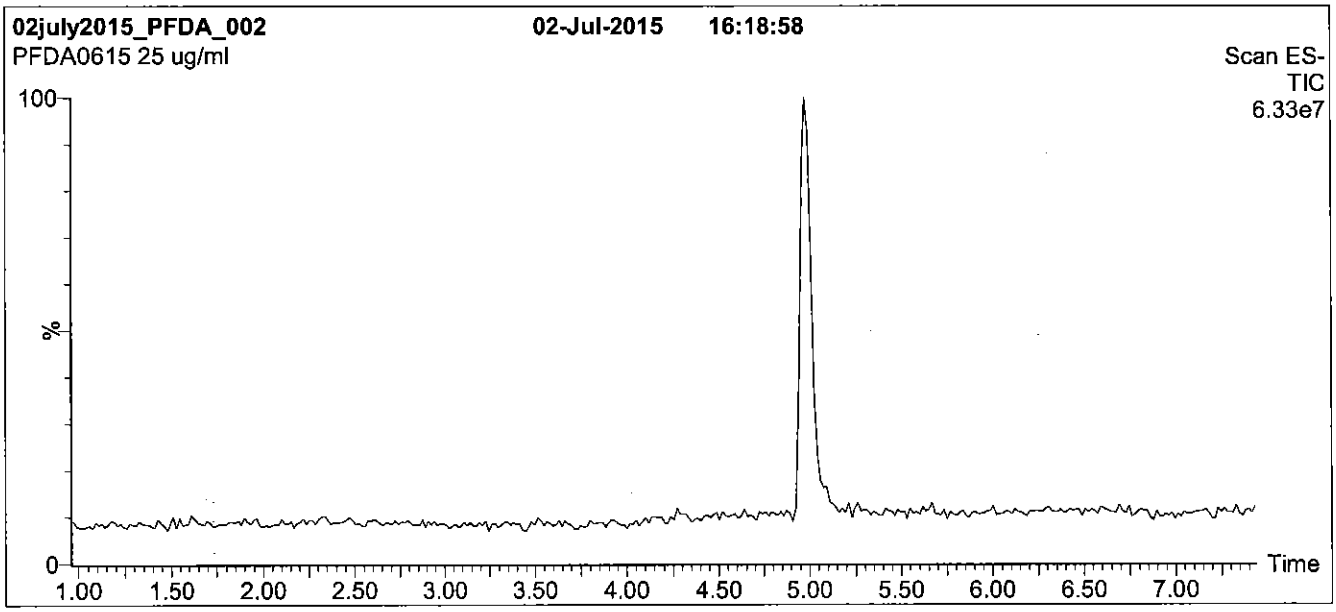
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

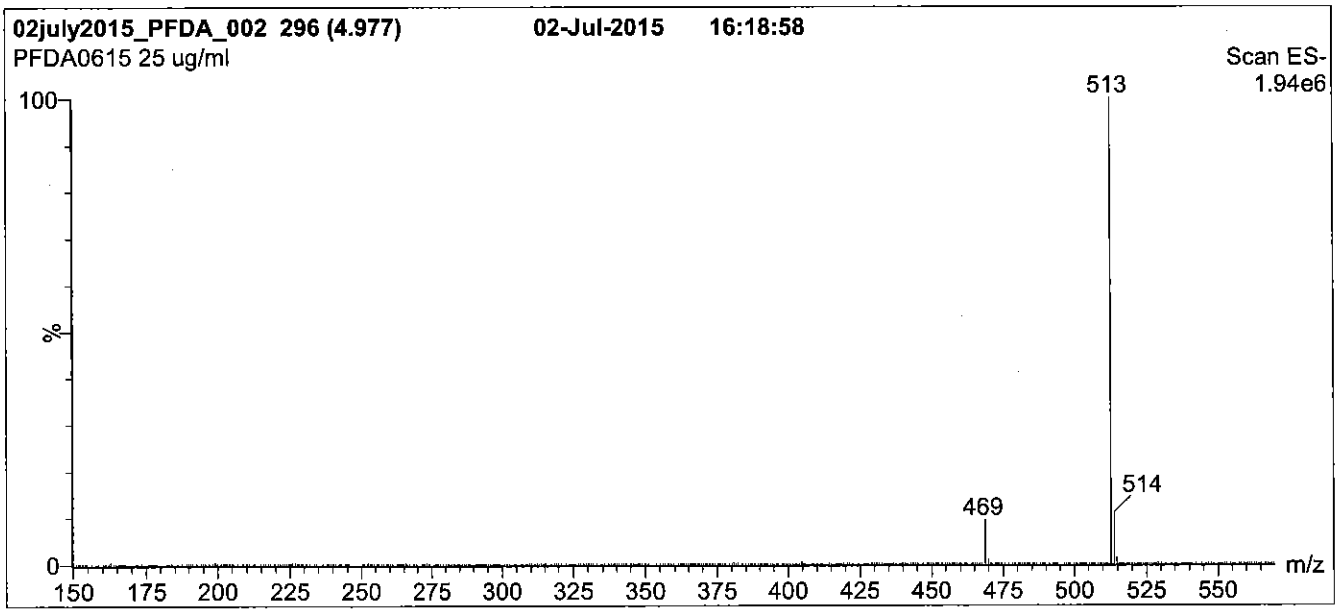
CALA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

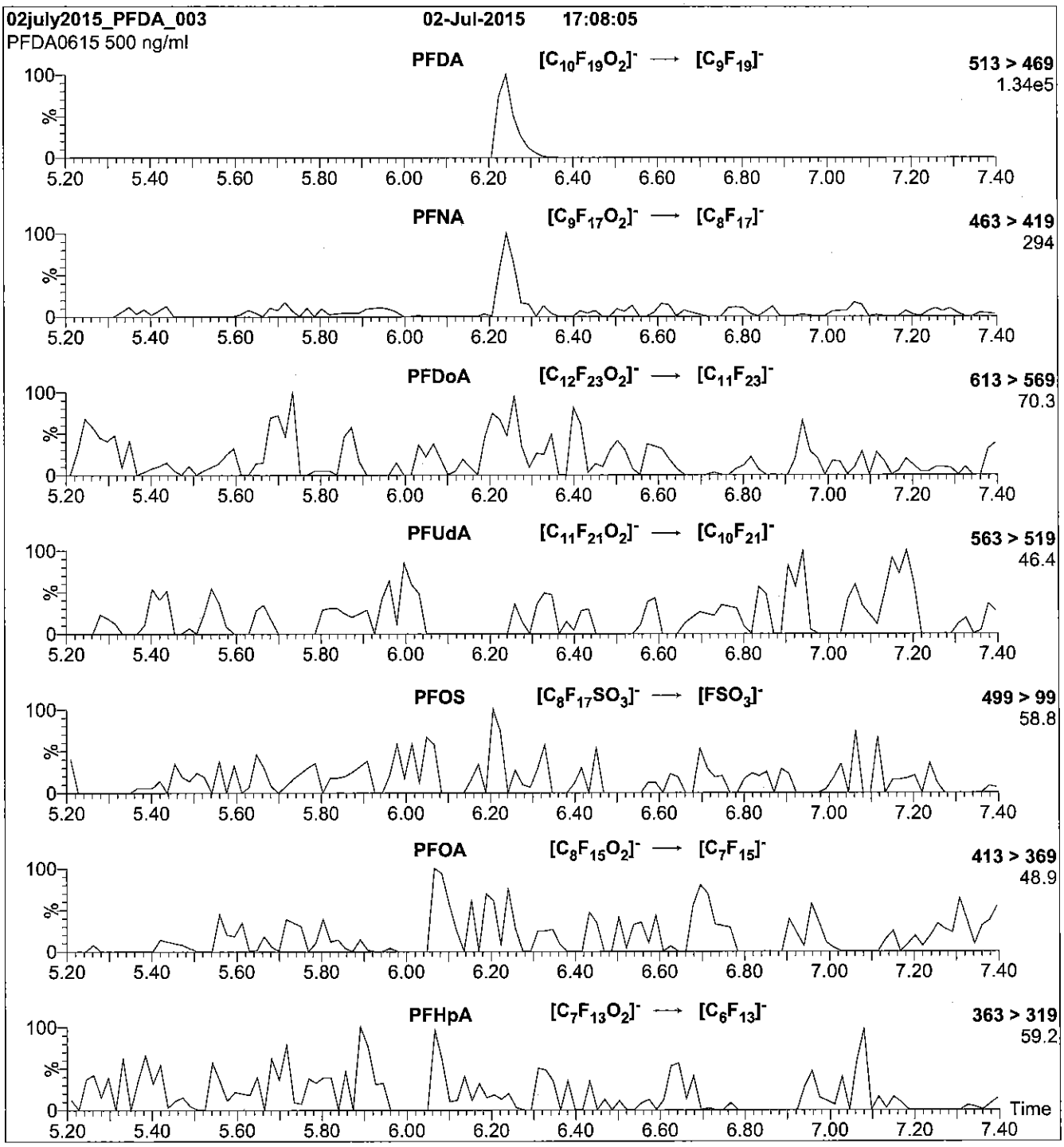
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFDA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.62e-3
Collision Energy (eV) = 13

Reagent

LCPFDoA_00004

Rec: 12/30/15 cw

WELLINGTON LABORATORIES

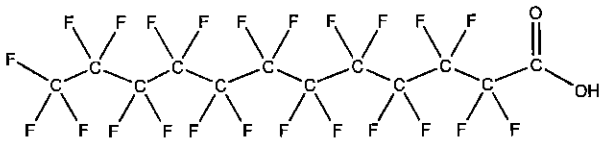
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFDoA
COMPOUND: Perfluoro-n-dodecanoic acid

LOT NUMBER: PFDoA0115

STRUCTURE:

CAS #: 307-55-1



MOLECULAR FORMULA: $C_{12}HF_{23}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 614.10
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/30/2015
EXPIRY DATE: (mm/dd/yyyy) 01/30/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/25/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

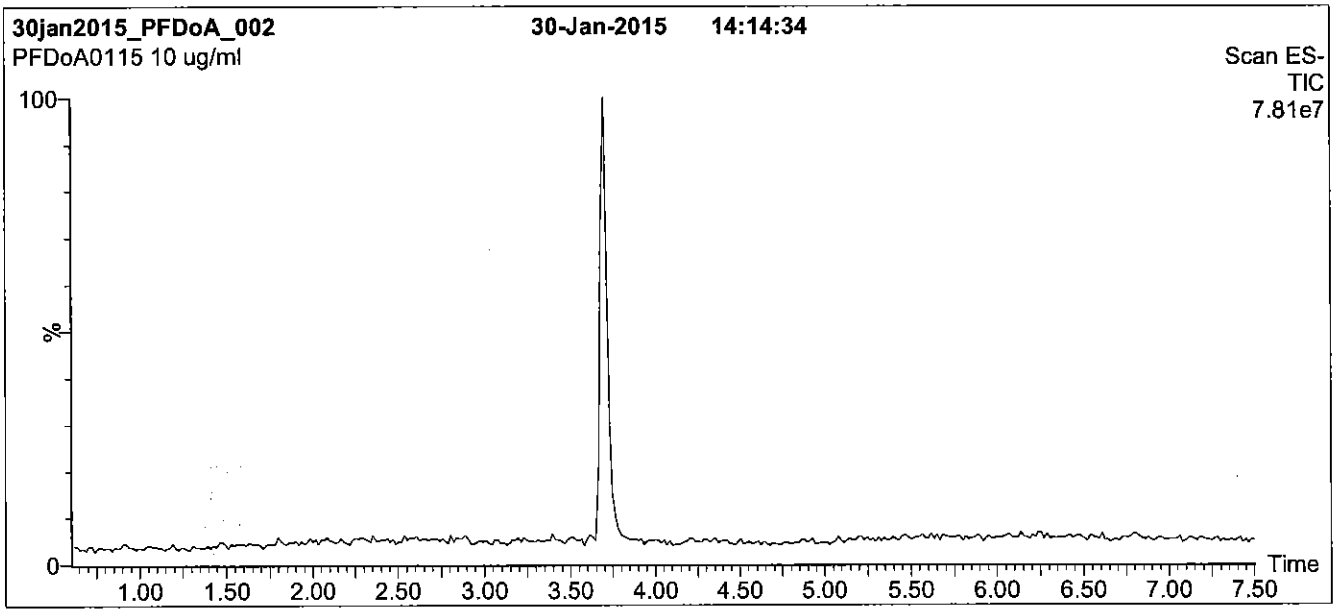
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

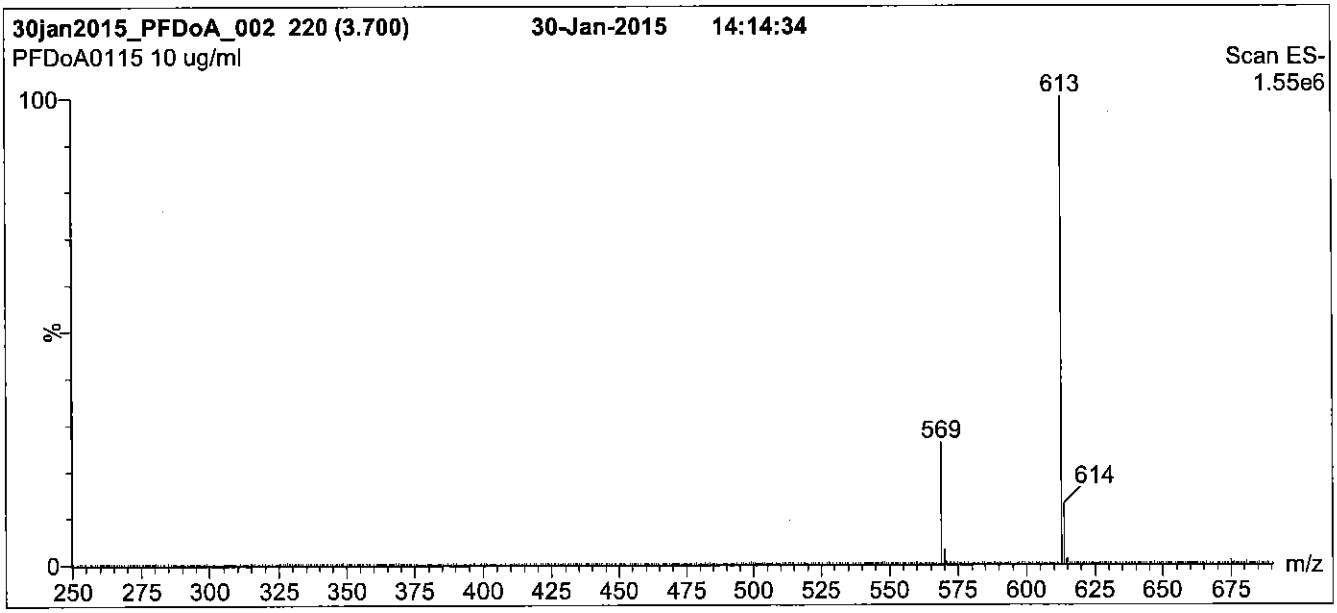
CALA Testing Accredited No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

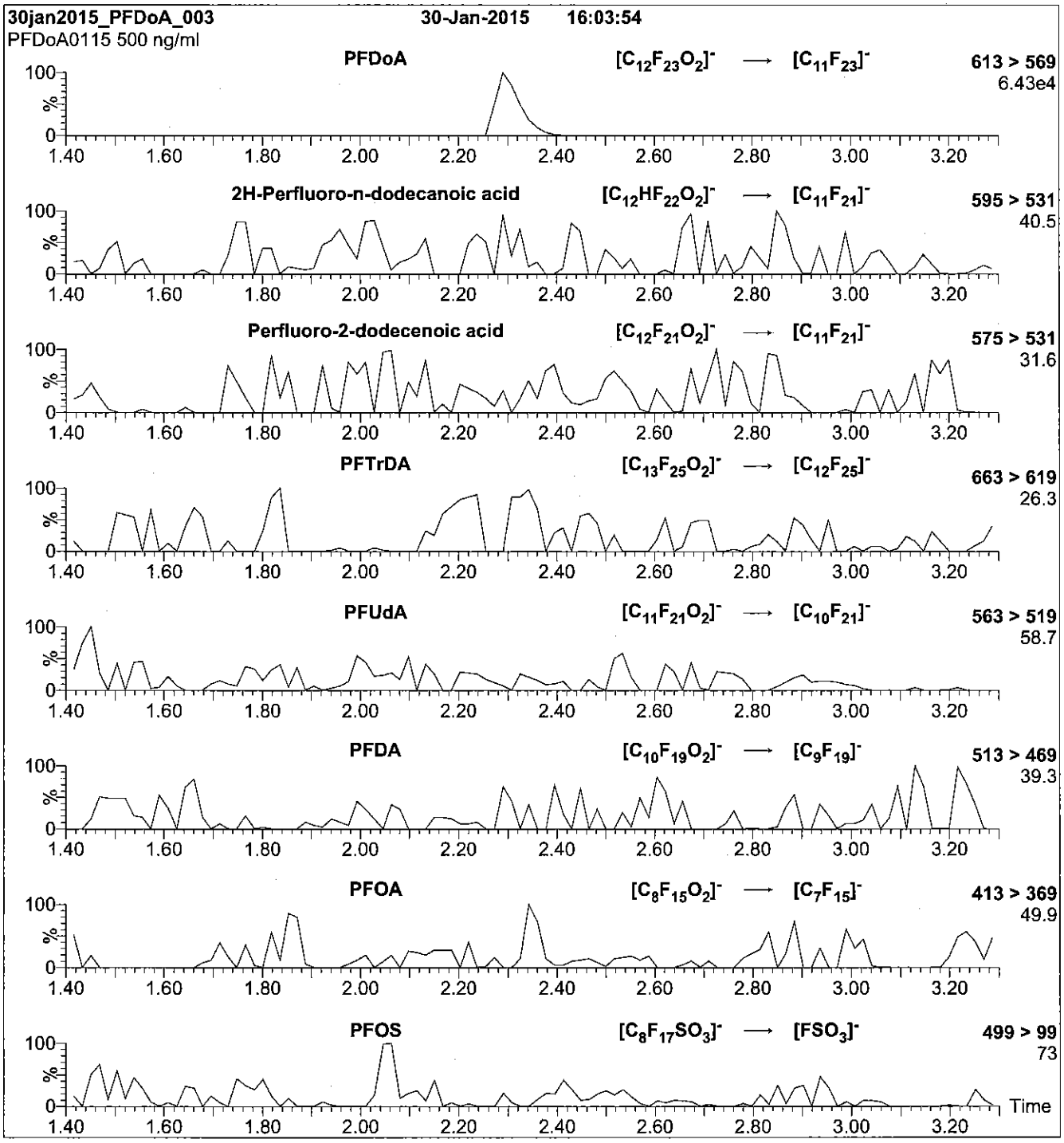
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1000 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 13

Reagent

LCPFDS_00005

Rec. 3/29/16 JRB

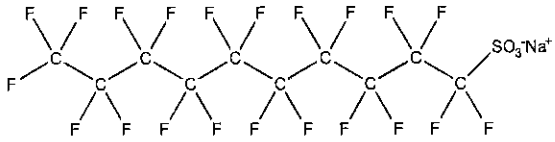
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: L-PFDS
LOT NUMBER: LPFDS0615
COMPOUND: Sodium perfluoro-1-decanesulfonate

STRUCTURE:

CAS #: 2806-15-7



MOLECULAR FORMULA:	$C_{10}F_{21}SO_3Na$
MOLECULAR WEIGHT:	622.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)
	48.2 ± 2.4 µg/ml (PFDS anion)
SOLVENT(S):	Methanol
CHEMICAL PURITY:	>98%
LAST TESTED: (mm/dd/yyyy)	07/02/2015
EXPIRY DATE: (mm/dd/yyyy)	07/02/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.9% of sodium perfluoro-1-dodecanesulfonate (L-PFDoS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/07/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

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UNCERTAINTY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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CALA

ANAB ACCREDITED

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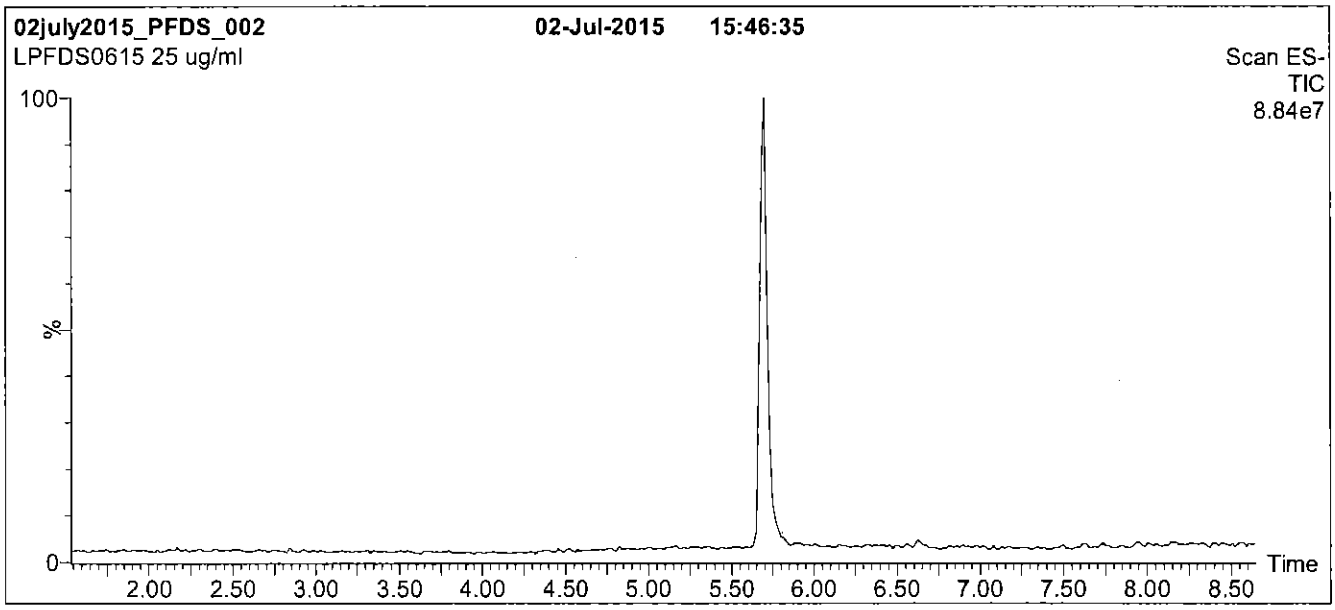
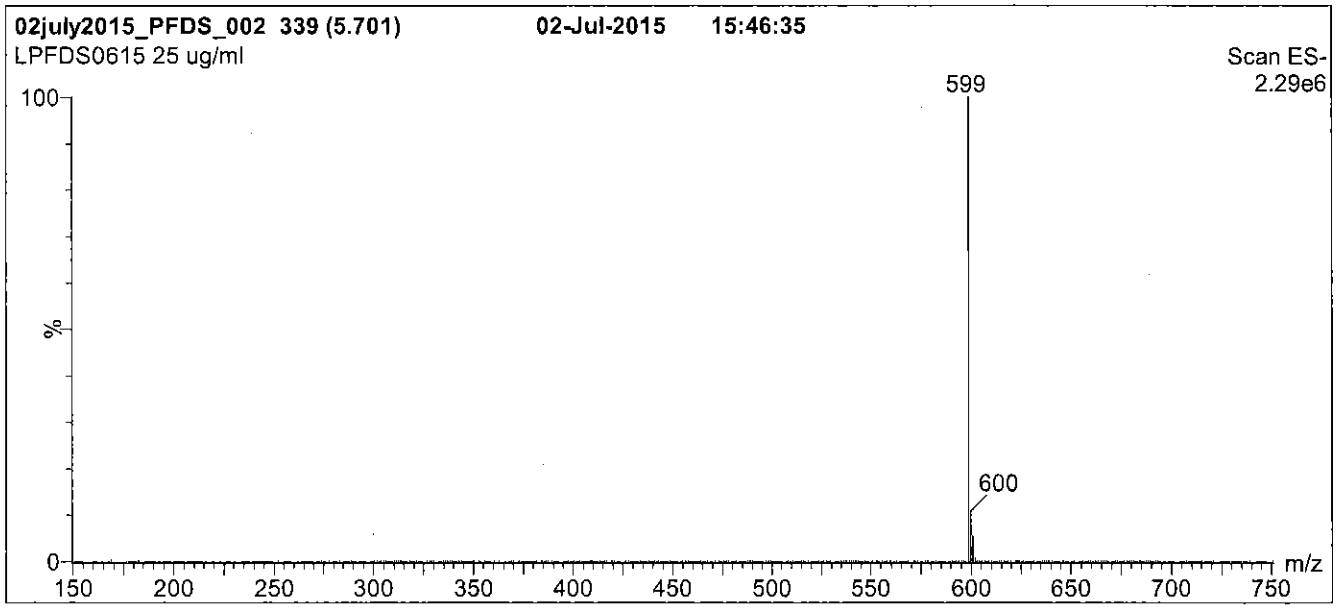
Figure 1: **L-PFDS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

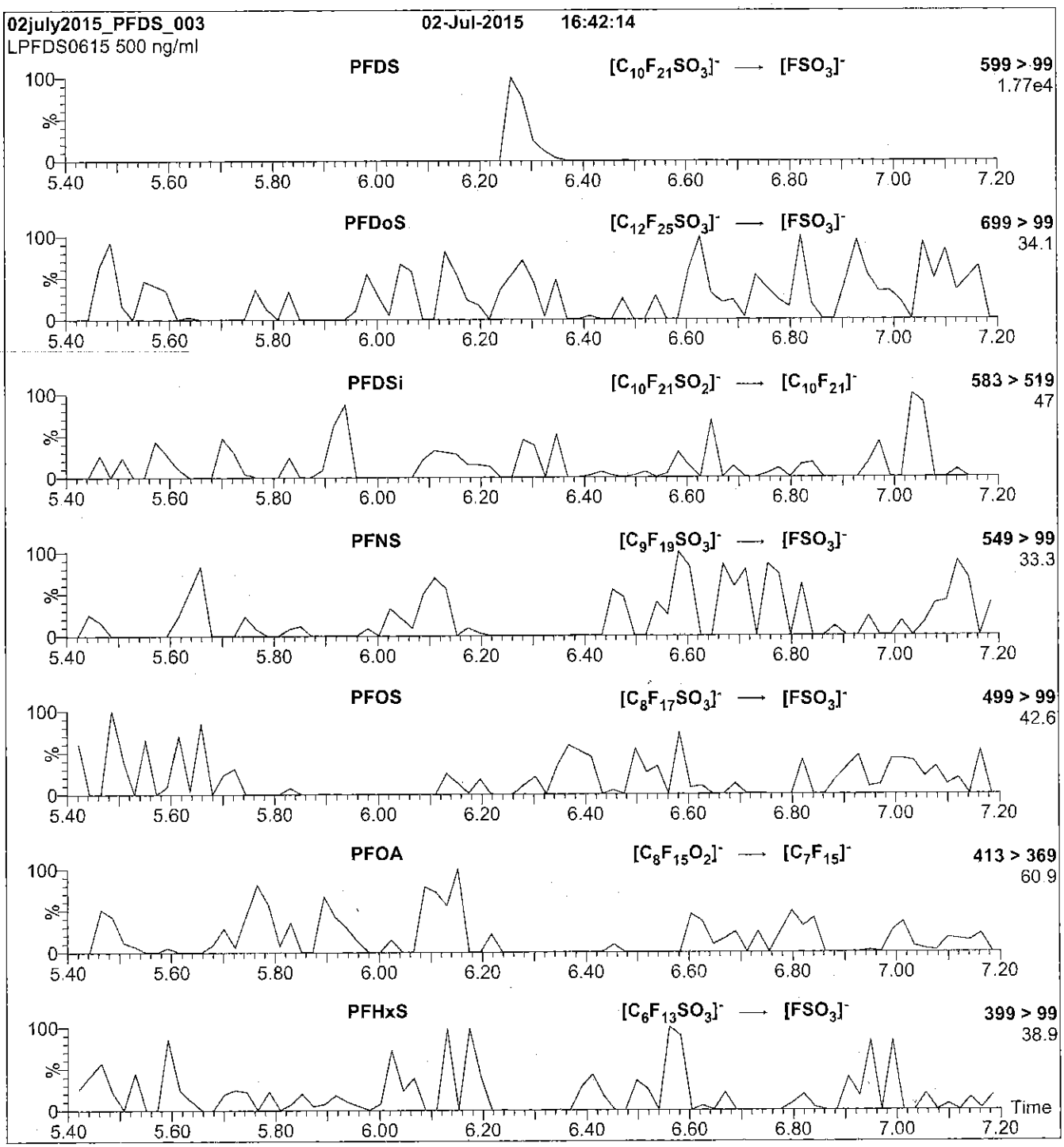
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 70.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **L-PFDS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFDS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 50

Reagent

LCPFHpA_00005

609699
ID: LCPFHpA_00005
Exp: 01/22/21 Prpd: CBW
PF-n-heptanoic acid

R: 4/7/16 CBW

WELLINGTON LABORATORIES

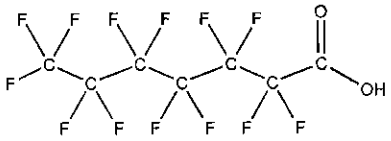
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFHpA
COMPOUND: Perfluoro-n-heptanoic acid

LOT NUMBER: PFHpA0116

STRUCTURE:

CAS #: 375-85-9



MOLECULAR FORMULA: $C_7HF_{13}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 364.06
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/22/2016
EXPIRY DATE: (mm/dd/yyyy) 01/22/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/02/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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UNCERTAINTY:

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The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

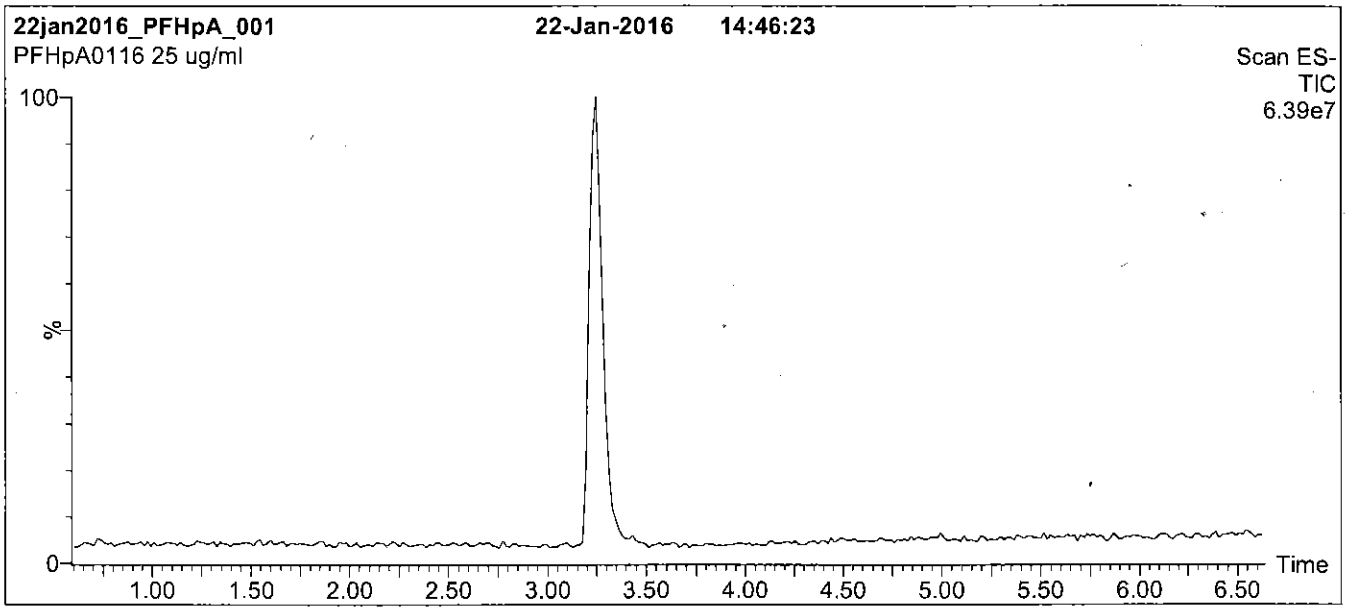
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

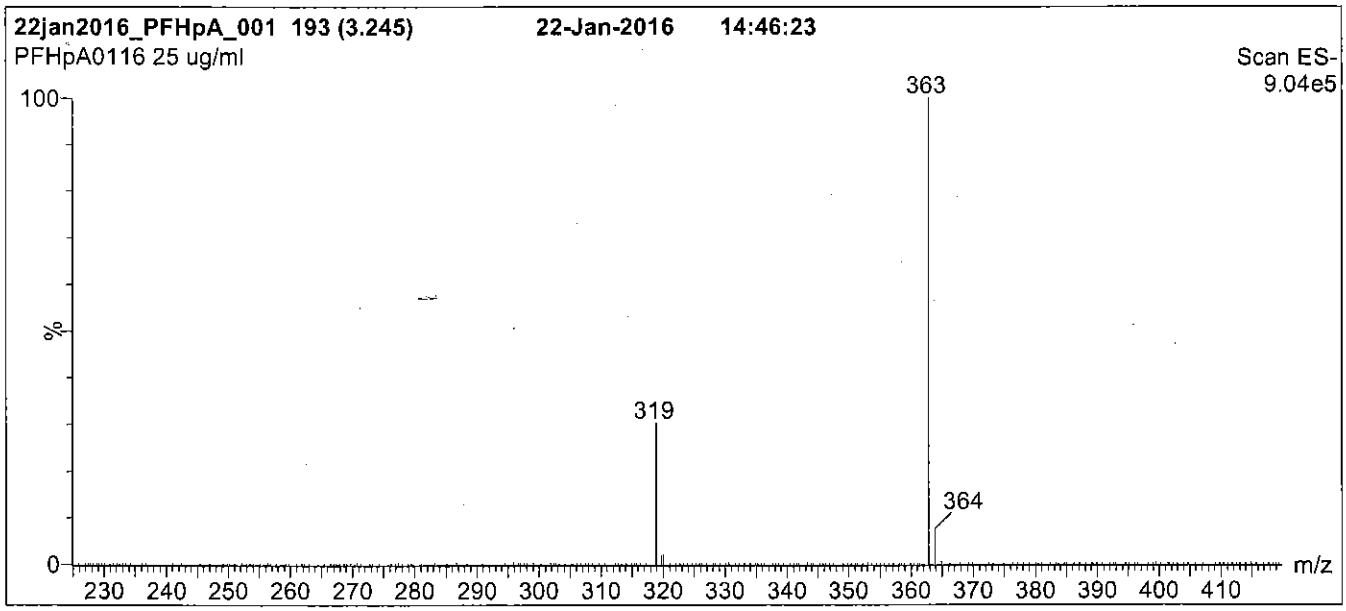
CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

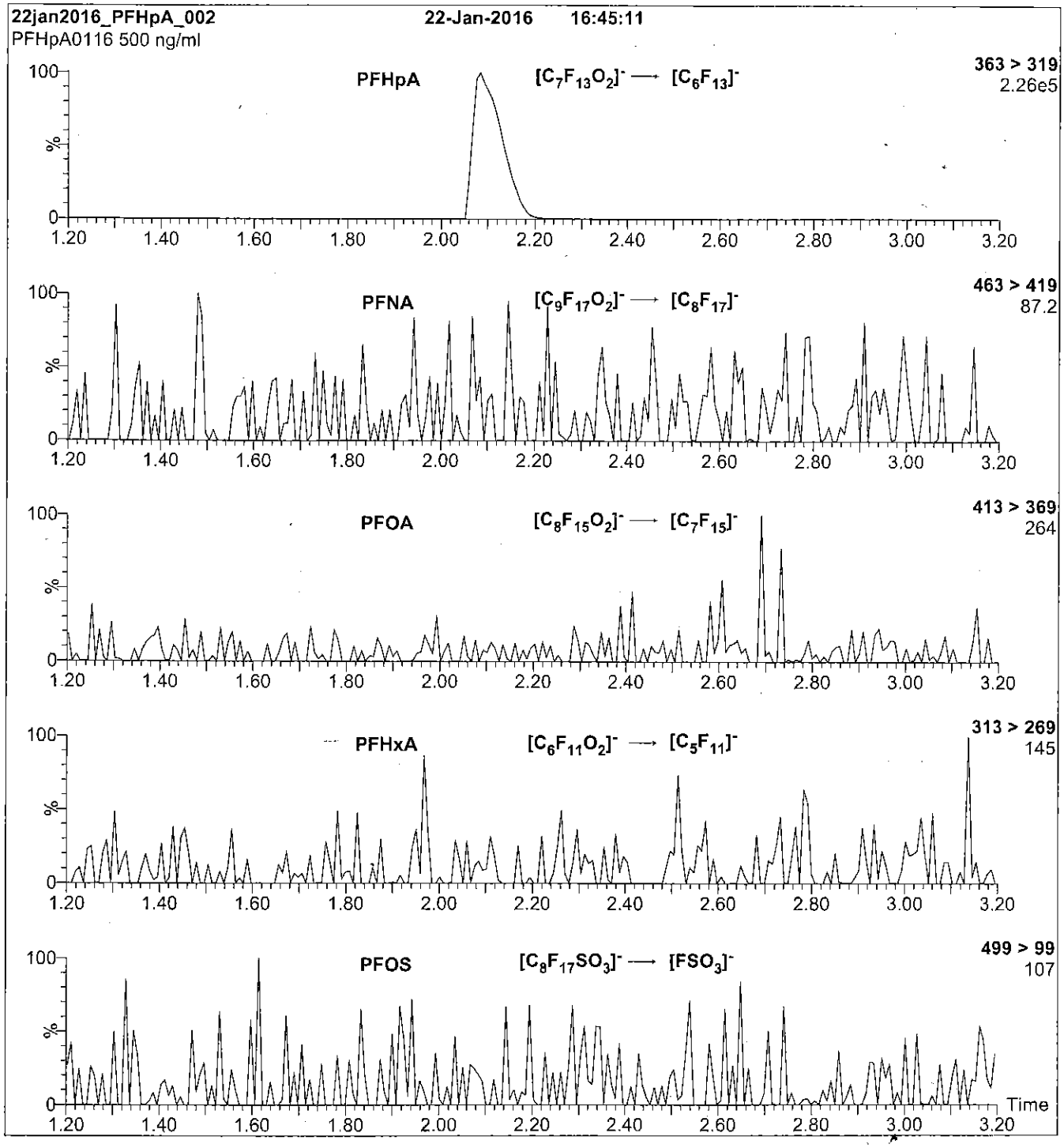
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFHpA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 11

Reagent

LCPFHxA_00004

609702
ID: LCPFHxA_00004
Exp: 12/22/20 Prpd: CBW
PF-n-hexanoic acid

R: 4/7/16 CBW

WELLINGTON LABORATORIES

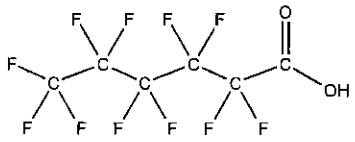
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFHxA
COMPOUND: Perfluoro-n-hexanoic acid

LOT NUMBER: PFHxA1215

STRUCTURE:

CAS #: 307-24-4



MOLECULAR FORMULA: $C_6HF_{11}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 314.05
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/22/2015
EXPIRY DATE: (mm/dd/yyyy) 12/22/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of Perfluoro-n-pentanoic acid (PFPeA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/23/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17025 REFERENCE MATERIAL PRODUCER

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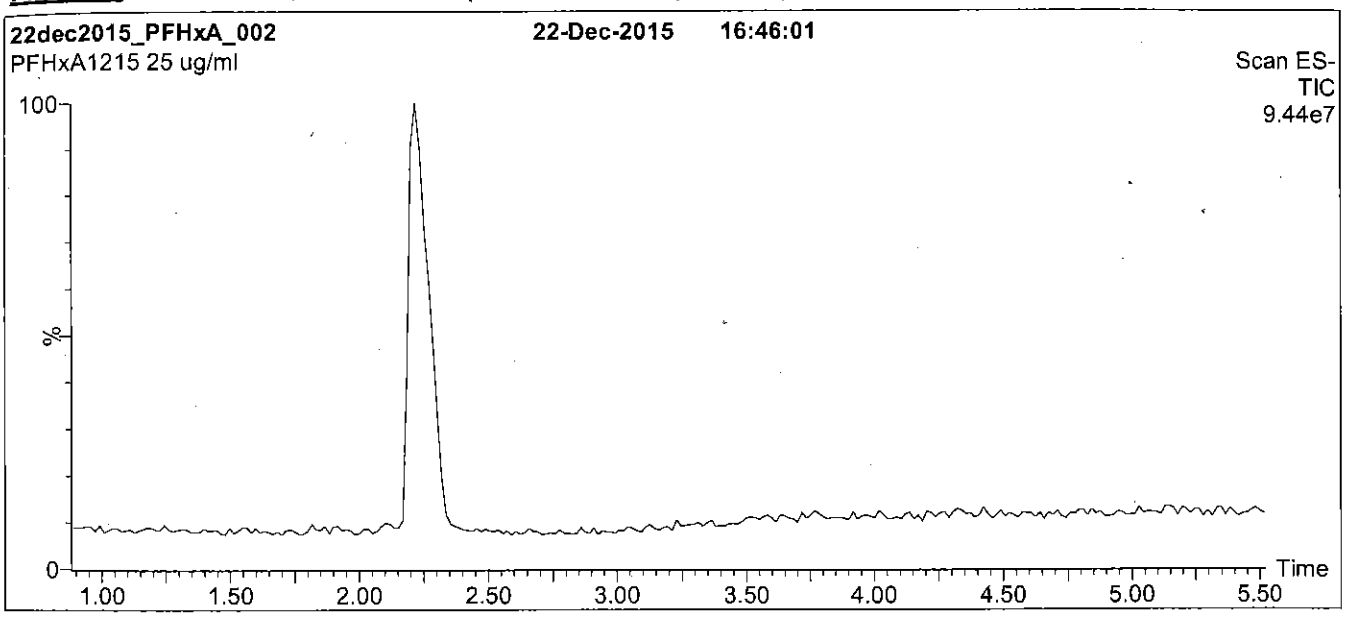
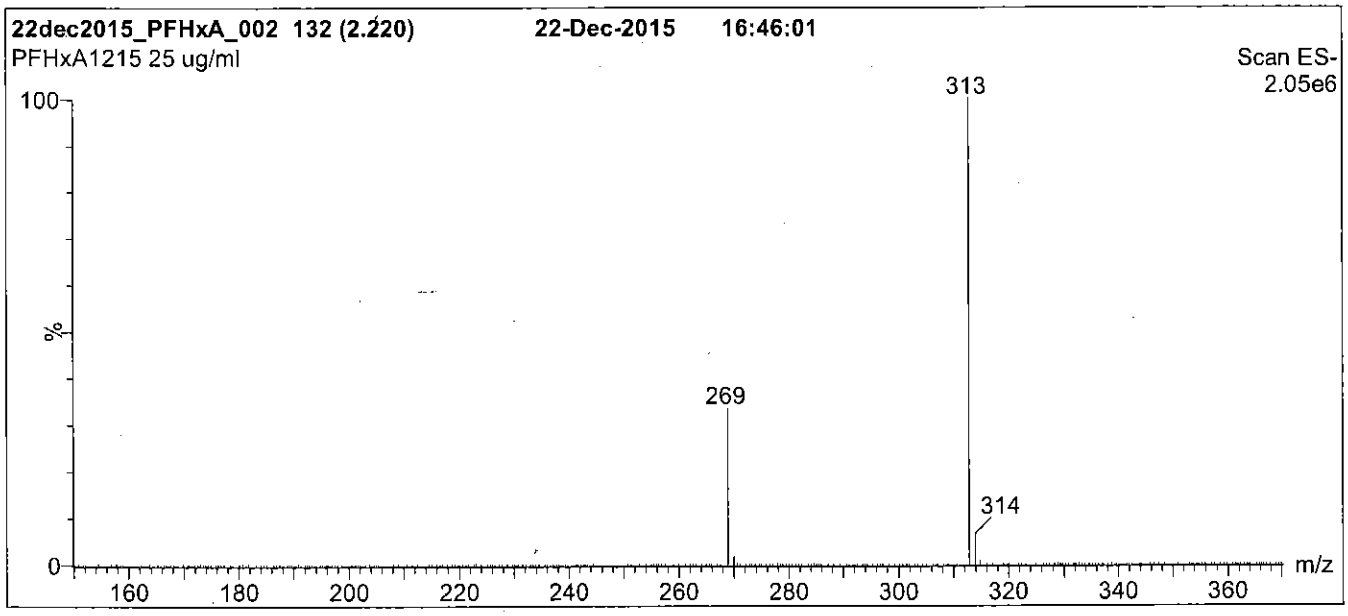
Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

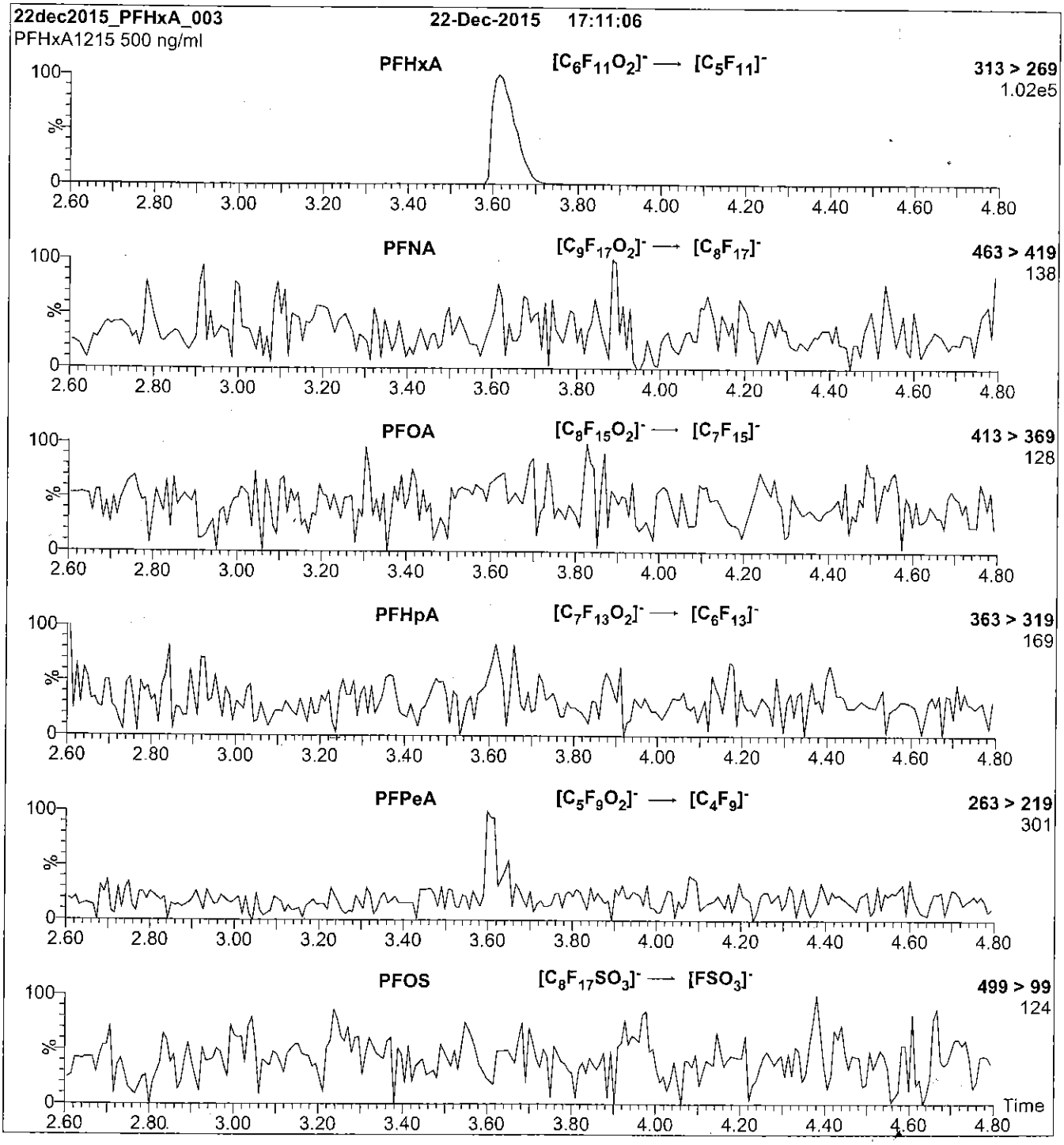
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 10

Reagent

LCPFHxS-br_00001

P: 12/9/15 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFHxSK
LOT NUMBER:	brPFHxSK0615
CONCENTRATION:	50.0 ± 2.5 µg/ml (total potassium salt)
	45.5 ± 2.3 µg/ml (total PFHxS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	06/29/2015
LAST TESTED: (mm/dd/yyyy)	07/03/2015
EXPIRY DATE: (mm/dd/yyyy)	07/03/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorohexanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% of perfluoro-1-pentanesulfonate and ~ 0.2% of perfluoro-1-octanesulfonate.
- CAS#: 3871-99-6 (for linear isomer; potassium salt).

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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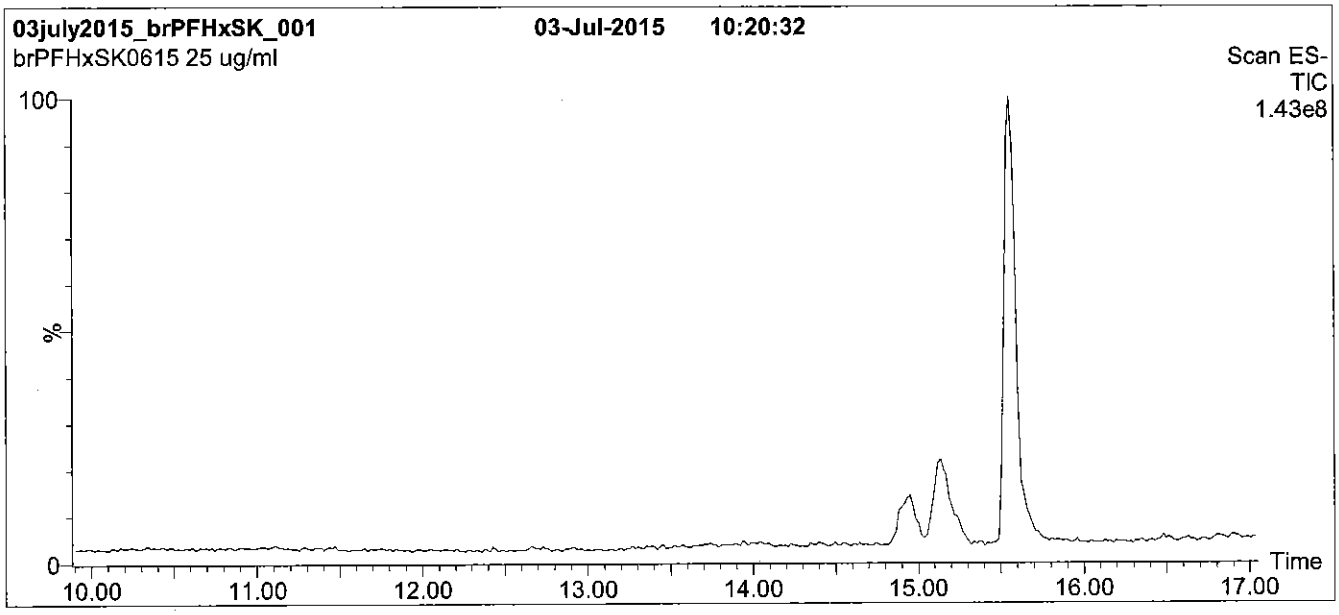
Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

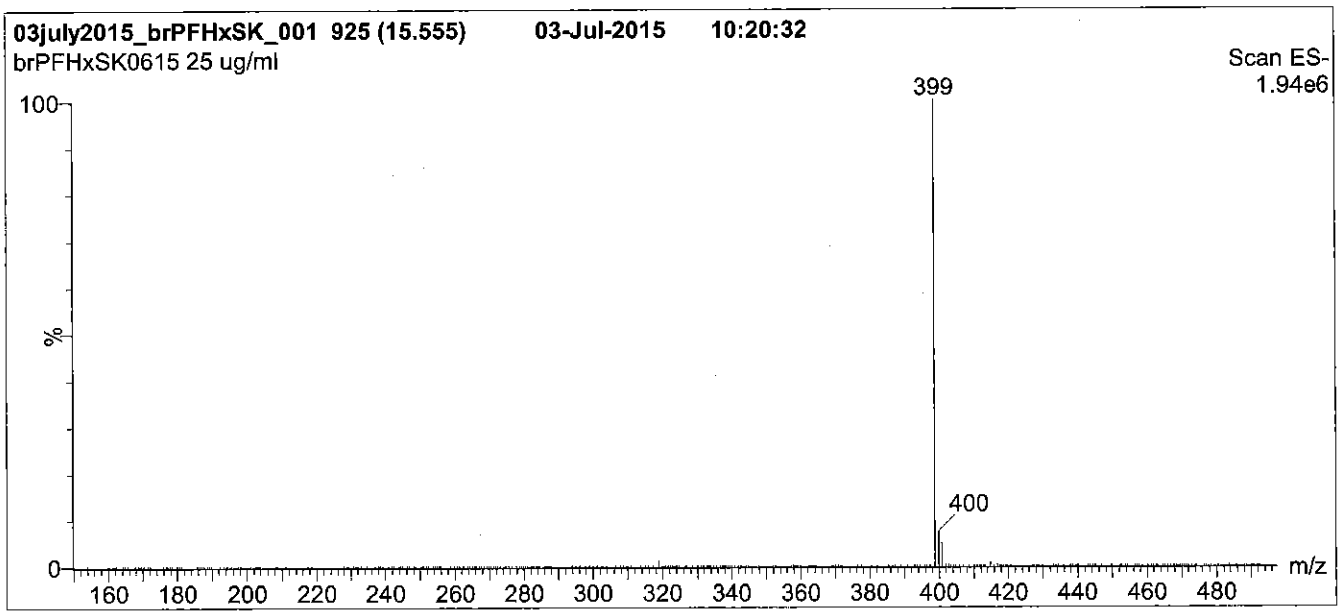
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)CF_2CF_2SO_3^-K^+$	0.2
7	Other Unidentified Isomers		0.5

* Percent of total perfluorohexanesulfonate isomers only.
** Systematic Name: Potassium perfluorohexane-2-sulfonate.

Certified By: _____ **Date:** 07/15/2015
B.G. Chittim (mm/dd/yyyy)

Figure 1: **br-PFHxSK; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 20 min

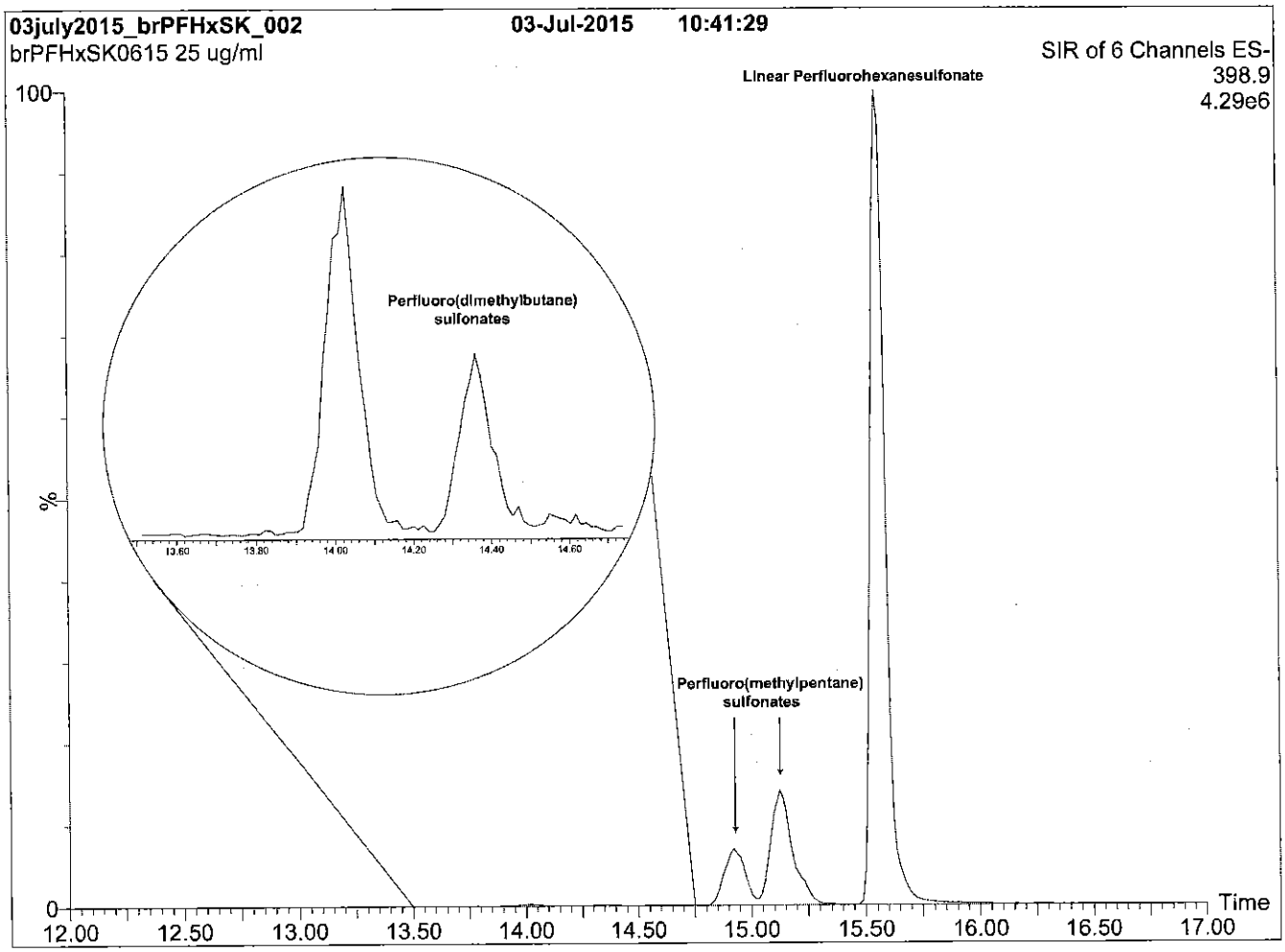
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-PFHxSK; LC/MS Data**



Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 20 min

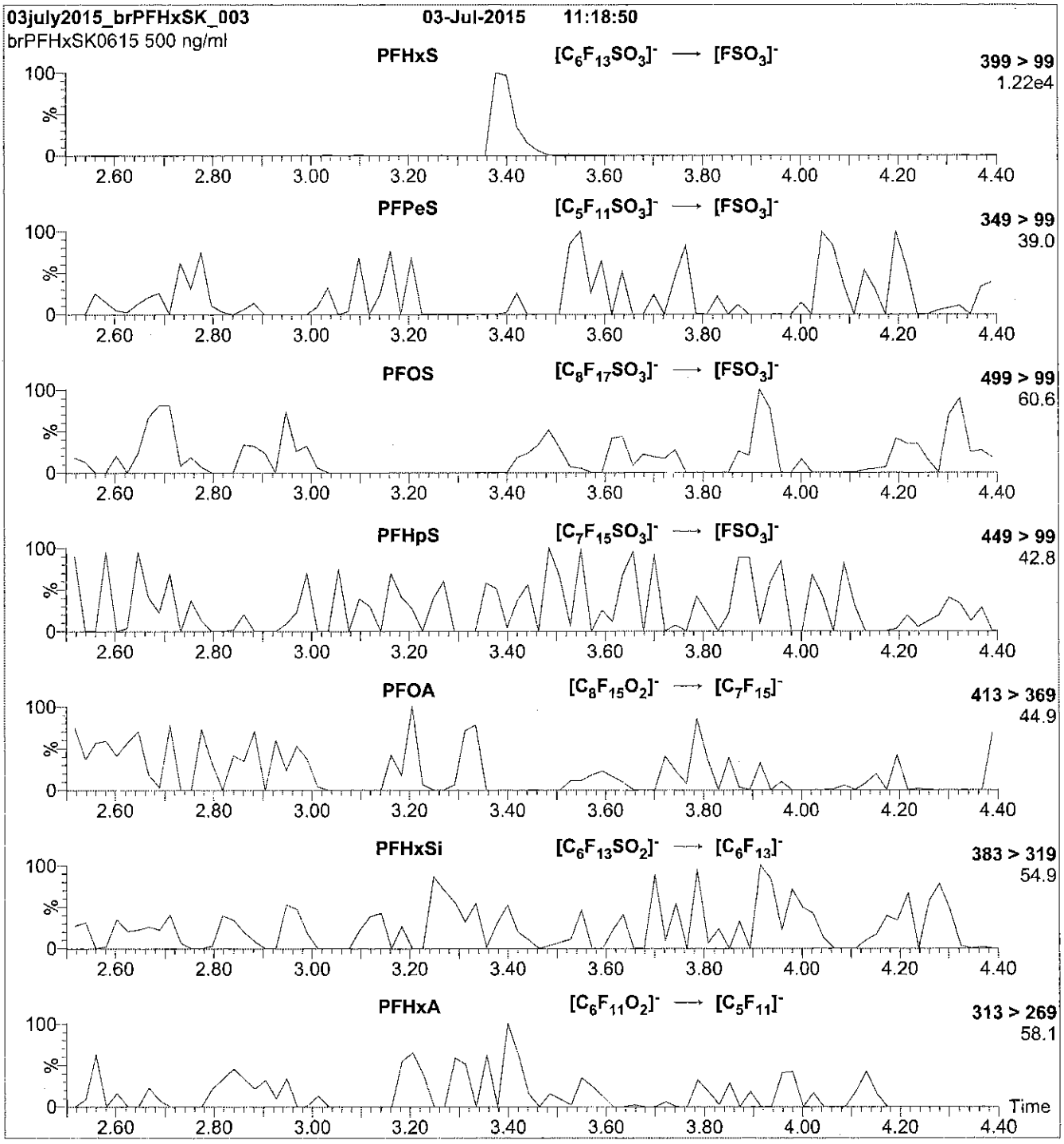
Flow: 300 µl/min

MS Parameters

Experiment: SIR (6 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 3: **br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection:	Direct loop injection 10 µl (500 ng/ml br-PFHxSK)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 30

Reagent

LCPFNA_00005

609703
ID: LCPFNA_00005
Exp: 10/23/20 Prpd: CBW
PF-n-nonanoic acid

R 4/7/16 CBW

WELLINGTON LABORATORIES

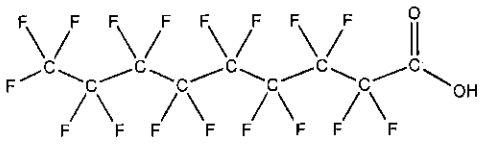
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFNA
COMPOUND: Perfluoro-n-nonanoic acid

LOT NUMBER: PFNA1015

STRUCTURE:

CAS #: 375-95-1



MOLECULAR FORMULA: $C_9HF_{17}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 464.08
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/23/2015
EXPIRY DATE: (mm/dd/yyyy) 10/23/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA) and < 0.1% of perfluoro-n-heptanoic acid (PFHpA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/30/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

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The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

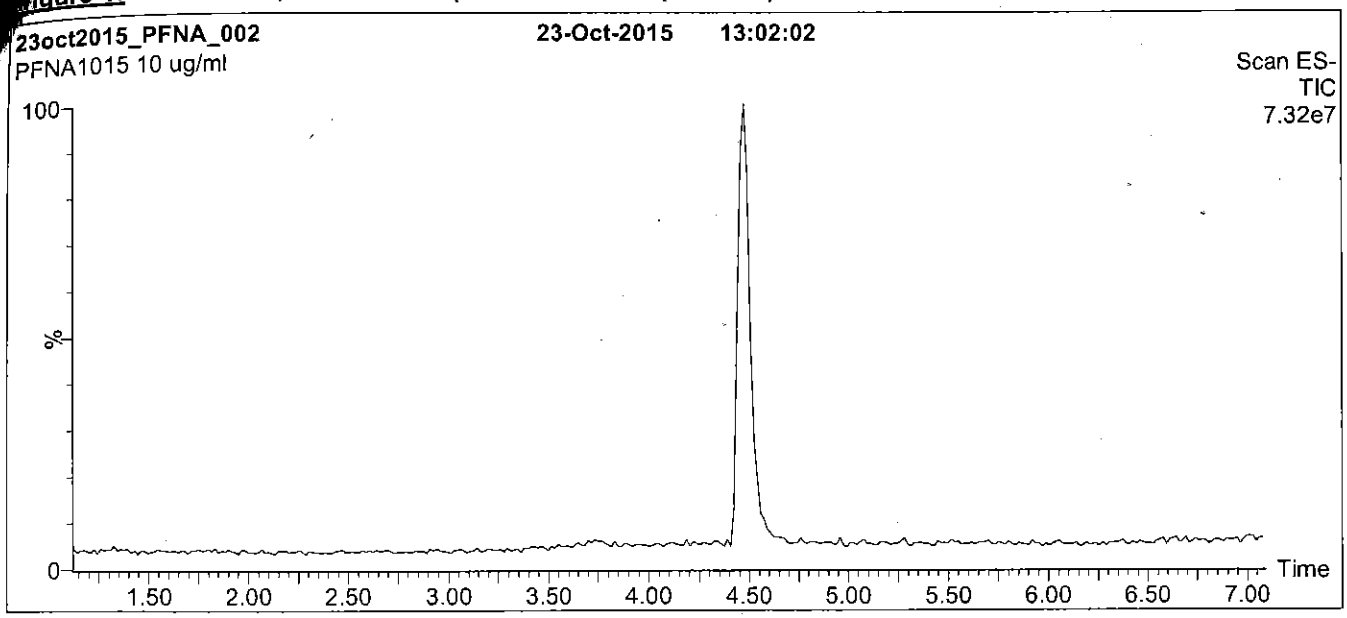
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

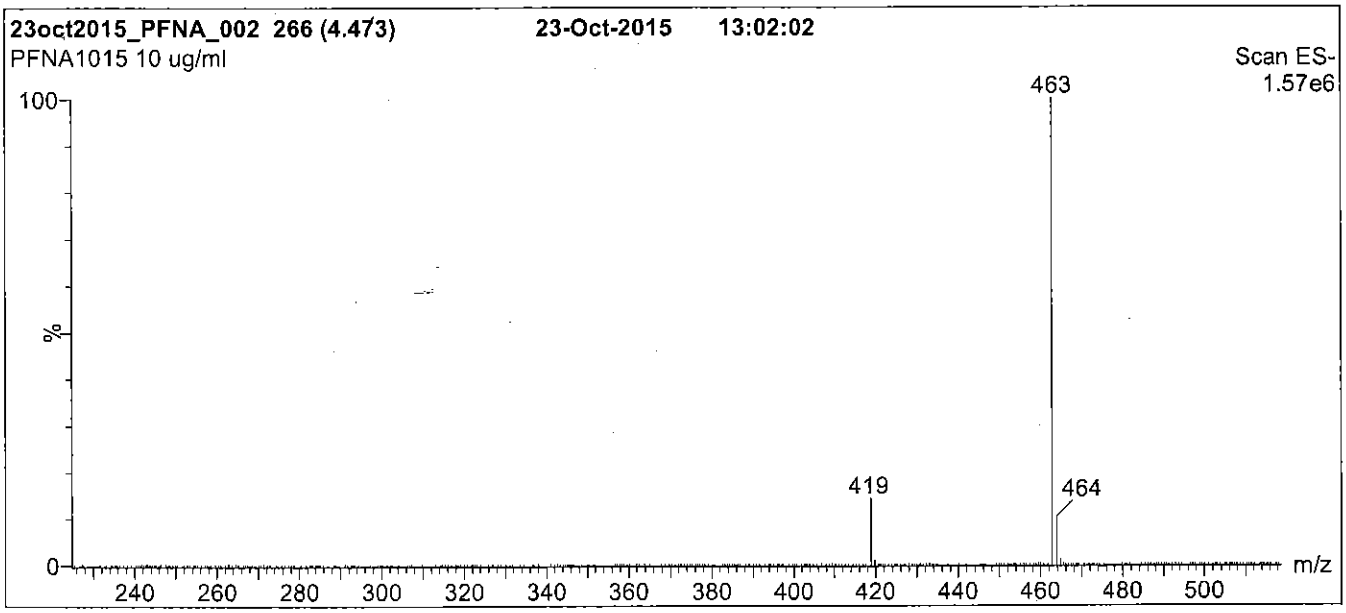
CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: PFNA; LC/MS Data (TIC and Mass Spectrum)





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

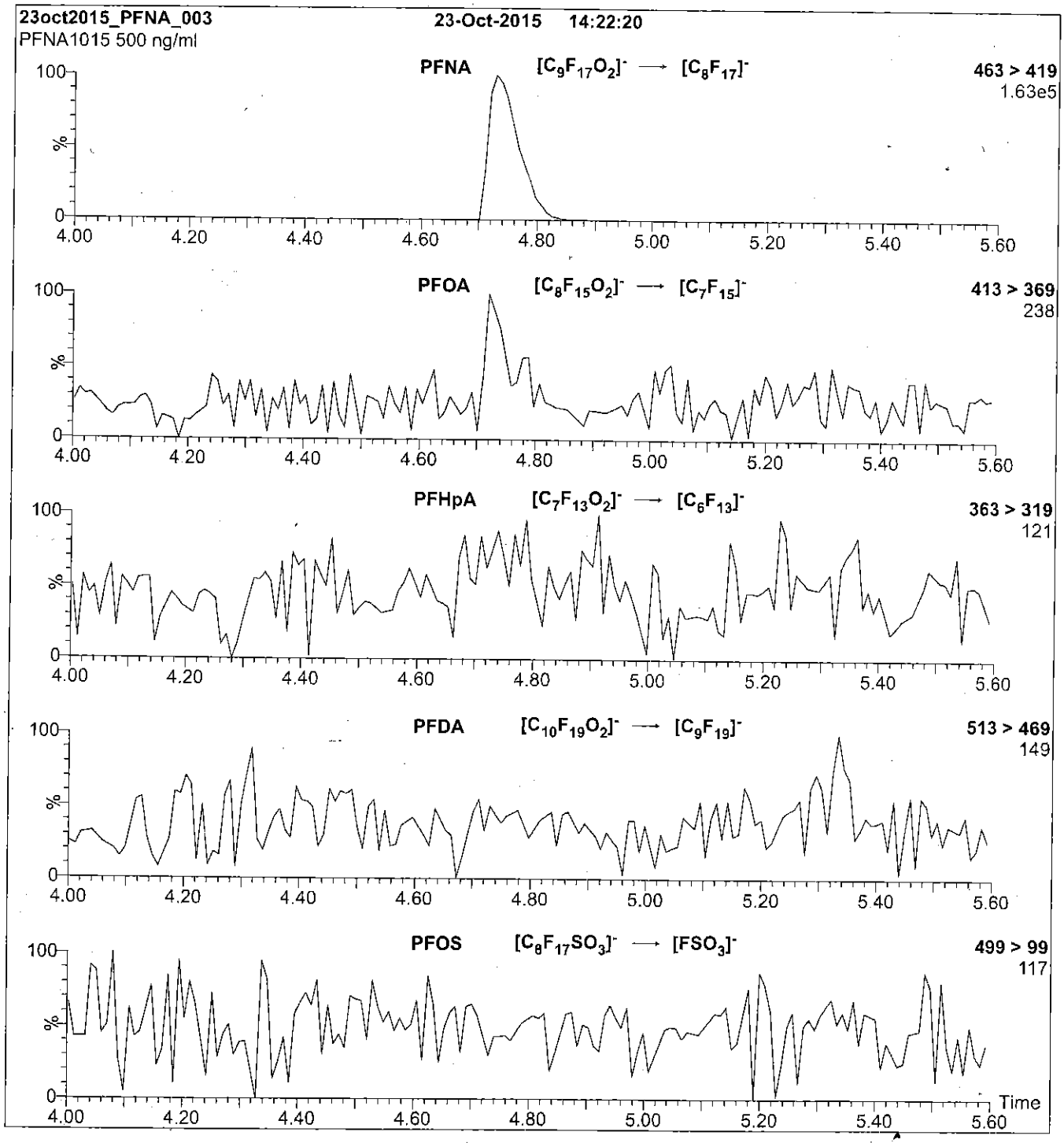
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

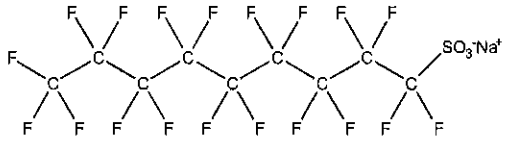
LCPFNS_00002

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFNS
COMPOUND: Sodium perfluoro-1-nonanesulfonate
LOT NUMBER: LPFNS0712
CAS #: 98789-57-2

STRUCTURE:



MOLECULAR FORMULA:	$C_9F_{19}SO_3Na$	**MOLECULAR WEIGHT:**	572.12
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 48.0 ± 2.4 µg/ml (PFNS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/04/2012		
EXPIRY DATE: (mm/dd/yyyy)	07/04/2017		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 01/15/2013 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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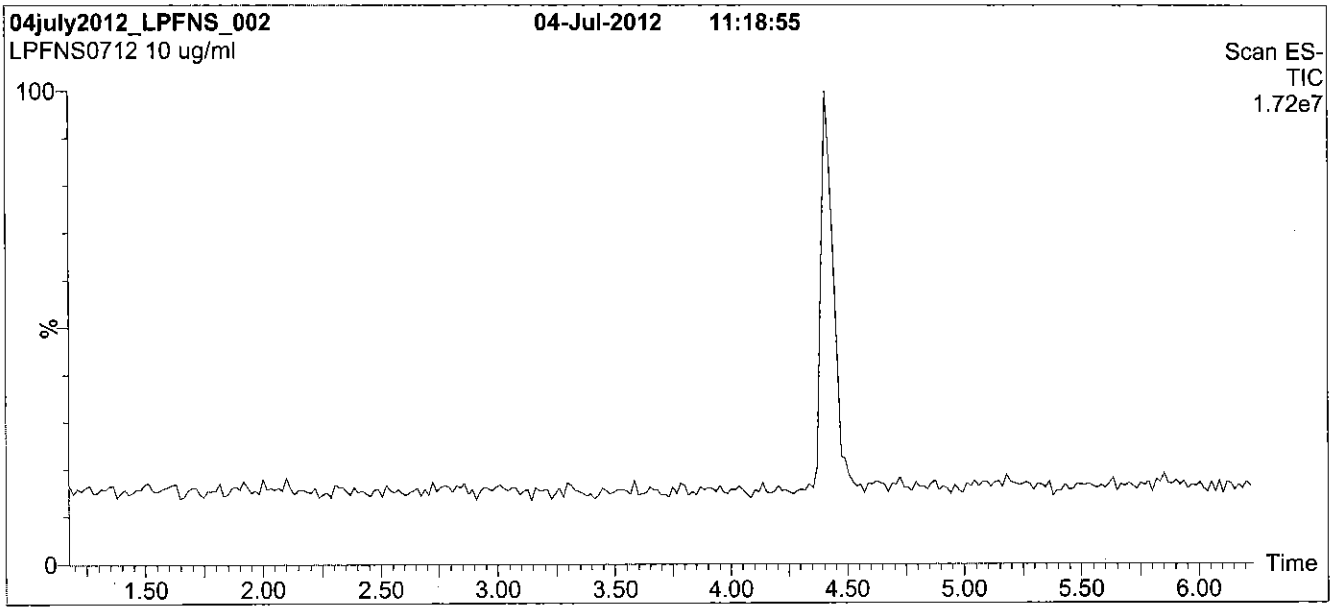
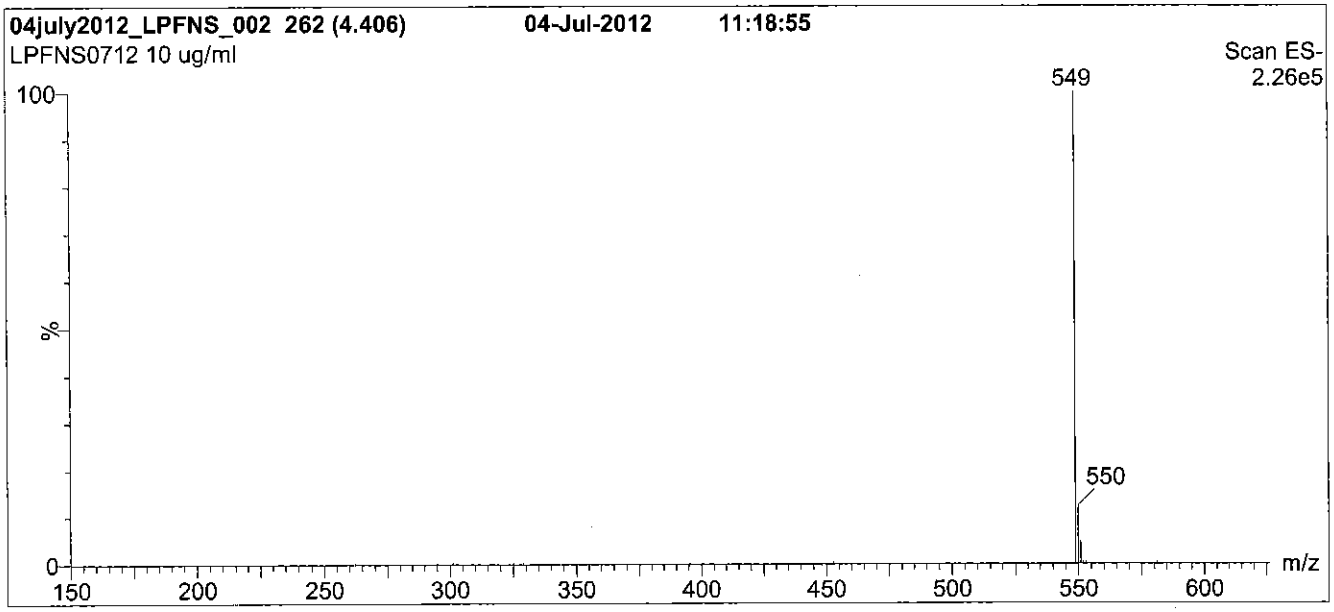
Figure 1: **L-PFNS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

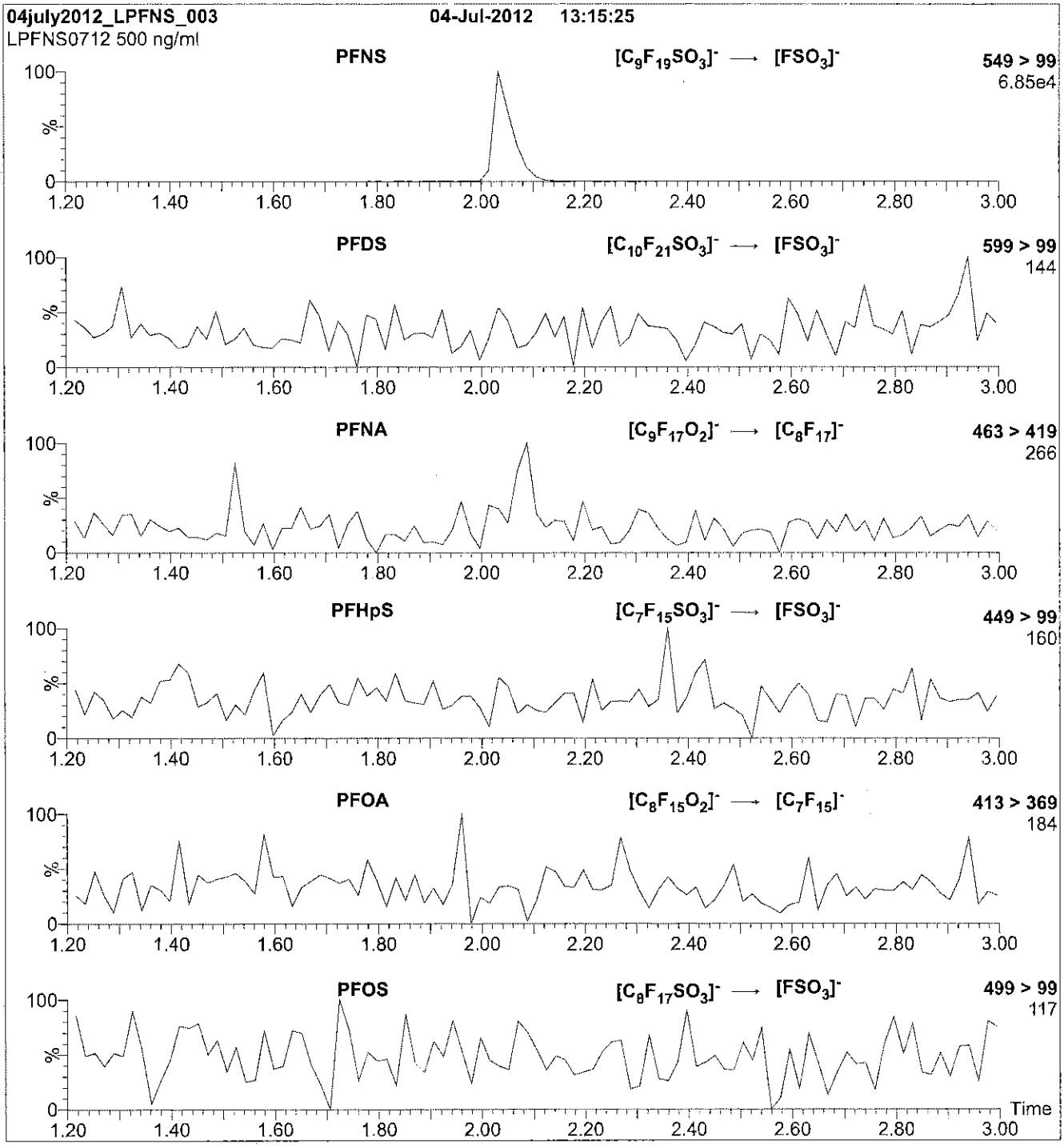
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 65.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **L-PFNS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFNS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 45

Reagent

LCPFOA_00005

Rec 4/30/15 CW

WELLINGTON LABORATORIES

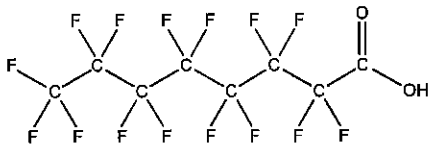
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFOA
COMPOUND: Perfluoro-n-octanoic acid

LOT NUMBER: PFOA1115

STRUCTURE:

CAS #: 335-67-1



MOLECULAR FORMULA: $C_8HF_{15}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 414.07
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/06/2015
EXPIRY DATE: (mm/dd/yyyy) 11/06/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 11/11/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

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HAZARDS:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034:2016 REFERENCE MATERIAL PRODUCER

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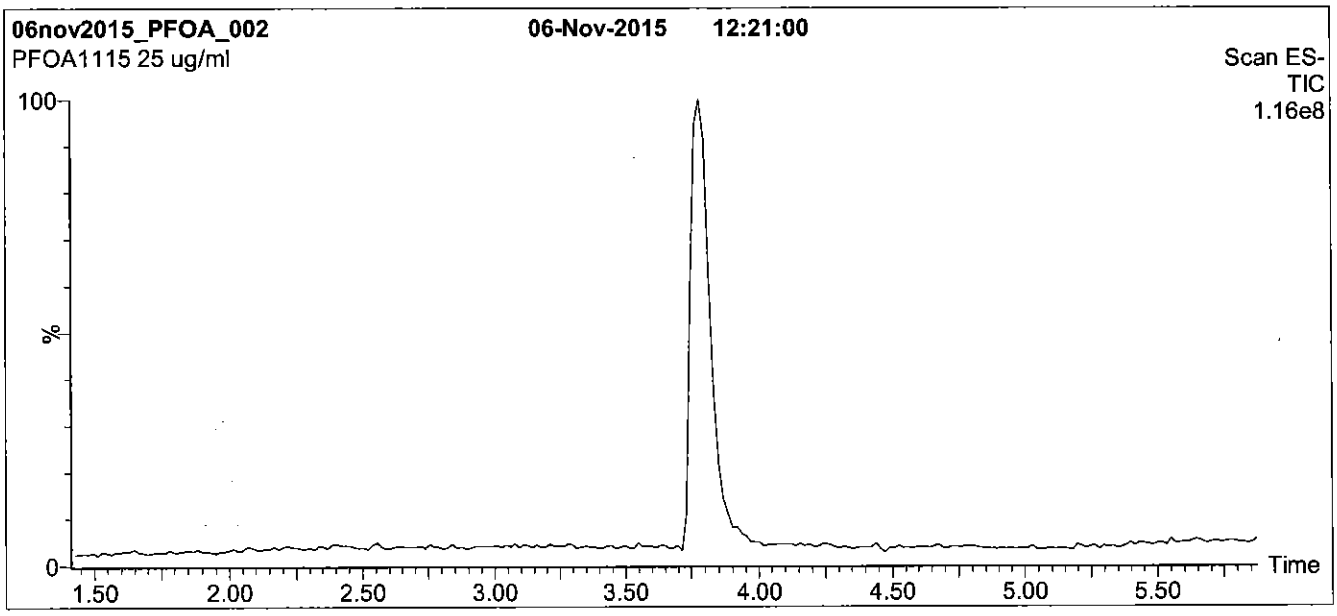
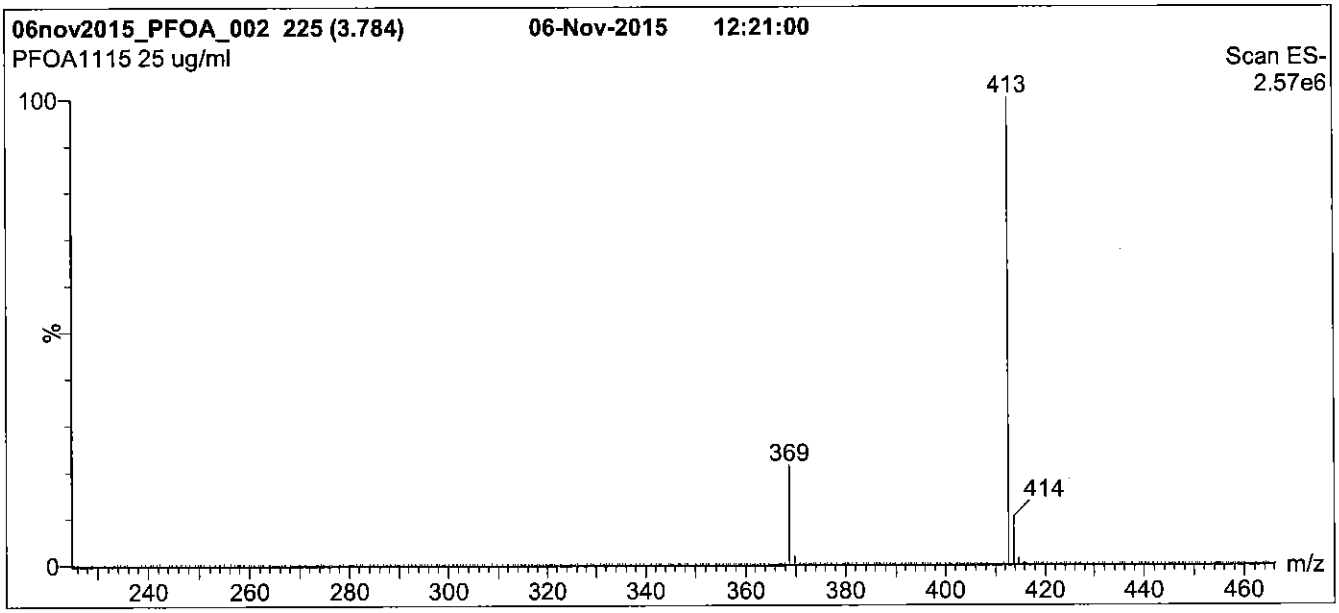
Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

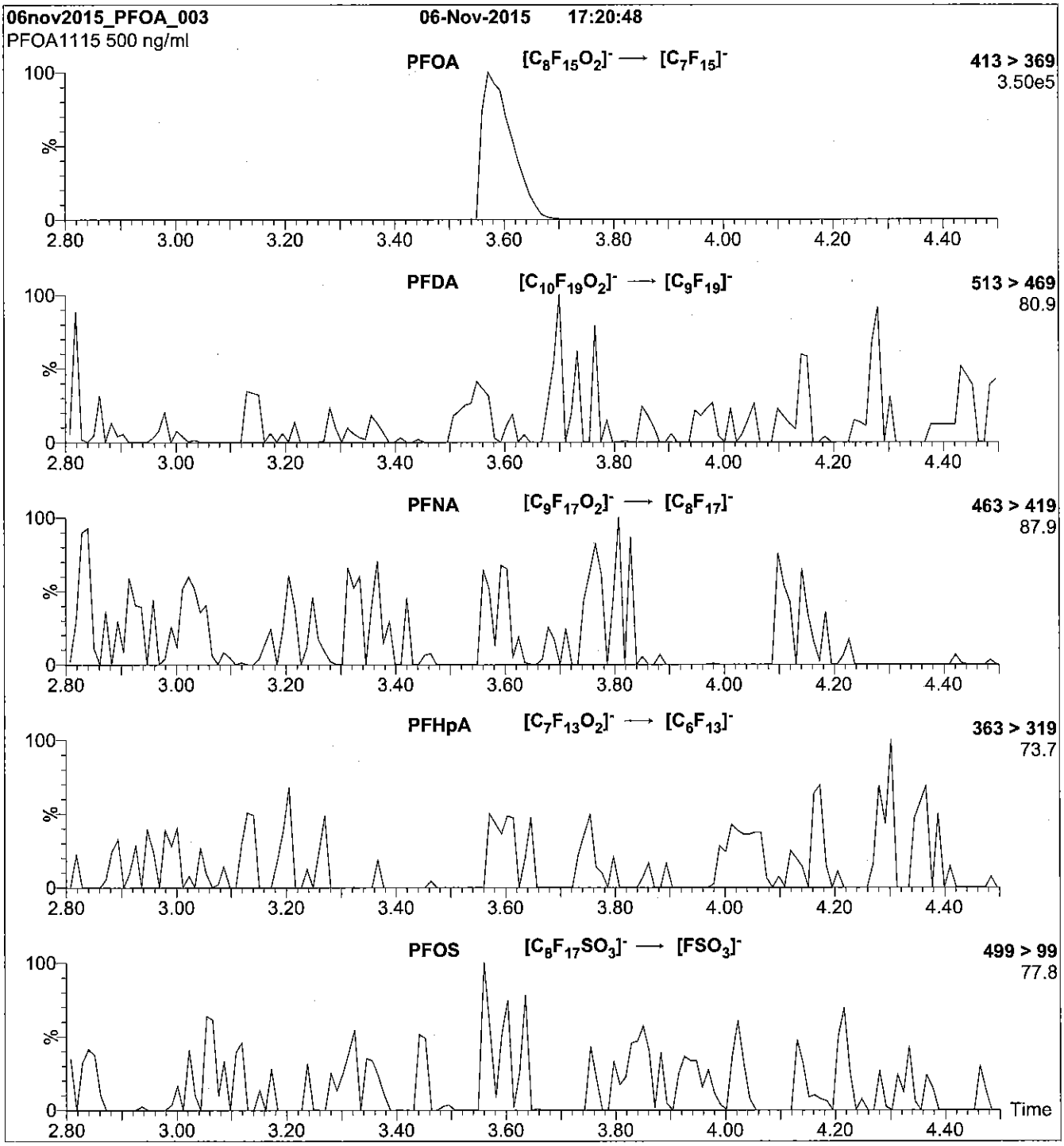
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFOA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 10

Reagent

LCPFODA_00005

Rec. 3/29/16 JRB

WELLINGTON LABORATORIES

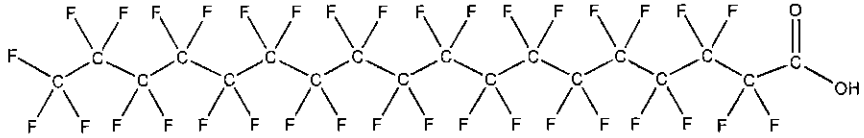
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFODA
COMPOUND: Perfluoro-n-octadecanoic acid

LOT NUMBER: PFODA0115

STRUCTURE:

CAS #: 16517-11-6



MOLECULAR FORMULA: $C_{18}HF_{35}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 914.14
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/30/2015
EXPIRY DATE: (mm/dd/yyyy) 01/30/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/25/2015 (mm/dd/yyyy)

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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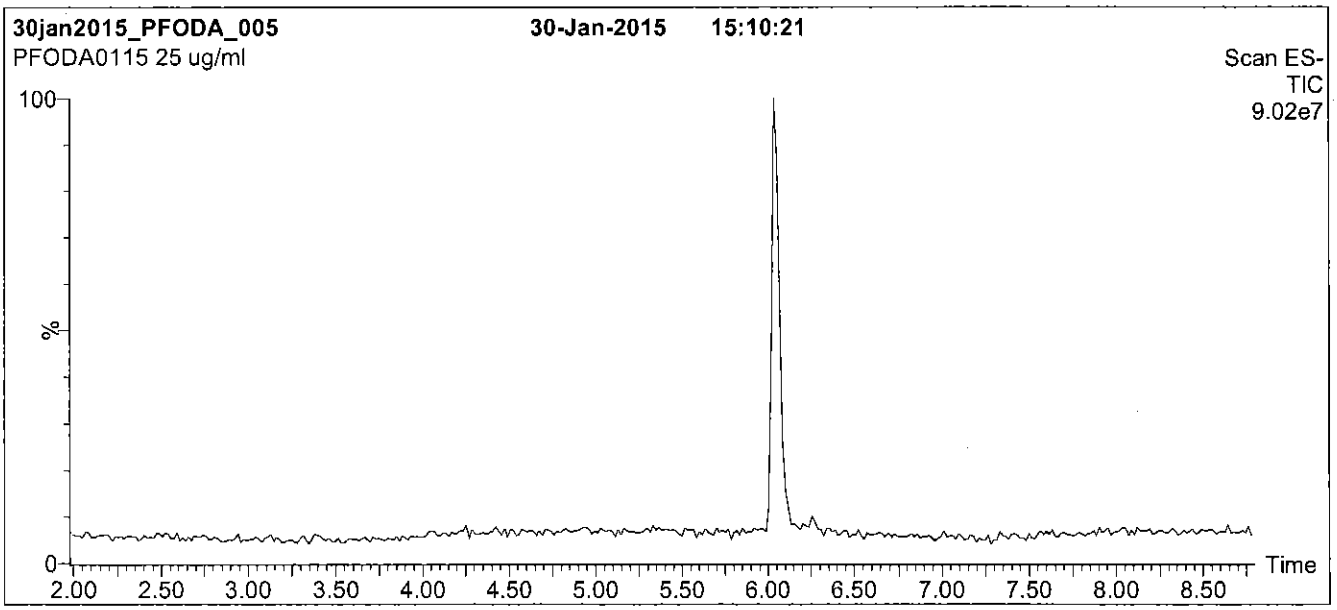
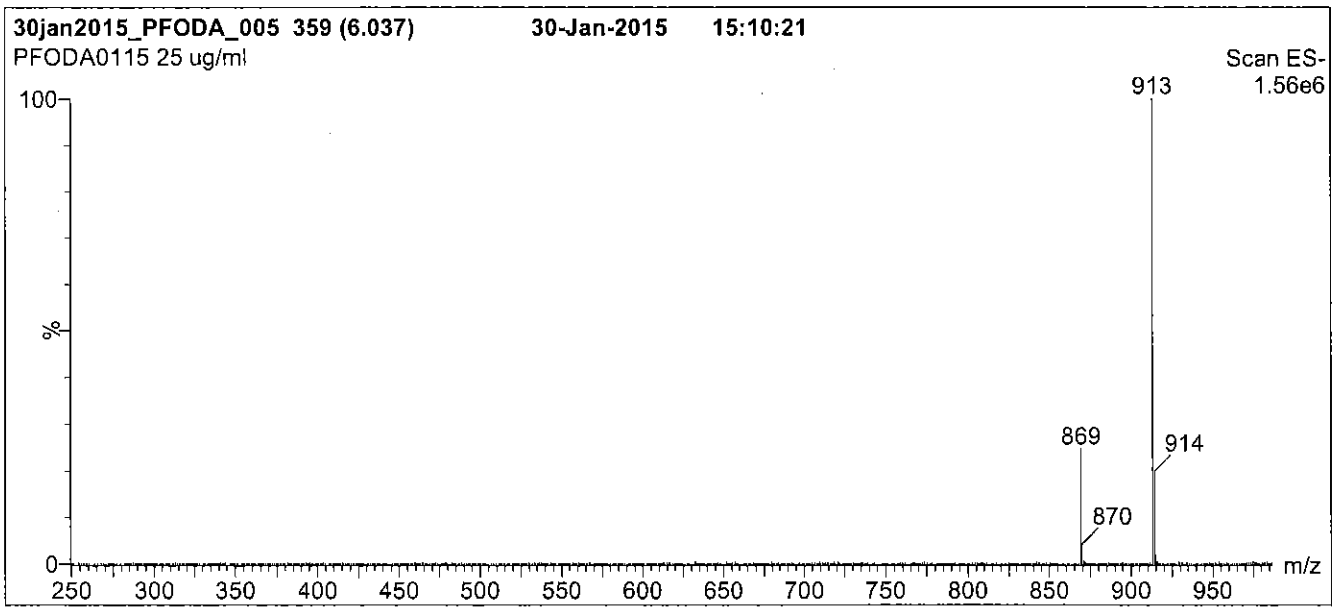
Figure 1: **PFODA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

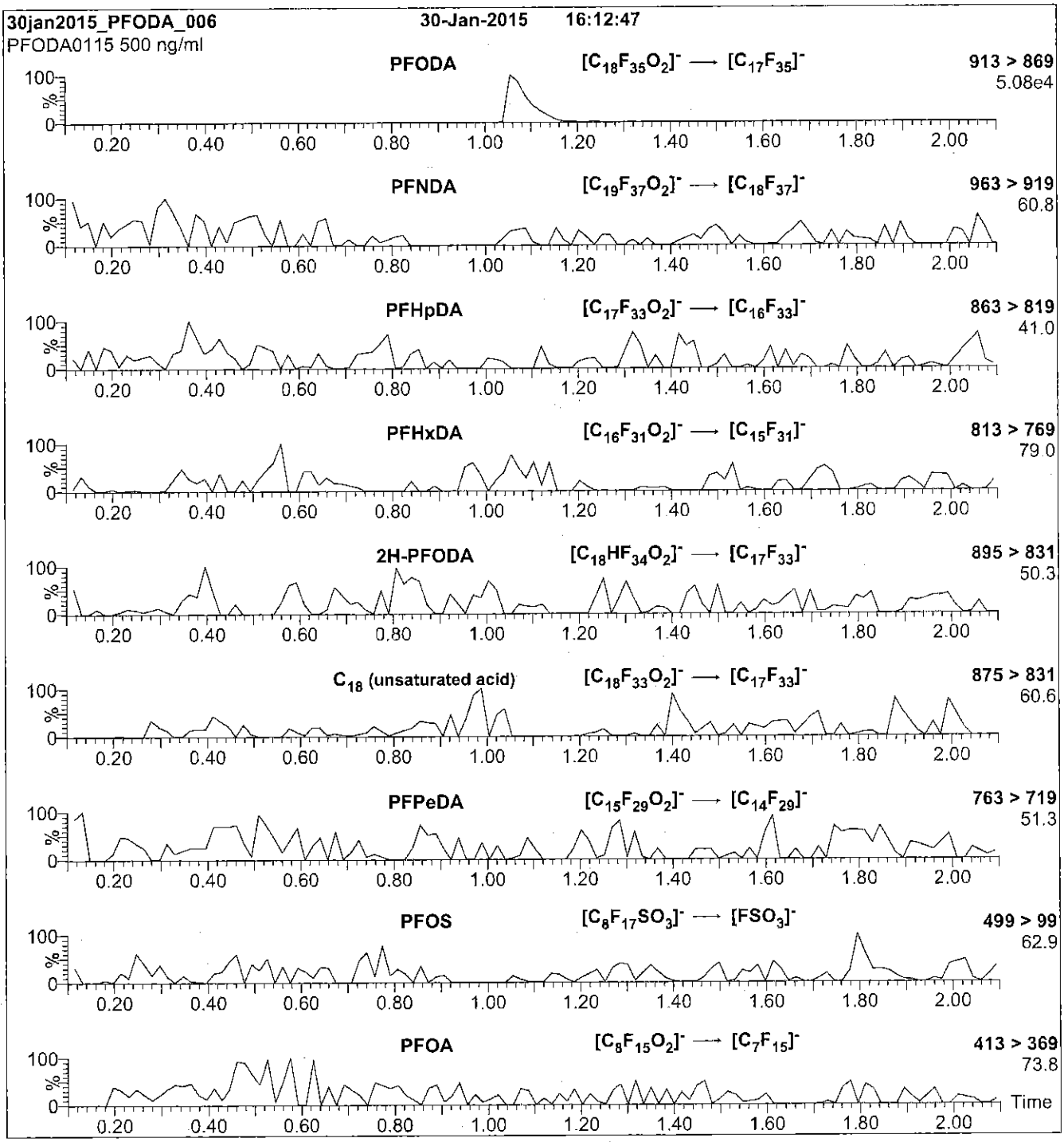
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1000 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFODA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFODA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 15

Reagent

LCPFOS-br_00001

566008
ID: LCPFOS-br_00001
Exp: 10/14/20 Pipd: CBW
Potassium Perfluorooctane

P: 12/9/15 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFOSK
LOT NUMBER:	brPFOSK1015
CONCENTRATION:	50 ± 2.5 µg/ml (total potassium salt)
	46.4 ± 2.3 µg/ml (total PFOS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	10/13/2015
LAST TESTED: (mm/dd/yyyy)	10/14/2015
EXPIRY DATE: (mm/dd/yyyy)	10/14/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorooctanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

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Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

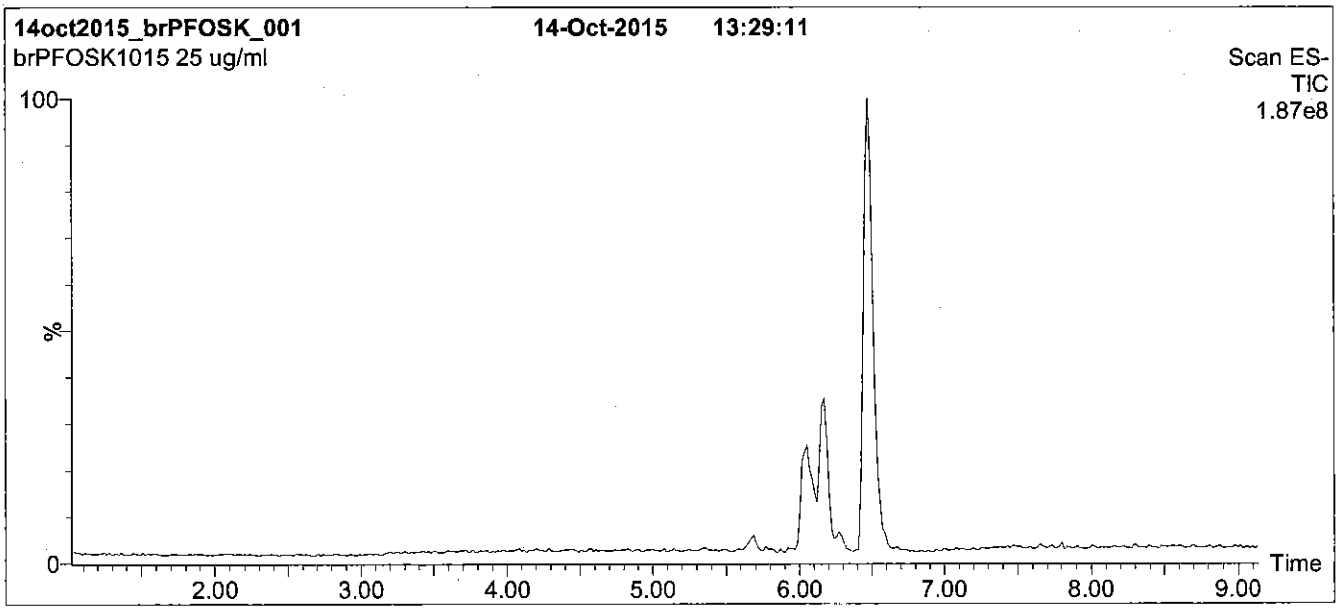
Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

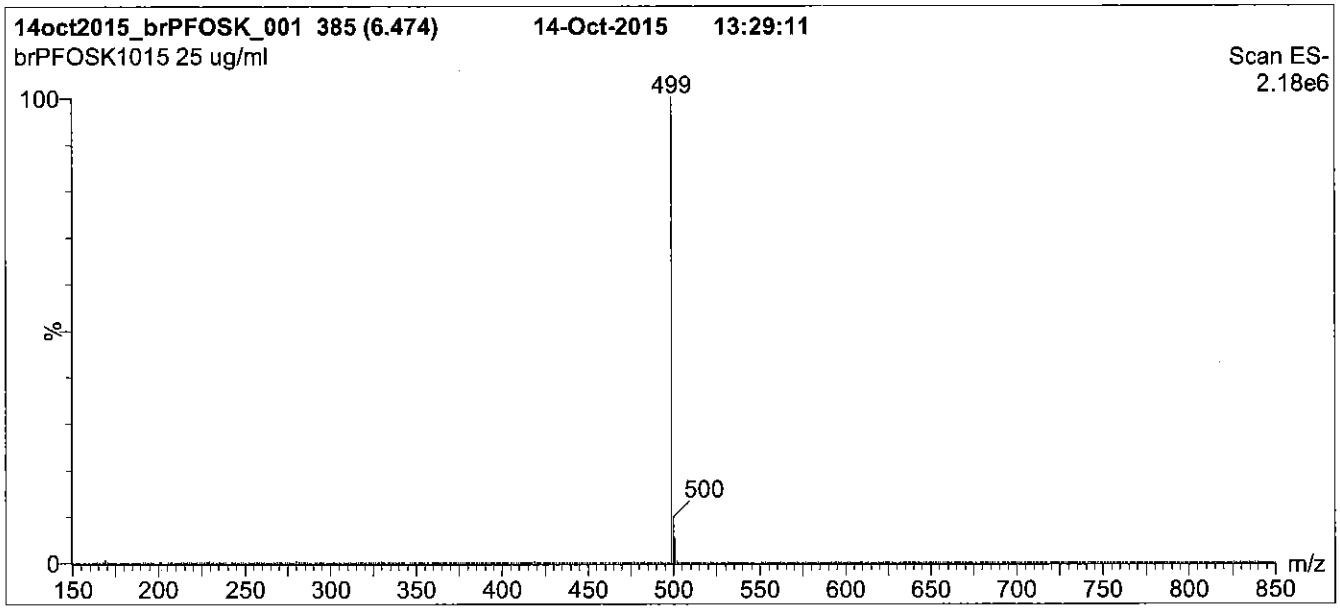
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-C(CF_3)_2CF_2CF_2CF_2SO_3^-K^+$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2-C(CF_3)_2-CF_2CF_2SO_3^-K^+$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF(CF_3)-CF_2CF_2CF_2SO_3^-K^+$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF_2-CF(CF_3)-CF_2CF_2SO_3^-K^+$	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: _____ **Date:** 10/15/2015
(mm/dd/yyyy)
B.G. Chittim

Figure 1: **br-PFOSK; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

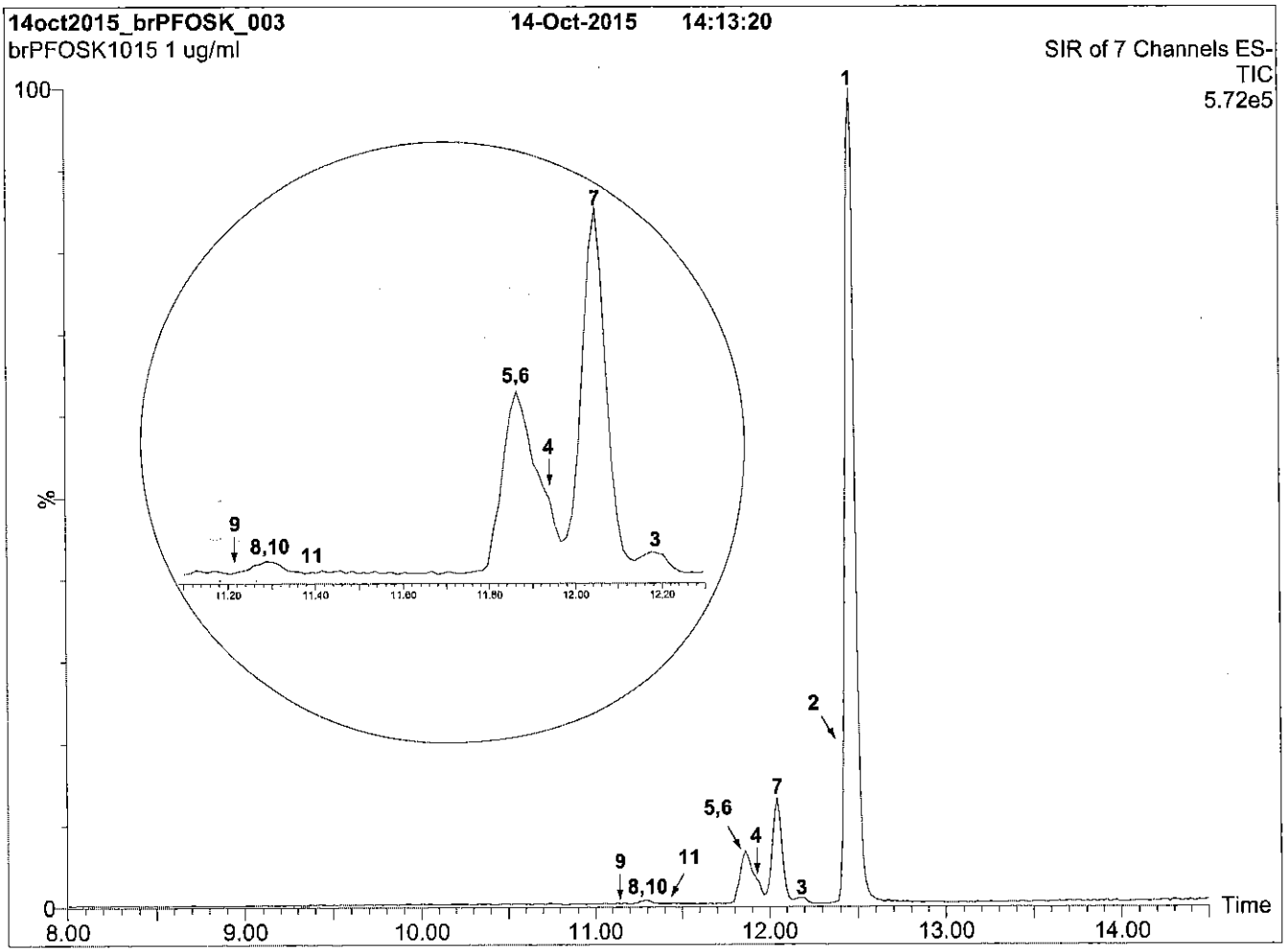
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-PFOSK; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP_{18} (1.7 µm, 2.1 x 100 mm)

Injection: 1.0 µg/ml of br-PFOSK

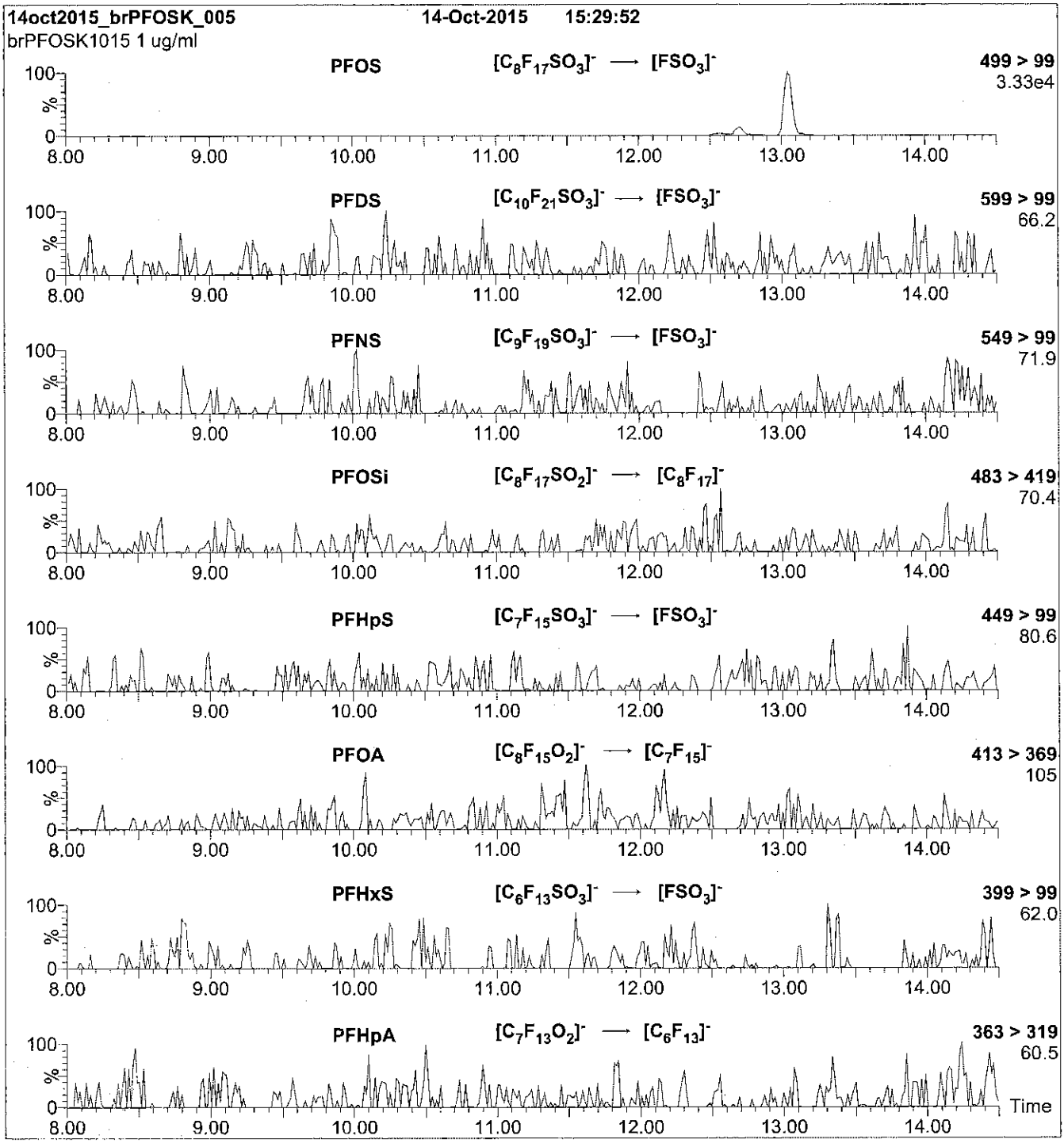
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

Flow: 300 µl/min

MS Conditions:

SIR (ES^-)
Source = 110 °C
Desolvation = 325 °C
Cone Voltage = 60V

Figure 3: **br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.06e-3
Collision Energy (eV) = 11-50 (variable)

Reagent

LCPFOSA_00006

Rec 12/30/15 CW

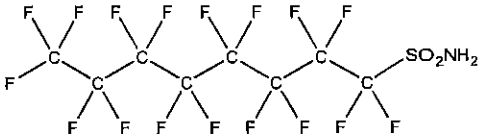
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: FOSA-I
COMPOUND: Perfluoro-1-octanesulfonamide
LOT NUMBER: FOSA0815I

STRUCTURE:

CAS #: 754-91-6



MOLECULAR FORMULA:	$C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	499.14
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/02/2015		
EXPIRY DATE: (mm/dd/yyyy)	09/02/2017		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: _____ **Date:** 09/11/2015
B.G. Chittim (mm/dd/yyyy)

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INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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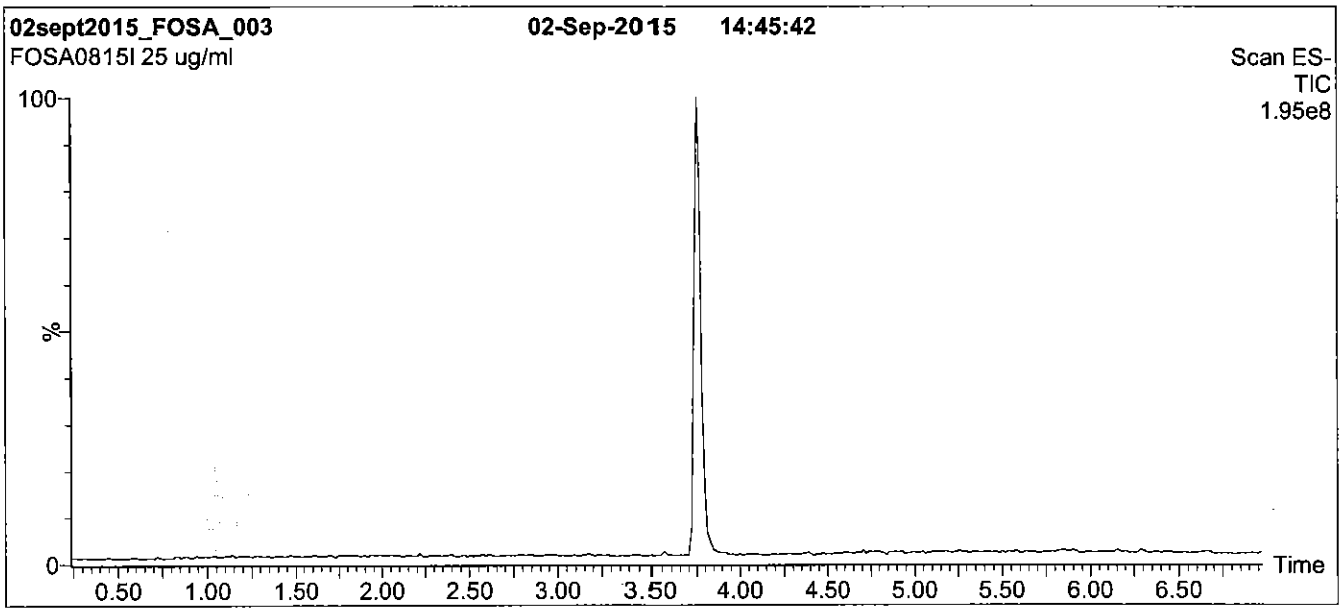
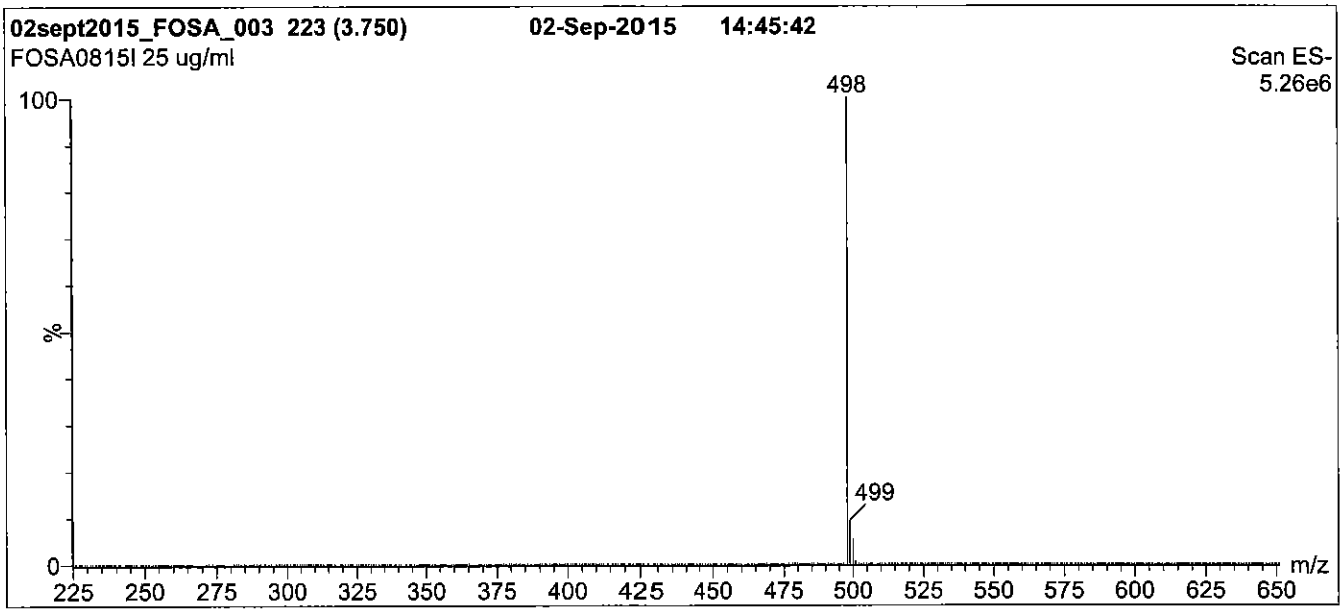
Figure 1: **FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

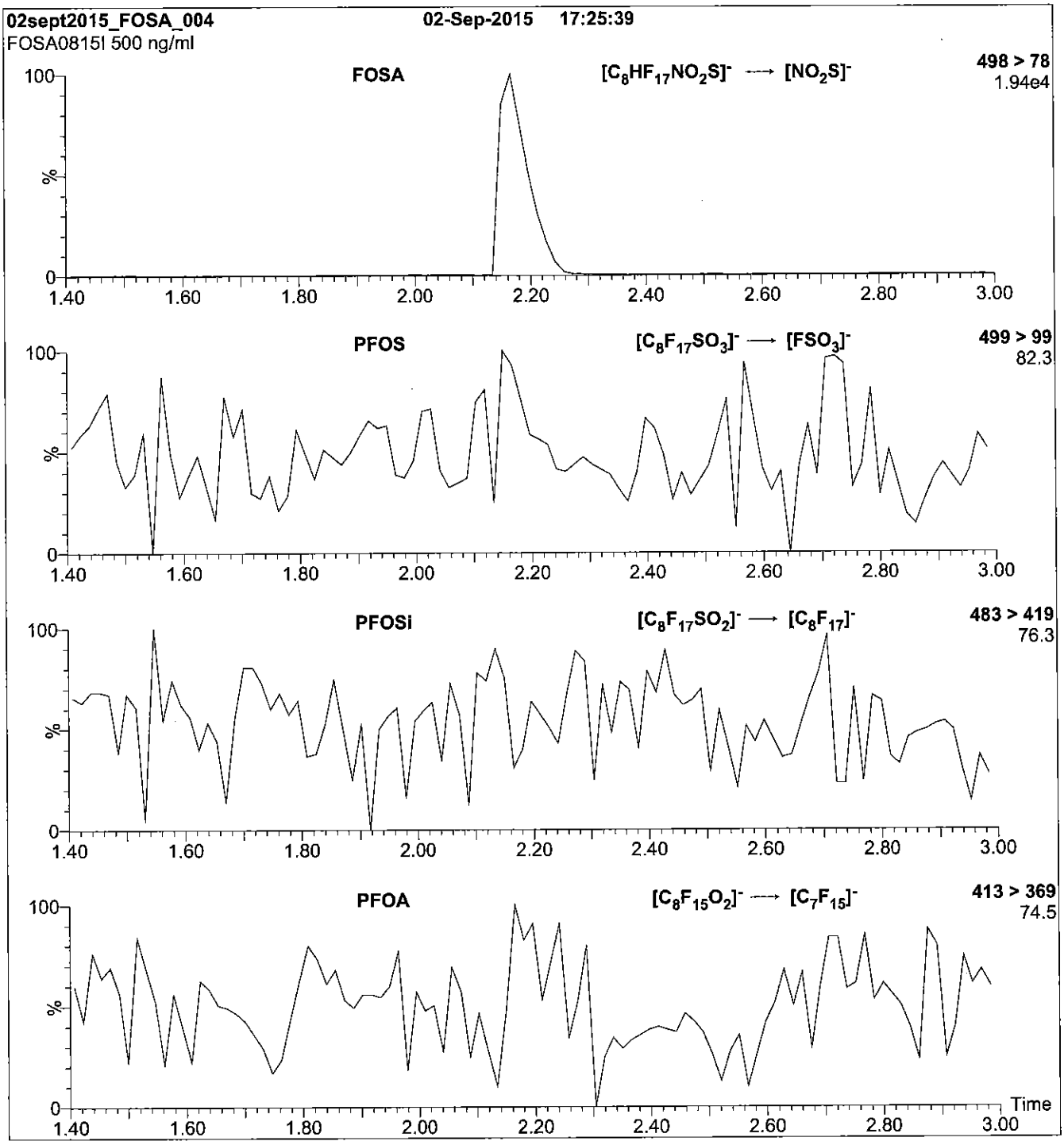
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 30

Reagent

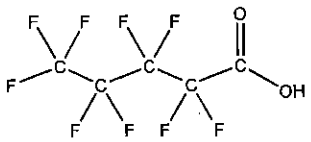
LCPFPeA_00004

Rec: 12/30/15 aw

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFPeA	**LOT NUMBER:**	PFPeA0115
COMPOUND:	Perfluoro-n-pentanoic acid		
STRUCTURE:		**CAS #:**	2706-90-3



MOLECULAR FORMULA:	$C_5HF_9O_2$	**MOLECULAR WEIGHT:**	264.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	01/30/2015		
EXPIRY DATE: (mm/dd/yyyy)	01/30/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of $C_5H_2F_8O_2$ (hydrido - derivative) as measured by ^{19}F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/26/2015 (mm/dd/yyyy)
B.G. Chittim

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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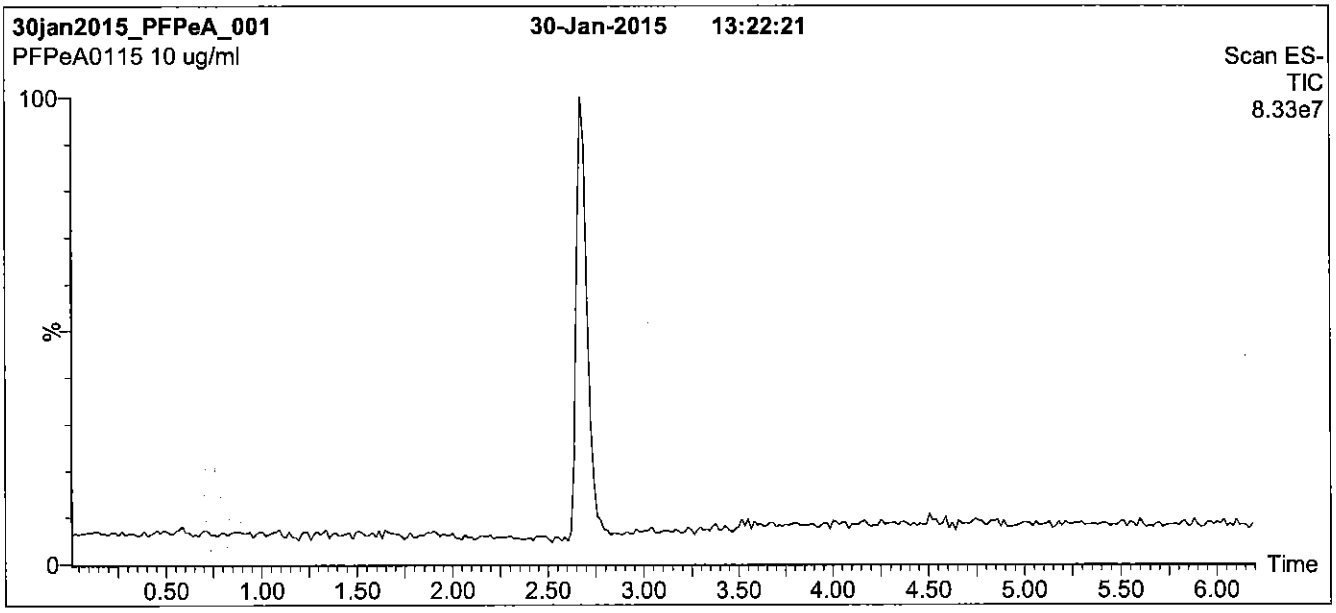
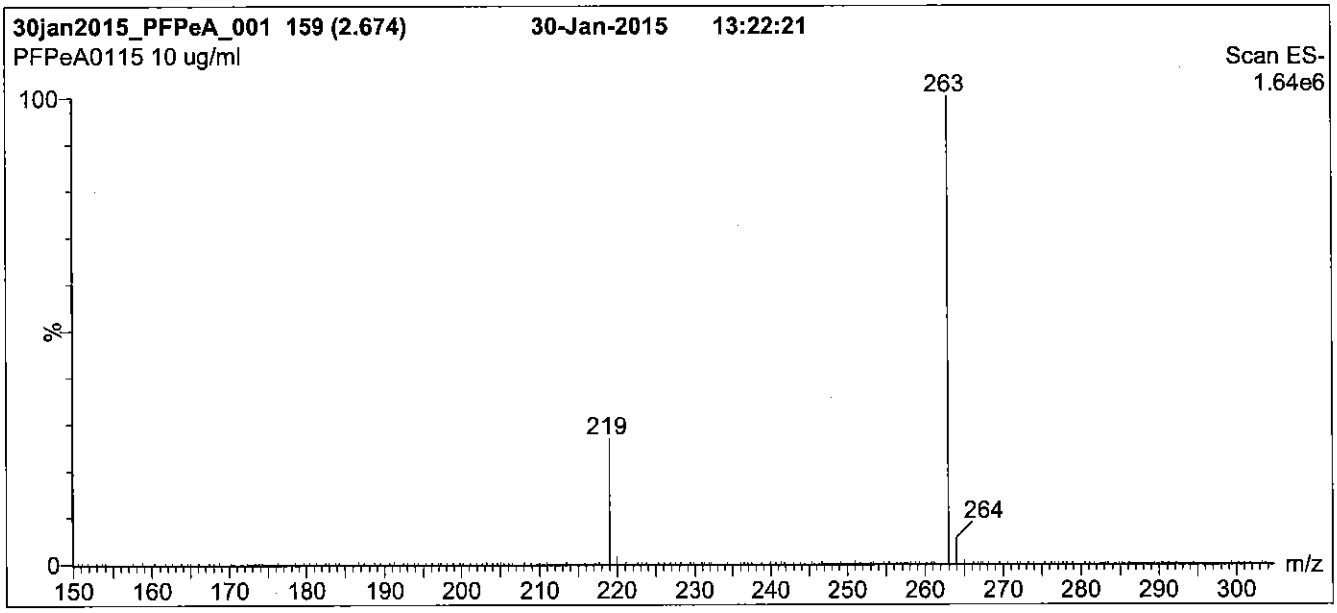
CALA Testing Accreditation No. 1226

ANAB ACCREDITED ISO 17025 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

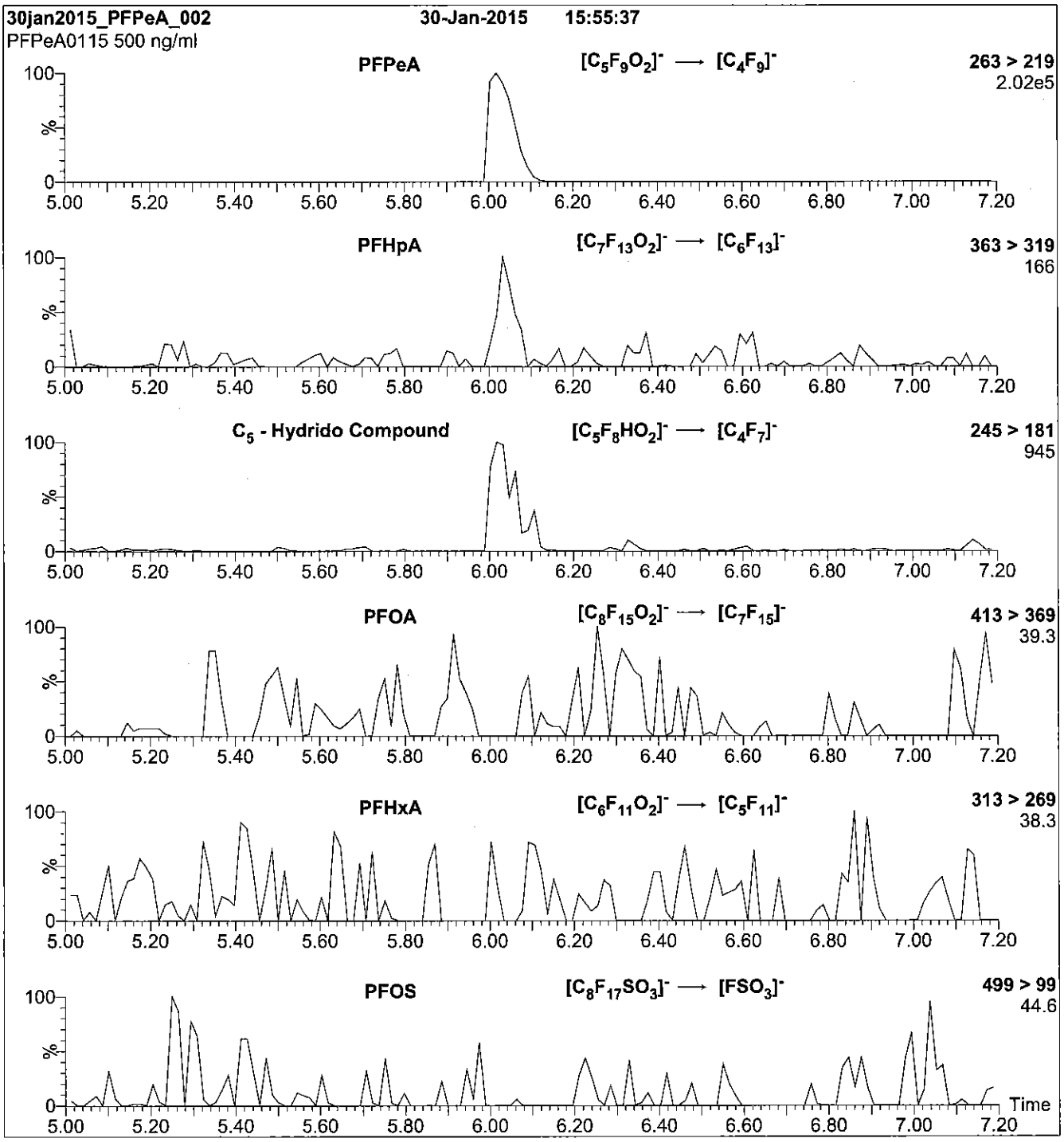
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 9

Reagent

LCPFPeS_00002

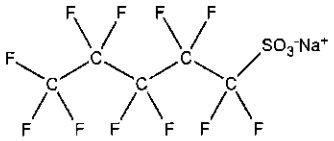
R 24hrs ow

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: L-PFPeS
COMPOUND: Sodium perfluoro-1-pentanesulfonate
LOT NUMBER: LPFPeS0712

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$C_5F_{11}SO_3Na$	**MOLECULAR WEIGHT:**	372.09
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 46.9 ± 2.3 µg/ml (PFPeS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/04/2012		
EXPIRY DATE: (mm/dd/yyyy)	07/04/2017		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 01/15/2013
B.G. Chittim (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Material Safety Data Sheets (MSDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product, unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, x-ray crystallography and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external, ISO/IEC 17025:2005 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration for the period of time specified by the expiry date in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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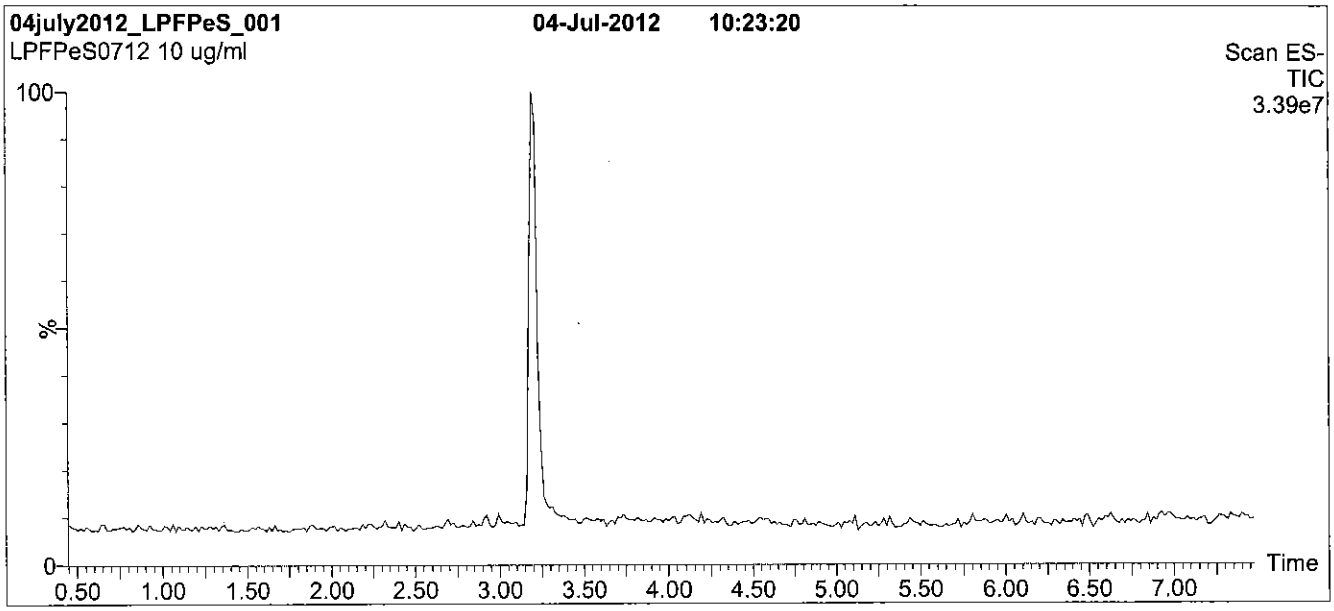
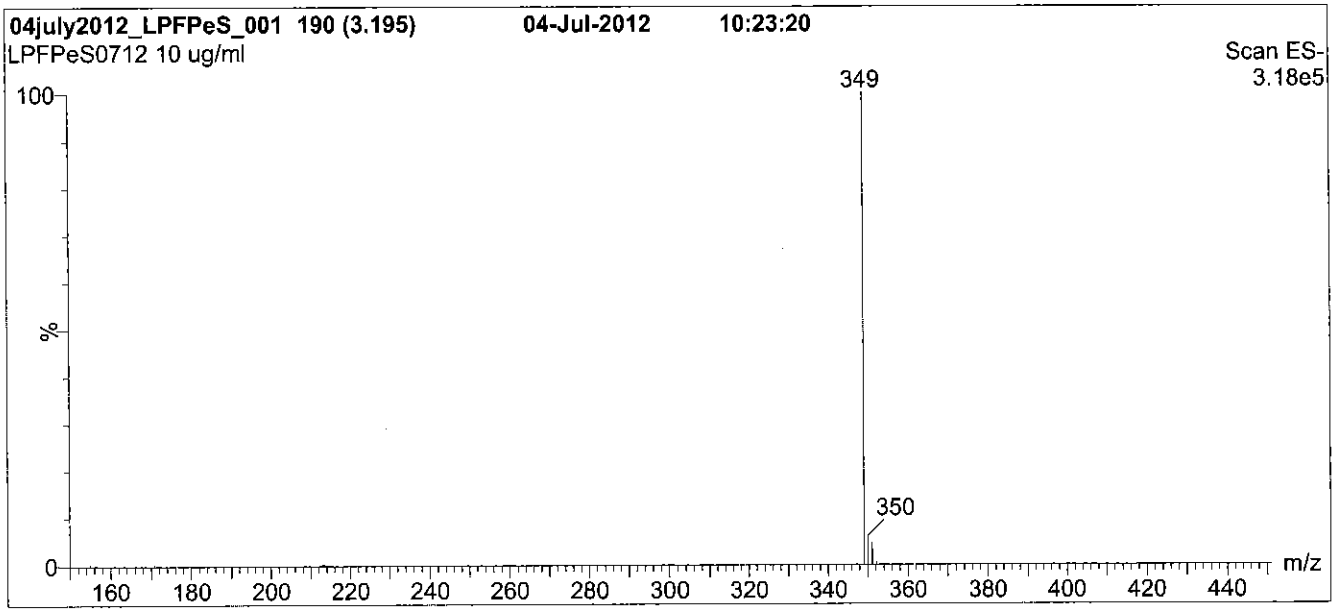
Figure 1: **L-PFPeS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions over 0.5 min.
Time: 10 min

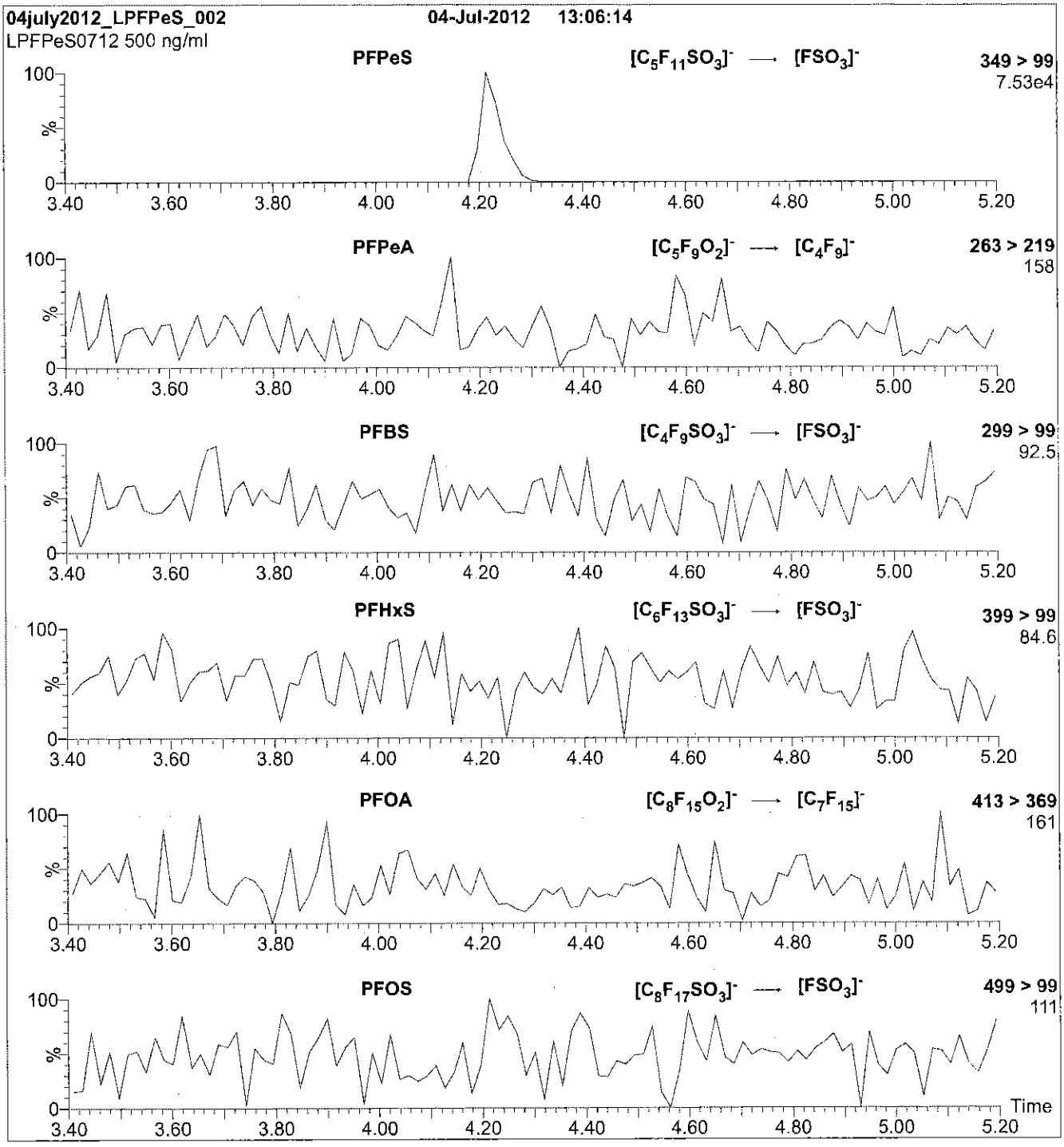
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **L-PFPeS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFPeS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 30

Reagent

LCPFTeDA_00004

609696
ID: LCPFTeDA_00004
Exp: 12/09/20 Prpd: CBW
PF-n-tetradecanoic acid

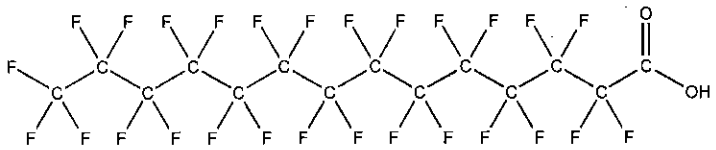
R: 4/7/16 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFTeDA
LOT NUMBER: PFTeDA1215
COMPOUND: Perfluoro-n-tetradecanoic acid

STRUCTURE:
CAS #: 376-06-7



MOLECULAR FORMULA: $C_{14}HF_{27}O_2$
MOLECULAR WEIGHT: 714.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/09/2015
EXPIRY DATE: (mm/dd/yyyy) 12/09/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFDoA ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/09/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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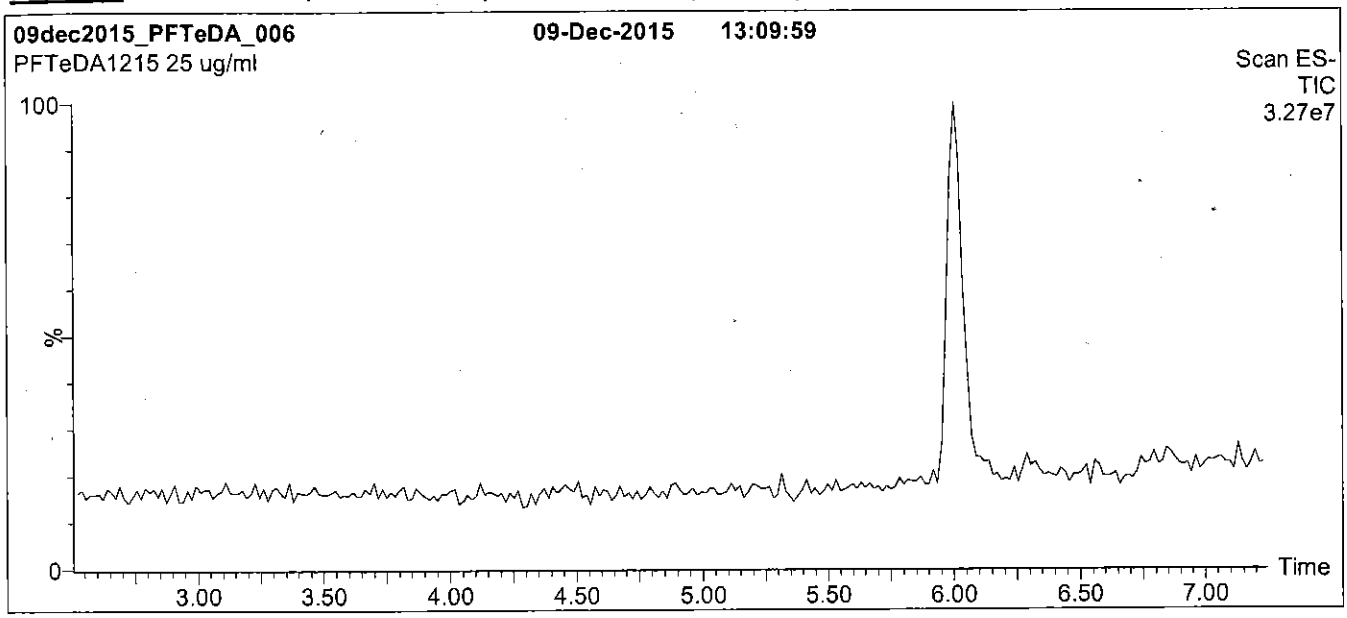
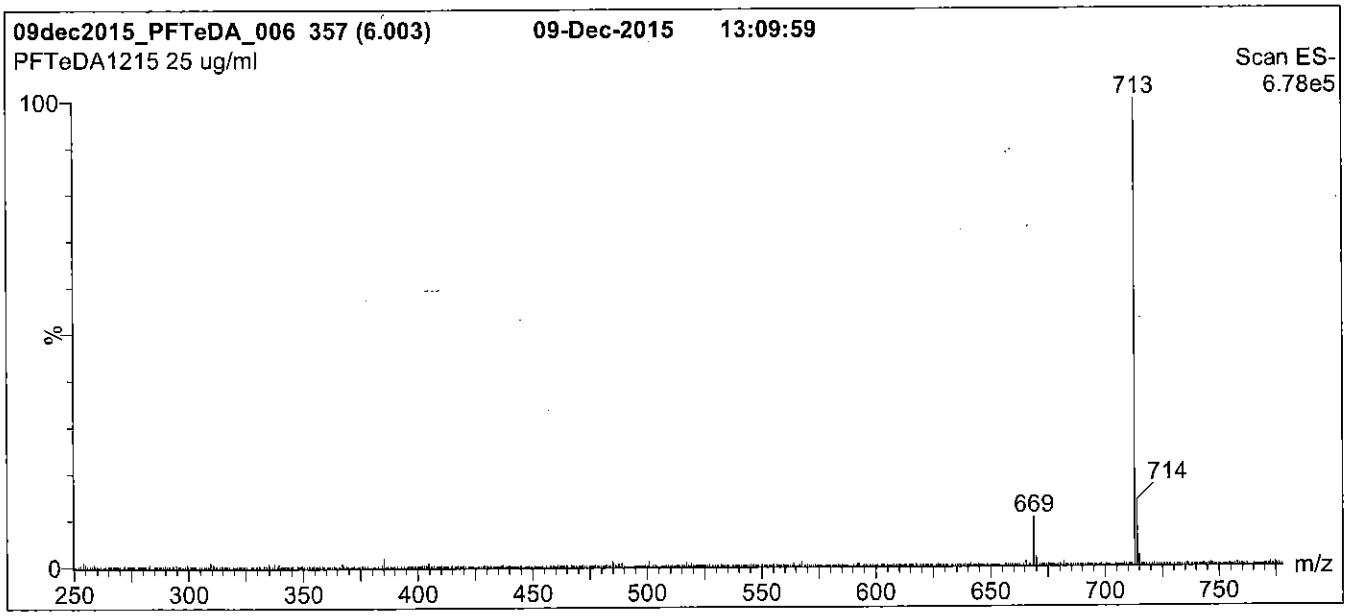
Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

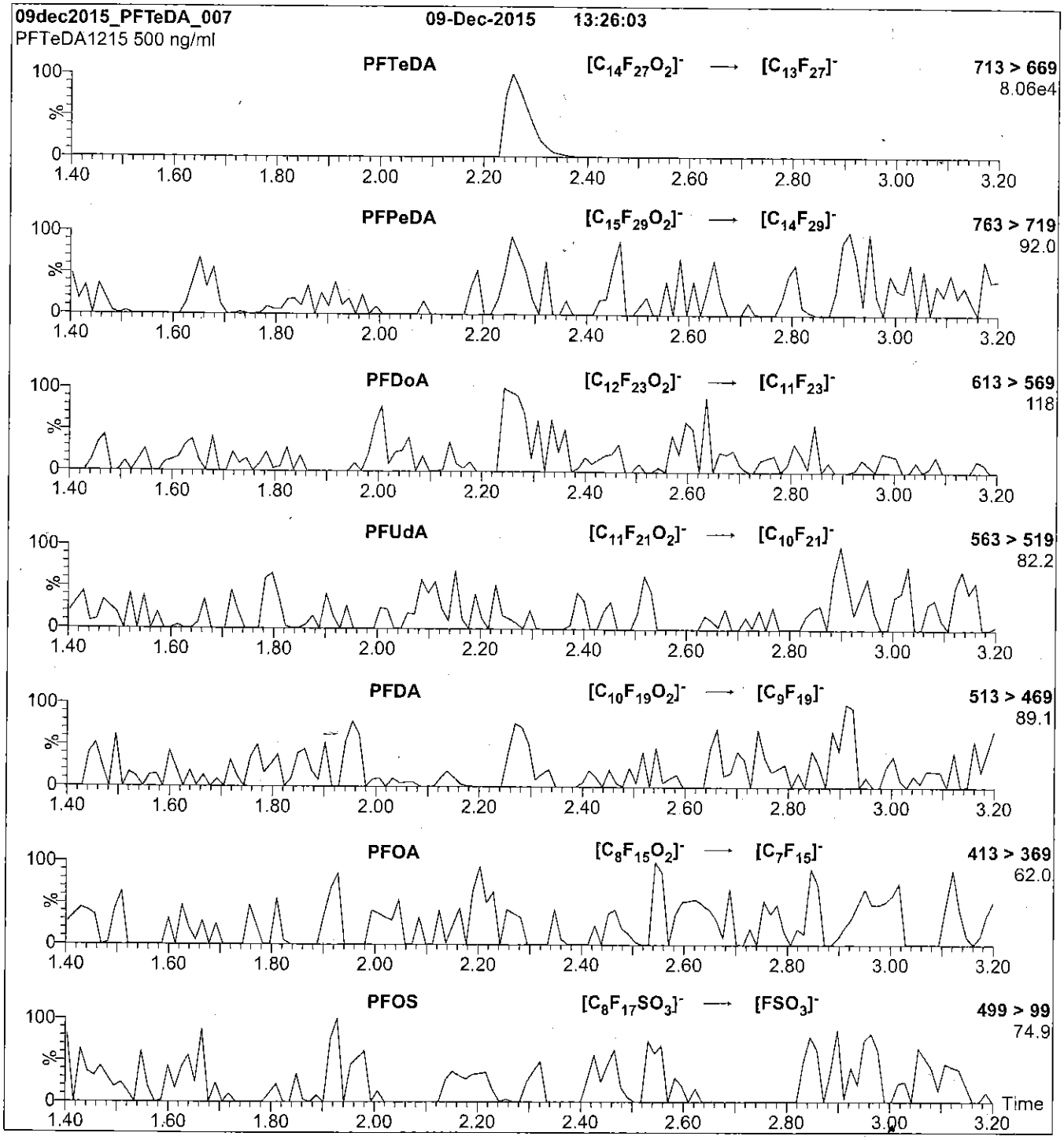
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 14

Reagent

LCPFTrDA_00004

609697
ID: LCPFTrDA_00004
Exp: 12/10/18 Prpd: CBW
PF-n-tridecanoic acid

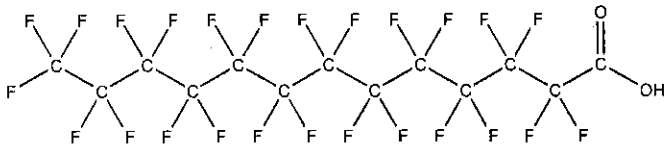
R: 4/7/16 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTrDA
LOT NUMBER: PFTrDA1213
COMPOUND: Perfluoro-n-tridecanoic acid

STRUCTURE:
CAS #: 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{25}O_2$
MOLECULAR WEIGHT: 664.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/10/2013
EXPIRY DATE: (mm/dd/yyyy) 12/10/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$); ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/25/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON 'N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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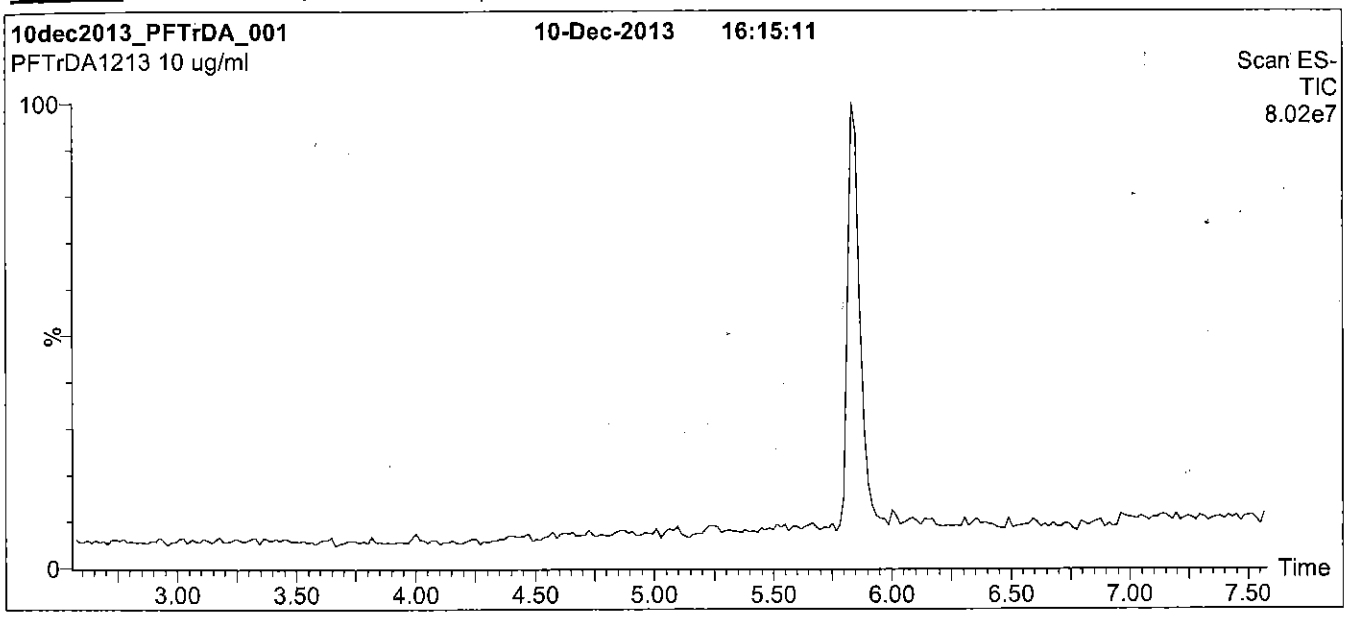
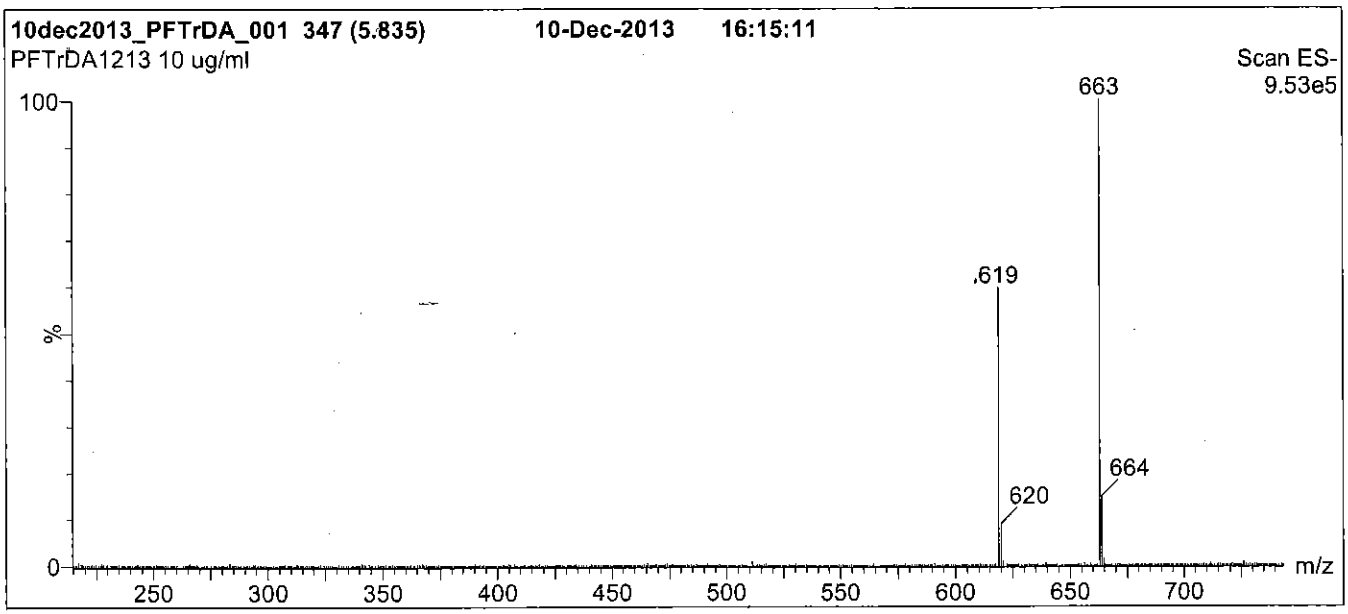
CALA Member Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFTrDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

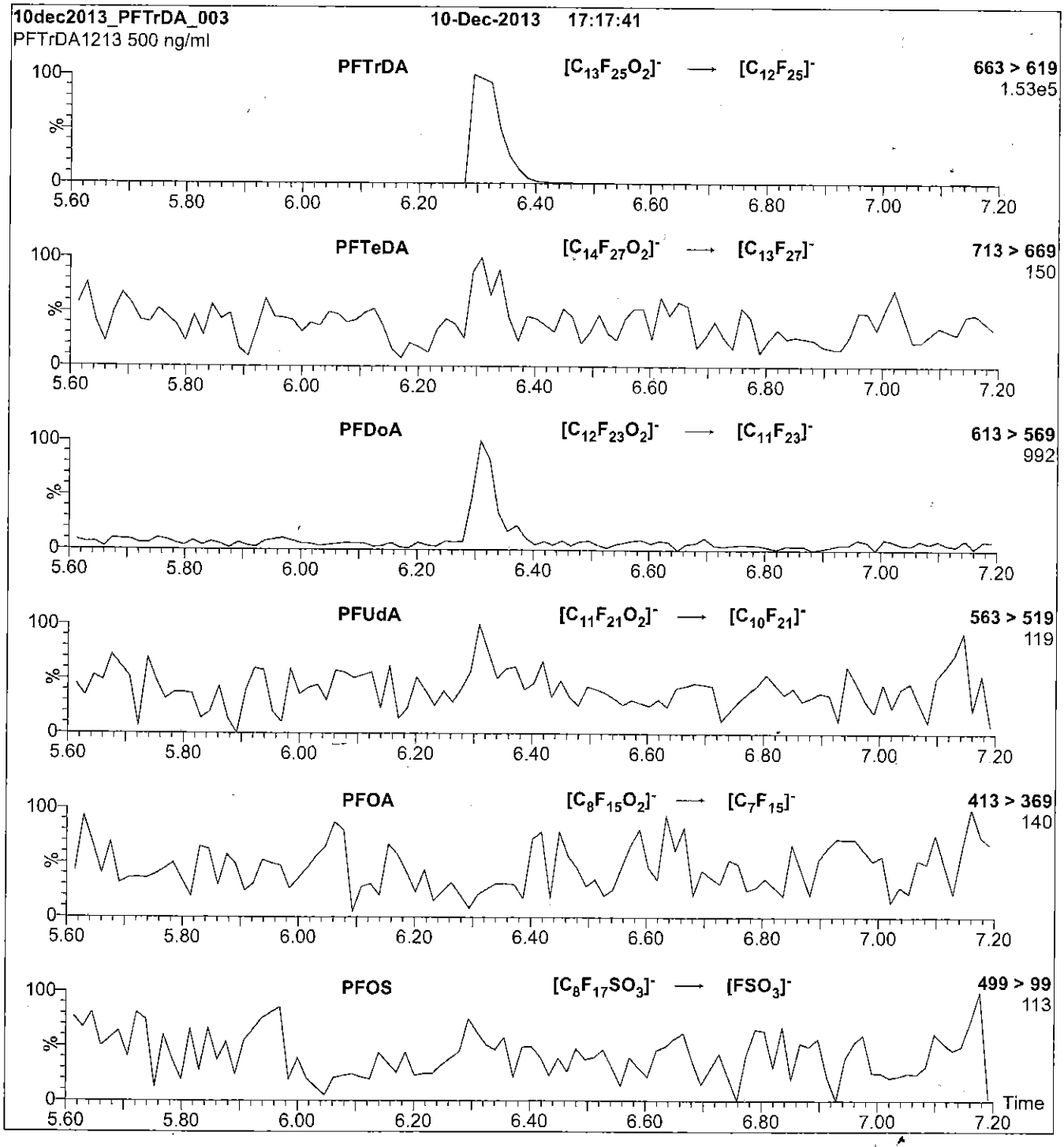
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (215 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 22.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

Figure 2: **PFTrDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 15

Reagent

LCPFUdA_00004

Rec. 3/29/16 JRB ✓

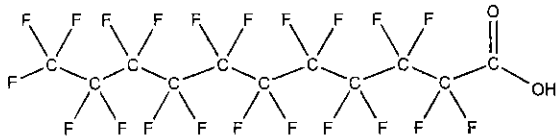
605242
ID: LCPFUdA_00004
Exp: 08/19/20 Prpd: CBW
PF-n-undecanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFUdA
LOT NUMBER: PFUdA0815
COMPOUND: Perfluoro-n-undecanoic acid

STRUCTURE:
CAS #: 2058-94-8



MOLECULAR FORMULA: $C_{11}HF_{21}O_2$
MOLECULAR WEIGHT: 564.09
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 08/19/2015
EXPIRY DATE: (mm/dd/yyyy) 08/19/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 08/21/2015 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

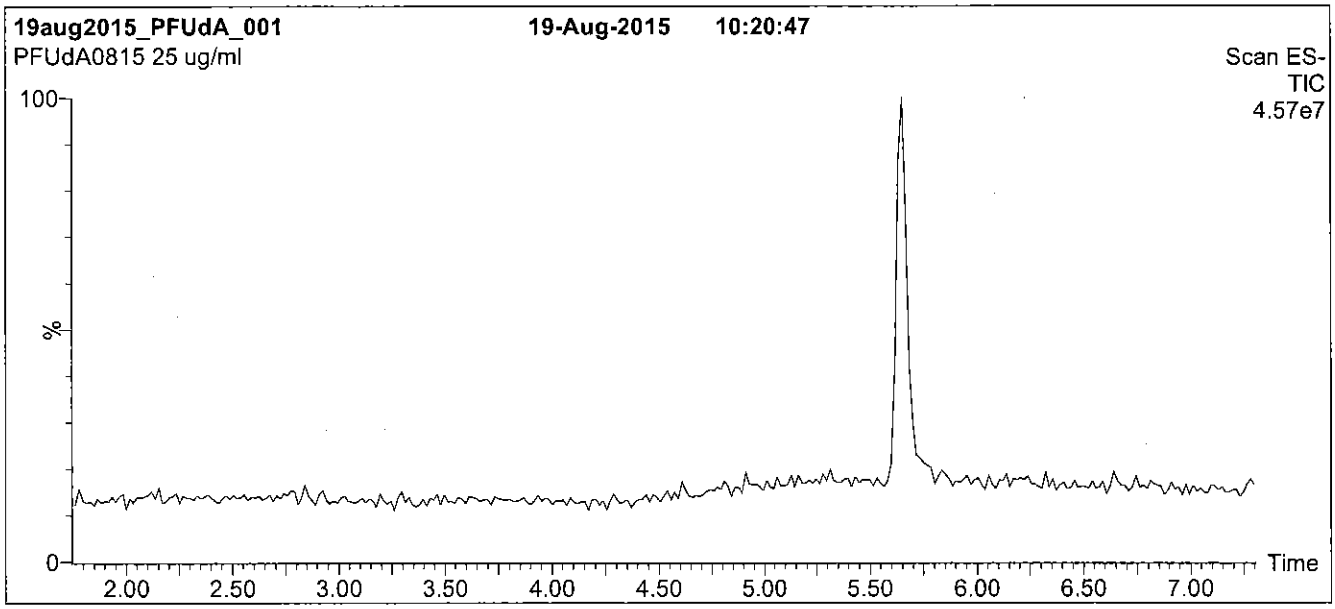
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

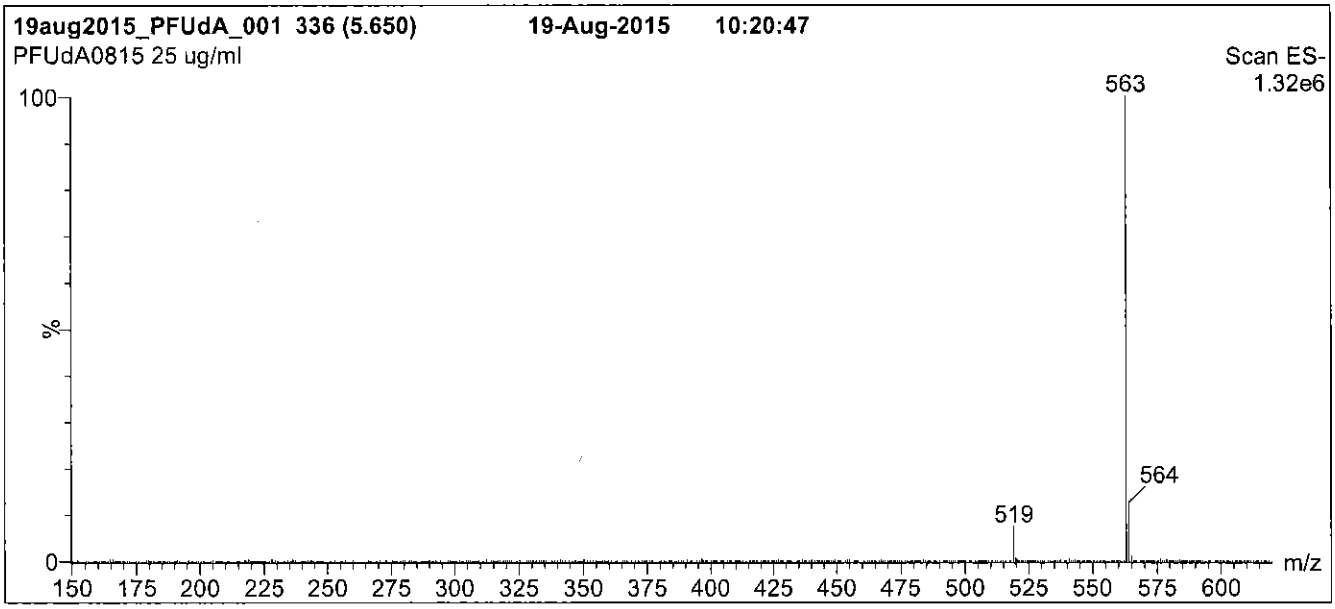
CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

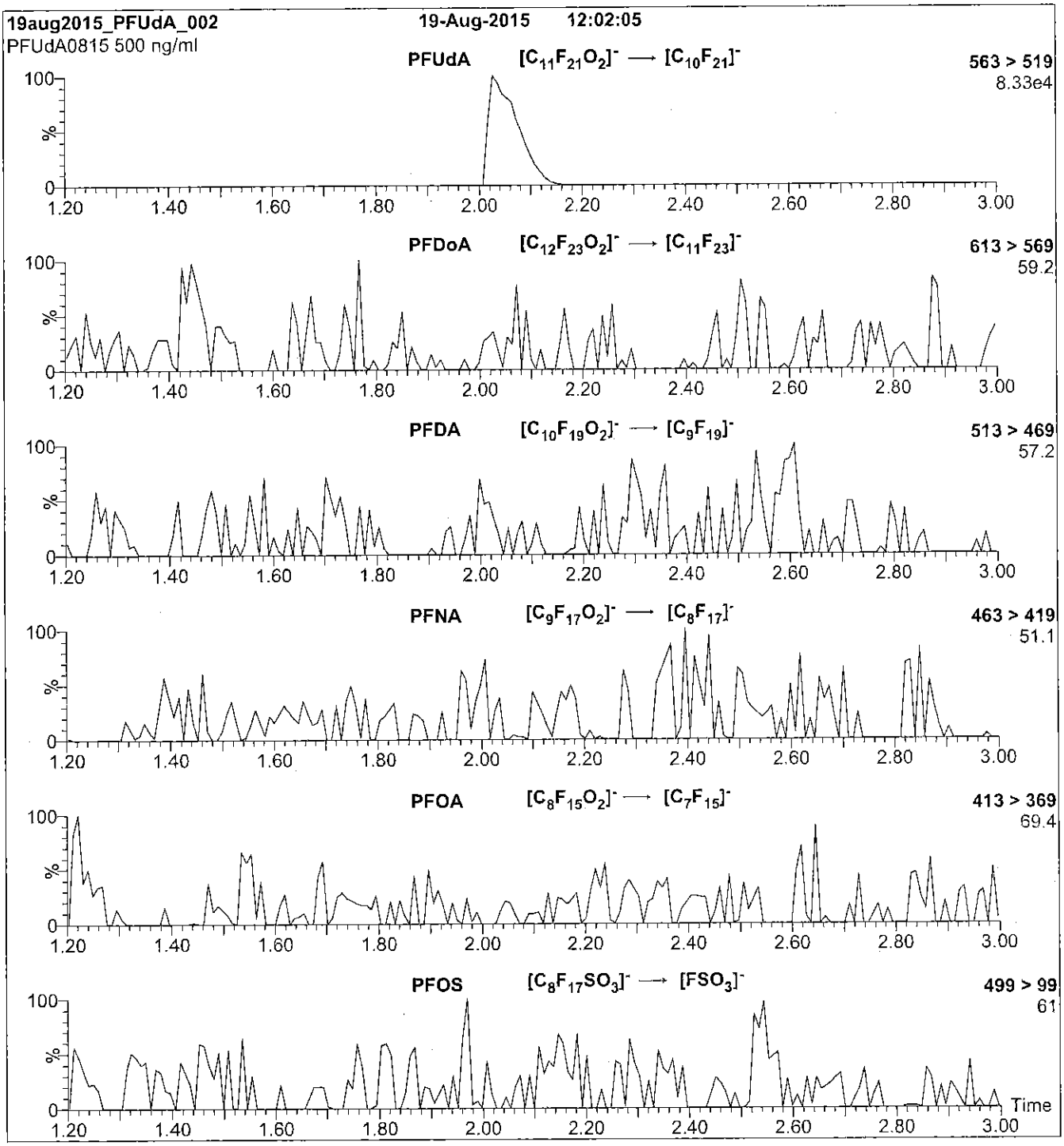
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 11

Method PFC DOD

Perfluronated Hydrocarbons (LC/MS) by Method PFC_DOD

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFHxA #	13CHpA #	PFHxS #	PFOA #	PFOS #	PFNA #
DW-57	320-19198-1	87	80	128	70	112	51
FB-DW-57	320-19198-2	112	113	120	123	121	117
DW-95	320-19198-3	94	88	120	59	99	35
FB-DW-95	320-19198-4	108	109	115	123	117	112
DUP-052616	320-19198-5	80	77	116	57	98	46
	MB 320-112069/1-A	107	116	116	116	112	117
	LCS 320-112069/2-A	108	111	115	116	117	104
DW-57 MS	320-19198-1 MS	79	72	117	61	102	49
DW-57 MSD	320-19198-1 MSD	83	79	121	69	107	55

	QC LIMITS
PFHxA = 13C2 PFHxA	25-150
13CHpA = 13C4-PFHpA	25-150
PFHxS = 18O2 PFHxS	25-150
PFOA = 13C4 PFOA	25-150
PFOS = 13C4 PFOS	25-150
PFNA = 13C5 PFNA	25-150

Column to be used to flag recovery values

FORM II WS-LC-0025

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 03JUN2016A6A_016.d

Lab ID: LCS 320-112069/2-A Client ID:

COMPOUND	SPIKE ADDED (ng/L)	LCS CONCENTRATION (ng/L)	LCS % REC	QC LIMITS REC	#
13C2 PFHxA	100	108	108	25-150	
13C4 PFOA	100	116	116	25-150	
13C4 PFOS	95.6	112	117	25-150	
13C4-PFHpA	100	111	111	25-150	
13C5 PFNA	100	104	104	25-150	
18O2 PFHxS	94.6	109	115	25-150	
Perfluorobutanesulfonic acid (PFBS)	35.4	35.9	101	50-150	
Perfluoroheptanoic acid (PFHpA)	40.0	44.8	112	60-140	
Perfluorohexanesulfonic acid (PFHxS)	36.4	37.5	103	60-140	M
Perfluorononanoic acid (PFNA)	40.0	45.3	113	60-140	
Perfluorooctanesulfonic acid (PFOS)	37.1	38.5	104	60-140	M
Perfluorooctanoic acid (PFOA)	40.0	39.7	99	60-140	

Column to be used to flag recovery and RPD values

FORM III WS-LC-0025

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 03JUN2016A6A_018.d

Lab ID: 320-19198-1 MS Client ID: DW-57 MS

COMPOUND	SPIKE ADDED (ng/L)	SAMPLE CONCENTRATION (ng/L)	MS CONCENTRATION (ng/L)	MS % REC	QC LIMITS REC	#
13C2 PFHxA	93.9	83	73.8	79	25-150	
13C4 PFOA	93.9	66	57.7	61	25-150	
13C4 PFOS	89.8	100	92.0	102	25-150	
13C4-PFHpA	93.9	76	67.9	72	25-150	
13C5 PFNA	93.9	48	46.3	49	25-150	
18O2 PFHxS	88.9	120	104	117	25-150	
Perfluorobutanesulfonic acid (PFBS)	33.2	2.9	34.8	96	50-150	
Perfluoroheptanoic acid (PFHpA)	37.6	4.5	45.1	108	60-140	
Perfluorohexanesulfonic acid (PFHxS)	34.2	35	72.4	110	60-140	M
Perfluorononanoic acid (PFNA)	37.6	2.0 J	44.0	112	60-140	
Perfluorooctanesulfonic acid (PFOS)	34.9	150	189	120	60-140	M 4
Perfluorooctanoic acid (PFOA)	37.6	17	59.6	113	60-140	M

Column to be used to flag recovery and RPD values

FORM III WS-LC-0025

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 03JUN2016A6A_019.d

Lab ID: 320-19198-1 MSD Client ID: DW-57 MSD

COMPOUND	SPIKE ADDED (ng/L)	MSD CONCENTRATION (ng/L)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
13C2 PFHxA	95.1	78.8	83			25-150	
13C4 PFOA	95.1	65.7	69			25-150	
13C4 PFOS	90.9	96.9	107			25-150	
13C4-PFHpA	95.1	75.0	79			25-150	
13C5 PFNA	95.1	52.0	55			25-150	
18O2 PFHxS	90.0	109	121			25-150	
Perfluorobutanesulfonic acid (PFBS)	33.6	38.0	104	9	30	50-150	
Perfluoroheptanoic acid (PFHpA)	38.0	46.4	110	3	30	60-140	
Perfluorohexanesulfonic acid (PFHxS)	34.6	73.8	113	2	30	60-140	M
Perfluorononanoic acid (PFNA)	38.0	41.9	105	5	30	60-140	
Perfluorooctanesulfonic acid (PFOS)	35.3	198	142	4	30	60-140	M 4
Perfluorooctanoic acid (PFOA)	38.0	54.8	99	9	30	60-140	M

Column to be used to flag recovery and RPD values

FORM III WS-LC-0025

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Lab File ID: 03JUN2016A6A_015.d Lab Sample ID: MB 320-112069/1-A

Matrix: Water Date Extracted: 06/01/2016 11:06

Instrument ID: A6 Date Analyzed: 06/03/2016 21:26

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-112069/2-A	03JUN2016A6A_016.d	06/03/2016 21:48
DW-57	320-19198-1	03JUN2016A6A_017.d	06/03/2016 22:09
DW-57 MS	320-19198-1 MS	03JUN2016A6A_018.d	06/03/2016 22:30
DW-57 MSD	320-19198-1 MSD	03JUN2016A6A_019.d	06/03/2016 22:51
FB-DW-57	320-19198-2	03JUN2016A6A_020.d	06/03/2016 23:13
DW-95	320-19198-3	03JUN2016A6A_021.d	06/03/2016 23:34
FB-DW-95	320-19198-4	03JUN2016A6A_022.d	06/03/2016 23:55
DUP-052616	320-19198-5	03JUN2016A6A_023.d	06/04/2016 00:17

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-19198-1

SDG No.:

Client Sample ID: DW-57 | Lab Sample ID: 320-19198-1

Matrix: Water | Lab File ID: 03JUN2016A6A_017.d

Analysis Method: WS-LC-0025 | Date Collected: 05/26/2016 11:01

Extraction Method: 3535 | Date Extracted: 06/01/2016 11:06

Sample wt/vol: 523(mL) | Date Analyzed: 06/03/2016 22:09

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 112504 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.9		2.4	1.9	0.88
375-85-9	Perfluoroheptanoic acid (PFHpA)	4.5		2.4	1.9	0.77
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	35	M	2.4	1.9	0.83
375-95-1	Perfluorononanoic acid (PFNA)	2.0	J	2.4	1.9	0.63
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	150	M J	3.8	2.9	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	17	M	2.4	1.9	0.72

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		25-150
STL00990	13C4 PFOA	70		25-150
STL00991	13C4 PFOS	112		25-150
STL01892	13C4-PFHpA	80		25-150
STL00995	13C5 PFNA	51		25-150
STL00994	18O2 PFHxS	128		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_017.d
Lims ID: 320-19198-B-1-A
Client ID: DW-57
Sample Type: Client
Inject. Date: 03-Jun-2016 22:09:25 ALS Bottle#: 16 Worklist Smp#: 17
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-19198-b-1-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 06-Jun-2016 11:40:56 Calib Date: 03-Jun-2016 19:40:28
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:19:21

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.785	5.784	0.001		1117584	41.6		83.1	70272	
2 Perfluorobutyric acid										
212.9 > 169.0	5.785	5.786	-0.001	1.000	63973	2.31			327	
D 3 13C5-PFPeA										
267.9 > 223.0	6.937	6.939	-0.002		2876514	46.0		92.0	4567	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.941	6.941	0.0	1.000	194219	3.52			47.4	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.064	7.069	-0.005	1.000	41200	1.53				
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.064	7.069	-0.005	1.000	41200	NC			7.5	
298.9 > 99.0	7.071	7.069	0.002	1.001	19400		2.12(0.00-0.00)		40.3	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.214	8.216	-0.002	1.000	200973	3.80			150	
D 6 13C2 PFHxA										
315.0 > 270.0	8.214	8.217	-0.003		2883985	43.6		87.2	27159	
D 8 13C4-PFHpA										
367.0 > 322.0	9.458	9.456	0.002		2887320	39.8		79.5	32511	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.464	9.457	0.007	1.000	126747	2.35			113	
D 11 18O2 PFHxS										
403.0 > 84.0	9.493	9.492	0.001		1908130	60.7		128	6033	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.493	9.495	-0.002	1.000	561461	18.2				M
10 Perfluorohexane Sulfonate										M
399.0 > 80.0	9.495	9.495	0.0	1.000	0	NC			166	M
D 12 13C4 PFOA										
417.0 > 372.0	10.568	10.569	-0.001		2792192	34.8		69.5	62102	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										M
413.0 > 369.0	10.568	10.572	-0.004	1.000	411777	8.92			304	M
413.0 > 169.0	10.568	10.572	-0.004	1.000	166872		2.47(0.00-0.00)		189	M
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.577	10.581	-0.004	1.000	205370	NC			95.7	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.577	10.581	-0.004	1.000	205370	7.39				
D 16 13C4 PFOS										
503.0 > 80.0	11.527	11.525	0.002		2045569	53.3		112	29455	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.527	11.527	0.0	1.000	3695361	77.1			3460	M
499.0 > 99.0	11.527	11.527	0.0	1.000	1376916		2.68(0.00-0.00)		13100	M
D 17 13C5 PFNA										
468.0 > 423.0	11.545	11.542	0.003		1797528	25.3		50.7	52333	
18 Perfluorononanoic acid										
463.0 > 419.0	11.545	11.543	0.002	1.000	25511	1.02			115	
D 19 13C2 PFDA										
515.0 > 470.0	12.373	12.373	0.0		1393593	24.3		48.6	85661	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.373	12.373	0.0	1.000	15416	0.5016			366	
D 23 13C8 FOSA										
506.0 > 78.0	12.994	12.985	0.009		475021	4.18		8.4	31310	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.984	12.987	-0.003	1.000	11126	1.78			711	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.041	13.033	0.008	1.000	9039	0.5523				
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.041	13.033	0.008	1.000	9039	NC			627	
D 26 13C2 PFUnA										
565.0 > 520.0	13.076	13.076	0.0		2603844	32.1		64.2	92896	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.076	13.077	-0.001	1.000	48701	0.6412			1013	
D 28 13C2 PFDoA										
615.0 > 570.0	13.666	13.663	0.003		3971998	39.4		78.8	27322	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.666	13.666	0.0	1.000	21385	0.4223			263	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.167	14.165	0.002	1.000	27631	0.3762			46.1	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.589	14.589	0.0		3687572	46.2		92.4	13095	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.589	14.589	0.0	1.000	60876	1.01			44.2	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.179	15.177	0.002		5644899	43.3		86.6	8422	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.179	15.177	0.002	1.000	207730	0.9455			204	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.436	15.437	-0.001	1.000	145466	1.50			149	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

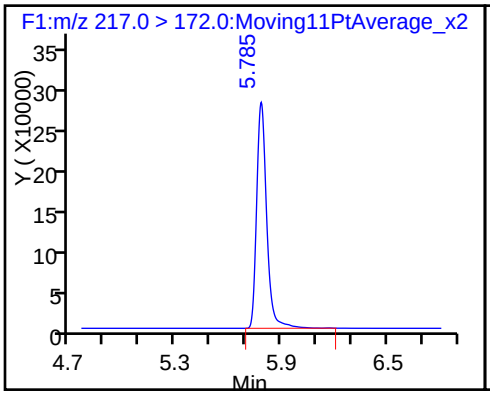
Report Date: 06-Jun-2016 11:41:03 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

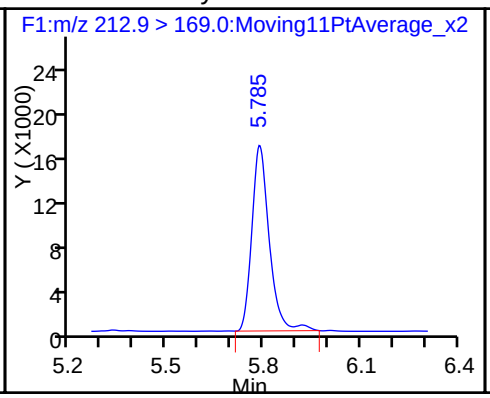
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_017.d

Injection Date:	03-Jun-2016 22:09:25	Instrument ID:	A6		
Lims ID:	320-19198-B-1-A	Lab Sample ID:	320-19198-1		
Client ID:	DW-57				
Operator ID:	JRB	ALS Bottle#:	16	Worklist Smp#:	17
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		

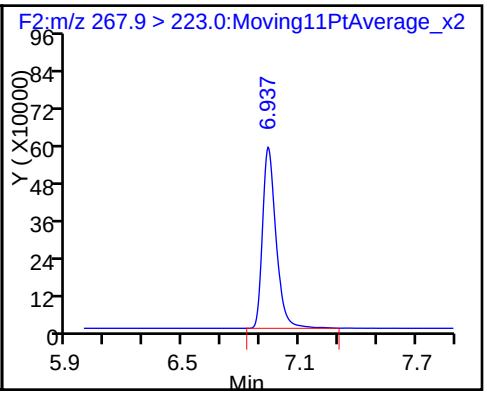
D 1 13C4 PFBA



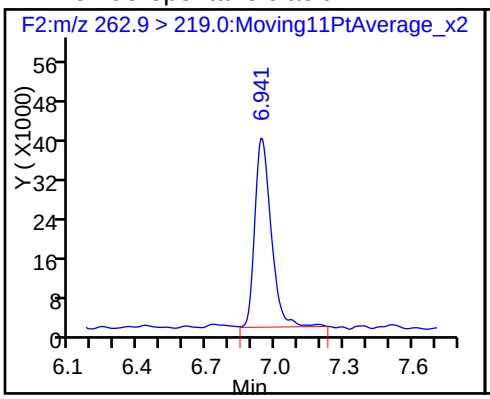
2 Perfluorobutyric acid



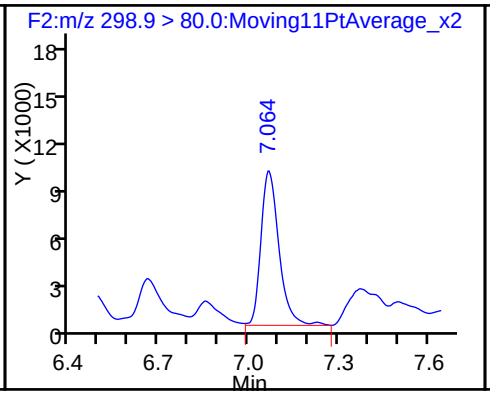
D 3 13C5-PFPeA



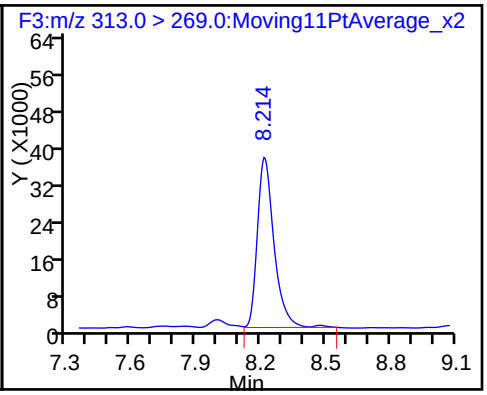
4 Perfluoropentanoic acid



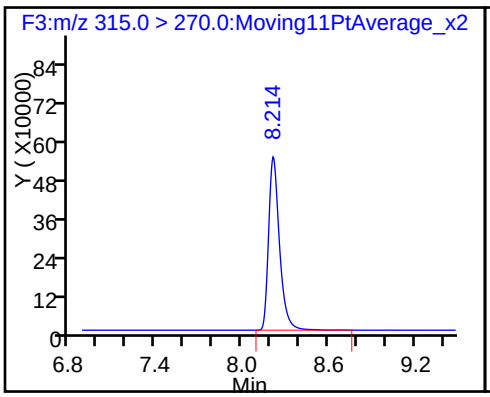
40 Perfluorobutanesulfonic acid



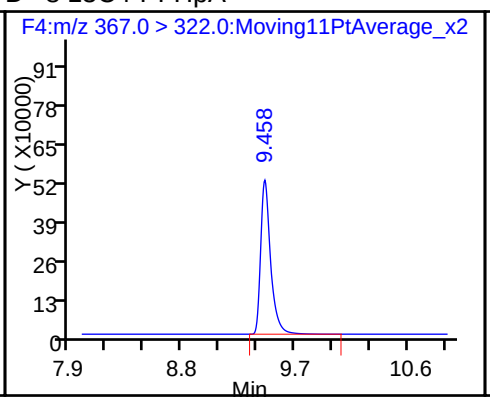
7 Perfluorohexanoic acid



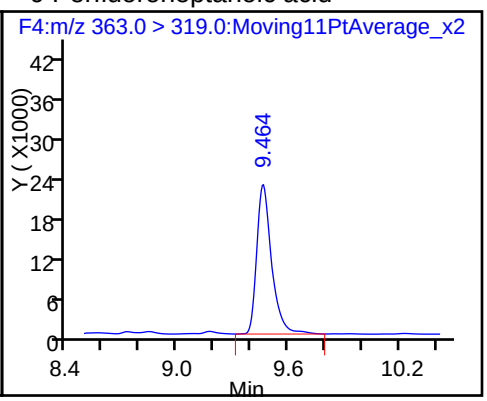
D 6 13C2 PFHxA



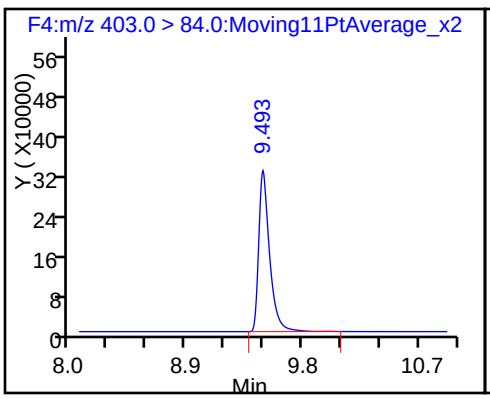
D 8 13C4-PFHpA



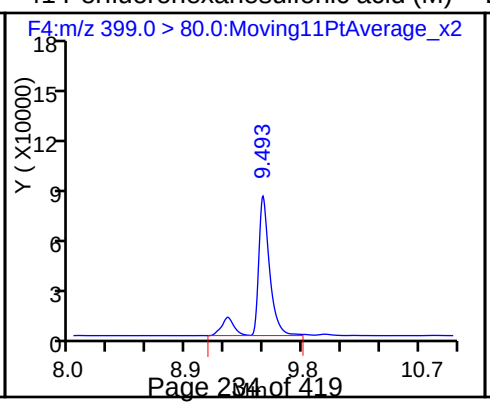
9 Perfluoroheptanoic acid



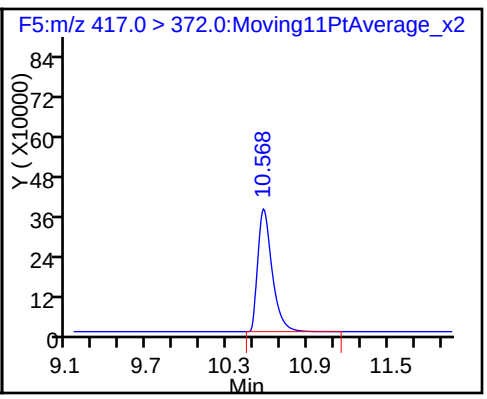
D 11 18O2 PFHxS



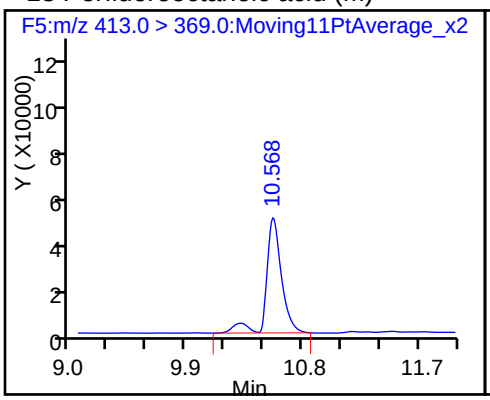
41 Perfluorohexanesulfonic acid (M)



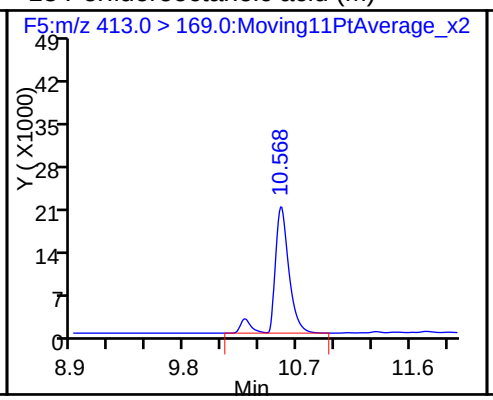
D 12 13C4 PFOA



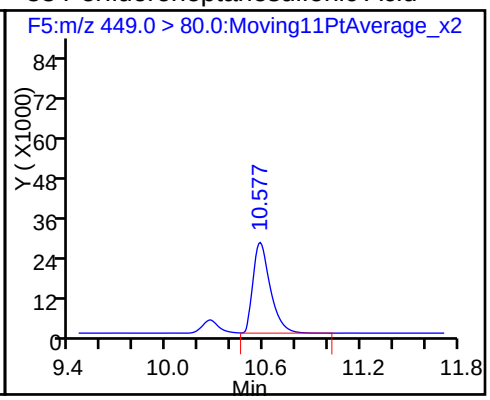
13 Perfluorooctanoic acid (M)



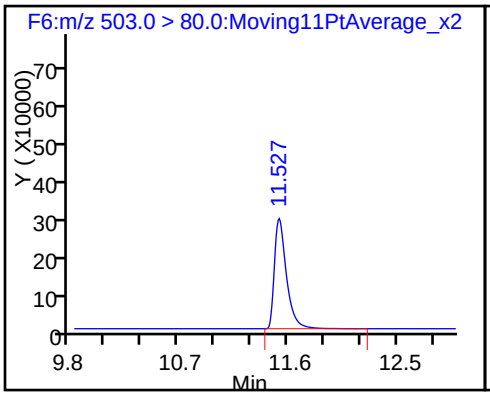
13 Perfluorooctanoic acid (M)



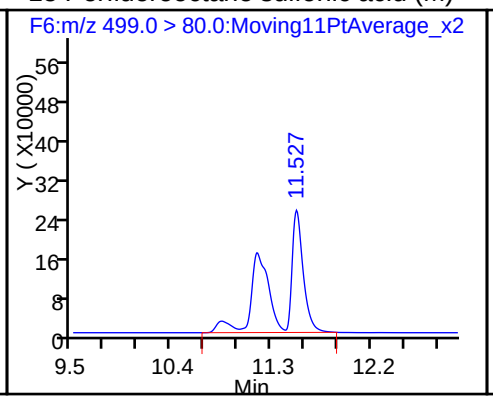
38 Perfluoroheptanesulfonic Acid



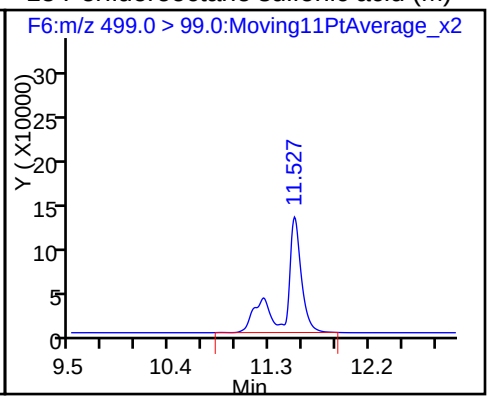
D 16 13C4 PFOS



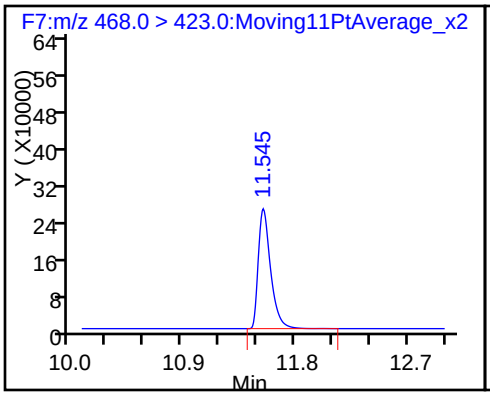
15 Perfluorooctane sulfonic acid (M)



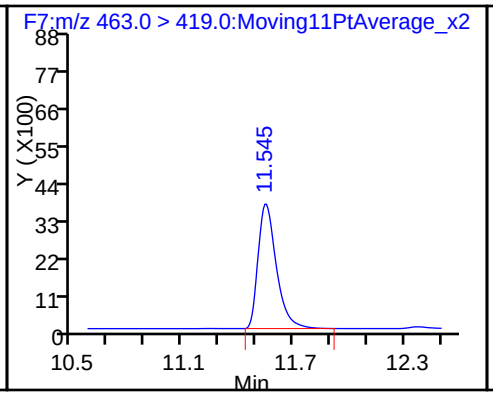
15 Perfluorooctane sulfonic acid (M)



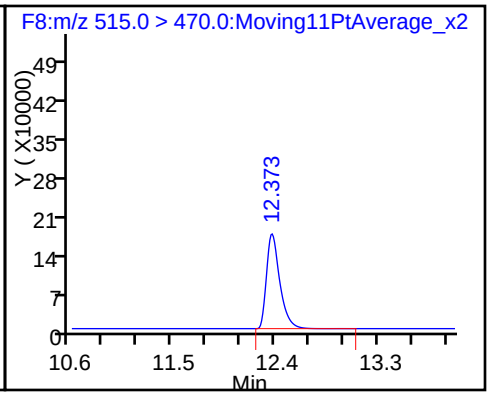
D 17 13C5 PFNA



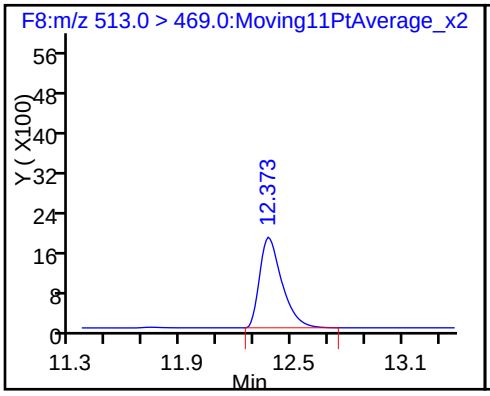
18 Perfluorononanoic acid



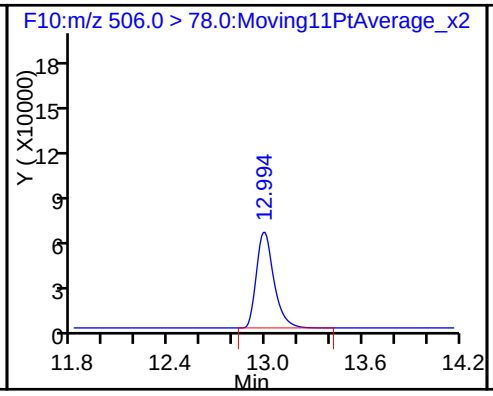
D 19 13C2 PFDA



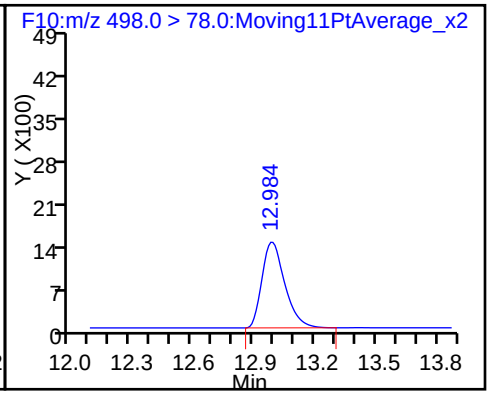
20 Perfluorodecanoic acid



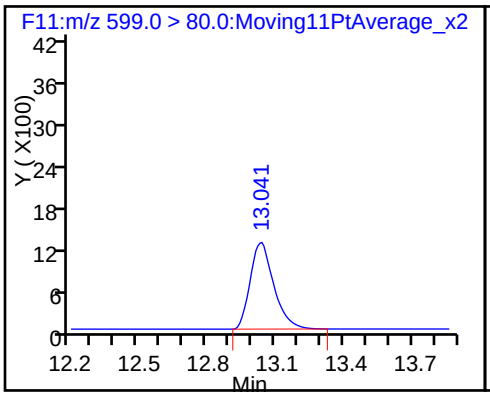
D 23 13C8 FOSA



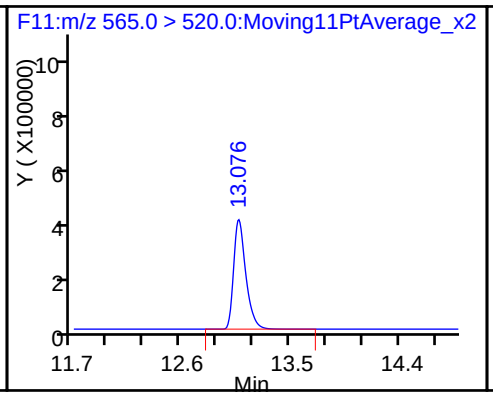
24 Perfluorooctane Sulfonamide



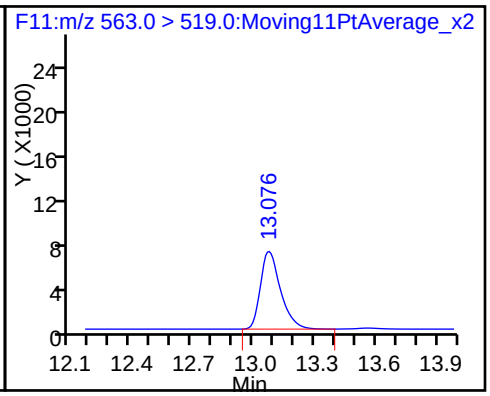
39 Perfluorodecane Sulfonic acid



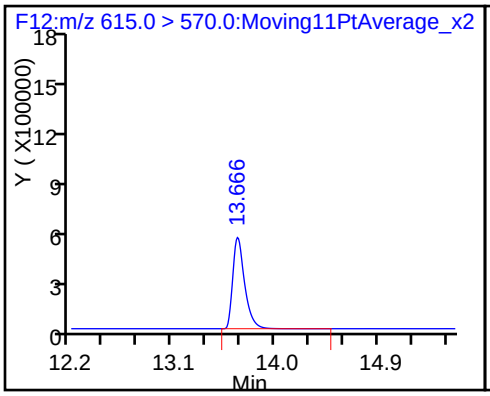
D 26 13C2 PFUnA



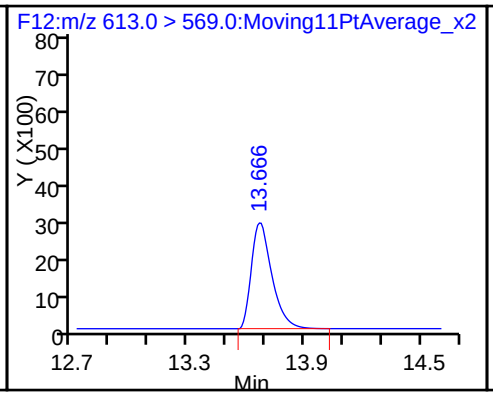
27 Perfluoroundecanoic acid



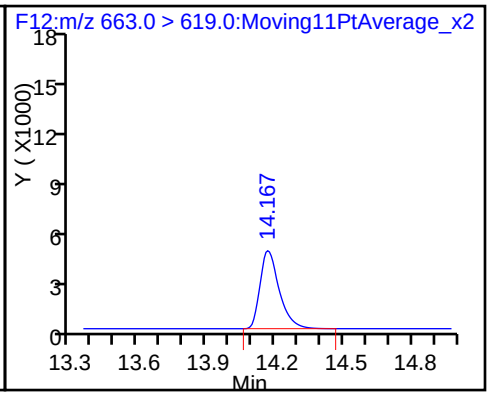
D 28 13C2 PFDoA



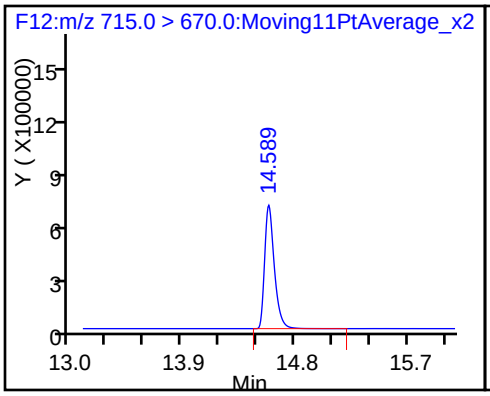
29 Perfluorododecanoic acid



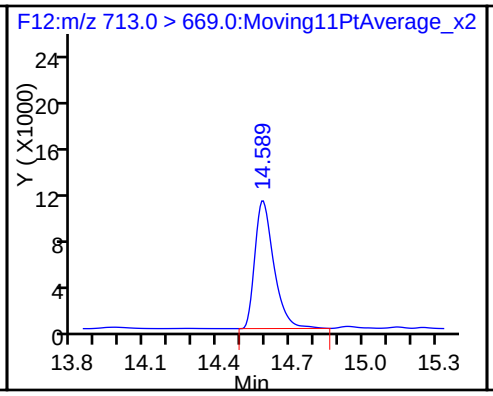
30 Perfluorotridecanoic acid



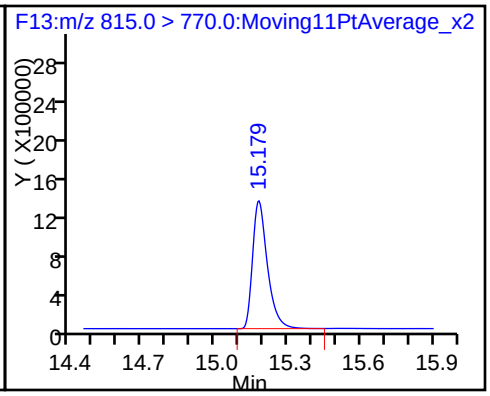
D 33 13C2-PFTeDA



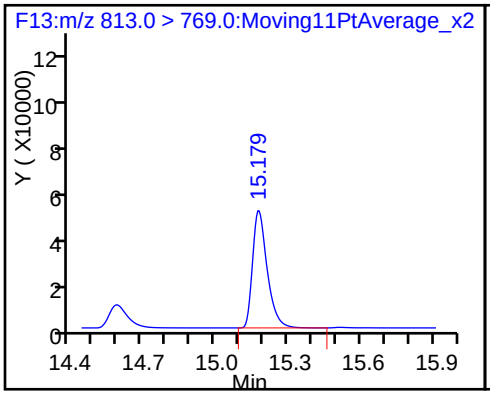
32 Perfluorotetradecanoic acid



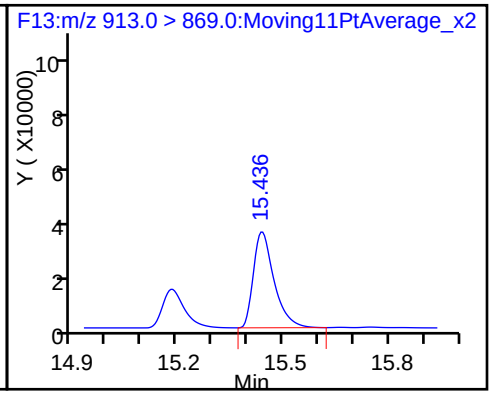
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

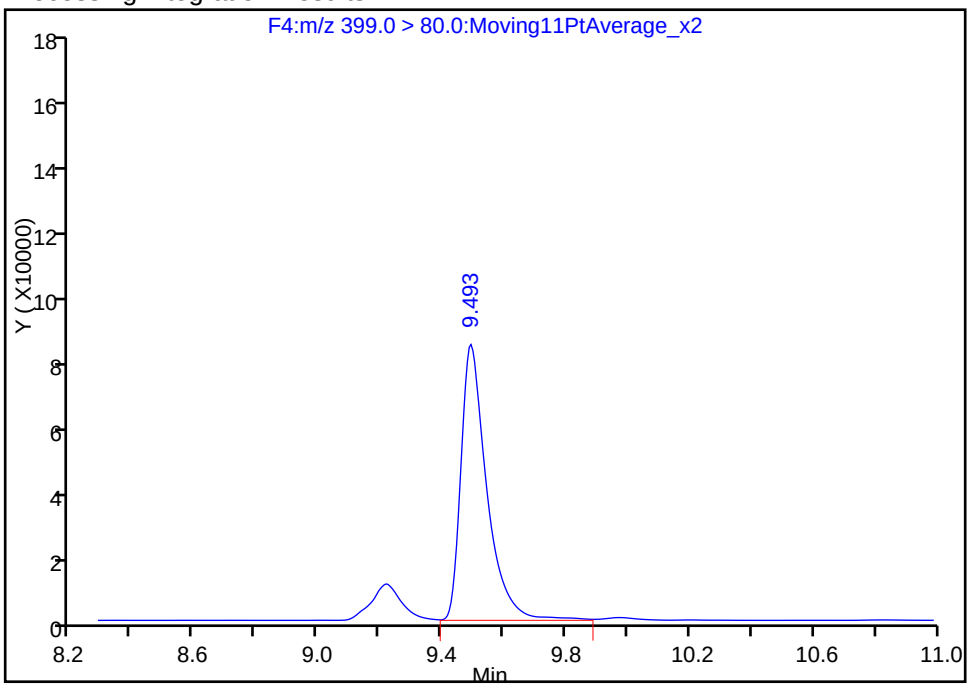
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_017.d				
Injection Date:	03-Jun-2016 22:09:25	Instrument ID:	A6		
Lims ID:	320-19198-B-1-A	Lab Sample ID:	320-19198-1		
Client ID:	DW-57				
Operator ID:	JRB	ALS Bottle#:	16	Worklist Smp#:	17
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F4:MRM		

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

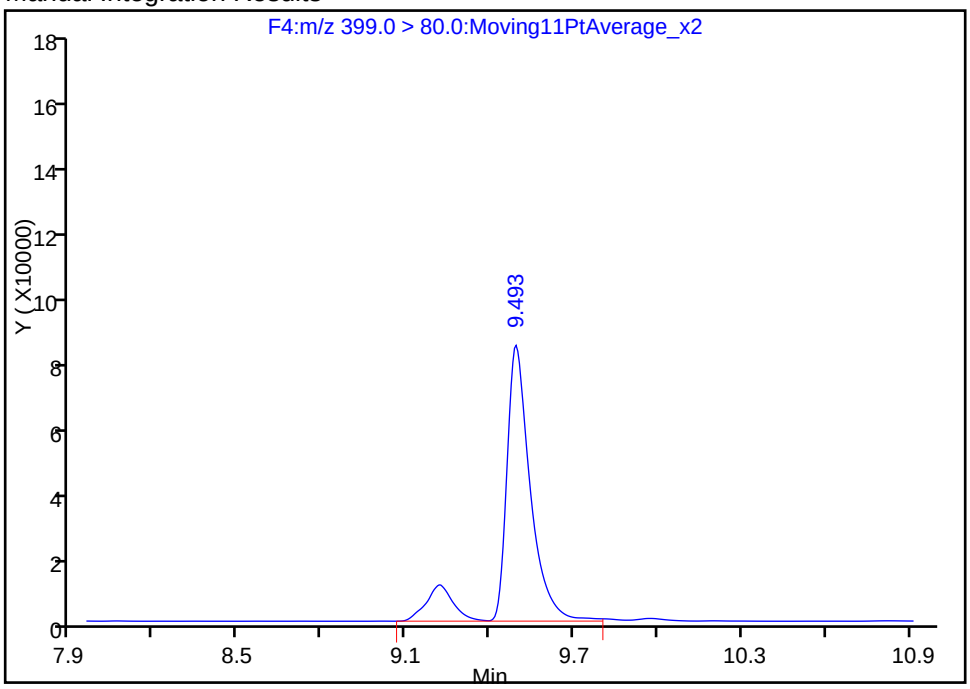
Processing Integration Results

RT: 9.49
Area: 490202
Amount: 15.926260
Amount Units: ng/ml



Manual Integration Results

RT: 9.49
Area: 561461
Amount: 18.241406
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:19:21

Audit Action: Assigned Compound ID Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

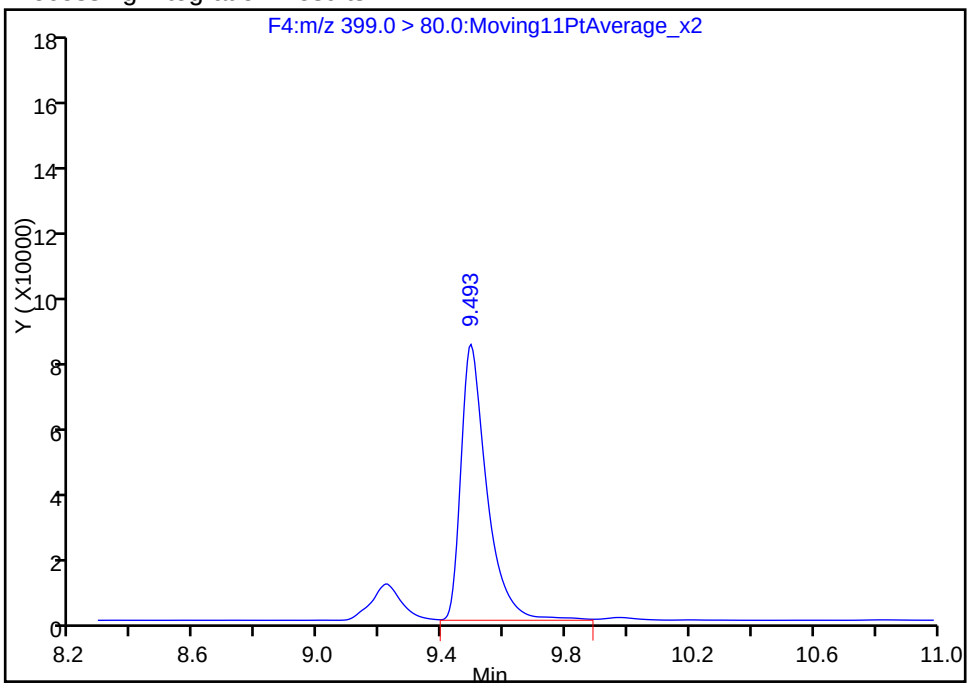
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_017.d				
Injection Date:	03-Jun-2016 22:09:25	Instrument ID:	A6		
Lims ID:	320-19198-B-1-A	Lab Sample ID:	320-19198-1		
Client ID:	DW-57				
Operator ID:	JRB	ALS Bottle#:	16	Worklist Smp#:	17
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F4:MRM		

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

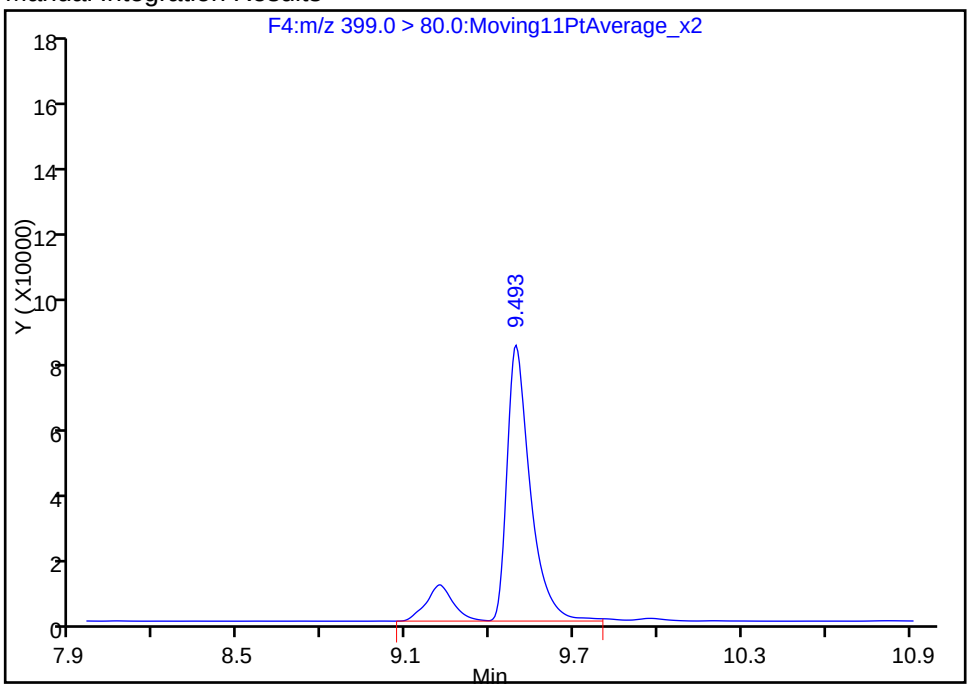
Processing Integration Results

RT: 9.49
Area: 490202
Amount: 15.926260
Amount Units: ng/ml



Manual Integration Results

RT: 9.49
Area: 561461
Amount: 18.241406
Amount Units: ng/ml



Reviewer: barnettj, 06-Jun-2016 11:29:45

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

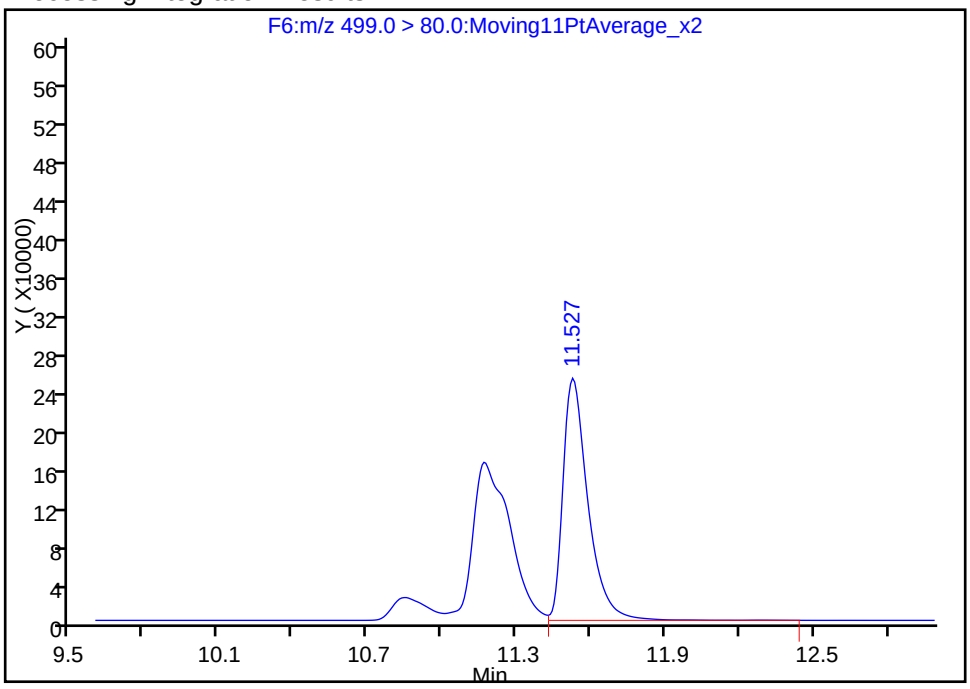
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_017.d				
Injection Date:	03-Jun-2016 22:09:25	Instrument ID:	A6		
Lims ID:	320-19198-B-1-A	Lab Sample ID:	320-19198-1		
Client ID:	DW-57				
Operator ID:	JRB	ALS Bottle#:	16	Worklist Smp#:	17
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F6:MRM		

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

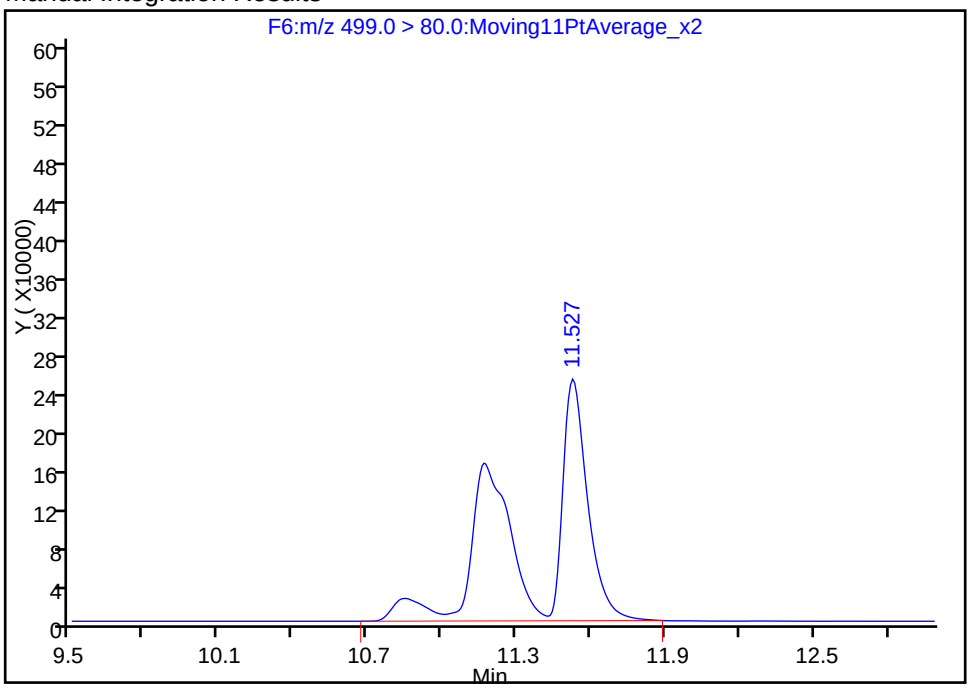
Processing Integration Results

RT: 11.53
Area: 1781088
Amount: 37.173776
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 3695361
Amount: 77.127308
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:19:21

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_017.d

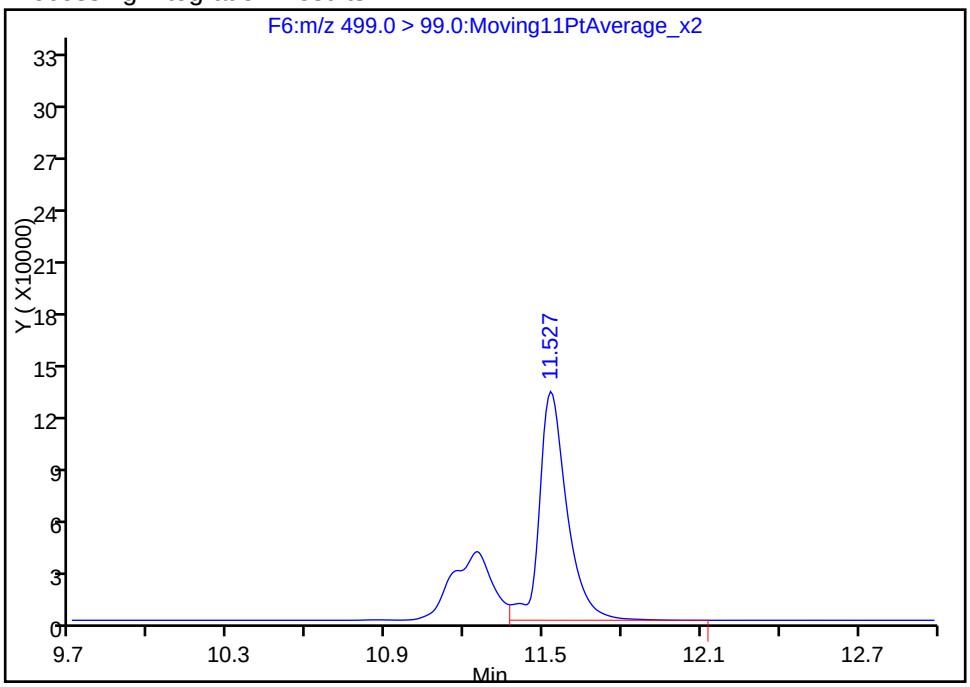
Injection Date:	03-Jun-2016 22:09:25	Instrument ID:	A6		
Lims ID:	320-19198-B-1-A	Lab Sample ID:	320-19198-1		
Client ID:	DW-57				
Operator ID:	JRB	ALS Bottle#:	16	Worklist Smp#:	17
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F6:MRM		

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

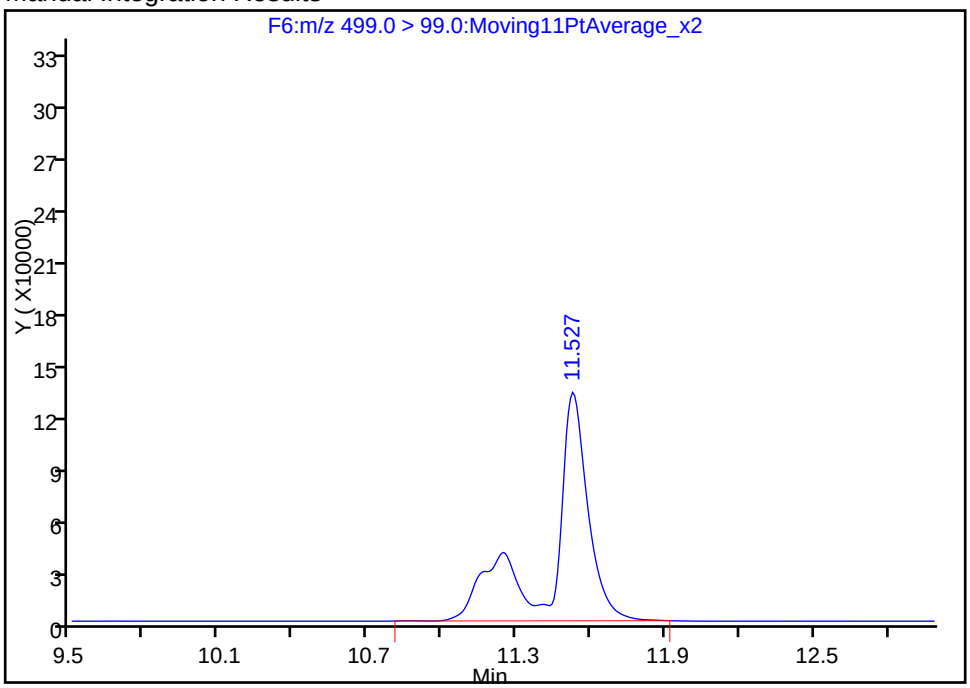
Processing Integration Results

RT: 11.53
Area: 964549
Amount: 37.173776
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 1376916
Amount: 77.127308
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:19:21

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

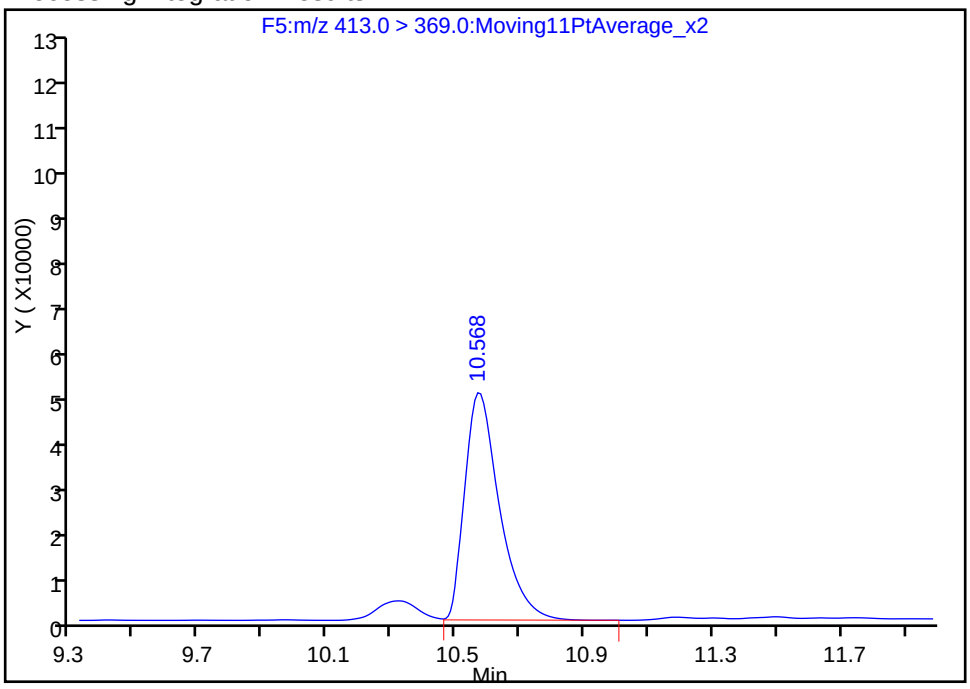
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_017.d				
Injection Date:	03-Jun-2016 22:09:25	Instrument ID:	A6		
Lims ID:	320-19198-B-1-A	Lab Sample ID:	320-19198-1		
Client ID:	DW-57				
Operator ID:	JRB	ALS Bottle#:	16	Worklist Smp#:	17
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F5:MRM		

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

Processing Integration Results

RT: 10.57
Area: 375431
Amount: 8.385713
Amount Units: ng/ml



Manual Integration Results

RT: 10.57
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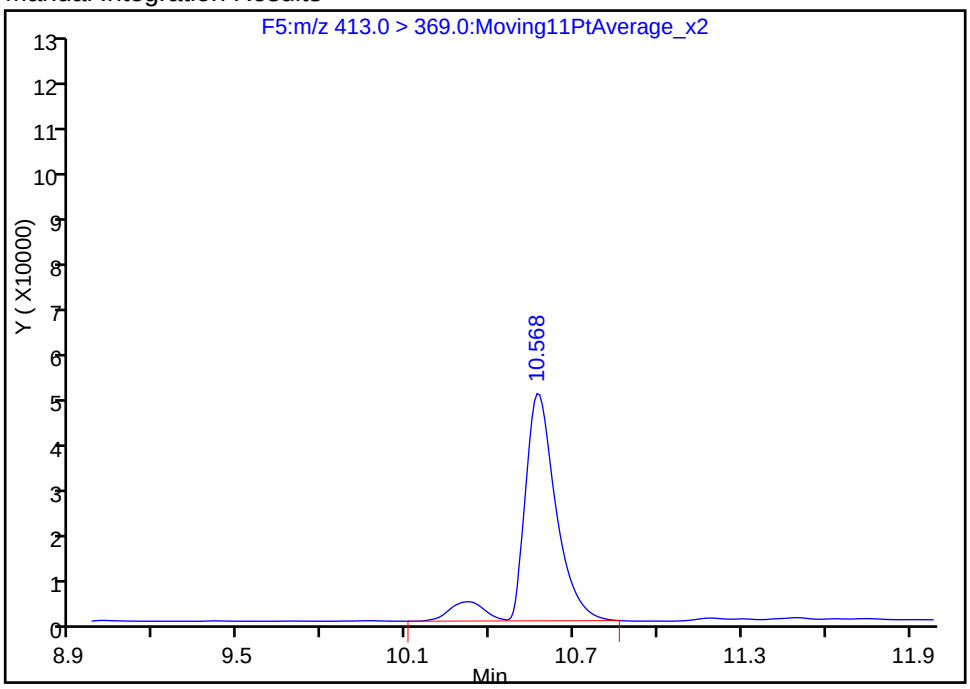
Amount: 8.915225
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:19:21

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

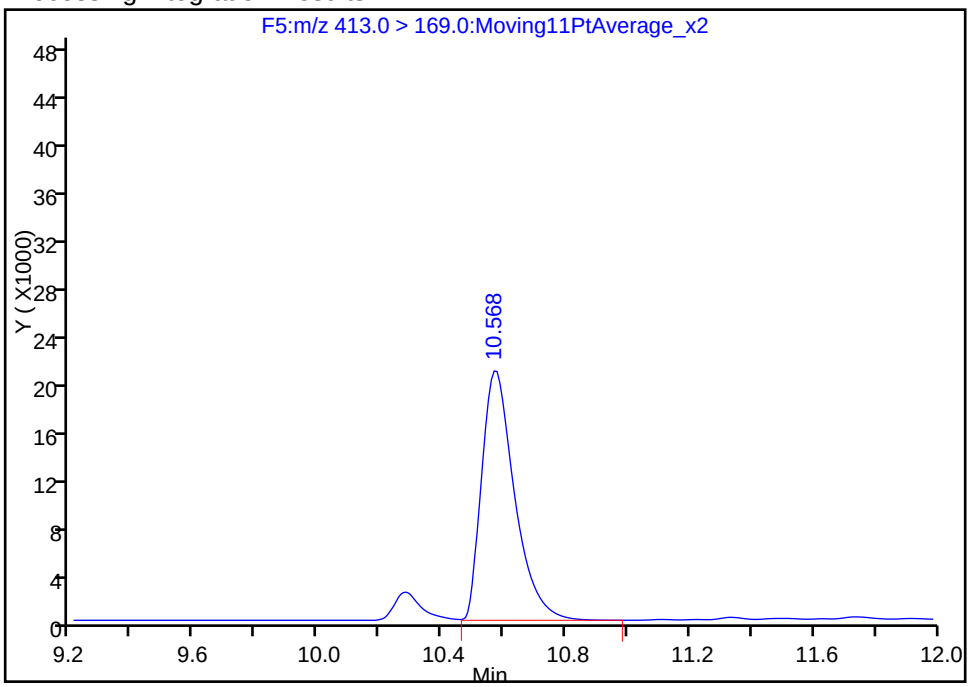
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_017.d				
Injection Date:	03-Jun-2016 22:09:25	Instrument ID:	A6		
Lims ID:	320-19198-B-1-A	Lab Sample ID:	320-19198-1		
Client ID:	DW-57				
Operator ID:	JRB	ALS Bottle#:	16	Worklist Smp#:	17
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F5:MRM		

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

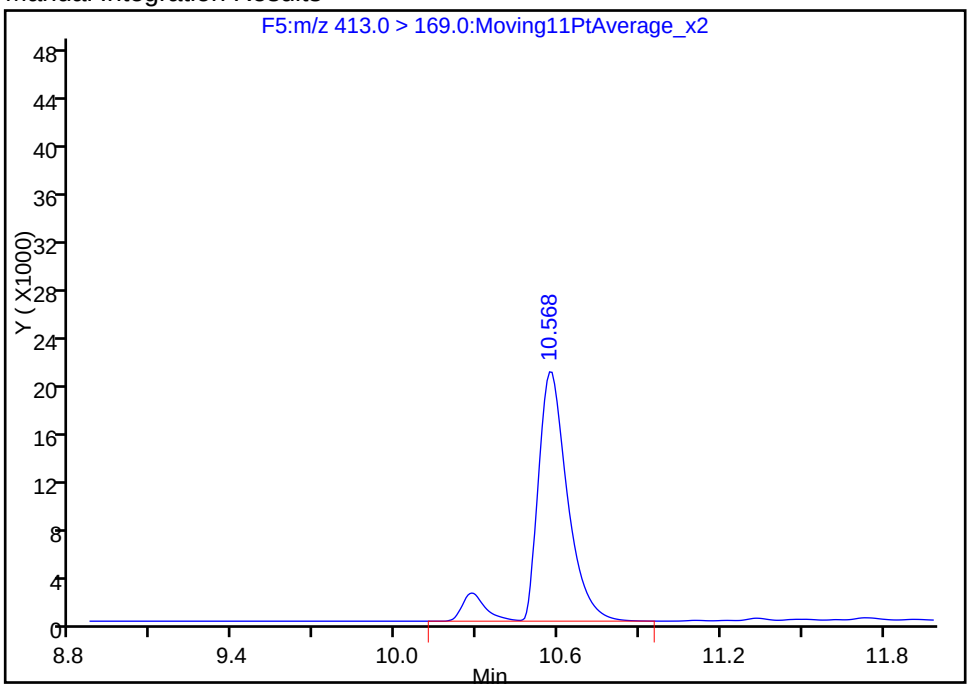
Processing Integration Results

RT: 10.57
Area: 152914
Amount: 8.385713
Amount Units: ng/ml



Manual Integration Results

RT: 10.57
Area: 166872
Amount: 8.915225
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:19:21

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-19198-1

SDG No.:

Client Sample ID: FB-DW-57 | Lab Sample ID: 320-19198-2

Matrix: Water | Lab File ID: 03JUN2016A6A_020.d

Analysis Method: WS-LC-0025 | Date Collected: 05/26/2016 11:05

Extraction Method: 3535 | Date Extracted: 06/01/2016 11:06

Sample wt/vol: 530.2(mL) | Date Analyzed: 06/03/2016 23:13

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 112504 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.5	J	2.4	1.9	0.87
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	U	2.4	1.9	0.76
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.83	J M	2.4	1.9	0.82
375-95-1	Perfluorononanoic acid (PFNA)	1.9	U	2.4	1.9	0.62
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	7.5	M	3.8	2.8	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	0.71	J	2.4	1.9	0.71

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	112		25-150
STL00990	13C4 PFOA	123		25-150
STL00991	13C4 PFOS	121		25-150
STL01892	13C4-PFHpA	113		25-150
STL00995	13C5 PFNA	117		25-150
STL00994	18O2 PFHxS	120		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_020.d
Lims ID: 320-19198-B-2-A
Client ID: FB-DW-57
Sample Type: Client
Inject. Date: 03-Jun-2016 23:13:13 ALS Bottle#: 19 Worklist Smp#: 20
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-19198-b-2-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 06-Jun-2016 11:40:56 Calib Date: 03-Jun-2016 19:40:28
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:22:26

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.085	7.069	0.016	1.000	7249	0.7785				
D 6 13C2 PFHxA										
315.0 > 270.0	8.219	8.217	0.002		3713195	56.1		112	34357	
D 8 13C4-PFHpA										
367.0 > 322.0	9.458	9.456	0.002		4120059	56.7		113	31115	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.458	9.457	0.001	1.000	10870	0.1414			163	
D 11 18O2 PFHxS										
403.0 > 84.0	9.493	9.492	0.001		1778109	56.5		120	18141	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.505	9.495	0.010	1.000	12578	0.4385				M
D 12 13C4 PFOA										
417.0 > 372.0	10.577	10.569	0.008		4918159	61.3		123	42762	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.577	10.572	0.005	1.000	30671	0.3770			19.7	
413.0 > 169.0	10.586	10.572	0.014	1.001	14707		2.09(0.00-0.00)		48.9	
D 16 13C4 PFOS										
503.0 > 80.0	11.527	11.525	0.002		2219404	57.8		121	21000	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.527	11.527	0.0	1.000	205488	3.95			6349	M
499.0 > 99.0	11.527	11.527	0.0	1.000	91671		2.24(0.00-0.00)		2898	M
D 17 13C5 PFNA										
468.0 > 423.0	11.544	11.542	0.002		4154560	58.6		117	37355	
18 Perfluorononanoic acid										
463.0 > 419.0	11.544	11.543	0.001	1.000	16064	0.2789			211	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 06-Jun-2016 11:41:06 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_020.d

Injection Date: 03-Jun-2016 23:13:13 Instrument ID: A6

Lims ID: 320-19198-B-2-A Lab Sample ID: 320-19198-2

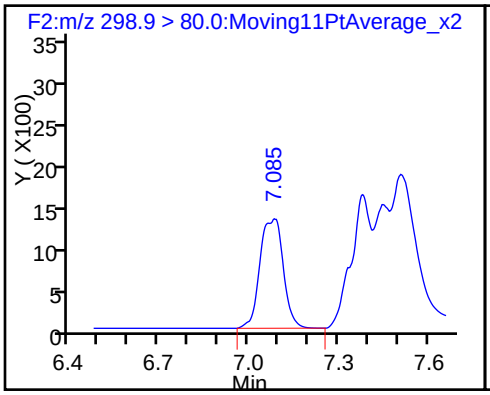
Client ID: FB-DW-57

Operator ID: JRB ALS Bottle#: 19 Worklist Smp#: 20

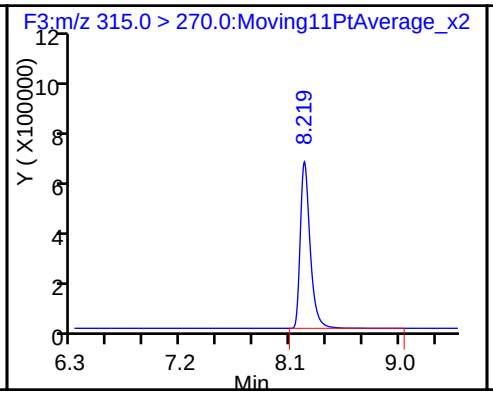
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

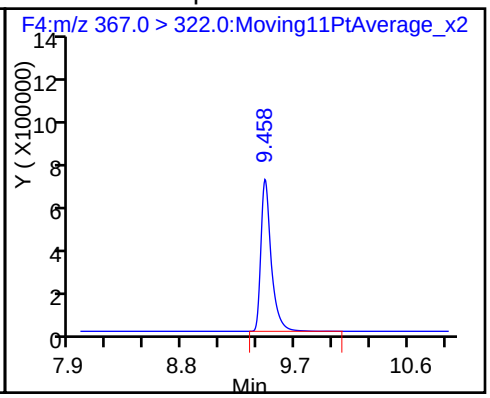
40 Perfluorobutanesulfonic acid



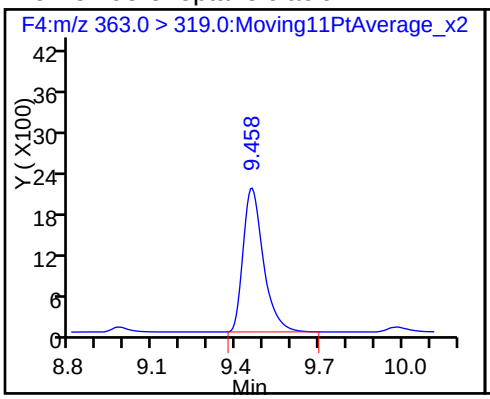
D 6 13C2 PFHxA



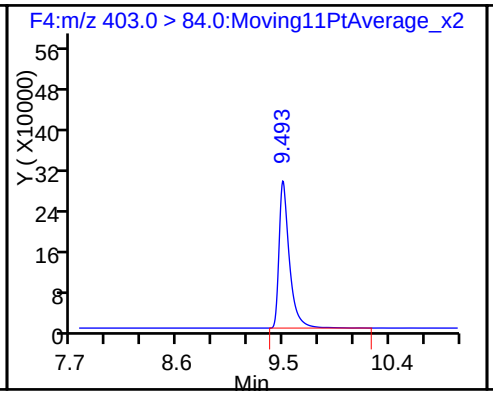
D 8 13C4-PFHpA



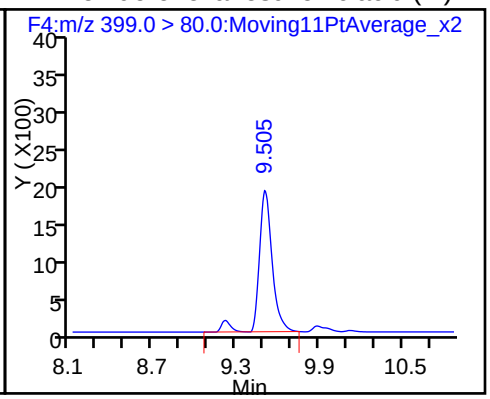
9 Perfluoroheptanoic acid



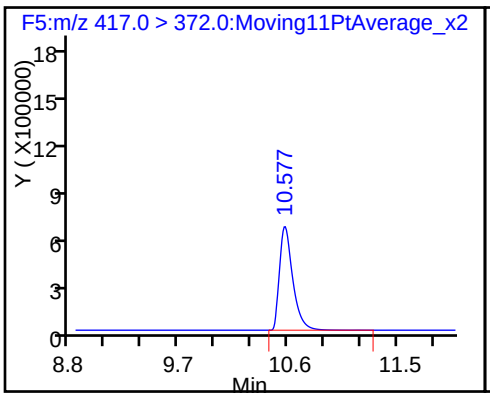
D 11 18O2 PFHxS



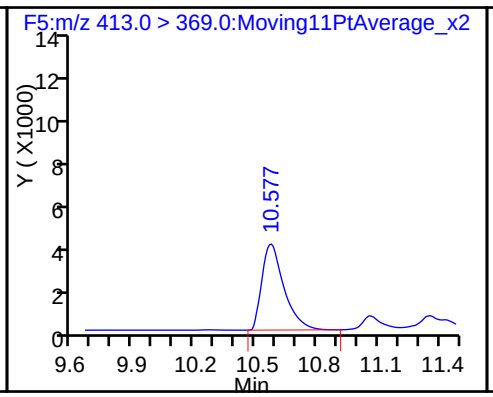
41 Perfluorohexanesulfonic acid (M)



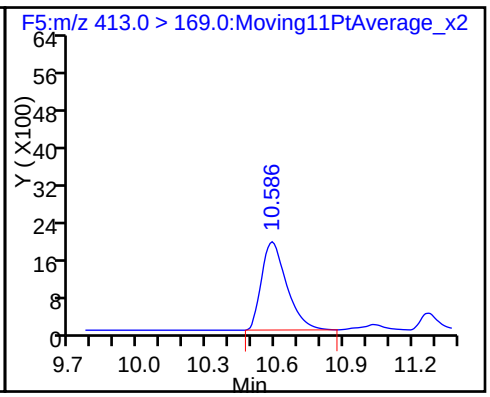
D 12 13C4 PFOA



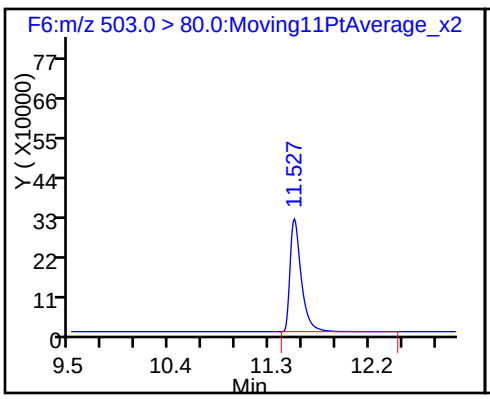
13 Perfluorooctanoic acid



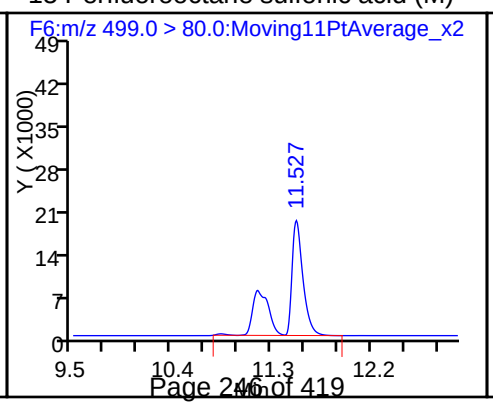
13 Perfluorooctanoic acid



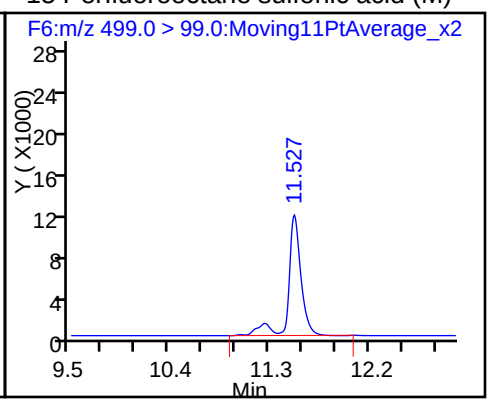
D 16 13C4 PFOS



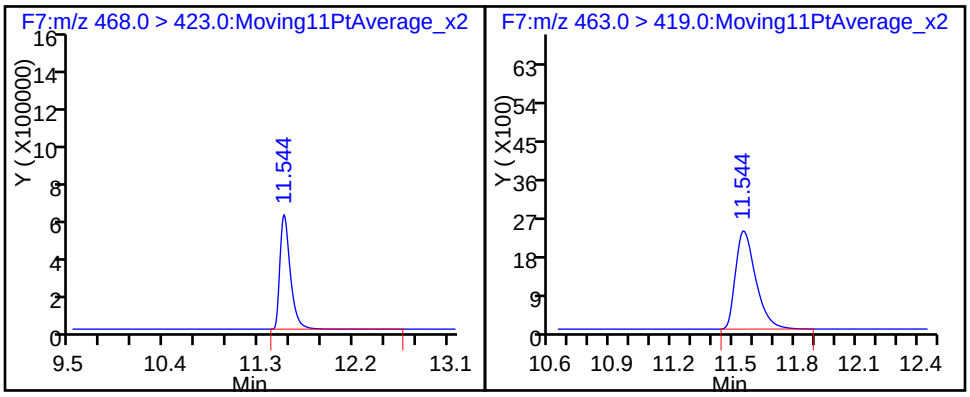
15 Perfluorooctane sulfonic acid (M)



15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA 18 Perfluorononanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

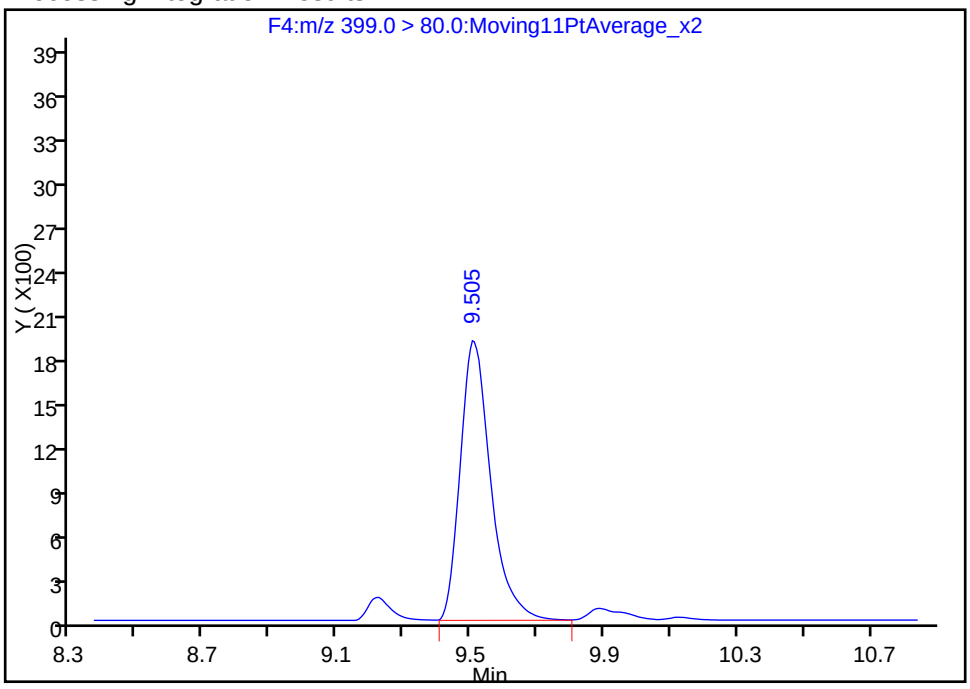
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_020.d				
Injection Date:	03-Jun-2016 23:13:13	Instrument ID:	A6		
Lims ID:	320-19198-B-2-A	Lab Sample ID:	320-19198-2		
Client ID:	FB-DW-57				
Operator ID:	JRB	ALS Bottle#:	19	Worklist Smp#:	20
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F4:MRM		

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

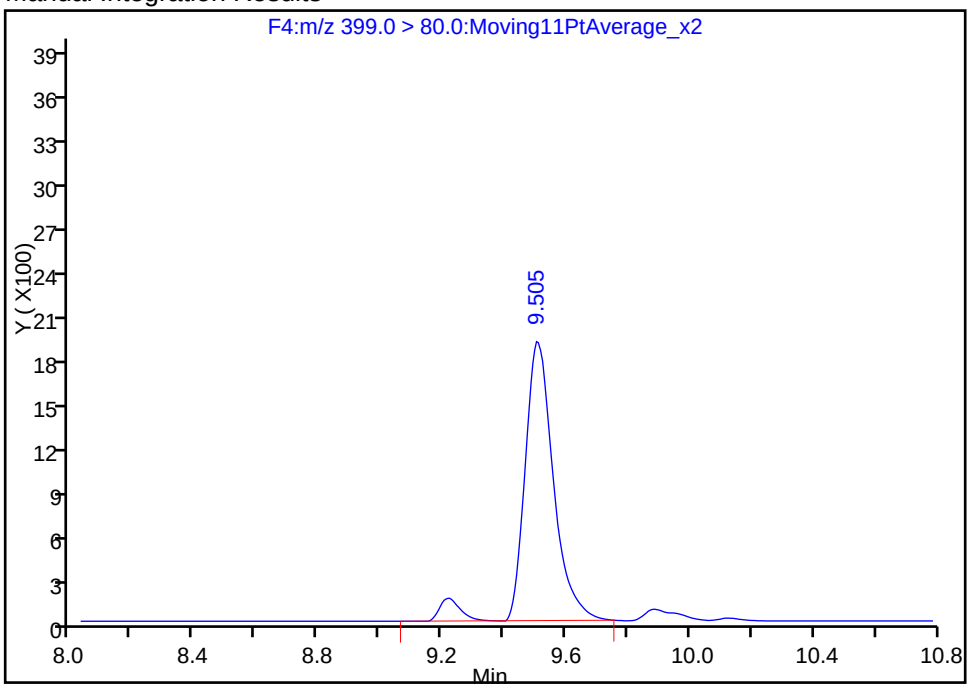
Processing Integration Results

RT: 9.50
Area: 11981
Amount: 0.417716
Amount Units: ng/ml



Manual Integration Results

RT: 9.50
Area: 12578
Amount: 0.438531
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:22:26

Audit Action: Assigned Compound ID Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

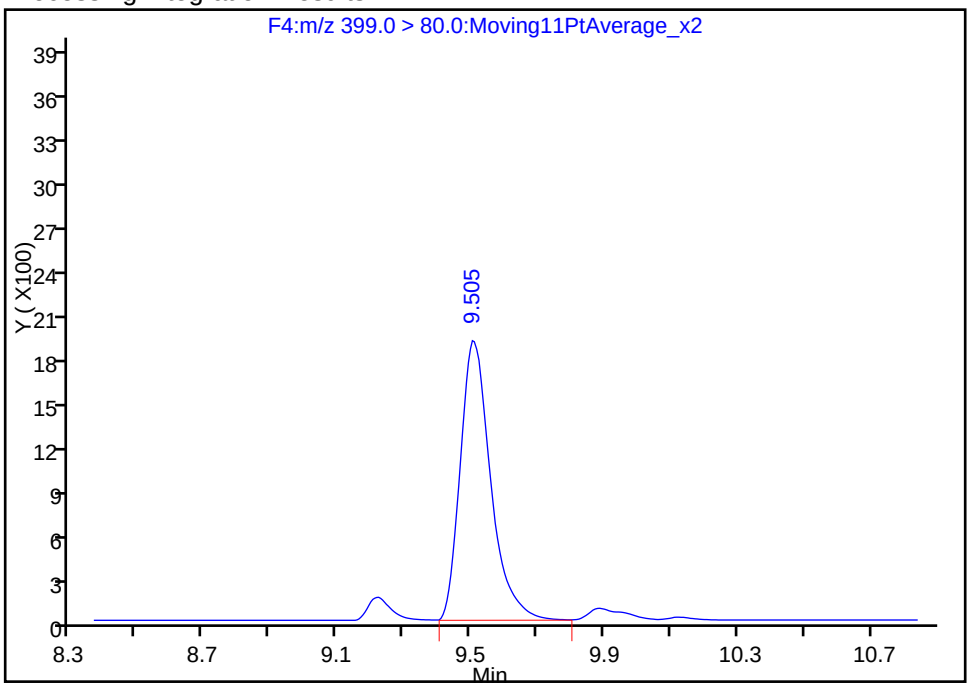
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_020.d				
Injection Date:	03-Jun-2016 23:13:13	Instrument ID:	A6		
Lims ID:	320-19198-B-2-A	Lab Sample ID:	320-19198-2		
Client ID:	FB-DW-57				
Operator ID:	JRB	ALS Bottle#:	19	Worklist Smp#:	20
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F4:MRM		

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

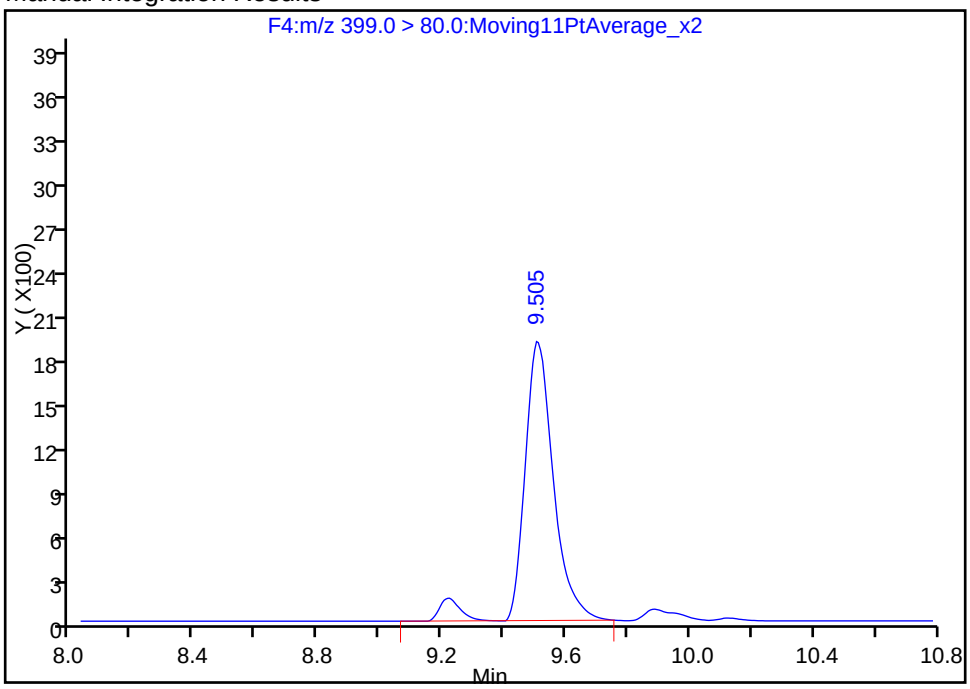
Processing Integration Results

RT: 9.50
Area: 11981
Amount: 0.417716
Amount Units: ng/ml



Manual Integration Results

RT: 9.50
Area: 12578
Amount: 0.438531
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:22:26

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

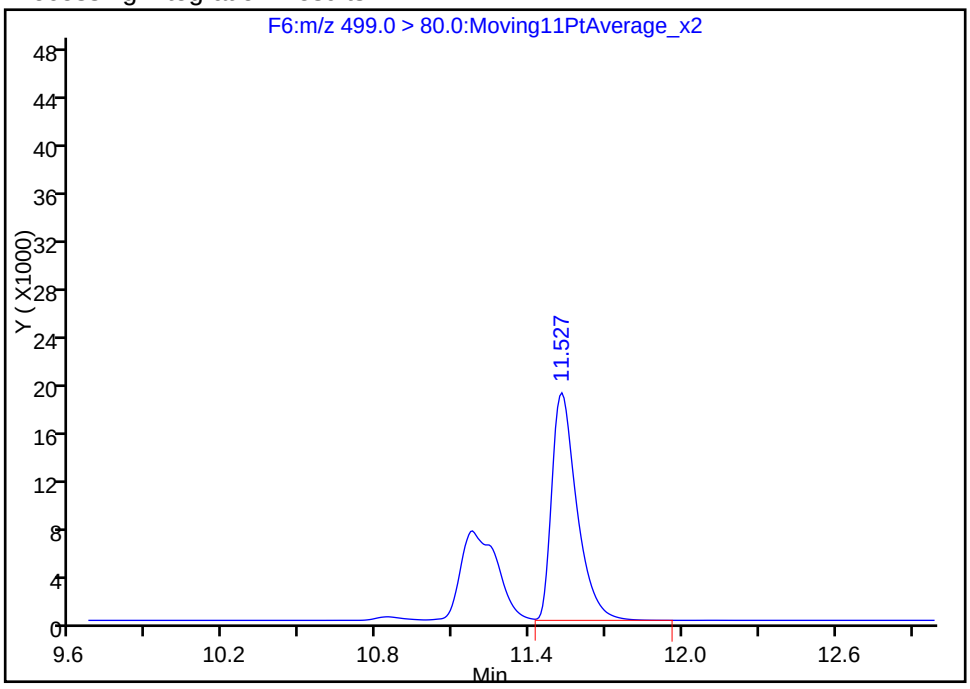
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_020.d				
Injection Date:	03-Jun-2016 23:13:13	Instrument ID:	A6		
Lims ID:	320-19198-B-2-A	Lab Sample ID:	320-19198-2		
Client ID:	FB-DW-57				
Operator ID:	JRB	ALS Bottle#:	19	Worklist Smp#:	20
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F6:MRM		

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

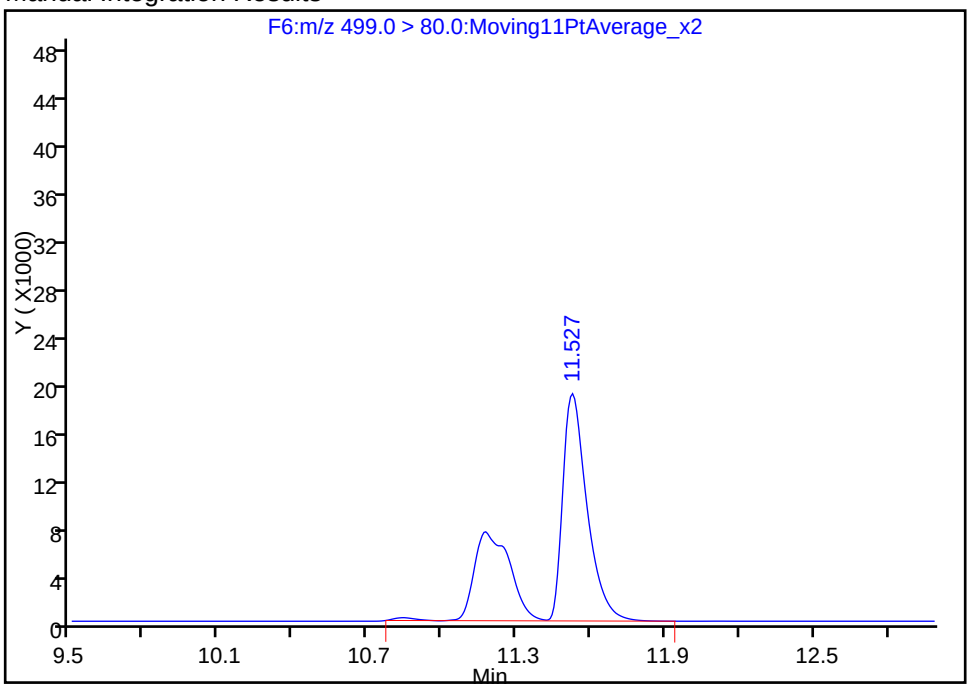
Processing Integration Results

RT: 11.53
Area: 130701
Amount: 2.514247
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 205488
Amount: 3.952897
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:22:26

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

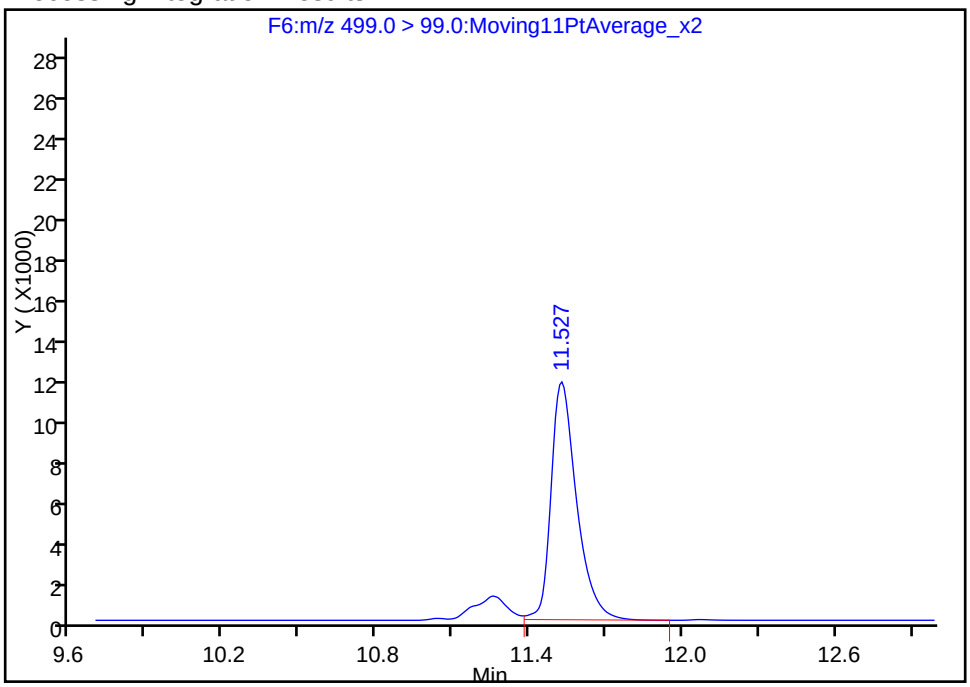
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_020.d				
Injection Date:	03-Jun-2016 23:13:13	Instrument ID:	A6		
Lims ID:	320-19198-B-2-A	Lab Sample ID:	320-19198-2		
Client ID:	FB-DW-57				
Operator ID:	JRB	ALS Bottle#:	19	Worklist Smp#:	20
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F6:MRM		

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

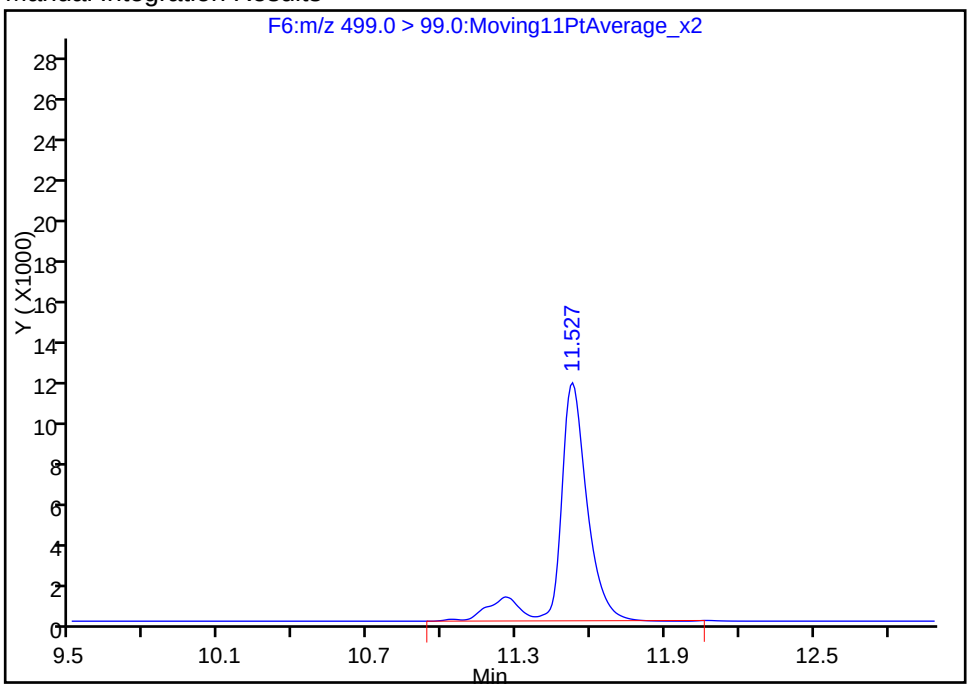
Processing Integration Results

RT: 11.53
Area: 81010
Amount: 2.514247
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 91671
Amount: 3.952897
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:22:26

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-19198-1

SDG No.:

Client Sample ID: DW-95 | Lab Sample ID: 320-19198-3

Matrix: Water | Lab File ID: 03JUN2016A6A_021.d

Analysis Method: WS-LC-0025 | Date Collected: 05/26/2016 11:26

Extraction Method: 3535 | Date Extracted: 06/01/2016 11:06

Sample wt/vol: 537.1(mL) | Date Analyzed: 06/03/2016 23:34

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 112504 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	3.3		2.3	1.9	0.85
375-85-9	Perfluoroheptanoic acid (PFHpA)	13		2.3	1.9	0.75
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.6	M	2.3	1.9	0.81
375-95-1	Perfluorononanoic acid (PFNA)	1.4	J	2.3	1.9	0.61
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	37	M	3.7	2.8	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	55	M	2.3	1.9	0.70

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	94		25-150
STL00990	13C4 PFOA	59		25-150
STL00991	13C4 PFOS	99		25-150
STL01892	13C4-PFHpA	88		25-150
STL00995	13C5 PFNA	35		25-150
STL00994	18O2 PFHxS	120		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_021.d
Lims ID: 320-19198-A-3-A
Client ID: DW-95
Sample Type: Client
Inject. Date: 03-Jun-2016 23:34:29 ALS Bottle#: 20 Worklist Smp#: 21
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-19198-a-3-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 06-Jun-2016 11:40:56 Calib Date: 03-Jun-2016 19:40:28
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:23:23

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.075	7.069	0.006	1.000	48675	1.77				
D 6 13C2 PFHxA										
315.0 > 270.0	8.219	8.217	0.002		3122571	47.2		94.4	23023	
D 8 13C4-PFHpA										
367.0 > 322.0	9.458	9.456	0.002		3209425	44.2		88.4	17461	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.464	9.457	0.007	1.000	405377	6.77			177	
D 11 18O2 PFHxS										
403.0 > 84.0	9.499	9.492	0.007		1792480	57.0		120	19304	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.493	9.495	-0.002	1.000	103044	3.56				M
D 12 13C4 PFOA										
417.0 > 372.0	10.577	10.569	0.008		2386165	29.7		59.4	10082	
13 Perfluorooctanoic acid										M
413.0 > 369.0	10.577	10.572	0.005	1.000	1156534	29.3			393	M
413.0 > 169.0	10.577	10.572	0.005	1.000	426328		2.71(0.00-0.00)		768	M
D 16 13C4 PFOS										
503.0 > 80.0	11.527	11.525	0.002		1824441	47.5		99.5	19832	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.535	11.527	0.008	1.000	854017	20.0			2948	M
499.0 > 99.0	11.535	11.527	0.008	1.000	338721		2.52(0.00-0.00)		7357	M
D 17 13C5 PFNA										
468.0 > 423.0	11.544	11.542	0.002		1235438	17.4		34.8	29740	
18 Perfluorononanoic acid										
463.0 > 419.0	11.553	11.543	0.010	1.000	13090	0.7643			77.9	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 06-Jun-2016 11:41:07 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_021.d

Injection Date: 03-Jun-2016 23:34:29 Instrument ID: A6

Lims ID: 320-19198-A-3-A Lab Sample ID: 320-19198-3

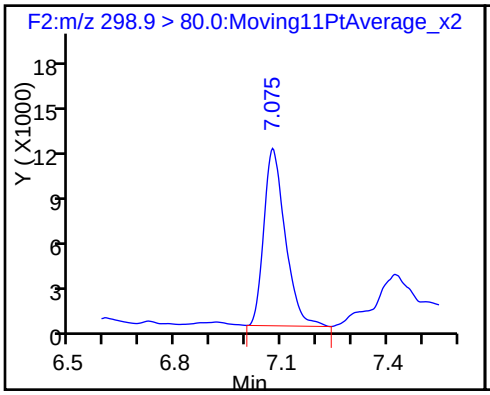
Client ID: DW-95

Operator ID: JRB ALS Bottle#: 20 Worklist Smp#: 21

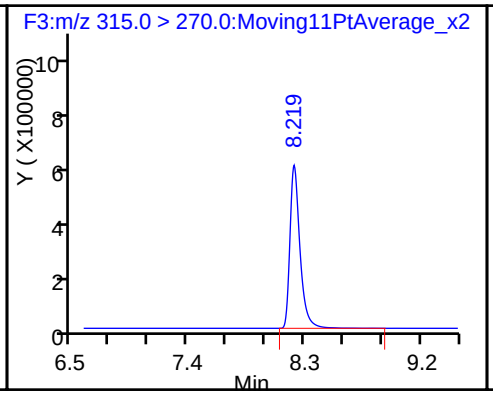
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

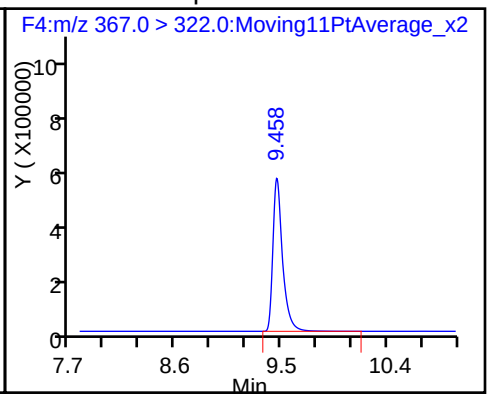
40 Perfluorobutanesulfonic acid



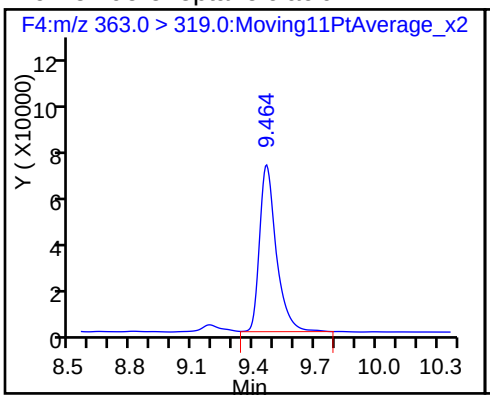
D 6 13C2 PFHxA



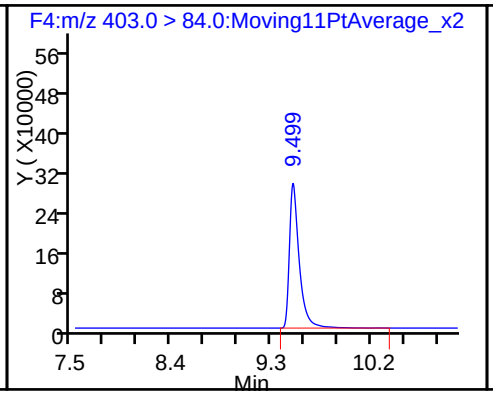
D 8 13C4-PFHpA



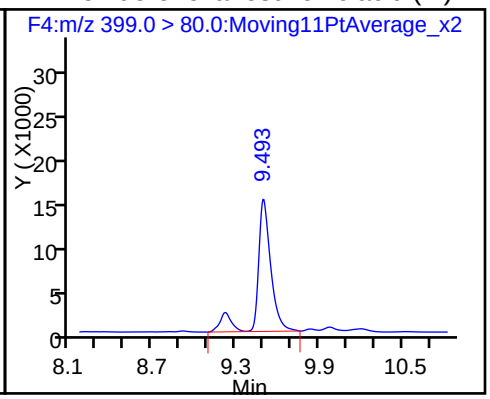
9 Perfluoroheptanoic acid



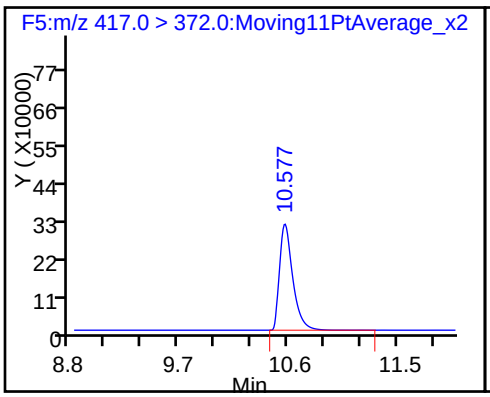
D 11 18O2 PFHxS



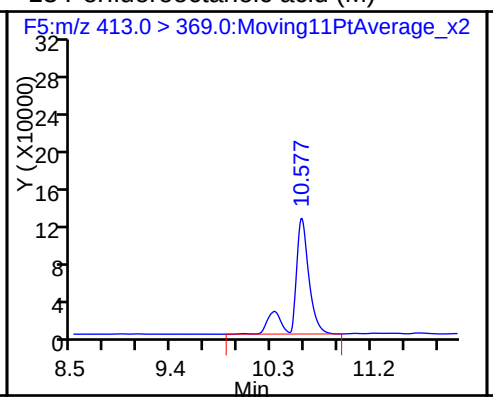
41 Perfluorohexanesulfonic acid (M)



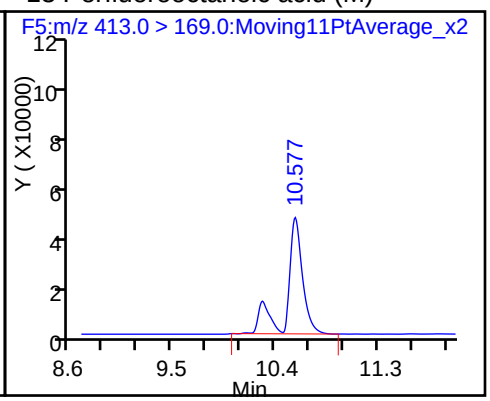
D 12 13C4 PFOA



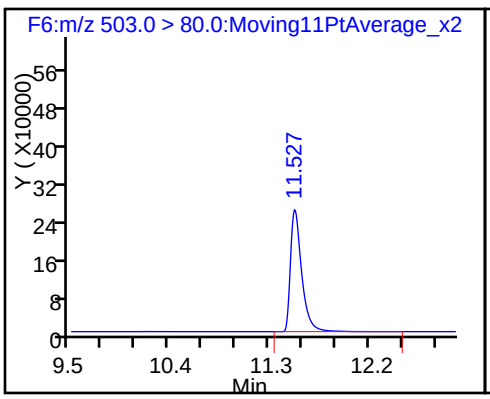
13 Perfluorooctanoic acid (M)



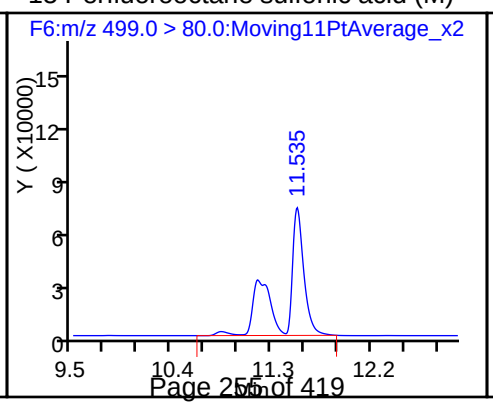
13 Perfluorooctanoic acid (M)



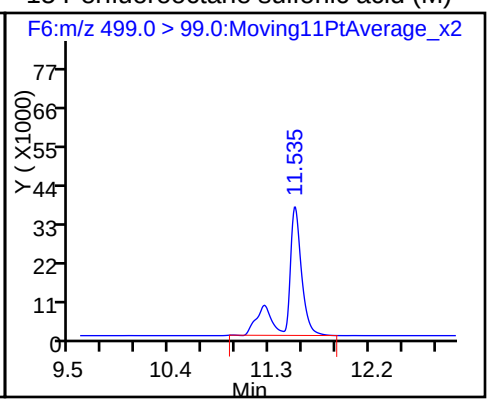
D 16 13C4 PFOS



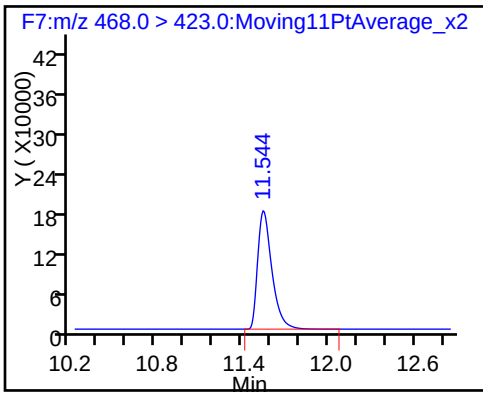
15 Perfluorooctane sulfonic acid (M)



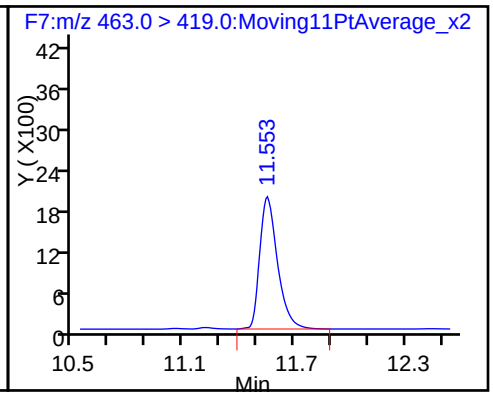
15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA



18 Perfluorononanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

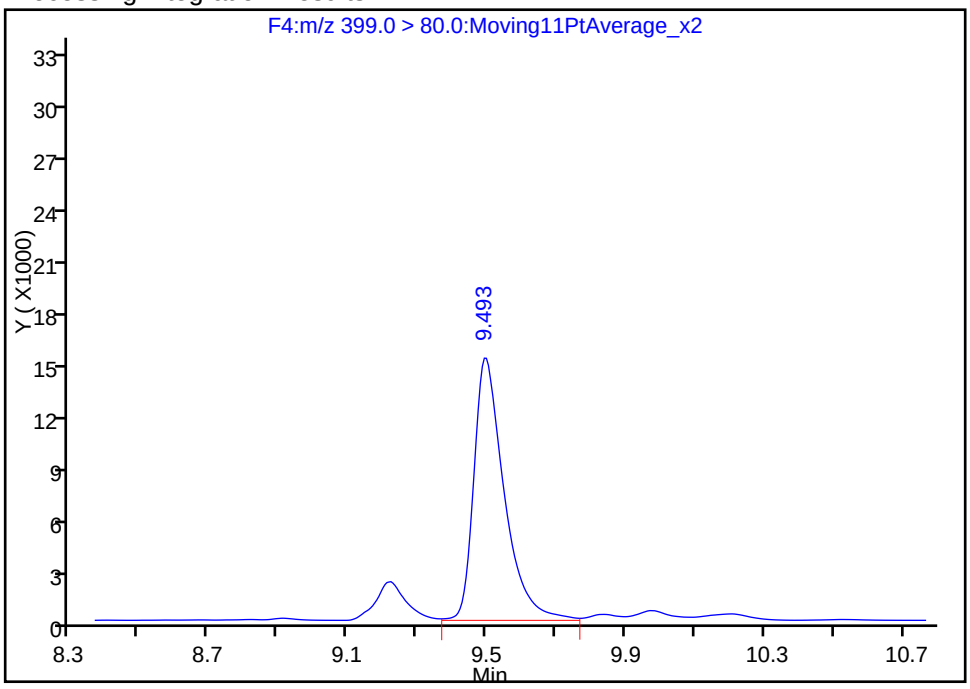
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_021.d				
Injection Date:	03-Jun-2016 23:34:29	Instrument ID:	A6		
Lims ID:	320-19198-A-3-A	Lab Sample ID:	320-19198-3		
Client ID:	DW-95				
Operator ID:	JRB	ALS Bottle#:	20	Worklist Smp#:	21
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F4:MRM		

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

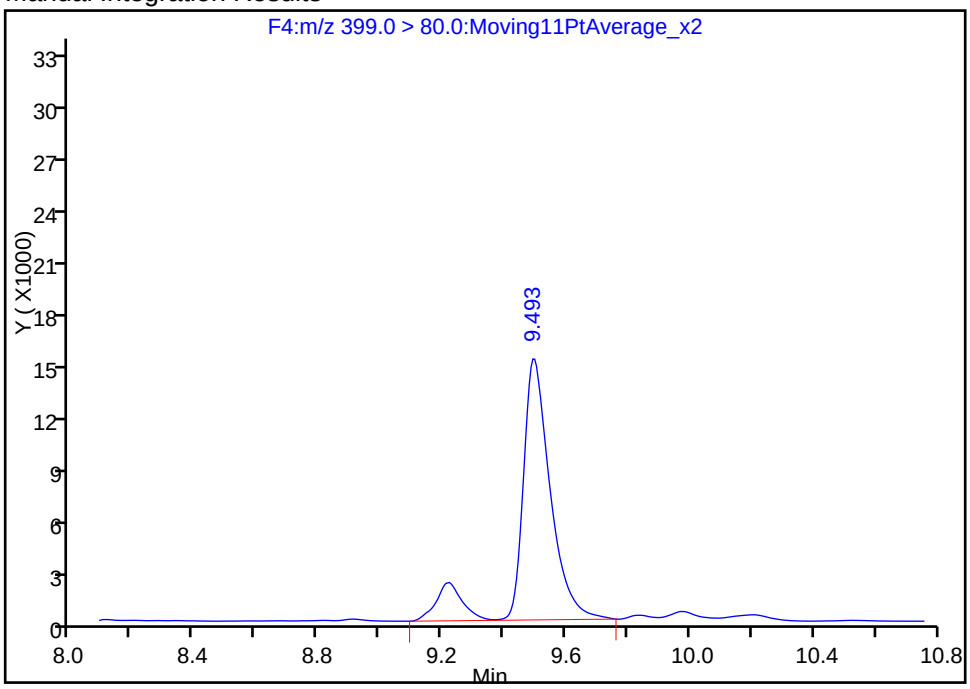
Processing Integration Results

RT: 9.49
Area: 92054
Amount: 3.183721
Amount Units: ng/ml



Manual Integration Results

RT: 9.49
Area: 103044
Amount: 3.563814
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:23:23

Audit Action: Assigned Compound ID Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

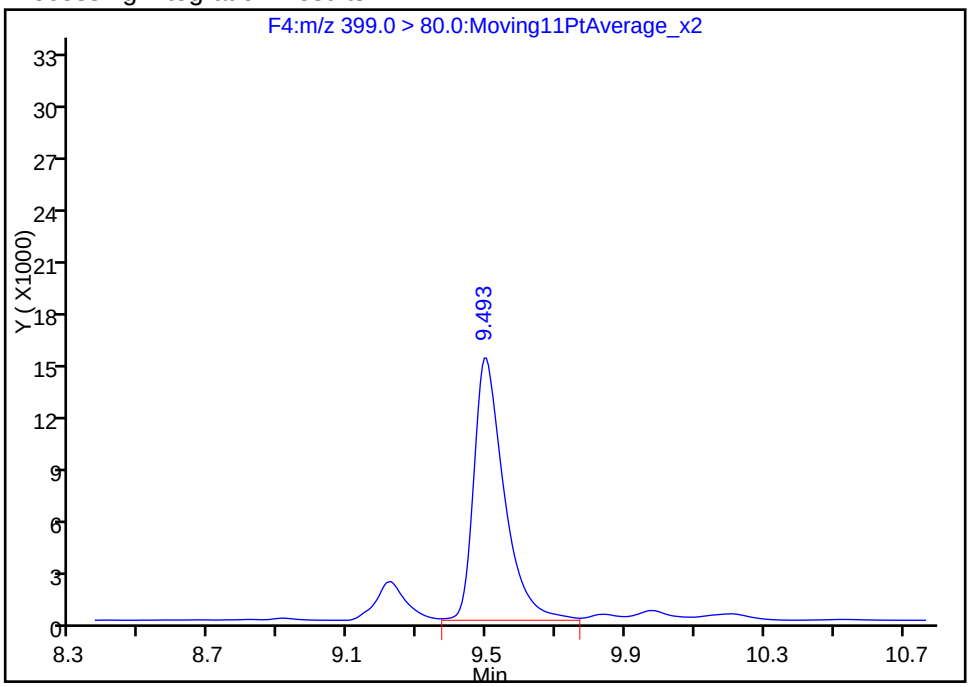
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_021.d				
Injection Date:	03-Jun-2016 23:34:29	Instrument ID:	A6		
Lims ID:	320-19198-A-3-A	Lab Sample ID:	320-19198-3		
Client ID:	DW-95				
Operator ID:	JRB	ALS Bottle#:	20	Worklist Smp#:	21
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F4:MRM		

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

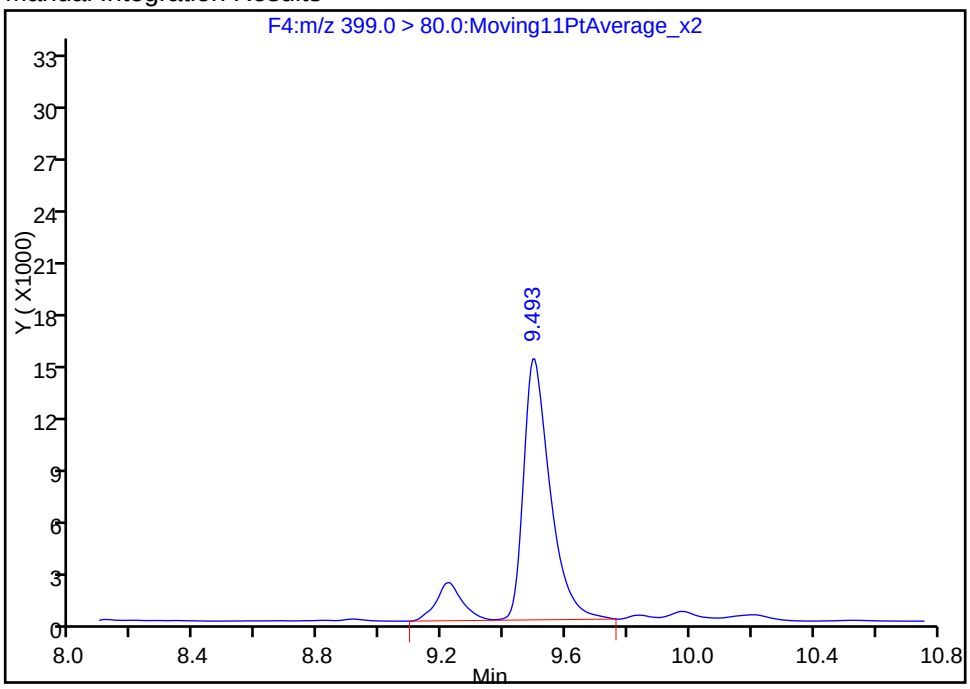
Processing Integration Results

RT: 9.49
Area: 92054
Amount: 3.183721
Amount Units: ng/ml



Manual Integration Results

RT: 9.49
Area: 103044
Amount: 3.563814
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:23:23

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

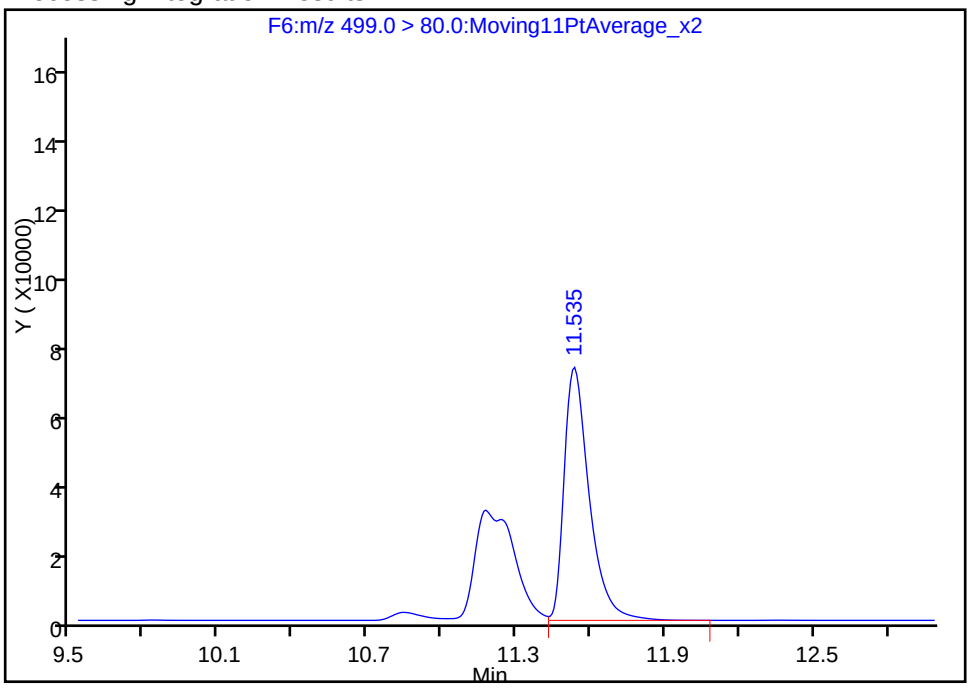
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_021.d				
Injection Date:	03-Jun-2016 23:34:29	Instrument ID:	A6		
Lims ID:	320-19198-A-3-A	Lab Sample ID:	320-19198-3		
Client ID:	DW-95				
Operator ID:	JRB	ALS Bottle#:	20	Worklist Smp#:	21
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F6:MRM		

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

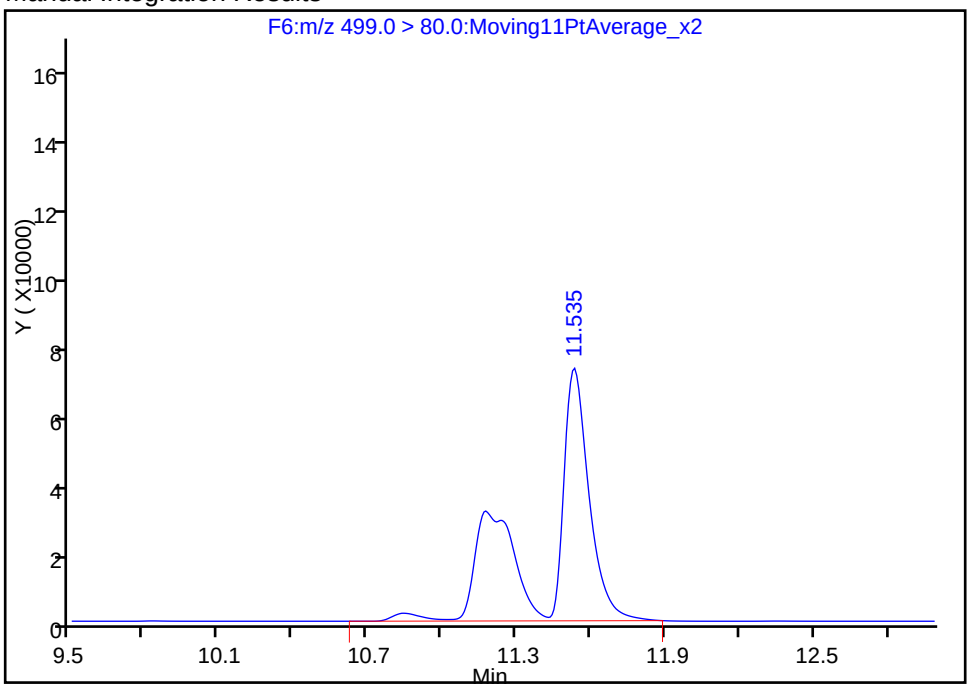
Processing Integration Results

RT: 11.54
Area: 501791
Amount: 11.742444
Amount Units: ng/ml



Manual Integration Results

RT: 11.54
Area: 854017
Amount: 19.984907
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:23:23

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

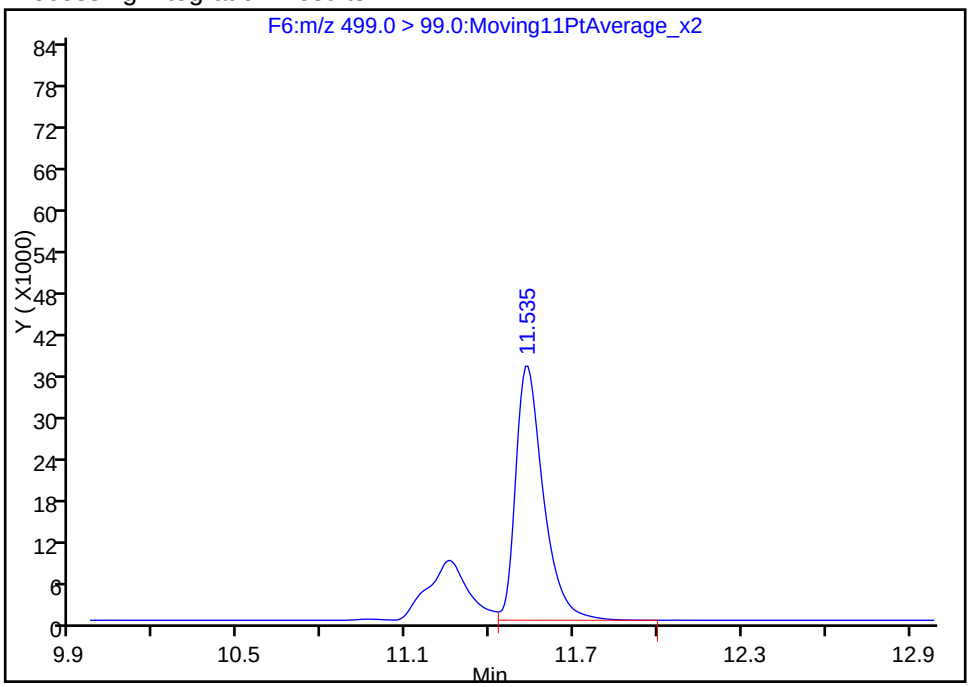
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_021.d				
Injection Date:	03-Jun-2016 23:34:29	Instrument ID:	A6		
Lims ID:	320-19198-A-3-A	Lab Sample ID:	320-19198-3		
Client ID:	DW-95				
Operator ID:	JRB	ALS Bottle#:	20	Worklist Smp#:	21
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F6:MRM		

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

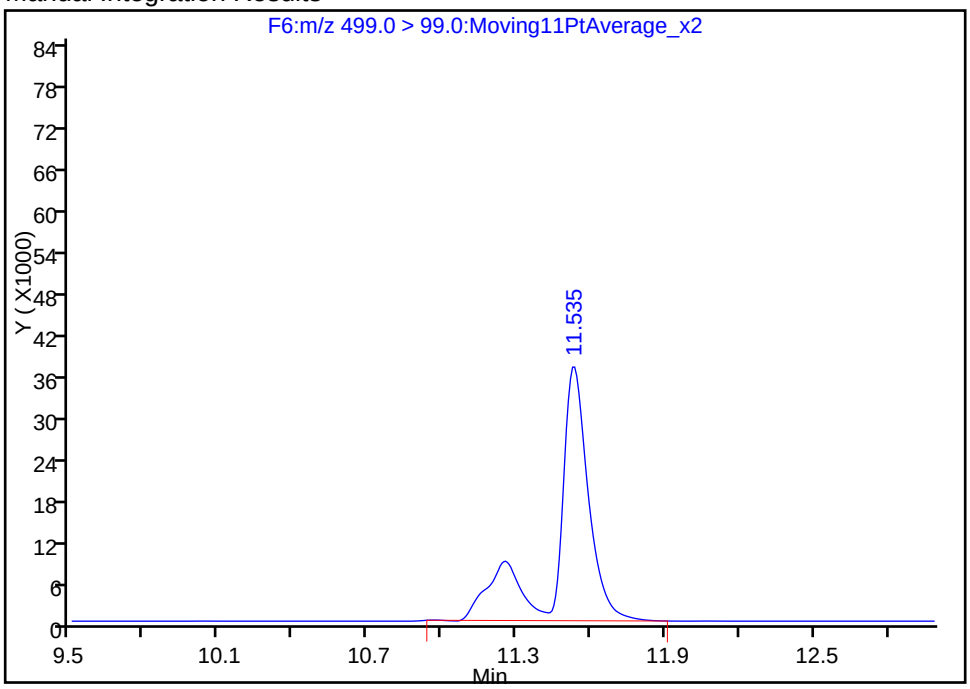
Processing Integration Results

RT: 11.54
Area: 254736
Amount: 11.742444
Amount Units: ng/ml



Manual Integration Results

RT: 11.54
Area: 338721
Amount: 19.984907
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:23:23

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

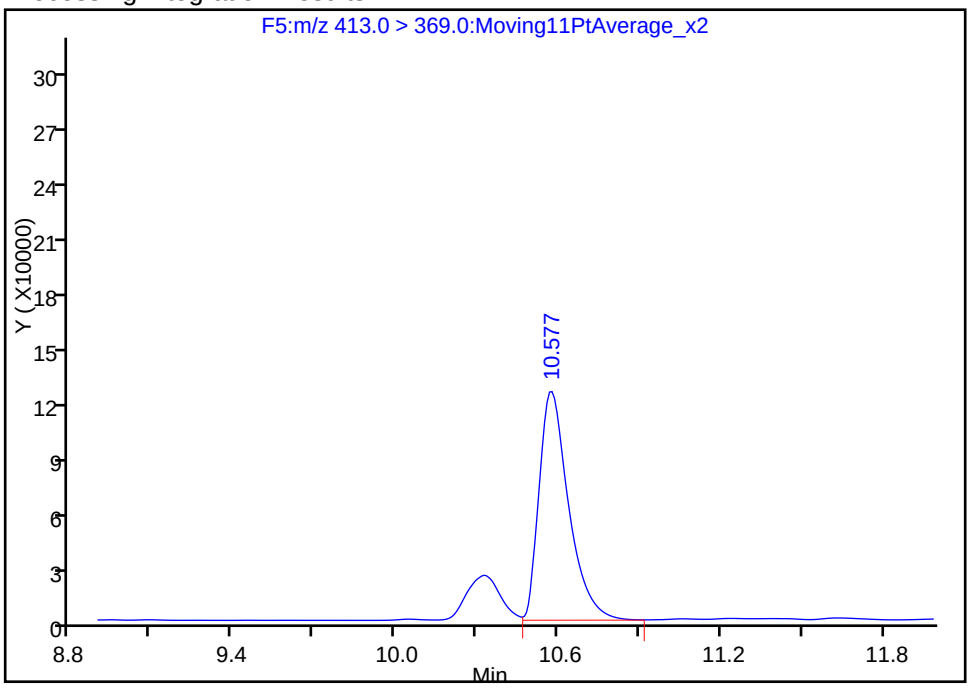
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_021.d				
Injection Date:	03-Jun-2016 23:34:29	Instrument ID:	A6		
Lims ID:	320-19198-A-3-A	Lab Sample ID:	320-19198-3		
Client ID:	DW-95				
Operator ID:	JRB	ALS Bottle#:	20	Worklist Smp#:	21
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F5:MRM		

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

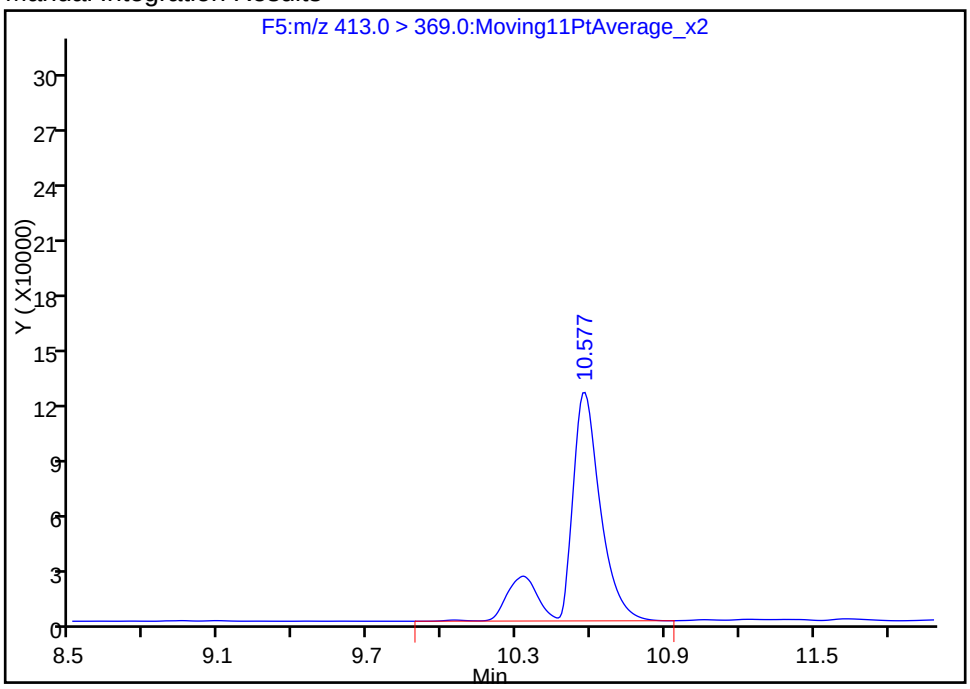
Processing Integration Results

RT: 10.58
Area: 947815
Amount: 24.772980
Amount Units: ng/ml



Manual Integration Results

RT: 10.58
Area: 1156534
Amount: 29.300393
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:23:23

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

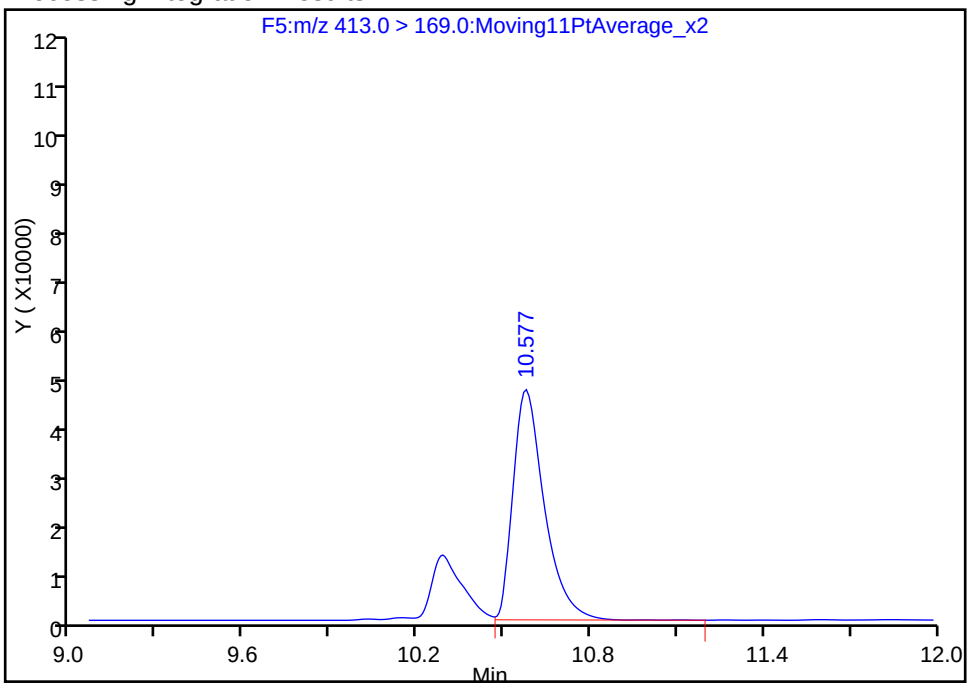
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_021.d				
Injection Date:	03-Jun-2016 23:34:29	Instrument ID:	A6		
Lims ID:	320-19198-A-3-A	Lab Sample ID:	320-19198-3		
Client ID:	DW-95				
Operator ID:	JRB	ALS Bottle#:	20	Worklist Smp#:	21
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F5:MRM		

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

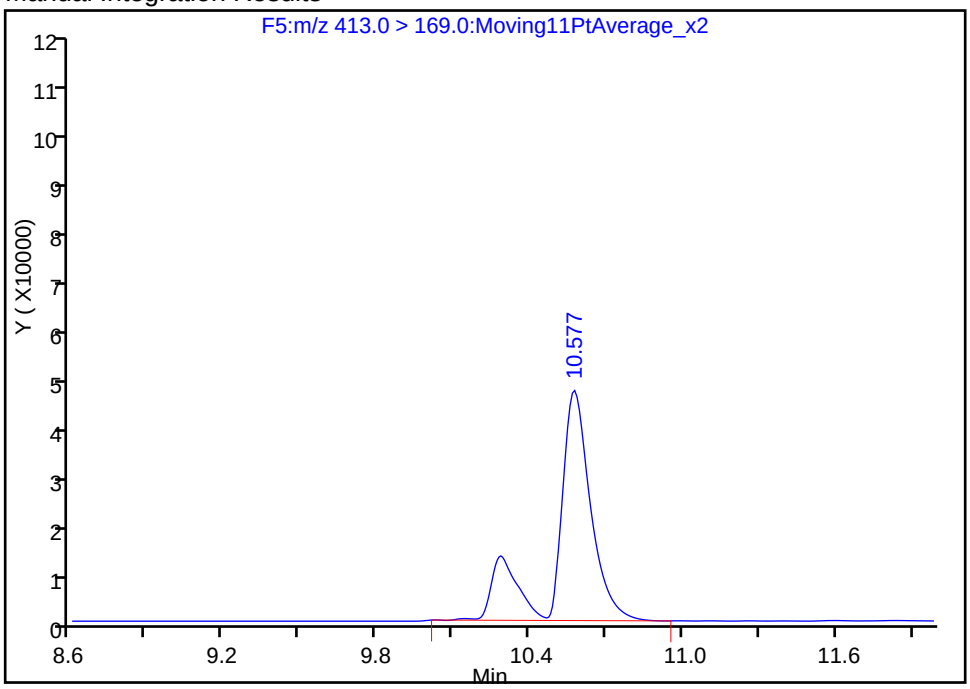
Processing Integration Results

RT: 10.58
Area: 336419
Amount: 24.772980
Amount Units: ng/ml



Manual Integration Results

RT: 10.58
Area: 426328
Amount: 29.300393
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:23:23

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-19198-1

SDG No.:

Client Sample ID: FB-DW-95 | Lab Sample ID: 320-19198-4

Matrix: Water | Lab File ID: 03JUN2016A6A_022.d

Analysis Method: WS-LC-0025 | Date Collected: 05/26/2016 11:28

Extraction Method: 3535 | Date Extracted: 06/01/2016 11:06

Sample wt/vol: 535.7(mL) | Date Analyzed: 06/03/2016 23:55

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 112504 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.2	J	2.3	1.9	0.86
375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	U	2.3	1.9	0.75
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	U	2.3	1.9	0.81
375-95-1	Perfluorononanoic acid (PFNA)	0.64	J	2.3	1.9	0.61
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	13	M	3.7	2.8	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	0.75	J	2.3	1.9	0.70

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	108		25-150
STL00990	13C4 PFOA	123		25-150
STL00991	13C4 PFOS	117		25-150
STL01892	13C4-PFHpA	109		25-150
STL00995	13C5 PFNA	112		25-150
STL00994	18O2 PFHxS	115		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_022.d
Lims ID: 320-19198-A-4-A
Client ID: FB-DW-95
Sample Type: Client
Inject. Date: 03-Jun-2016 23:55:45 ALS Bottle#: 21 Worklist Smp#: 22
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-19198-a-4-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 06-Jun-2016 11:40:56 Calib Date: 03-Jun-2016 19:40:28
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:25:30

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.075	7.069	0.006	1.000	1848	0.6497				
D 6 13C2 PFHxA										
315.0 > 270.0	8.219	8.217	0.002		3579779	54.1		108	6969	
D 8 13C4-PFHpA										
367.0 > 322.0	9.458	9.456	0.002		3963754	54.6		109	6504	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.458	9.457	0.001	1.000	11063	0.1496			147	
D 11 18O2 PFHxS										
403.0 > 84.0	9.493	9.492	0.001		1708021	54.3		115	8916	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.499	9.495	0.004	1.000	10039	0.3644				
D 12 13C4 PFOA										
417.0 > 372.0	10.568	10.569	-0.001		4933837	61.4		123	8855	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.568	10.572	-0.004	1.000	32640	0.3999			19.3	
413.0 > 169.0	10.577	10.572	0.005	1.001	9638		3.39(0.00-0.00)		16.1	
D 16 13C4 PFOS										
503.0 > 80.0	11.527	11.525	0.002		2143237	55.9		117	25409	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.527	11.527	0.0	1.000	339782	6.77			7884	M
499.0 > 99.0	11.527	11.527	0.0	1.000	131984		2.57(0.00-0.00)		7894	M
D 17 13C5 PFNA										
468.0 > 423.0	11.545	11.542	0.003		3969172	56.0		112	57264	
18 Perfluorononanoic acid										
463.0 > 419.0	11.545	11.543	0.002	1.000	18762	0.3410			462	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 06-Jun-2016 11:41:09 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_022.d

Injection Date: 03-Jun-2016 23:55:45 Instrument ID: A6

Lims ID: 320-19198-A-4-A Lab Sample ID: 320-19198-4

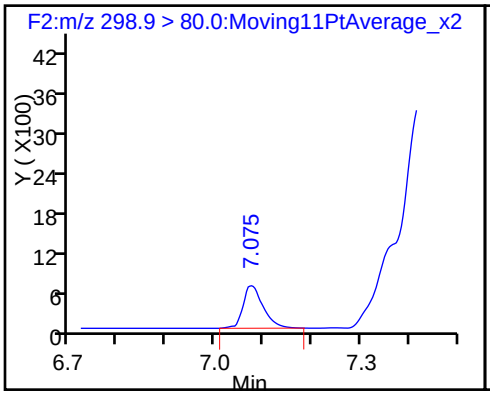
Client ID: FB-DW-95

Operator ID: JRB ALS Bottle#: 21 Worklist Smp#: 22

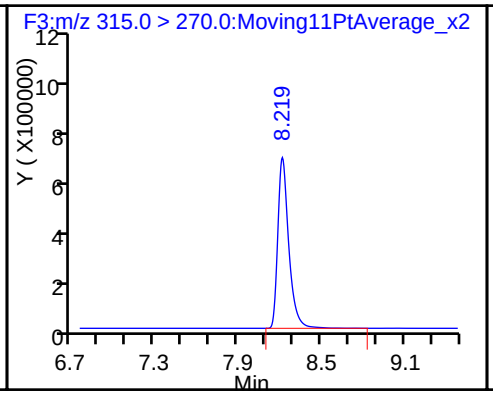
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

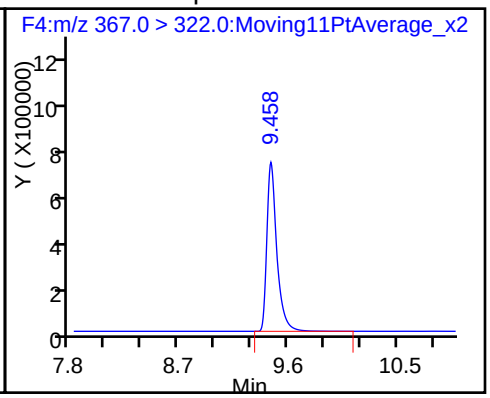
40 Perfluorobutanesulfonic acid



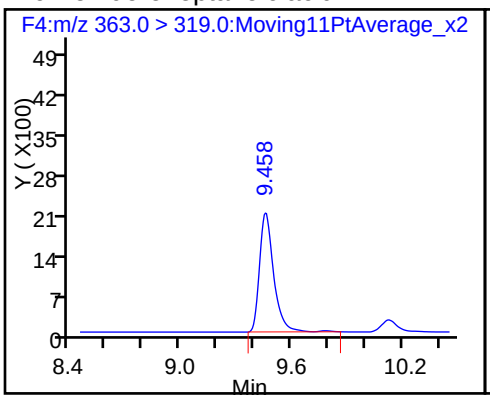
D 6 13C2 PFHxA



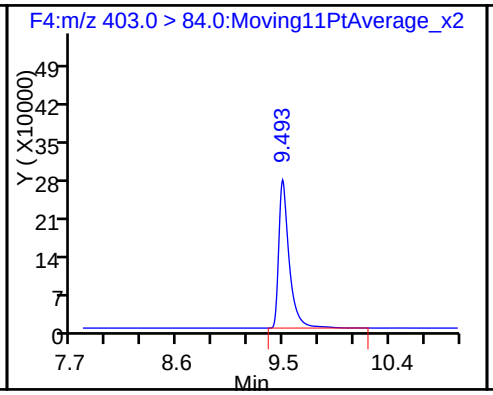
D 8 13C4-PFHpA



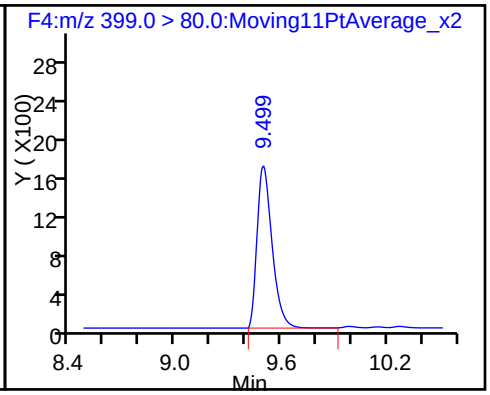
9 Perfluoroheptanoic acid



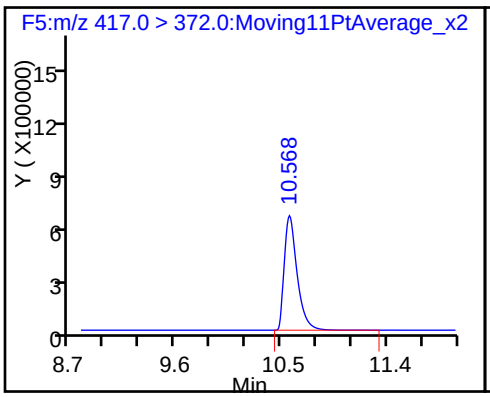
D 11 18O2 PFHxS



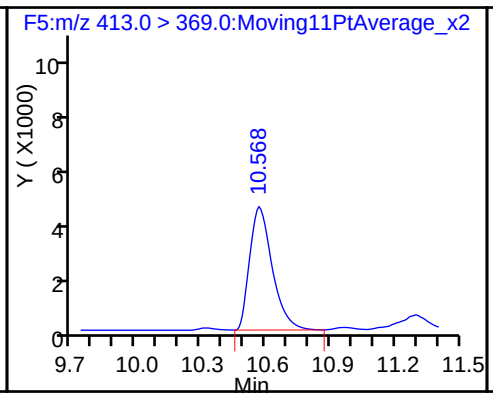
41 Perfluorohexanesulfonic acid



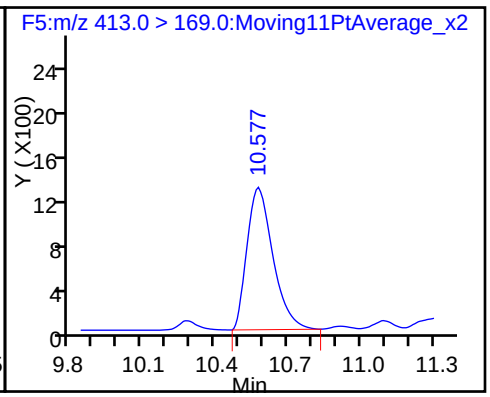
D 12 13C4 PFOA



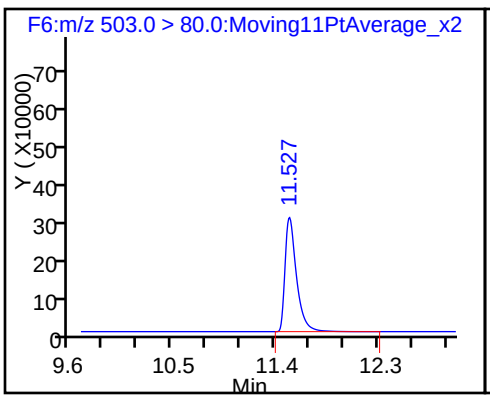
13 Perfluorooctanoic acid



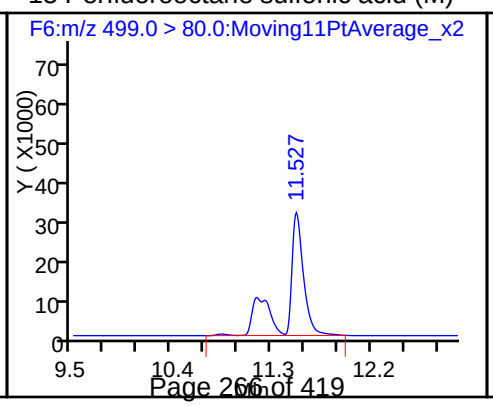
13 Perfluorooctanoic acid



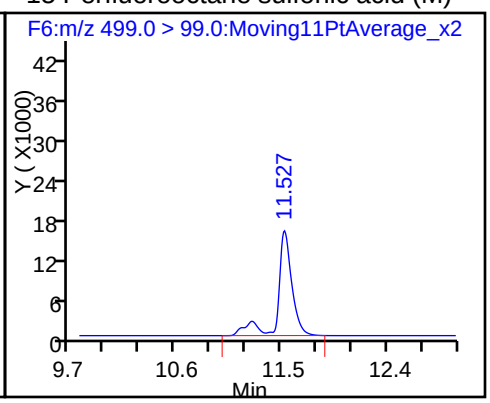
D 16 13C4 PFOS



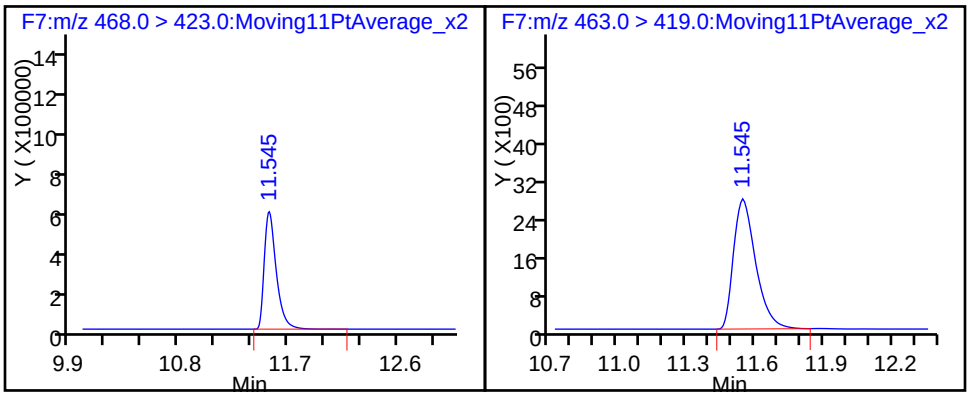
15 Perfluorooctane sulfonic acid (M)



15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA 18 Perfluorononanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

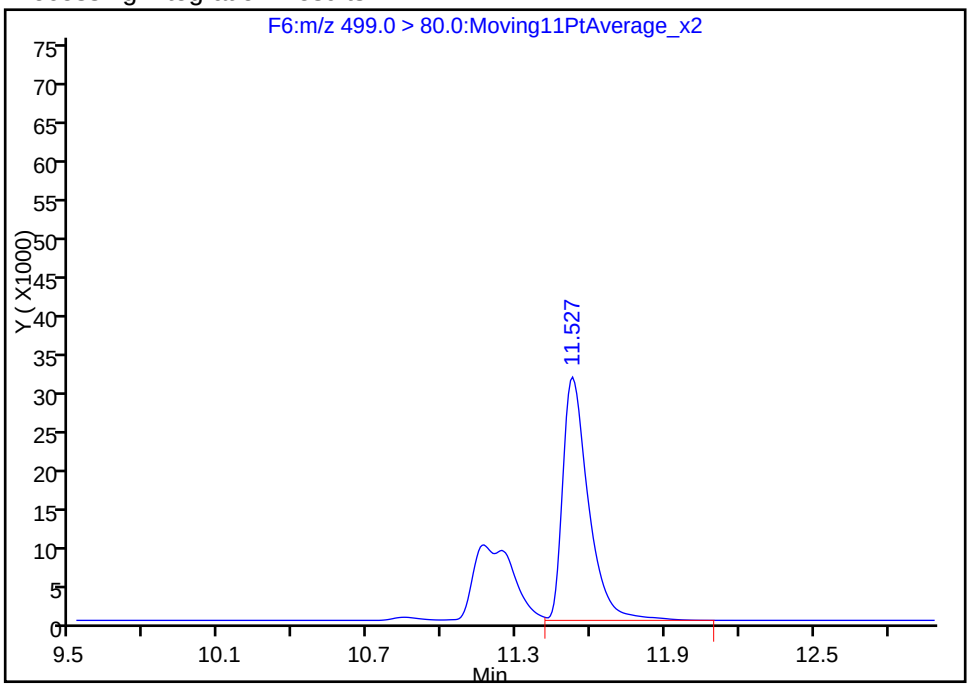
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_022.d				
Injection Date:	03-Jun-2016 23:55:45	Instrument ID:	A6		
Lims ID:	320-19198-A-4-A	Lab Sample ID:	320-19198-4		
Client ID:	FB-DW-95				
Operator ID:	JRB	ALS Bottle#:	21	Worklist Smp#:	22
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F6:MRM		

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

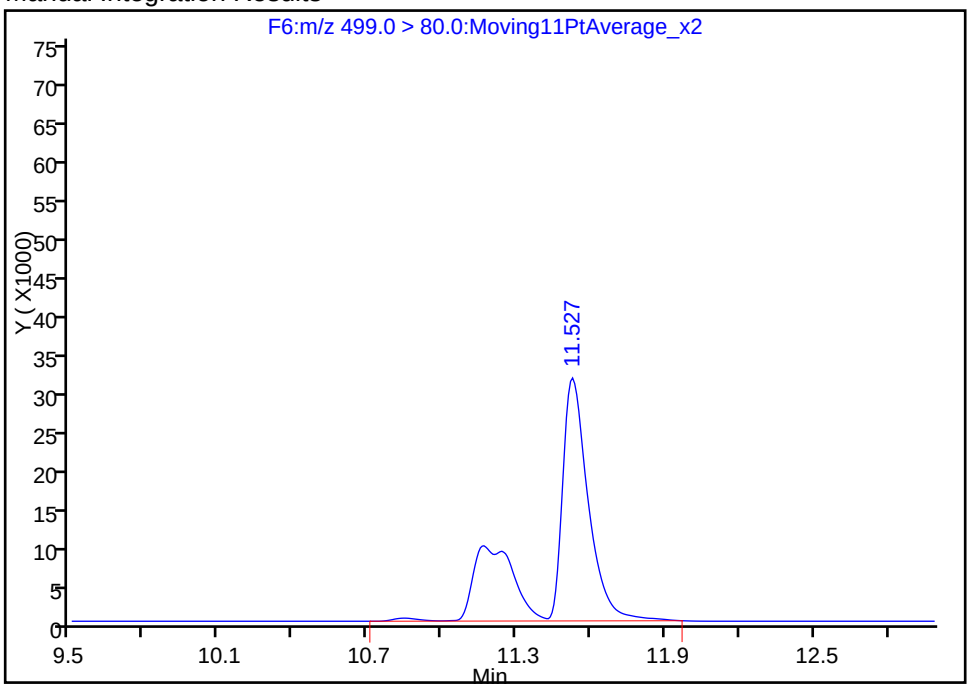
Processing Integration Results

RT: 11.53
Area: 228896
Amount: 4.559670
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 339782
Amount: 6.768549
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:25:30

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

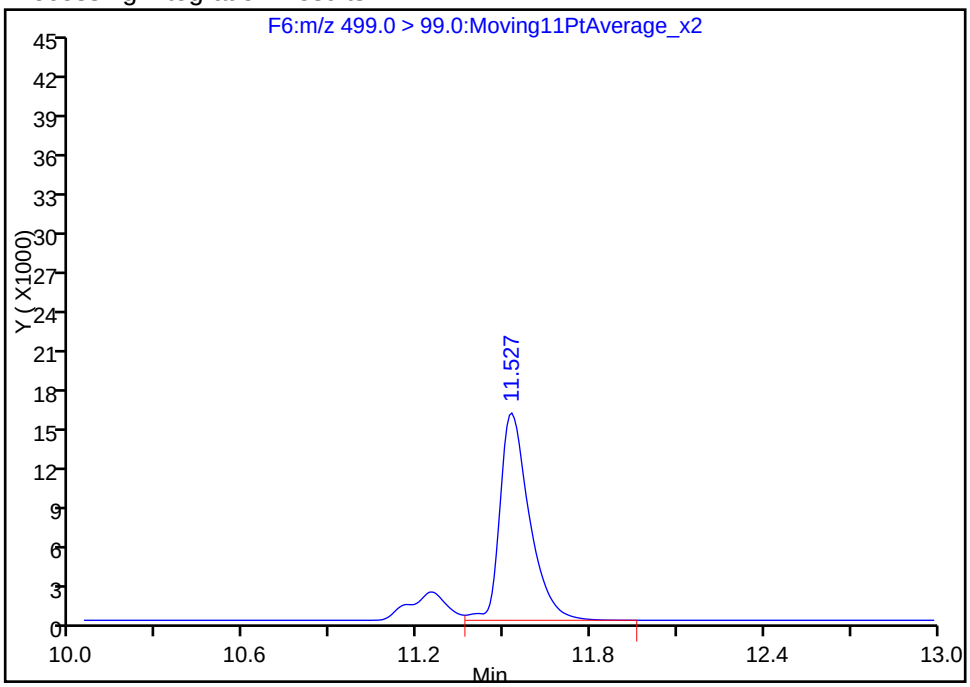
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_022.d				
Injection Date:	03-Jun-2016 23:55:45	Instrument ID:	A6		
Lims ID:	320-19198-A-4-A	Lab Sample ID:	320-19198-4		
Client ID:	FB-DW-95				
Operator ID:	JRB	ALS Bottle#:	21	Worklist Smp#:	22
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F6:MRM		

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

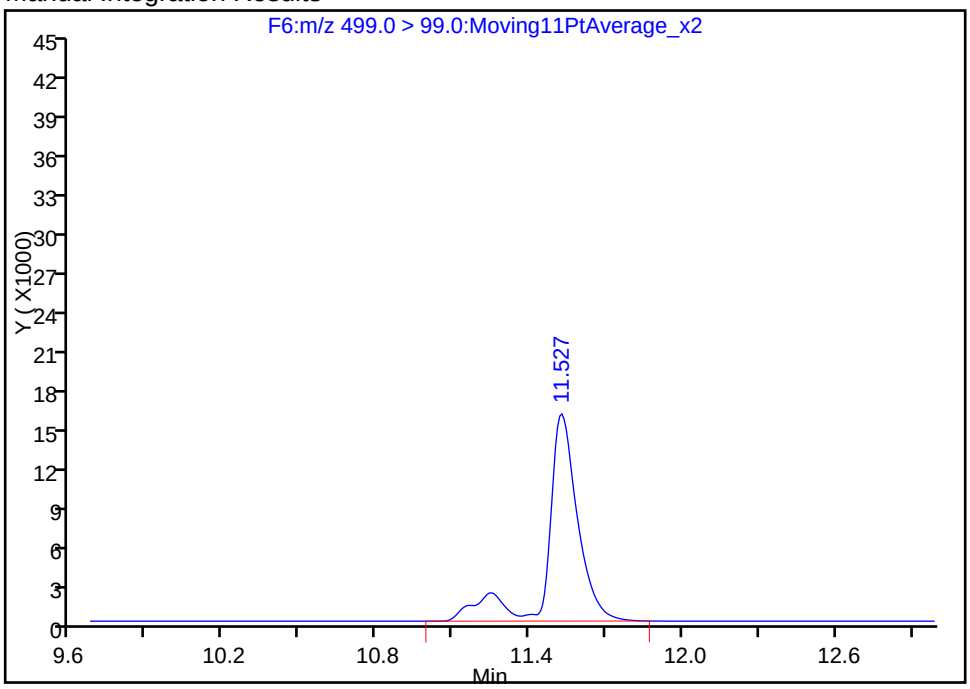
Processing Integration Results

RT: 11.53
Area: 112925
Amount: 4.559670
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 131984
Amount: 6.768549
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:25:30

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-19198-1

SDG No.:

Client Sample ID: DUP-052616 | Lab Sample ID: 320-19198-5

Matrix: Water | Lab File ID: 03JUN2016A6A_023.d

Analysis Method: WS-LC-0025 | Date Collected: 05/26/2016 11:26

Extraction Method: 3535 | Date Extracted: 06/01/2016 11:06

Sample wt/vol: 521.1(mL) | Date Analyzed: 06/04/2016 00:17

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 112504 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	3.1		2.4	1.9	0.88
375-85-9	Perfluoroheptanoic acid (PFHpA)	13		2.4	1.9	0.77
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.9	M	2.4	1.9	0.83
375-95-1	Perfluorononanoic acid (PFNA)	1.8	J	2.4	1.9	0.63
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	46	M	3.8	2.9	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	58	M	2.4	1.9	0.72

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	80		25-150
STL00990	13C4 PFOA	57		25-150
STL00991	13C4 PFOS	98		25-150
STL01892	13C4-PFHpA	77		25-150
STL00995	13C5 PFNA	46		25-150
STL00994	18O2 PFHxS	116		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_023.d
Lims ID: 320-19198-A-5-A
Client ID: DUP-052616
Sample Type: Client
Inject. Date: 04-Jun-2016 00:17:02 ALS Bottle#: 22 Worklist Smp#: 23
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-19198-a-5-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 06-Jun-2016 11:40:56 Calib Date: 03-Jun-2016 19:40:28
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:26:34

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.067	7.069	-0.002	1.000	40090	1.60				
D 6 13C2 PFHxA										
315.0 > 270.0	8.214	8.217	-0.003		2635972	39.8		79.7	18225	
D 8 13C4-PFHpA										
367.0 > 322.0	9.457	9.456	0.001		2802234	38.6		77.2	45306	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.457	9.457	0.0	1.000	364351	6.97			175	
D 11 18O2 PFHxS										
403.0 > 84.0	9.493	9.492	0.001		1733245	55.1		116	22788	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.493	9.495	-0.002	1.000	100184	3.58				M
D 12 13C4 PFOA										
417.0 > 372.0	10.568	10.569	-0.001		2288035	28.5		57.0	75444	
13 Perfluorooctanoic acid										M
413.0 > 369.0	10.568	10.572	-0.004	1.000	1141211	30.2			478	M
413.0 > 169.0	10.568	10.572	-0.004	1.000	441722		2.58(0.00-0.00)		762	M
D 16 13C4 PFOS										
503.0 > 80.0	11.526	11.525	0.001		1789646	46.6		97.6	11158	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.526	11.527	-0.001	1.000	998786	23.8			2293	M
499.0 > 99.0	11.526	11.527	-0.001	1.000	396657		2.52(0.00-0.00)		7571	M
D 17 13C5 PFNA										
468.0 > 423.0	11.544	11.542	0.002		1618503	22.8		45.6	117331	
18 Perfluorononanoic acid										
463.0 > 419.0	11.544	11.543	0.001	1.000	20893	0.9312			385	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 06-Jun-2016 11:41:10 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_023.d

Injection Date: 04-Jun-2016 00:17:02 Instrument ID: A6

Lims ID: 320-19198-A-5-A Lab Sample ID: 320-19198-5

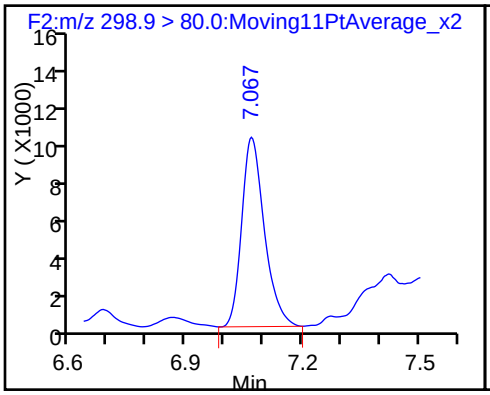
Client ID: DUP-052616

Operator ID: JRB ALS Bottle#: 22 Worklist Smp#: 23

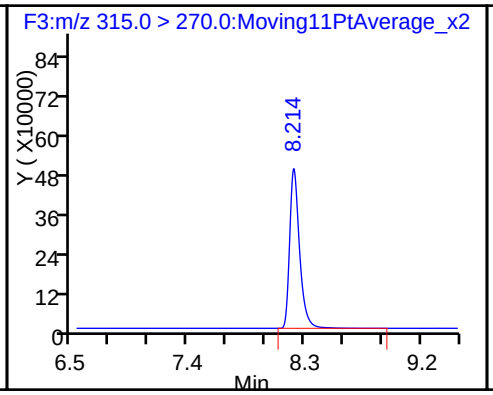
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

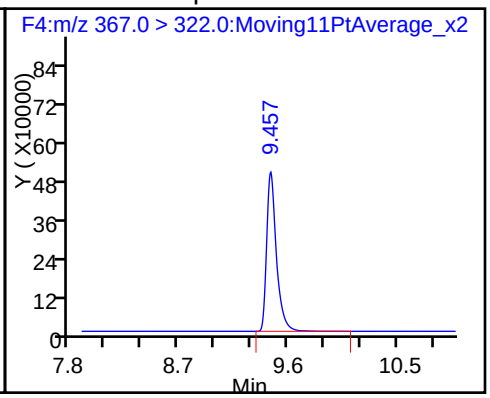
40 Perfluorobutanesulfonic acid



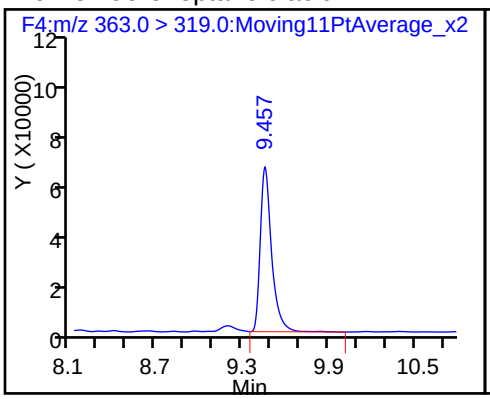
D 6 13C2 PFHxA



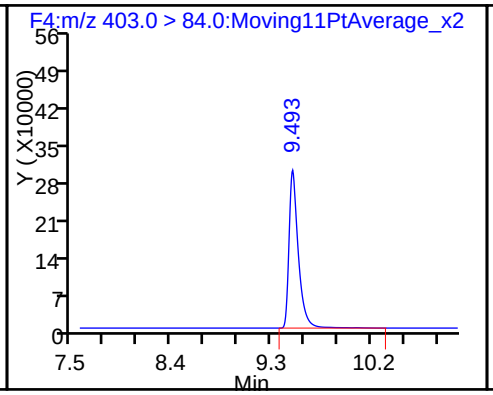
D 8 13C4-PFHpA



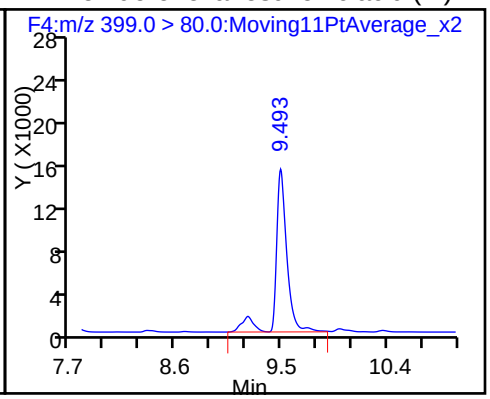
9 Perfluoroheptanoic acid



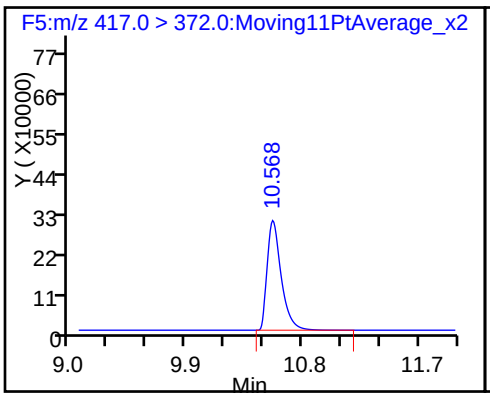
D 11 18O2 PFHxS



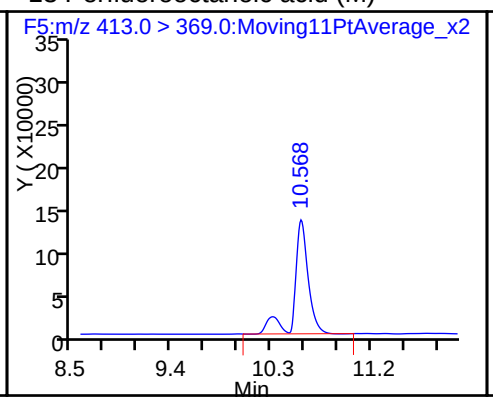
41 Perfluorohexanesulfonic acid (M)



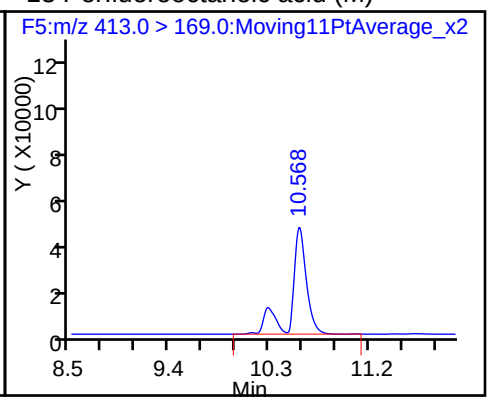
D 12 13C4 PFOA



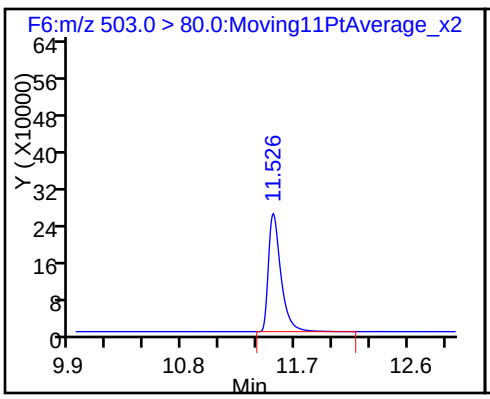
13 Perfluorooctanoic acid (M)



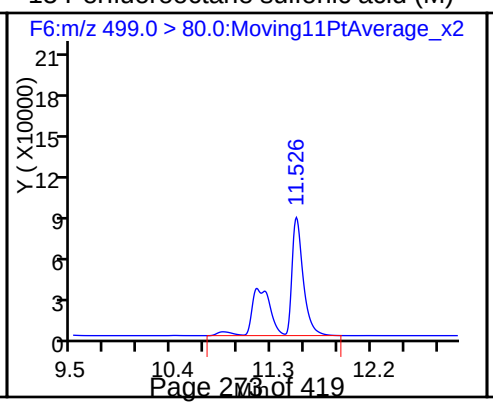
13 Perfluorooctanoic acid (M)



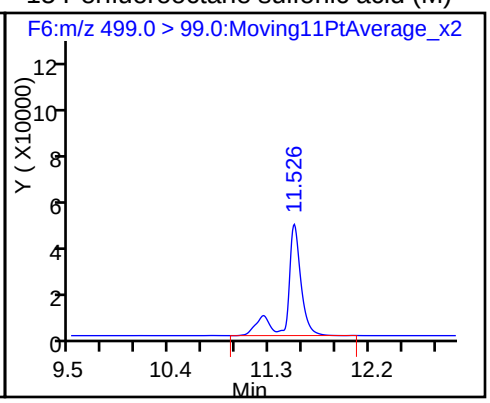
D 16 13C4 PFOS



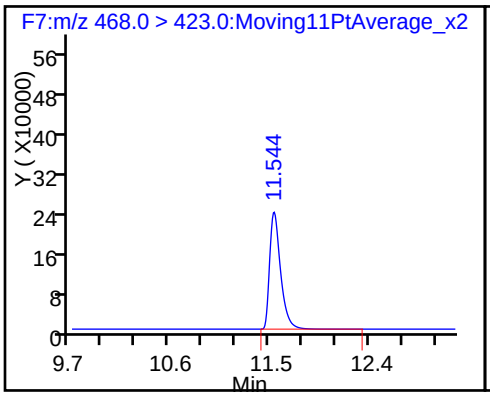
15 Perfluorooctane sulfonic acid (M)



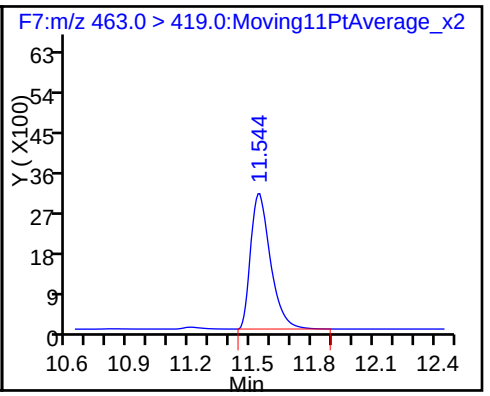
15 Perfluorooctane sulfonic acid (M)



D 17 13C5 PFNA



18 Perfluorononanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

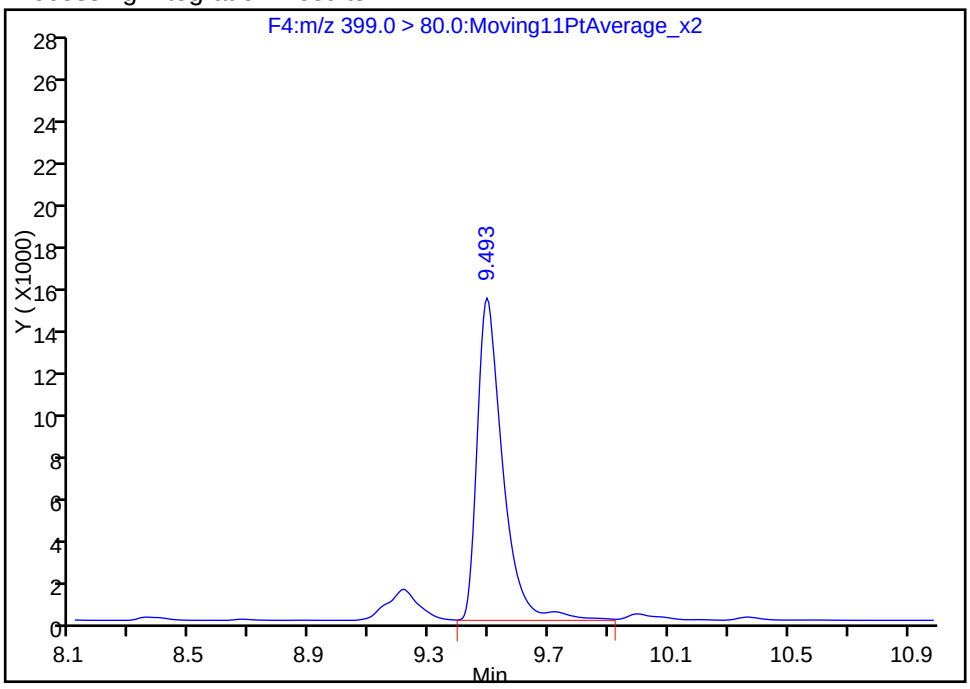
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_023.d				
Injection Date:	04-Jun-2016 00:17:02	Instrument ID:	A6		
Lims ID:	320-19198-A-5-A	Lab Sample ID:	320-19198-5		
Client ID:	DUP-052616				
Operator ID:	JRB	ALS Bottle#:	22	Worklist Smp#:	23
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F4:MRM		

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

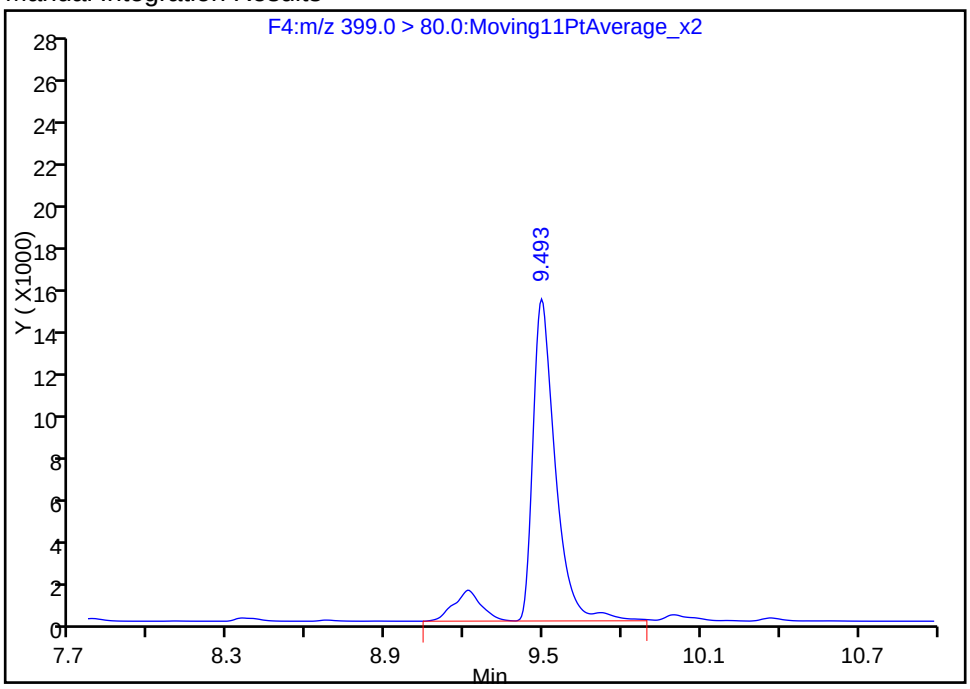
Processing Integration Results

RT: 9.49
Area: 90108
Amount: 3.222924
Amount Units: ng/ml



Manual Integration Results

RT: 9.49
Area: 100184
Amount: 3.583316
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:26:34

Audit Action: Assigned Compound ID Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

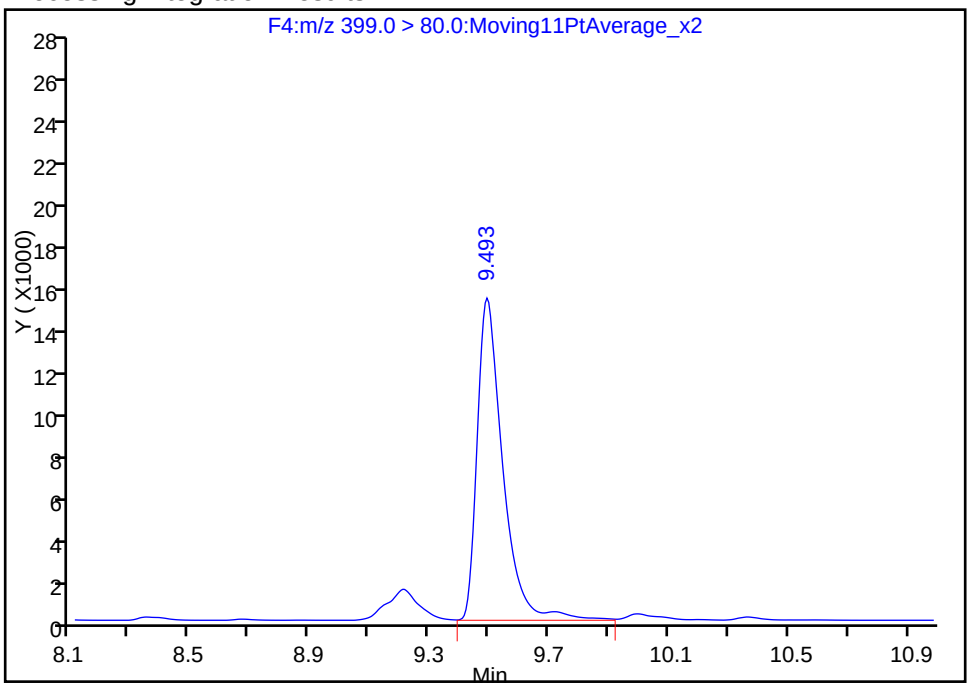
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_023.d				
Injection Date:	04-Jun-2016 00:17:02	Instrument ID:	A6		
Lims ID:	320-19198-A-5-A	Lab Sample ID:	320-19198-5		
Client ID:	DUP-052616				
Operator ID:	JRB	ALS Bottle#:	22	Worklist Smp#:	23
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F4:MRM		

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

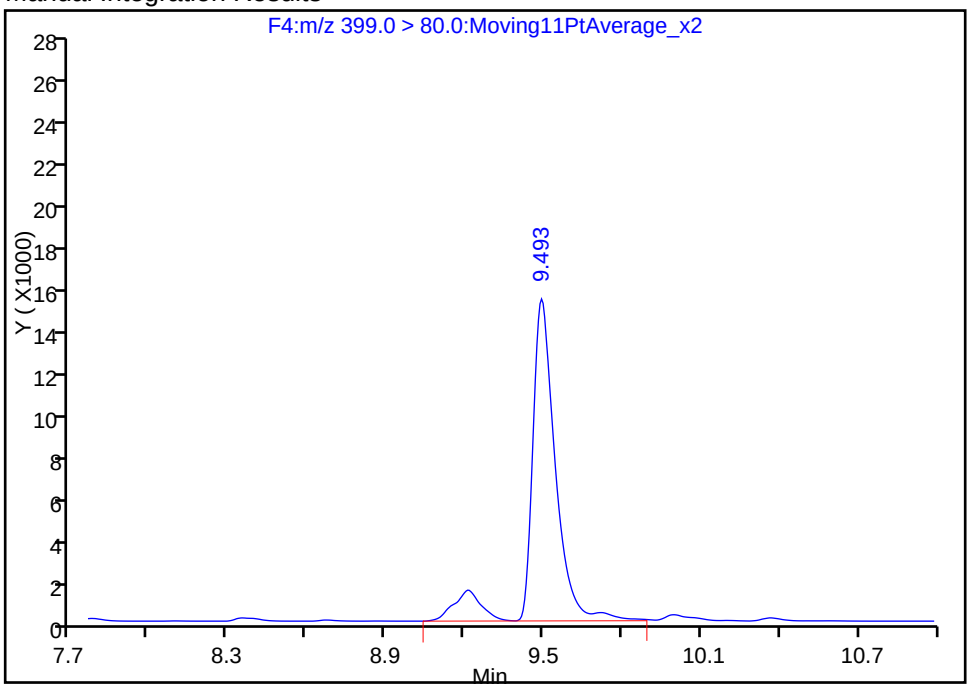
Processing Integration Results

RT: 9.49
Area: 90108
Amount: 3.222924
Amount Units: ng/ml



Manual Integration Results

RT: 9.49
Area: 100184
Amount: 3.583316
Amount Units: ng/ml



Reviewer: barnettj, 06-Jun-2016 11:32:18

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

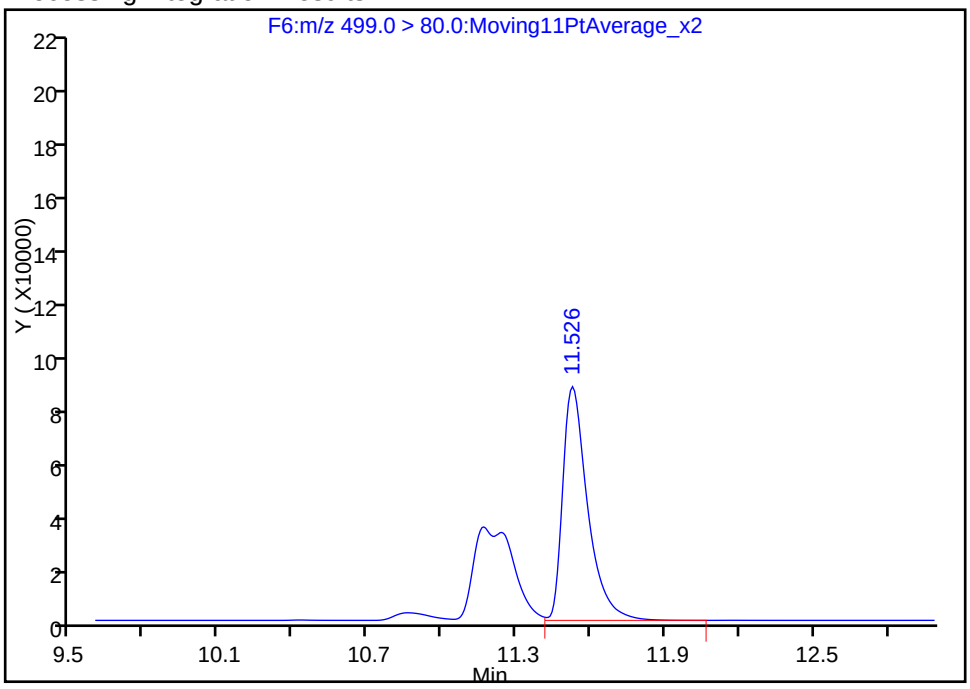
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_023.d				
Injection Date:	04-Jun-2016 00:17:02	Instrument ID:	A6		
Lims ID:	320-19198-A-5-A	Lab Sample ID:	320-19198-5		
Client ID:	DUP-052616				
Operator ID:	JRB	ALS Bottle#:	22	Worklist Smp#:	23
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F6:MRM		

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

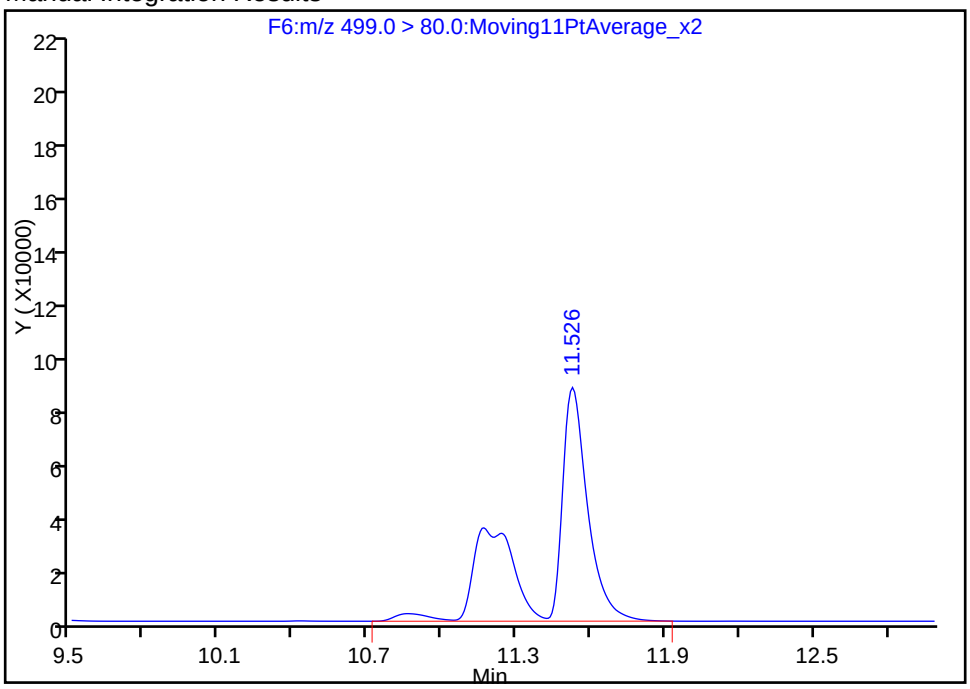
Processing Integration Results

RT: 11.53
Area: 596734
Amount: 14.235709
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 998786
Amount: 23.827076
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:26:34

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

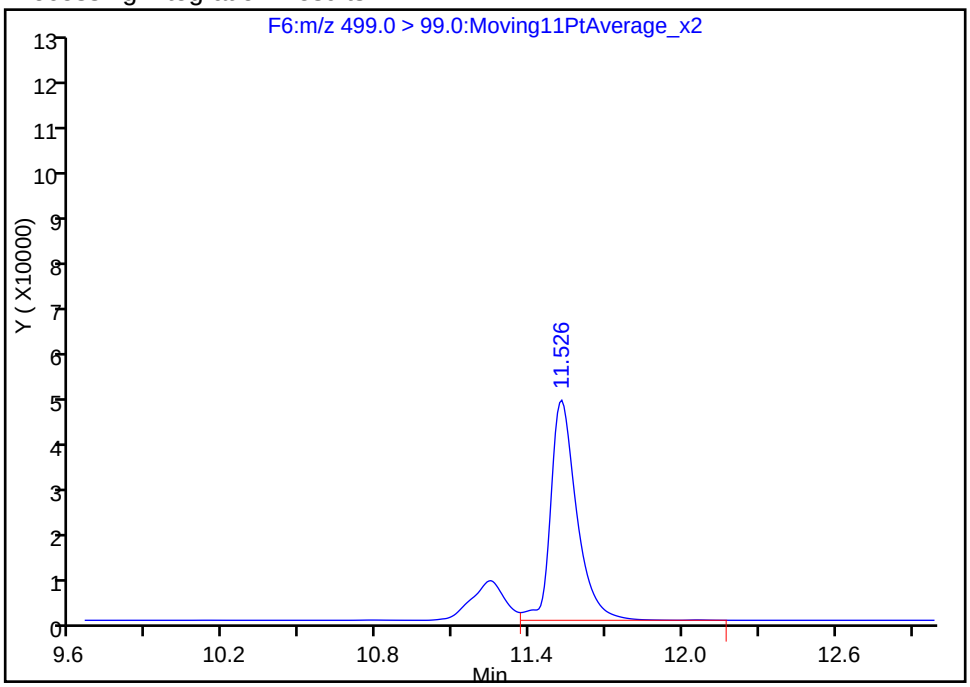
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_023.d				
Injection Date:	04-Jun-2016 00:17:02	Instrument ID:	A6		
Lims ID:	320-19198-A-5-A	Lab Sample ID:	320-19198-5		
Client ID:	DUP-052616				
Operator ID:	JRB	ALS Bottle#:	22	Worklist Smp#:	23
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F6:MRM		

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

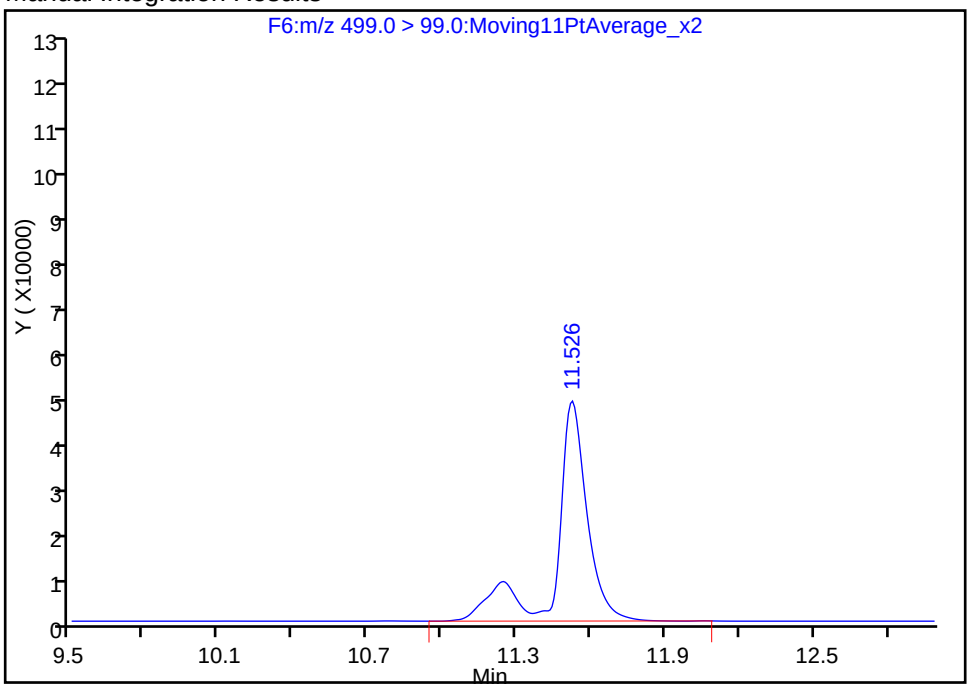
Processing Integration Results

RT: 11.53
Area: 324689
Amount: 14.235709
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 396657
Amount: 23.827076
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:26:34

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

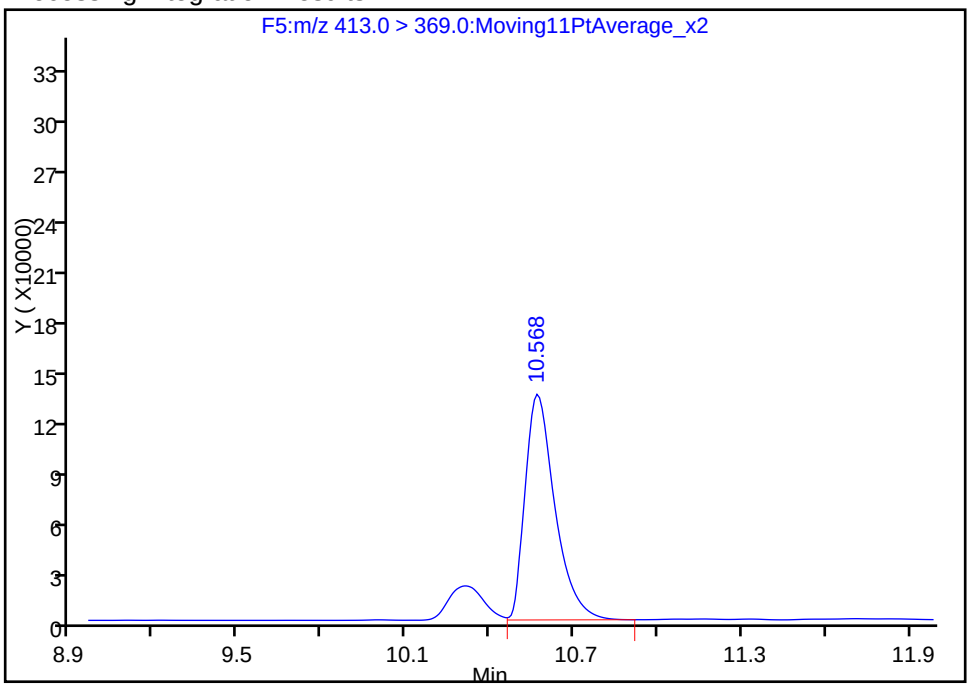
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_023.d				
Injection Date:	04-Jun-2016 00:17:02	Instrument ID:	A6		
Lims ID:	320-19198-A-5-A	Lab Sample ID:	320-19198-5		
Client ID:	DUP-052616				
Operator ID:	JRB	ALS Bottle#:	22	Worklist Smp#:	23
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F5:MRM		

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

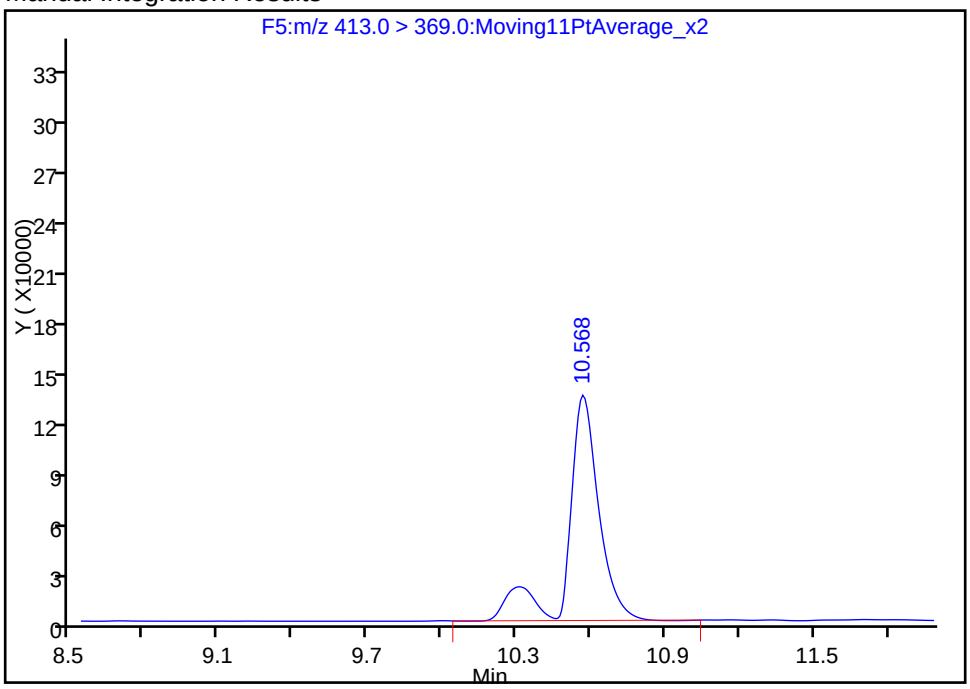
Processing Integration Results

RT: 10.57
Area: 978457
Amount: 26.670689
Amount Units: ng/ml



Manual Integration Results

RT: 10.57
Area: 1141211
Amount: 30.152186
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:26:34

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

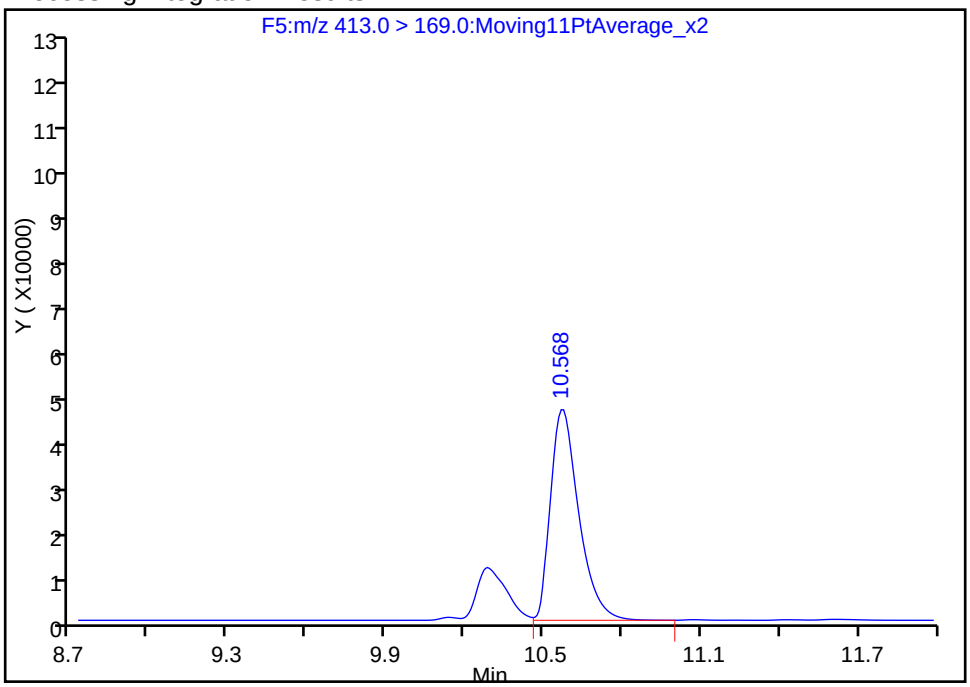
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_023.d				
Injection Date:	04-Jun-2016 00:17:02	Instrument ID:	A6		
Lims ID:	320-19198-A-5-A	Lab Sample ID:	320-19198-5		
Client ID:	DUP-052616				
Operator ID:	JRB	ALS Bottle#:	22	Worklist Smp#:	23
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F5:MRM		

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

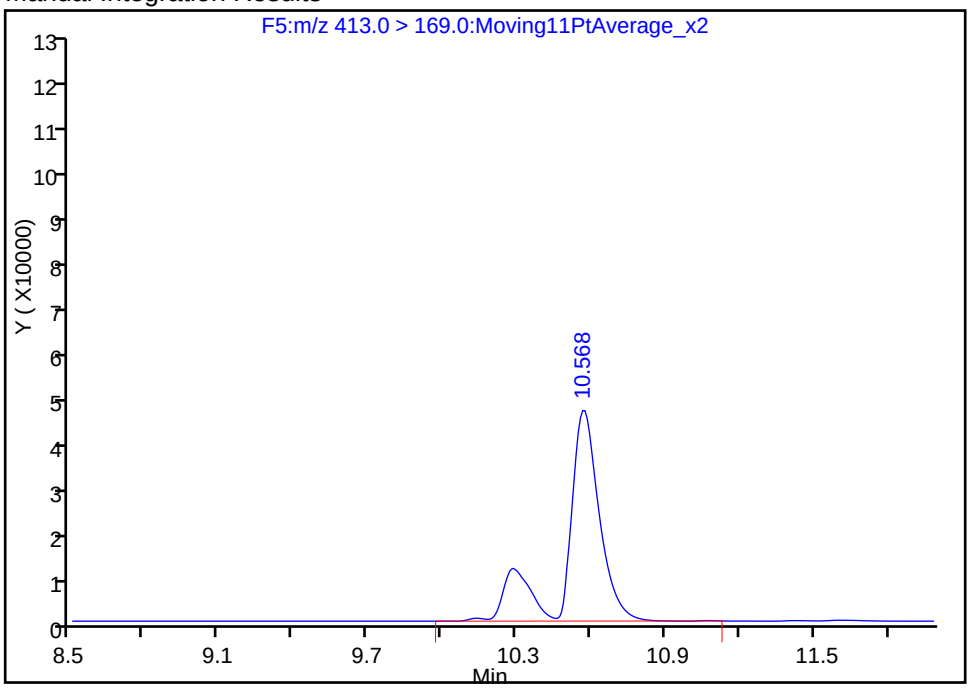
Processing Integration Results

RT: 10.57
Area: 349495
Amount: 26.670689
Amount Units: ng/ml



Manual Integration Results

RT: 10.57
Area: 441722
Amount: 30.152186
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:26:34

Audit Action: Manually Integrated Audit Reason: Isomers

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1 Analy Batch No.: 112504

SDG No.:

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 06/03/2016 17:32 Calibration End Date: 06/03/2016 19:40 Calibration ID: 21964

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-112504/4	03JUN2016A6A_004.d
Level 2	STD 320-112504/5	03JUN2016A6A_005.d
Level 3	STD 320-112504/6	03JUN2016A6A_006.d
Level 4	STD 320-112504/7	03JUN2016A6A_007.d
Level 5	STD 320-112504/8	03JUN2016A6A_008.d
Level 6	STD 320-112504/9	03JUN2016A6A_009.d
Level 7	STD 320-112504/10	03JUN2016A6A_010.d

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7				RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	+++++	5.779	5.785	5.788	5.788	5.785	5.788				5.536 - 6.036	5.786
Perfluoropentanoic acid (PFPeA)	+++++	6.937	6.941	6.946	6.941	6.941	6.941				6.691 - 7.191	6.941
Perfluorobutanesulfonic acid (PFBS)	+++++	7.064	7.067	7.071	7.071	7.071	+++++				6.819 - 7.319	7.069
Perfluorohexanoic acid (PFHxA)	+++++	8.214	8.214	8.220	8.219	8.219	8.219				7.966 - 8.466	8.218
Perfluoroheptanoic acid (PFHpA)	+++++	9.452	9.457	9.463	9.458	9.458	+++++				9.207 - 9.707	9.458
Perfluorohexanesulfonic acid (PFHxS)	+++++	9.493	9.493	9.493	9.493	9.493	9.499				9.245 - 9.745	9.494
Perfluorooctanoic acid (PFOA)	+++++	10.577	10.568	10.577	10.577	10.568	10.577				10.322 - 10.822	10.574
Perfluoroheptanesulfonic Acid (PFHpS)	+++++	10.577	10.577	10.586	10.586	10.577	+++++				10.331 - 10.831	10.581
Perfluorooctanesulfonic acid (PFOS)	+++++	11.518	11.526	11.535	11.527	11.527	11.527				11.277 - 11.777	11.527
Perfluorononanoic acid (PFNA)	+++++	11.536	11.544	11.544	11.545	11.544	+++++				11.293 - 11.793	11.543
Perfluorodecanoic acid (PFDA)	12.373	12.373	12.373	12.373	12.373	12.373	+++++				12.123 - 12.623	12.373
Perfluorooctane Sulfonamide (FOSA)	+++++	12.984	12.984	12.994	12.994	12.984	+++++				12.737 - 13.237	12.988
Perfluorodecanesulfonic acid (PFDS)	13.032	13.032	13.032	13.041	13.032	13.032	13.031				12.783 - 13.283	13.033
Perfluoroundecanoic acid (PFUnA)	+++++	13.076	13.076	13.085	13.076	13.076	+++++				12.827 - 13.327	13.078
Perfluorododecanoic acid (PFDoA)	+++++	13.657	13.666	13.675	13.666	13.666	+++++				13.416 - 13.916	13.666
Perfluorotridecanoic Acid (PFTriA)	+++++	14.159	14.167	14.174	14.167	14.167	+++++				13.915 - 14.415	14.167
Perfluorotetradecanoic acid (PFTeA)	+++++	14.583	14.589	14.596	14.589	14.589	+++++				14.339 - 14.839	14.589
Perfluoro-n-hexadecanoic acid (PFHxDA)	15.175	15.175	15.174	15.179	15.180	15.179	+++++				14.927 - 15.427	15.177
Perfluoro-n-octandecanoic acid (PFODA)	15.436	15.436	15.436	15.441	15.436	15.436	+++++				15.187 - 15.687	15.437
13C4 PFBA	5.782	5.782	5.785	5.788	5.785	5.785	5.785				5.534 - 6.034	5.785
13C5-PFPeA	6.937	6.937	6.941	6.941	6.937	6.941	6.937				6.689 - 7.189	6.939
13C2 PFHxA	8.214	8.214	8.214	8.220	8.219	8.219	8.219				7.967 - 8.467	8.217
13C4-PFHpA	9.452	9.452	9.457	9.457	9.458	9.458	+++++				9.206 - 9.706	9.456
18O2 PFHxS	9.487	9.487	9.493	9.499	9.493	9.493	9.493				9.242 - 9.742	9.492
13C4 PFOA	10.568	10.568	10.568	10.577	10.568	10.568	+++++				10.319 - 10.819	10.570
13C4 PFOS	11.518	11.527	11.526	11.526	11.527	11.527	11.527				11.275 - 11.775	11.525
13C5 PFNA	11.536	11.536	11.544	11.544	11.545	11.544	+++++				11.292 - 11.792	11.542
13C2 PFDA	12.373	12.373	12.373	12.373	12.373	12.373	+++++				12.123 - 12.623	12.373
13C8 FOSA	12.984	12.984	12.984	12.994	12.984	12.984	+++++				12.735 - 13.235	12.986
13C2 PFUnA	13.076	13.067	13.076	13.085	13.076	13.076	+++++				12.826 - 13.326	13.076
13C2 PFDoA	13.657	13.657	13.666	13.666	13.666	13.666	+++++				13.413 - 13.913	13.663
13C2-PFTeDA	14.583	14.583	14.589	14.596	14.589	14.589	14.594				14.339 - 14.839	14.589
13C2-PFHxDA	15.175	15.175	15.174	15.179	15.180	15.179	15.178				14.927 - 15.427	15.177

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1 Analy Batch No.: 112504

SDG No.:

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 06/03/2016 17:32 Calibration End Date: 06/03/2016 19:40 Calibration ID: 21964

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-112504/4	03JUN2016A6A_004.d
Level 2	STD 320-112504/5	03JUN2016A6A_005.d
Level 3	STD 320-112504/6	03JUN2016A6A_006.d
Level 4	STD 320-112504/7	03JUN2016A6A_007.d
Level 5	STD 320-112504/8	03JUN2016A6A_008.d
Level 6	STD 320-112504/9	03JUN2016A6A_009.d
Level 7	STD 320-112504/10	03JUN2016A6A_010.d

ANALYTE	CF				CURVE TYPE	COEFFICIENT			#	MIN CF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 5	LVL 2 LVL 6	LVL 3 LVL 7	LVL 4		B	M1	M2								
13C4 PFBA	28673 28006	30920 24022	28396 20243	28015	Ave		26896.3371				13.3		50.0			
13C5-PFPeA	67620 65496	73202 55425	67968 44140	64092	Ave		62563.2429				15.6		50.0			
13C2 PFHxA	72094 66643	76956 57445	70170 48172	71753	Ave		66176.0771				15.1		50.0			
13C4-PFHpA	76896 70285	81969 56212	75320 +++++	75057	Ave		72623.3233				12.2		50.0			
18O2 PFHxS	33264 31366	38063 28374	34091 21328	33699	Ave		31454.8445				17.0		50.0			
13C4 PFOA	87843 73577	94409 58045	88512 +++++	79383	Ave		80294.8467				16.4		50.0			
13C4 PFOS	41140 38826	45507 33158	41242 26336	42397	Ave		38372.2833				17.0		50.0			
13C5 PFNA	71371 67506	80702 55651	79795 +++++	70465	Ave		70914.9033				12.9		50.0			
13C2 PFDA	56027 55307	67931 46123	59544 +++++	59367	Ave		57383.1700				12.4		50.0			
13C8 FOSA	118618 107117	133881 88934	114447 +++++	119172	Ave		113694.830				13.2		50.0			
13C2 PFUnA	87061 76741	92392 60515	87873 +++++	82041	Ave		81103.6633				14.1		50.0			
13C2 PFDoA	105080 96889	114482 77641	110403 +++++	100671	Ave		100860.977				12.9		50.0			
13C2-PFTeDA	88130 79362	93240 70608	83916 58544	84999	Ave		79828.2886				14.7		50.0			
13C2-PFHxDA	136496 130488	155339 112444	142220 98750	136773	Ave		130358.649				14.6		50.0			

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

FORM VI

CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1 Analy Batch No.: 112504

SDG No.:

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 06/03/2016 17:32 Calibration End Date: 06/03/2016 19:40 Calibration ID: 21964

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	+++++ 32353	32544 30383	35805	32583	31156	AveID		1.2395				13.4		35.0			
Perfluoropentanoic acid (PFPeA)	+++++ 53114	72612 47512	67387	56191	56404	AveID		0.9593				8.4		35.0			
Perfluorobutanesulfonic acid (PFBS)	+++++ 32426	24192 +++++	30295	31042	29879	L1ID	-0.663	1.0994							0.9940		0.9900
Perfluorohexanoic acid (PFHxA)	+++++ 56250	62673 54752	61667	59886	57229	AveID		0.9171				13.3		35.0			
Perfluoroheptanoic acid (PFHpA)	+++++ 57392	67944 +++++	72143	70601	64297	AveID		0.9326				7.5		35.0			
Perfluorohexanesulfonic acid (PFHxS)	+++++ 21910	27662 21007	23447	23280	22440	AveID		0.7630				14.8		35.0			
Perfluorooctanoic acid (PFOA)	+++++ 52312	58777 45567	76274	65440	58760	AveID		0.8271				13.8		35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	+++++ 21006	31663 +++++	27694	25698	24910	AveID		0.6497				5.3		50.0			
Perfluorooctanesulfonic acid (PFOS)	+++++ 38800	45392 35254	48995	42839	39328	AveID		1.1196				12.2		35.0			
Perfluorononanoic acid (PFNA)	+++++ 40874	51338 +++++	59150	49690	43783	AveID		0.6931				7.0		35.0			
Perfluorodecanoic acid (PFDA)	73054 50414	81032 +++++	67242	54654	54015	AveID		1.1027				12.7		35.0			
Perfluorooctane Sulfonamide (FOSA)	+++++ 61129	82881 +++++	80004	72940	71024	AveID		0.6561				6.0		35.0			
Perfluorodecanesulfonic acid (PFDS)	12033 22006	26898 17682	30803	27899	26518	L2ID	-0.176	0.7006							0.9930		0.9900
Perfluoroundecanoic acid (PFUnA)	+++++ 53328	113910 +++++	77826	68285	60256	L2ID	0.4101	0.8189							0.9980		0.9900
Perfluorododecanoic acid (PFDoA)	+++++ 58426	63248 +++++	73508	63827	56429	AveID		0.6374				12.2		35.0			
Perfluorotridecanoic Acid (PFTriA)	+++++ 71209	104371 +++++	101253	99736	85843	AveID		0.9245				4.2		50.0			
Perfluorotetradecanoic acid (PFTeA)	+++++ 59785	112067 +++++	83994	66095	62469	AveID		0.7622				17.6		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	441322 100341	306272 +++++	155803	120455	113515	L2ID	1.5132	1.1652							0.9960		0.9900
Perfluoro-n-octandecanoic acid (PFODA)	127458 109127	118261 +++++	135214	122276	117181	AveID		1.2167				9.7		50.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1 Analy Batch No.: 112504

SDG No.:

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 06/03/2016 17:32 Calibration End Date: 06/03/2016 19:40 Calibration ID: 21964

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-112504/4	03JUN2016A6A_004.d
Level 2	STD 320-112504/5	03JUN2016A6A_005.d
Level 3	STD 320-112504/6	03JUN2016A6A_006.d
Level 4	STD 320-112504/7	03JUN2016A6A_007.d
Level 5	STD 320-112504/8	03JUN2016A6A_008.d
Level 6	STD 320-112504/9	03JUN2016A6A_009.d
Level 7	STD 320-112504/10	03JUN2016A6A_010.d

ANALYTE	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
		LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
13C4 PFBA	Ave	1433671 1201075	1546012 1012126	1419784	1400768	1400282	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C5-PFPeA	Ave	3381013 2771254	3660075 2207013	3398375	3204622	3274783	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFHxA	Ave	3604684 2872247	3847822 2408590	3508493	3587651	3332140	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C4-PFHpA	Ave	3844822 2810580	4098464 +++++	3766006	3752872	3514253	50.0 50.0	50.0 +++++	50.0	50.0	50.0
18O2 PFHxS	Ave	1573402 1342070	1800359 1008805	1612487	1593964	1483612	47.3 47.3	47.3 47.3	47.3	47.3	47.3
13C4 PFOA	Ave	4392169 2902241	4720448 +++++	4425597	3969152	3678847	50.0 50.0	50.0 +++++	50.0	50.0	50.0
13C4 PFOS	Ave	1966495 1584944	2175222 1258865	1971377	2026588	1855875	47.8 47.8	47.8 47.8	47.8	47.8	47.8
13C5 PFNA	Ave	3568543 2782565	4035116 +++++	3989744	3523227	3375276	50.0 50.0	50.0 +++++	50.0	50.0	50.0
13C2 PFDA	Ave	2801343 2306152	3396542 +++++	2977215	2968340	2765359	50.0 50.0	50.0 +++++	50.0	50.0	50.0
13C8 FOSA	Ave	5930916 4446696	6694027 +++++	5722353	5958609	5355848	50.0 50.0	50.0 +++++	50.0	50.0	50.0
13C2 PFUnA	Ave	4353025 3025738	4619594 +++++	4393670	4102038	3837034	50.0 50.0	50.0 +++++	50.0	50.0	50.0
13C2 PFDoA	Ave	5254008 3882040	5724119 +++++	5520133	5033532	4844461	50.0 50.0	50.0 +++++	50.0	50.0	50.0
13C2-PFTeDA	Ave	4406508 3530381	4661979 2927207	4195809	4249936	3968081	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFHxDA	Ave	6824804 5622192	7766962 4937522	7110984	6838654	6524409	50.0 50.0	50.0 50.0	50.0	50.0	50.0

Curve Type Legend:
Ave = Average

FORM VI

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1 Analy Batch No.: 112504

SDG No.:

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 06/03/2016 17:32 Calibration End Date: 06/03/2016 19:40 Calibration ID: 21964

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-112504/4	03JUN2016A6A_004.d
Level 2	STD 320-112504/5	03JUN2016A6A_005.d
Level 3	STD 320-112504/6	03JUN2016A6A_006.d
Level 4	STD 320-112504/7	03JUN2016A6A_007.d
Level 5	STD 320-112504/8	03JUN2016A6A_008.d
Level 6	STD 320-112504/9	03JUN2016A6A_009.d
Level 7	STD 320-112504/10	03JUN2016A6A_010.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)		AveID	+++++ 6470507	32544 12153239	179023	651668	1557786	+++++ 200	1.00 400	5.00	20.0	50.0
Perfluoropentanoic acid (PFPeA)		AveID	+++++ 10622898	72612 19004619	336933	1123821	2820215	+++++ 200	1.00 400	5.00	20.0	50.0
Perfluorobutanesulfonic acid (PFBS)		L1ID	+++++ 5732872	21386 +++++	133903	548826	1320665	+++++ 177	0.884 +++++	4.42	17.7	44.2
Perfluorohexanoic acid (PFHxA)		AveID	+++++ 11249940	62673 21900721	308334	1197711	2861454	+++++ 200	1.00 400	5.00	20.0	50.0
Perfluoroheptanoic acid (PFHpA)		AveID	+++++ 11478334	67944 +++++	360716	1412013	3214873	+++++ 200	1.00 +++++	5.00	20.0	50.0
Perfluorohexanesulfonic acid (PFHxS)		AveID	+++++ 3987643	25172 7646391	106683	423692	1021016	+++++ 182	0.910 364	4.55	18.2	45.5
Perfluorooctanoic acid (PFOA)		AveID	+++++ 10462425	58777 18226991	381371	1308801	2937982	+++++ 200	1.00 400	5.00	20.0	50.0
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	+++++ 3999590	30143 +++++	131824	489285	1185733	+++++ 190	0.952 +++++	4.76	19.0	47.6
Perfluorooctanesulfonic acid (PFOS)		AveID	+++++ 7201323	42124 13086316	227335	795095	1824798	+++++ 186	0.928 371	4.64	18.6	46.4
Perfluorononanoic acid (PFNA)		AveID	+++++ 8174809	51338 +++++	295749	993809	2189140	+++++ 200	1.00 +++++	5.00	20.0	50.0
Perfluorodecanoic acid (PFDA)		AveID	36527 10082852	81032 +++++	336212	1093082	2700743	0.500 200	1.00 +++++	5.00	20.0	50.0
Perfluorooctane Sulfonamide (FOSA)		AveID	+++++ 12225896	82881 +++++	400018	1458806	3551181	+++++ 200	1.00 +++++	5.00	20.0	50.0
Perfluorodecanesulfonic acid (PFDS)		L2ID	5800 4242771	25930 6818278	148469	537885	1278184	0.482 193	0.964 386	4.82	19.3	48.2
Perfluoroundecanoic acid (PFUnA)		L2ID	+++++ 10665638	113910 +++++	389128	1365693	3012794	+++++ 200	1.00 +++++	5.00	20.0	50.0
Perfluorododecanoic acid (PFDoA)		AveID	+++++ 11685203	63248 +++++	367538	1276533	2821435	+++++ 200	1.00 +++++	5.00	20.0	50.0

FORM VI

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1 Analy Batch No.: 112504

SDG No.:

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 06/03/2016 17:32 Calibration End Date: 06/03/2016 19:40 Calibration ID: 21964

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorotridecanoic Acid (PFTriA)		AveID	+++++ 14241779	104371 +++++	506263	1994716	4292140	+++++ 200	1.00 +++++	5.00	20.0	50.0
Perfluorotetradecanoic acid (PFTeA)		AveID	+++++ 11956911	112067 +++++	419971	1321903	3123427	+++++ 200	1.00 +++++	5.00	20.0	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)		L2ID	220661 20068210	306272 +++++	779014	2409097	5675759	0.500 200	1.00 +++++	5.00	20.0	50.0
Perfluoro-n-octandecanoic acid (PFODA)		AveID	63729 21825371	118261 +++++	676071	2445515	5859044	0.500 200	1.00 +++++	5.00	20.0	50.0

Curve Type Legend:

AveID = Average isotope dilution
L1ID = Linear 1/conc IsoDil
L2ID = Linear 1/conc^2 IsoDil

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_004.d
Lims ID: Std L1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 03-Jun-2016 17:32:49 ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L1
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A6*sub11

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 06-Jun-2016 11:40:41 Calib Date: 03-Jun-2016 19:40:28
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK047

First Level Reviewer: barnettj Date: 06-Jun-2016 11:28:39

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.782	5.784	-0.002		1433671	53.3		107	1372	
2 Perfluorobutyric acid										
212.9 > 169.0	5.788	5.786	0.002	1.000	10508	0.2957		59.1	410	
D 3 13C5-PFPeA										
267.9 > 223.0	6.937	6.939	-0.002		3381013	54.0		108	16668	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.941	6.941	0.0	1.000	37076	0.5715		114	11.2	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.071	7.069	0.002	1.000	7792	0.8162		185		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.071	7.069	0.002	1.000	7792	NC			4.0	
298.9 > 99.0	7.075	7.069	0.006	1.000	4056		1.92(0.00-0.00)		7.1	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.209	8.216	-0.007	1.000	20103	0.3041		60.8	741	
D 6 13C2 PFHxA										
315.0 > 270.0	8.214	8.217	-0.003		3604684	54.5		109	90470	
D 8 13C4-PFHpA										
367.0 > 322.0	9.452	9.456	-0.004		3844822	52.9		106	82643	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.452	9.457	-0.005	1.000	29599	0.4127		82.5	1762	
D 11 18O2 PFHxS										
403.0 > 84.0	9.487	9.492	-0.005		1573402	50.0		106	2939	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.499	9.495	0.004	1.000	8302	0.3271		71.9		
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.499	9.495	0.004	1.000	8302	NC			78.6	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.568	10.569	-0.001		4392169	54.7		109	26106	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.559	10.572	-0.013	1.000	23946	0.3296		65.9	20.9	
413.0 > 169.0	10.568	10.572	-0.004	1.001	8418		2.84(0.00-0.00)	65.9	23.1	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.577	10.581	-0.004	1.000	10805	NC			733	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.577	10.581	-0.004	1.000	10805	0.4042		84.9		
D 16 13C4 PFOS										
503.0 > 80.0	11.518	11.525	-0.007		1966495	51.2		107	90840	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.527	11.527	0.0	1.000	17027	0.3697		79.7	1174	M
499.0 > 99.0	11.518	11.527	-0.009	0.999	5583		3.05(0.00-0.00)	79.7	376	M
D 17 13C5 PFNA										
468.0 > 423.0	11.536	11.542	-0.006		3568543	50.3		101	51387	
18 Perfluorononanoic acid										
463.0 > 419.0	11.545	11.543	0.002	1.000	23515	0.4753		95.1	1740	
D 19 13C2 PFDA										
515.0 > 470.0	12.373	12.373	0.0		2801343	48.8		97.6	28241	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.373	12.373	0.0	1.000	36527	0.5912		118	2276	
D 23 13C8 FOSA										
506.0 > 78.0	12.984	12.985	-0.001		5930916	52.2		104	3313	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.984	12.987	-0.003	1.000	34358	0.4415		88.3	2185	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.032	13.033	-0.001	1.000	5800	0.4520		93.8		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.032	13.033	-0.001	1.000	5800	NC			415	
D 26 13C2 PFUnA										
565.0 > 520.0	13.076	13.076	0.0		4353025	53.7		107	38464	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.076	13.077	-0.001	1.000	71349	0.5000		100	3446	
D 28 13C2 PFDoA										
615.0 > 570.0	13.657	13.663	-0.006		5254008	52.1		104	14087	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.666	13.666	0.0	1.000	27774	0.4146		82.9	49.0	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.159	14.165	-0.006	1.000	40010	0.4118		82.4	38.3	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.583	14.589	-0.006		4406508	55.2		110	11406	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.583	14.589	-0.006	1.000	85586	1.07		214	54.9	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.175	15.177	-0.002		6824804	52.4		105	6114	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.175	15.177	-0.002	1.000	220661	0.5035		101	312	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.436	15.437	-0.001	1.000	63729	0.4985		99.7	51.7	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L1_00020 Amount Added: 1.00 Units: mL

Report Date: 06-Jun-2016 11:40:42 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_004.d

Injection Date: 03-Jun-2016 17:32:49 Instrument ID: A6

Lims ID: Std L1

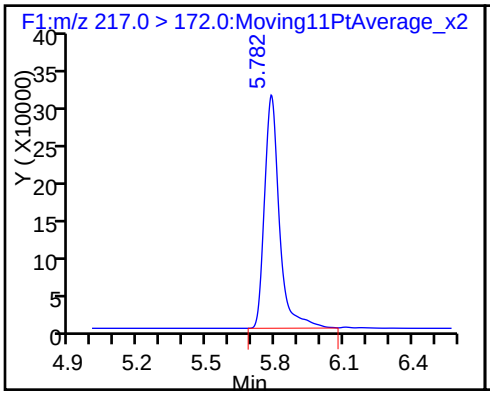
Client ID:

Operator ID: JRB ALS Bottle#: 1 Worklist Smp#: 4

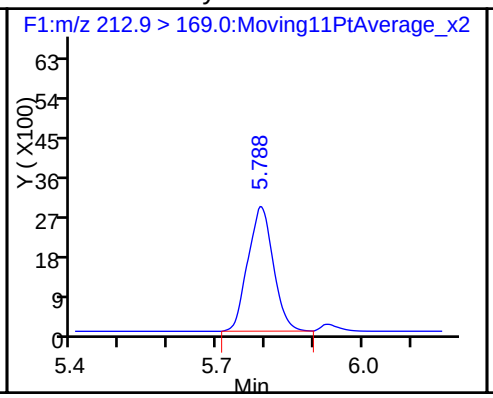
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

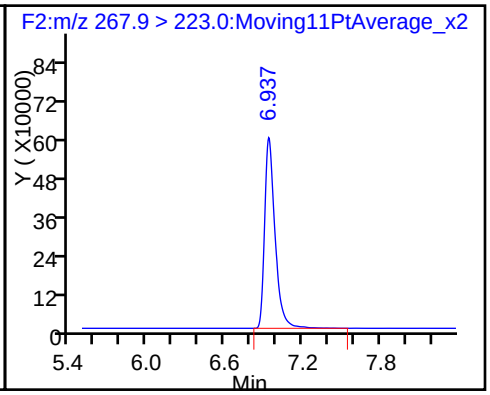
D 1 13C4 PFBA



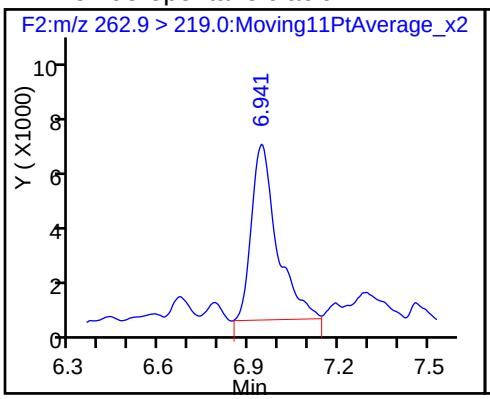
2 Perfluorobutyric acid



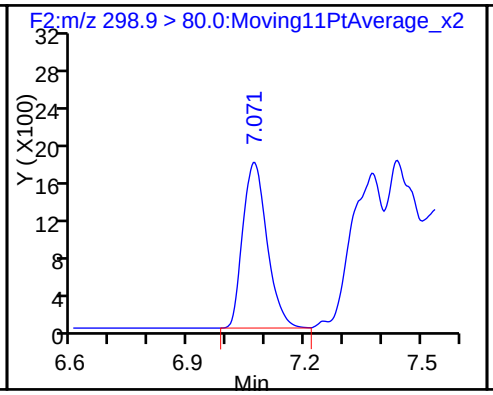
D 3 13C5-PFPeA



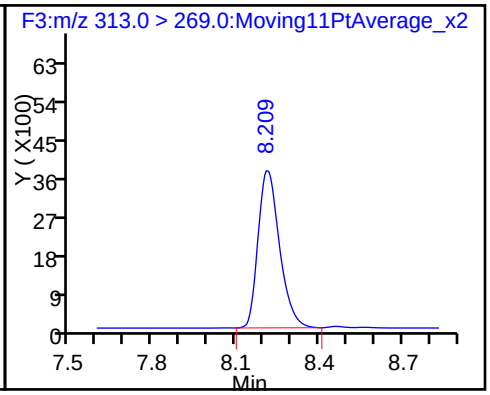
4 Perfluoropentanoic acid



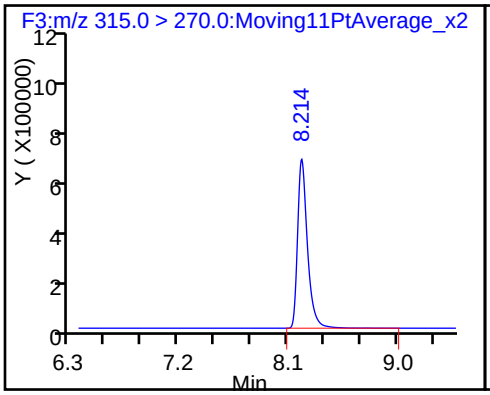
40 Perfluorobutanesulfonic acid



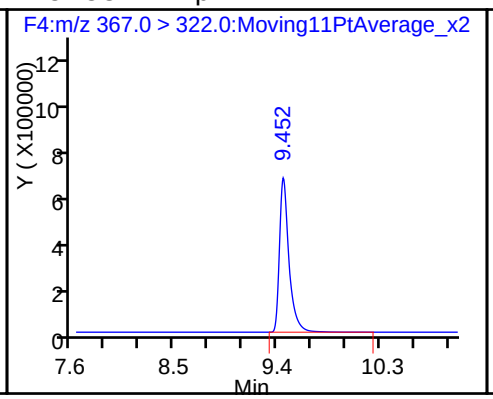
7 Perfluorohexanoic acid



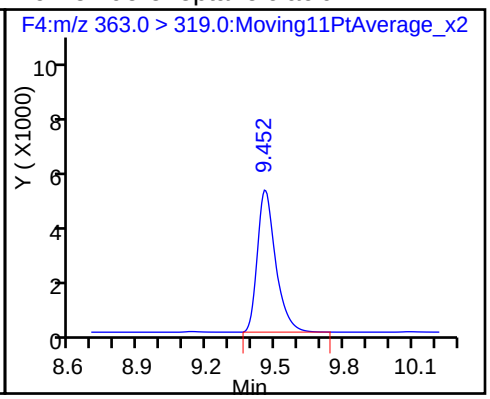
D 6 13C2 PFHxA



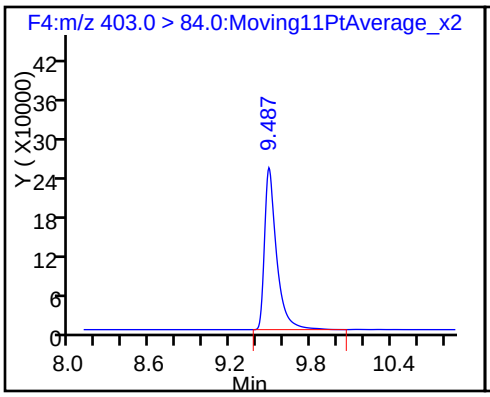
D 8 13C4-PFHpA



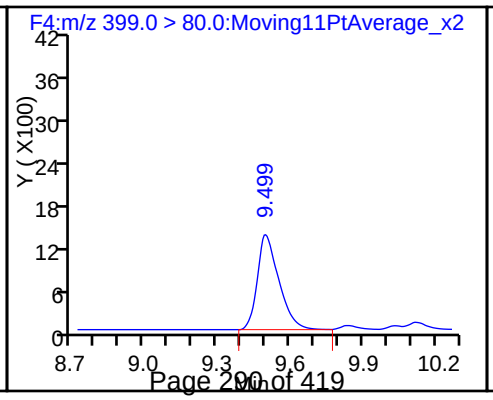
9 Perfluoroheptanoic acid



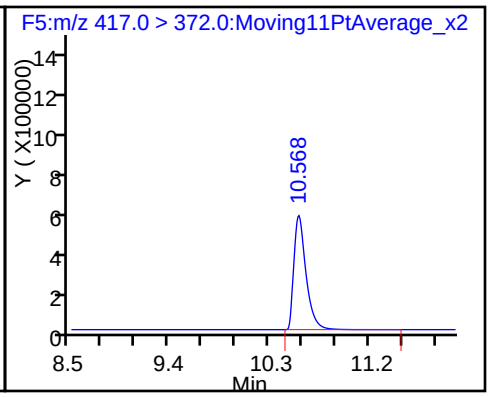
D 11 18O2 PFHxS



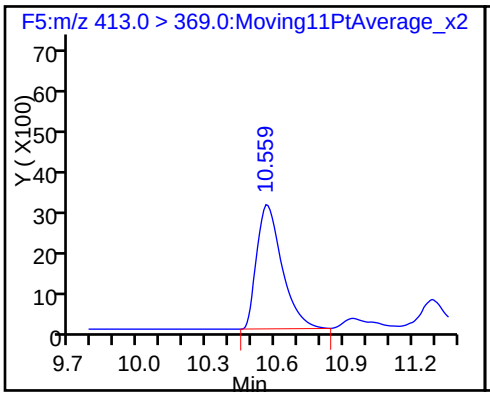
41 Perfluorohexanesulfonic acid



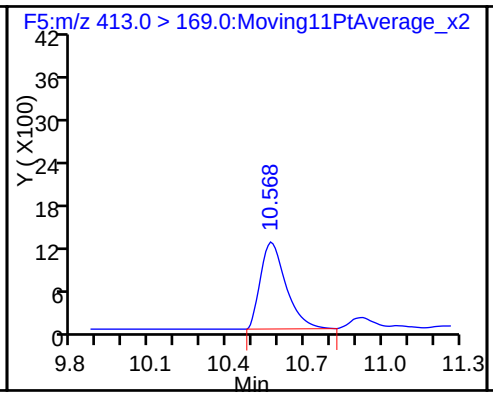
D 12 13C4 PFOA



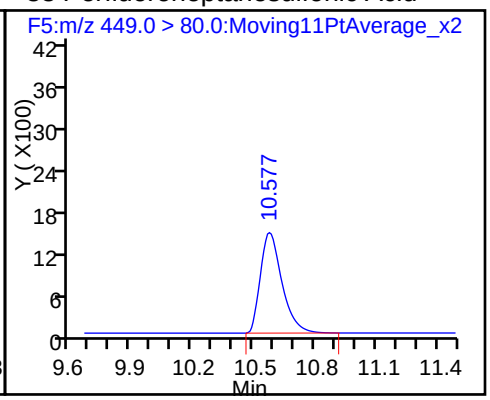
13 Perfluorooctanoic acid



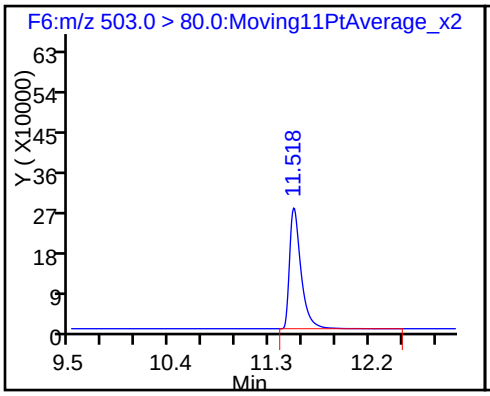
13 Perfluorooctanoic acid



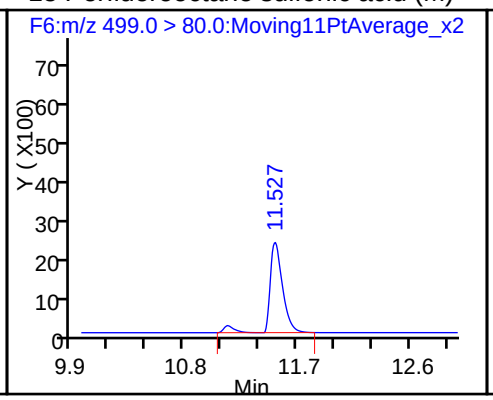
38 Perfluoroheptanesulfonic Acid



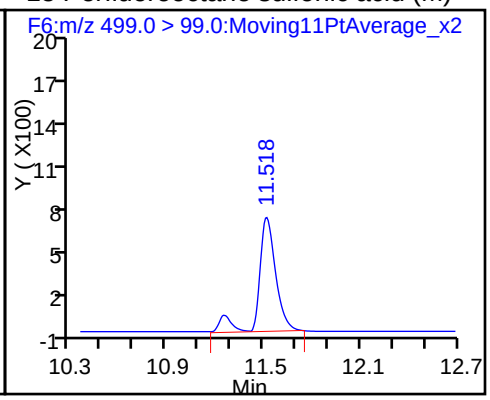
D 16 13C4 PFOS



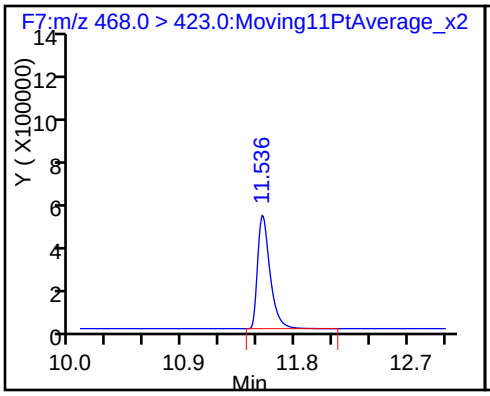
15 Perfluorooctane sulfonic acid (M)



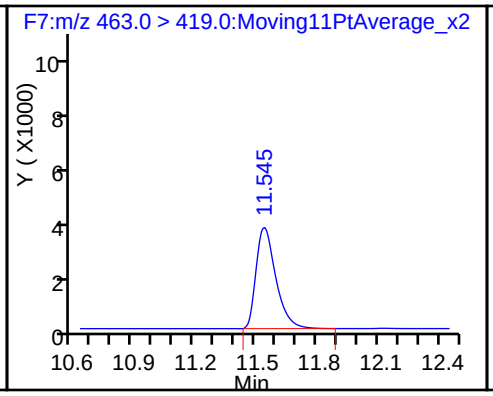
15 Perfluorooctane sulfonic acid (M)



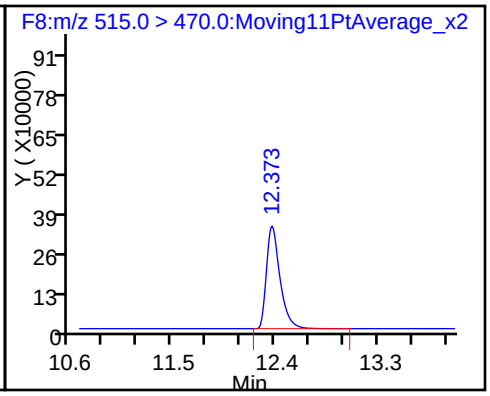
D 17 13C5 PFNA



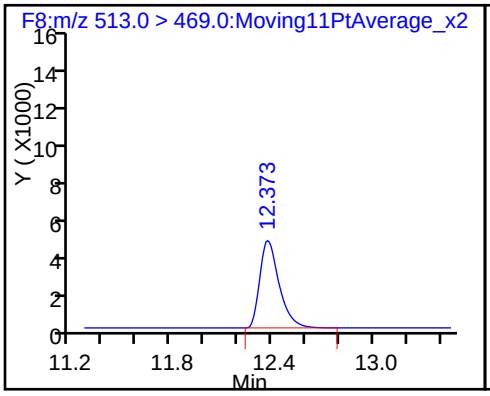
18 Perfluorononanoic acid



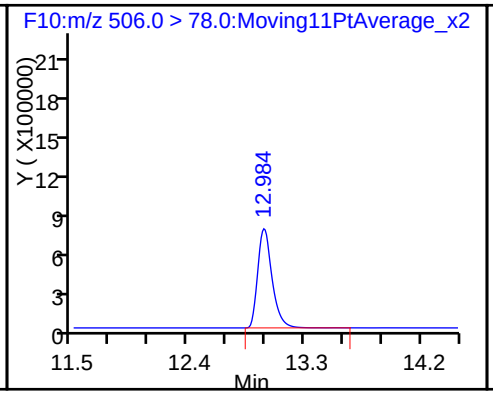
D 19 13C2 PFDA



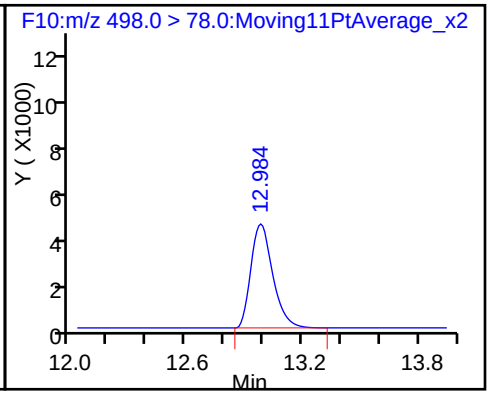
20 Perfluorodecanoic acid



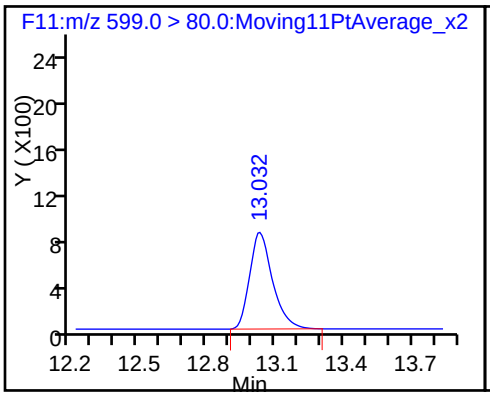
D 23 13C8 FOSA



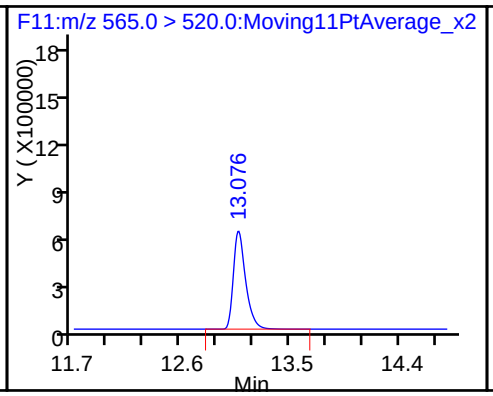
24 Perfluorooctane Sulfonamide



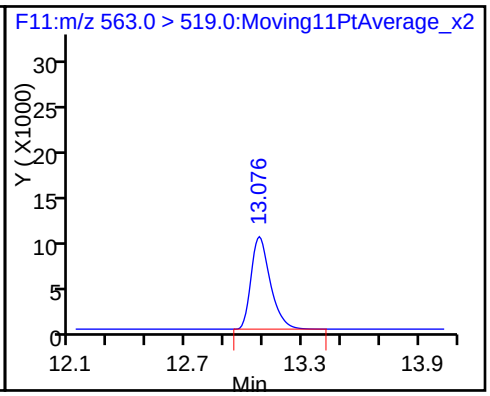
39 Perfluorodecane Sulfonic acid



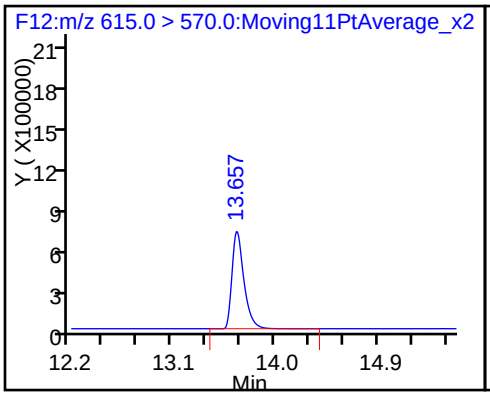
D 26 13C2 PFUnA



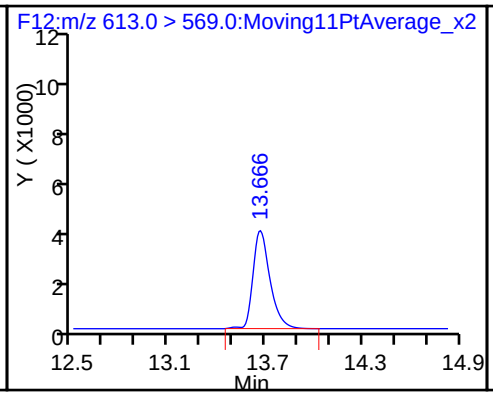
27 Perfluoroundecanoic acid



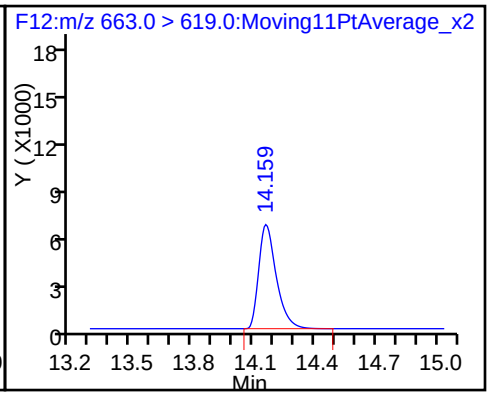
D 28 13C2 PFDoA



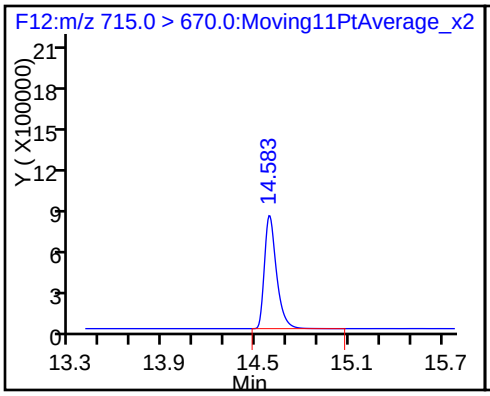
29 Perfluorododecanoic acid



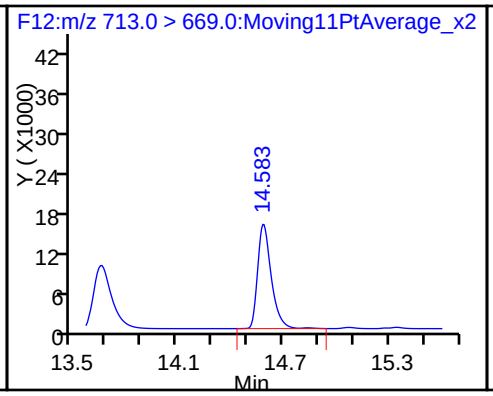
30 Perfluorotridecanoic acid



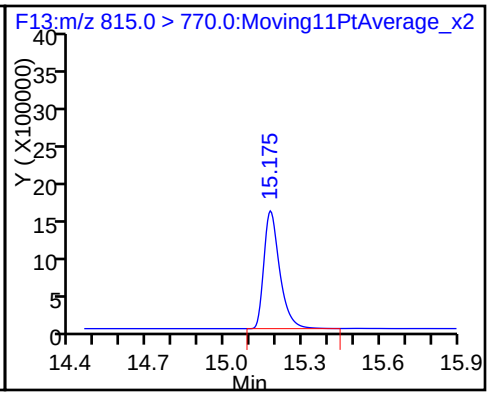
D 33 13C2-PFTeDA



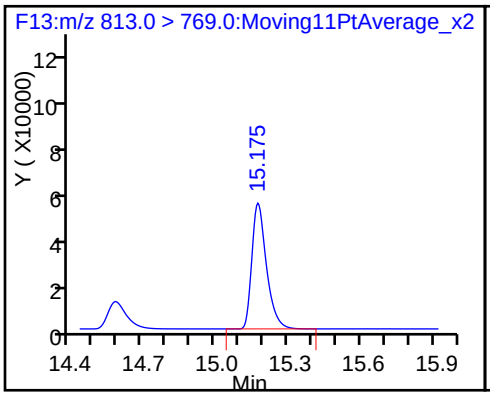
32 Perfluorotetradecanoic acid



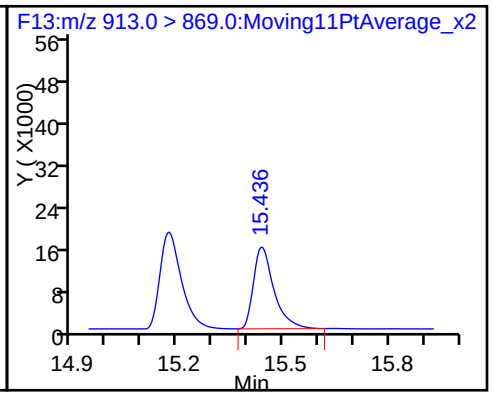
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

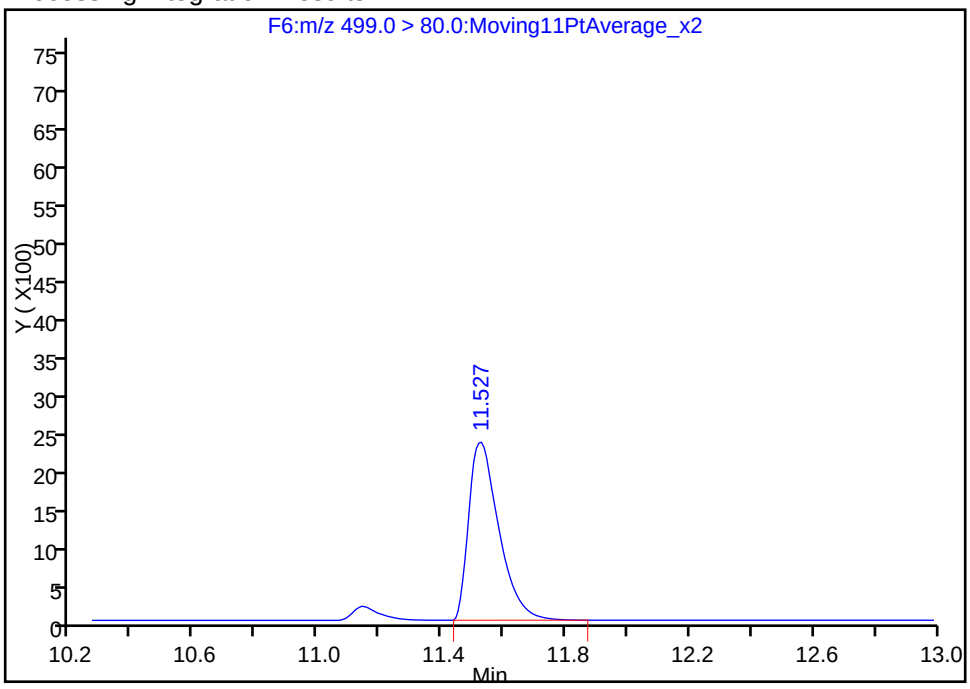
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_004.d
Injection Date: 03-Jun-2016 17:32:49 Instrument ID: A6
Lims ID: Std L1
Client ID:
Operator ID: JRB ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

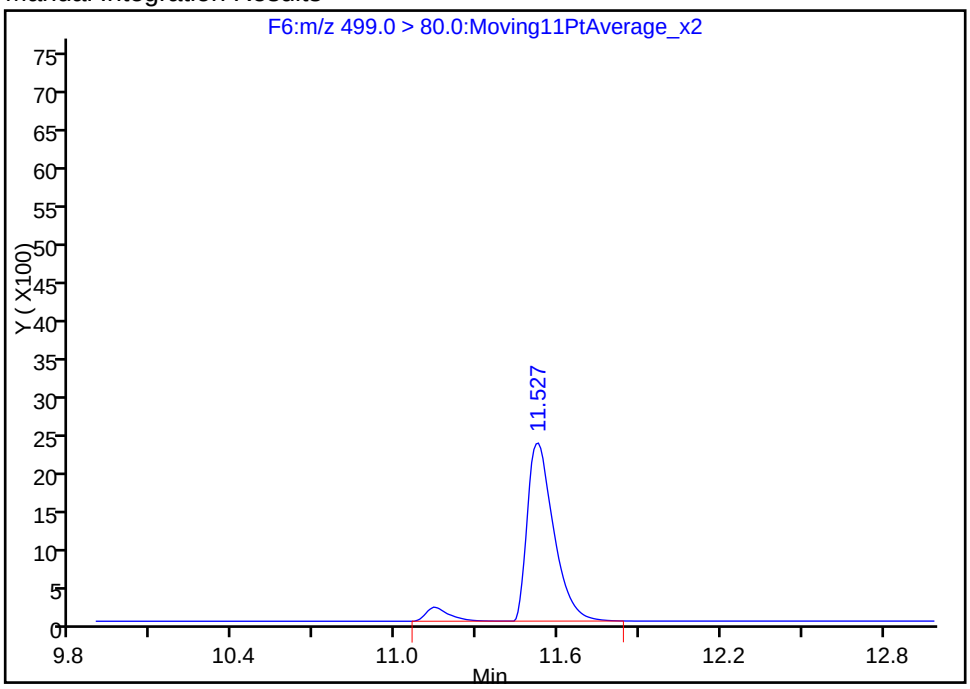
Processing Integration Results

RT: 11.53
Area: 15924
Amount: 0.345720
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 17027
Amount: 0.369667
Amount Units: ng/ml



Reviewer: barnettj, 06-Jun-2016 11:28:39
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

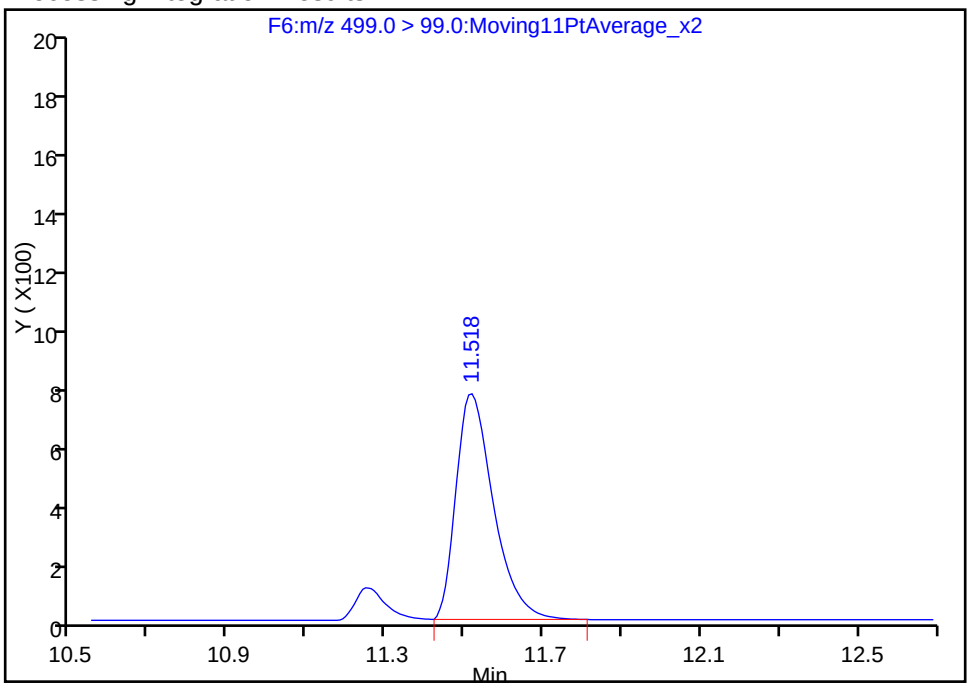
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_004.d
Injection Date: 03-Jun-2016 17:32:49 Instrument ID: A6
Lims ID: Std L1
Client ID:
Operator ID: JRB ALS Bottle#: 1 Worklist Smp#: 4
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

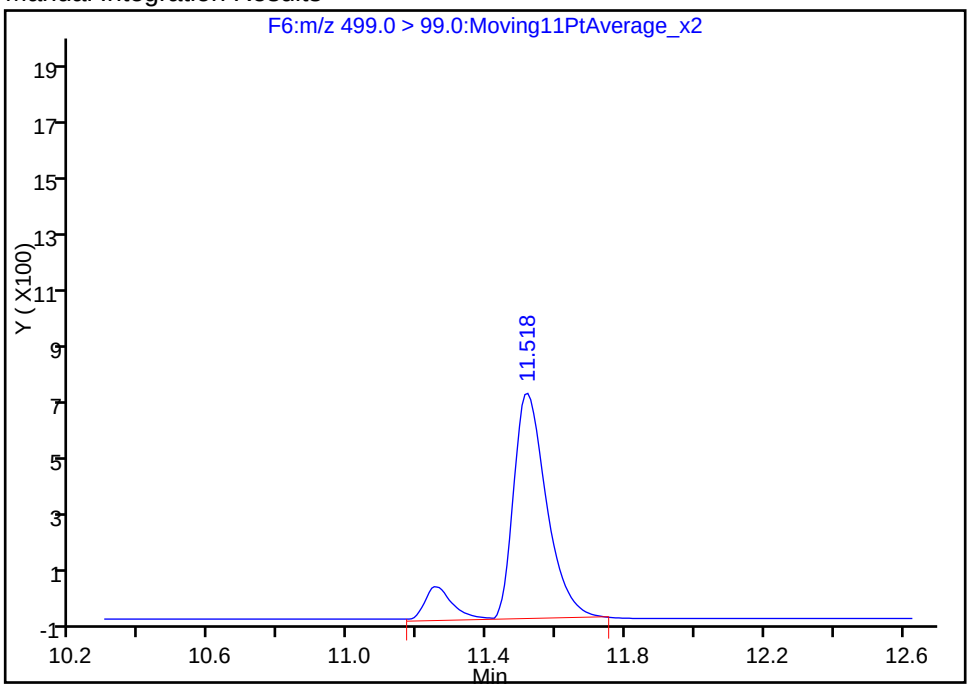
Processing Integration Results

RT: 11.52
Area: 4957
Amount: 0.345720
Amount Units: ng/ml



Manual Integration Results

RT: 11.52
Area: 5583
Amount: 0.369667
Amount Units: ng/ml



Reviewer: barnettj, 06-Jun-2016 11:28:39
Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_005.d
Lims ID: Std L2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 03-Jun-2016 17:54:05 ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L2
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A6*sub11

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 06-Jun-2016 11:40:43 Calib Date: 03-Jun-2016 19:40:28
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:01:40

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.782	5.784	-0.002		1546012	57.5		115	10217	
2 Perfluorobutyric acid										
212.9 > 169.0	5.779	5.786	-0.007	1.000	32544	0.8492		84.9	3874	
D 3 13C5-PFPeA										
267.9 > 223.0	6.937	6.939	-0.002		3660075	58.5		117	10507	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.937	6.941	-0.004	1.000	72612	1.03		103	18.8	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.064	7.069	-0.005	1.000	21386	1.11		126		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.064	7.069	-0.005	1.000	21386	NC			10.6	
298.9 > 99.0	7.064	7.069	-0.005	1.000	10898		1.96(0.00-0.00)		18.1	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.214	8.216	-0.002	1.000	62673	0.8881		88.8	2365	
D 6 13C2 PFHxA										
315.0 > 270.0	8.214	8.217	-0.003		3847822	58.1		116	21670	
D 8 13C4-PFHpA										
367.0 > 322.0	9.452	9.456	-0.004		4098464	56.4		113	12230	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.452	9.457	-0.005	1.000	67944	0.8888		88.9	1219	
D 11 18O2 PFHxS										
403.0 > 84.0	9.487	9.492	-0.005		1800359	57.2		121	5203	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.493	9.495	-0.002	1.000	25172	0.8668		95.2		M
10 Perfluorohexane Sulfonate										M
399.0 > 80.0	9.495	9.495	0.0	1.000	0	NC			140	M

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.568	10.569	-0.001		4720448	58.8		118	14949	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.577	10.572	0.005	1.000	58777	0.7527		75.3	73.9	
413.0 > 169.0	10.568	10.572	-0.004	0.999	20884		2.81(0.00-0.00)	75.3	38.6	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.577	10.581	-0.004	1.000	30143	NC			2006	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.577	10.581	-0.004	1.000	30143	1.02		107		
D 16 13C4 PFOS										
503.0 > 80.0	11.527	11.525	0.002		2175222	56.7		119	19114	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.518	11.527	-0.009	1.000	42124	0.8268		89.1	2854	M
499.0 > 99.0	11.527	11.527	0.0	1.001	19284		2.18(0.00-0.00)	89.1	1415	
D 17 13C5 PFNA										
468.0 > 423.0	11.536	11.542	-0.006		4035116	56.9		114	19318	
18 Perfluorononanoic acid										
463.0 > 419.0	11.536	11.543	-0.007	1.000	51338	0.9178		91.8	1269	
D 19 13C2 PFDA										
515.0 > 470.0	12.373	12.373	0.0		3396542	59.2		118	13339	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.373	12.373	0.0	1.000	81032	1.08		108	5039	
D 23 13C8 FOSA										
506.0 > 78.0	12.984	12.985	-0.001		6694027	58.9		118	2746	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.984	12.987	-0.003	1.000	82881	0.9435		94.4	5371	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.032	13.033	-0.001	1.000	25930	1.06		110		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.032	13.033	-0.001	1.000	25930	NC			1805	
D 26 13C2 PFUnA										
565.0 > 520.0	13.067	13.076	-0.009		4619594	57.0		114	9822	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.076	13.077	-0.001	1.000	113910	1.00		100	1140	
D 28 13C2 PFDoA										
615.0 > 570.0	13.657	13.663	-0.006		5724119	56.8		114	10996	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.657	13.666	-0.009	1.000	63248	0.8667		86.7	101	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.159	14.165	-0.006	1.000	104371	0.9861		98.6	103	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.583	14.589	-0.006		4661979	58.4		117	4200	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.583	14.589	-0.006	1.000	112067	1.28		128	78.4	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.175	15.177	-0.002		7766962	59.6		119	6229	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.175	15.177	-0.002	1.000	306272	1.00		99.7	336	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.436	15.437	-0.001	1.000	118261	0.8490		84.9	73.9	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L2_00021 Amount Added: 1.00 Units: mL

Report Date: 06-Jun-2016 11:40:44 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_005.d

Injection Date: 03-Jun-2016 17:54:05 Instrument ID: A6

Lims ID: Std L2

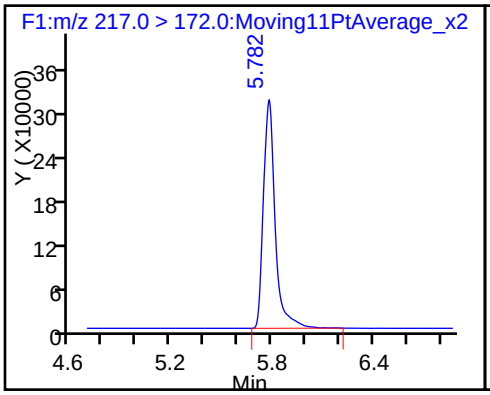
Client ID:

Operator ID: JRB ALS Bottle#: 2 Worklist Smp#: 5

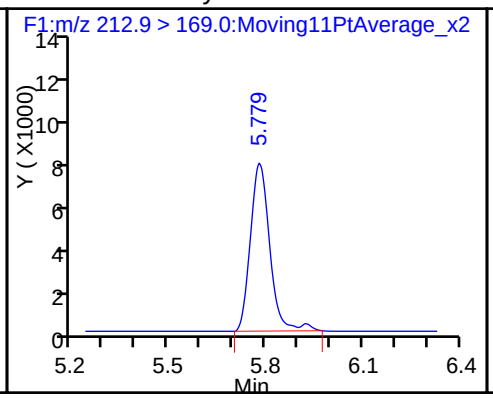
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

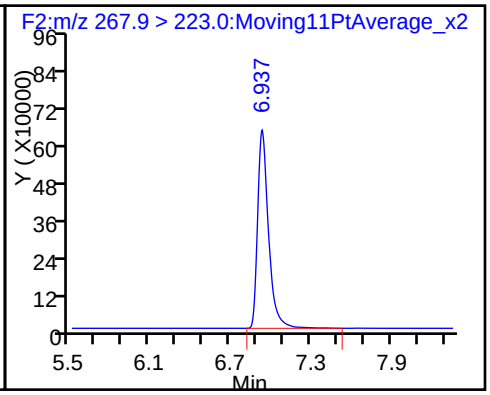
D 1 13C4 PFBA



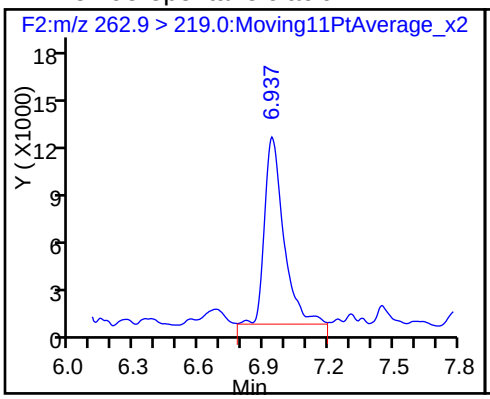
2 Perfluorobutyric acid



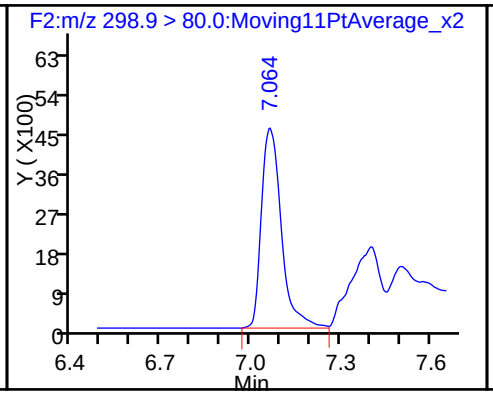
D 3 13C5-PFPeA



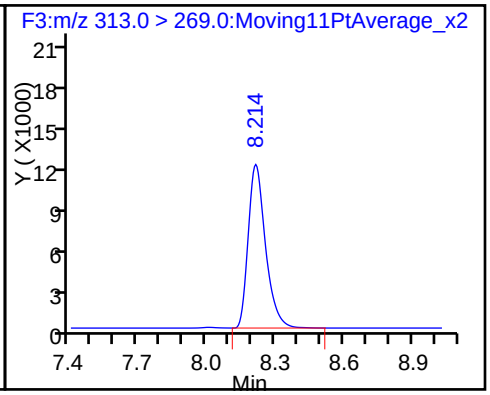
4 Perfluoropentanoic acid



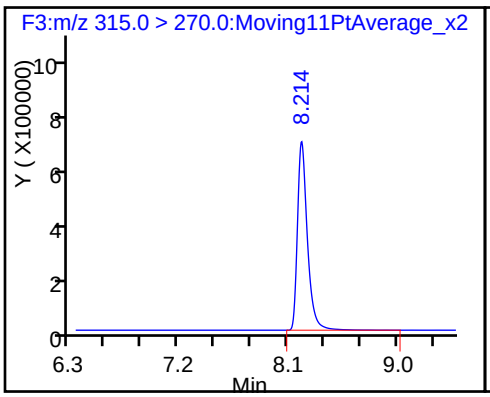
40 Perfluorobutanesulfonic acid



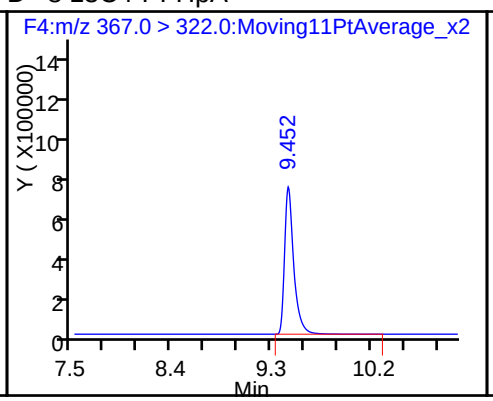
7 Perfluorohexanoic acid



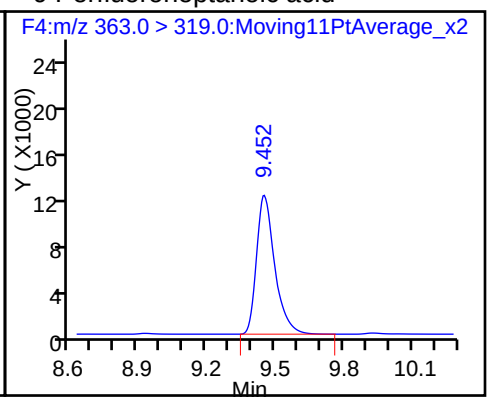
D 6 13C2 PFHxA



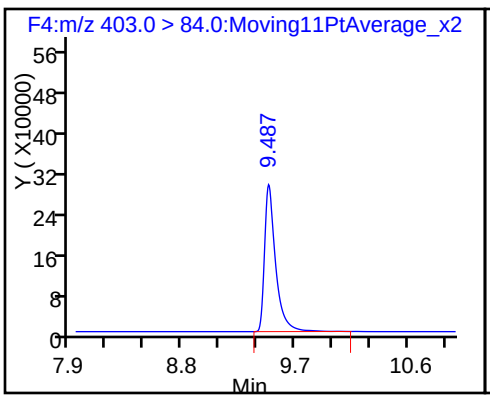
D 8 13C4-PFHpA



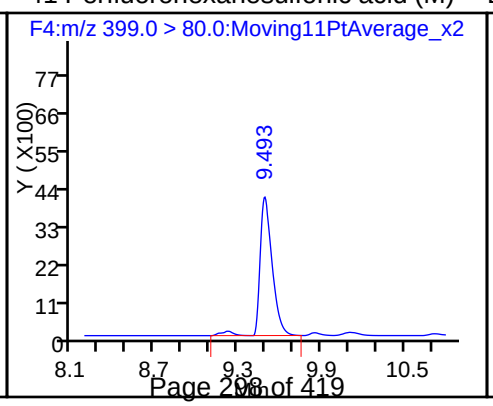
9 Perfluoroheptanoic acid



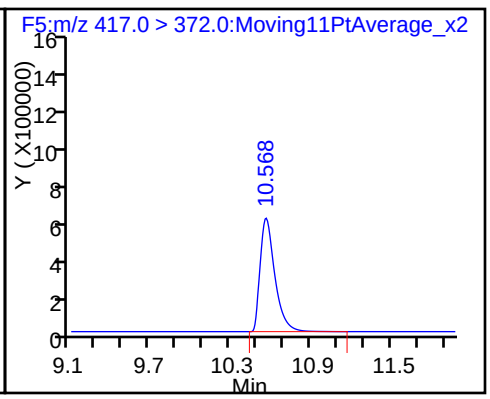
D 11 18O2 PFHxS



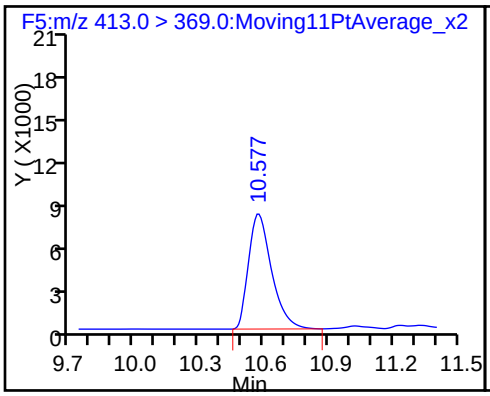
41 Perfluorohexanesulfonic acid (M)



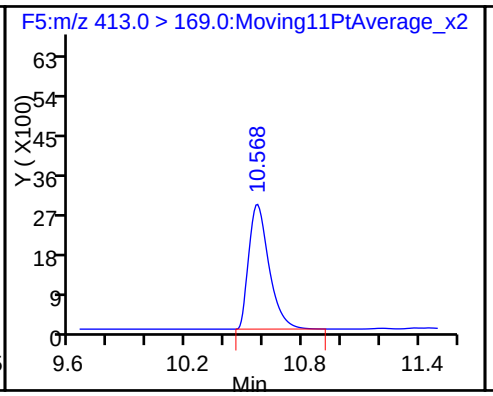
D 12 13C4 PFOA



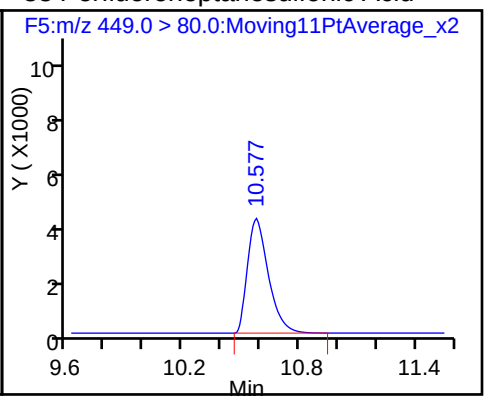
13 Perfluorooctanoic acid



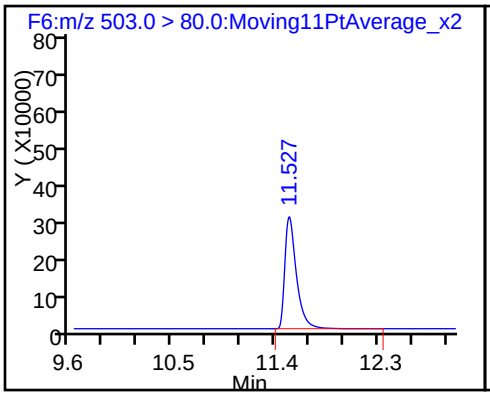
13 Perfluorooctanoic acid



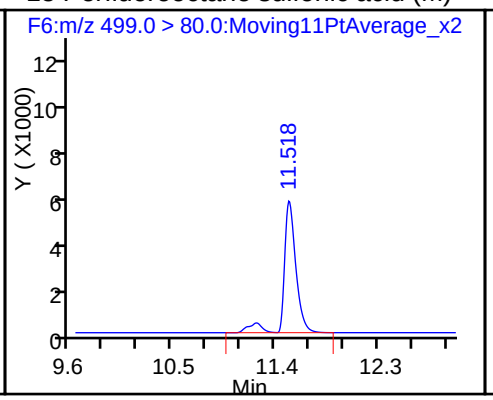
38 Perfluoroheptanesulfonic Acid



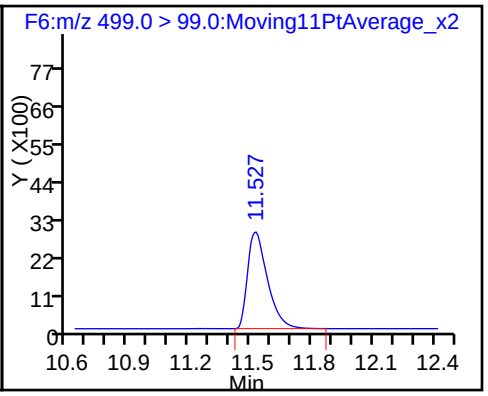
D 16 13C4 PFOS



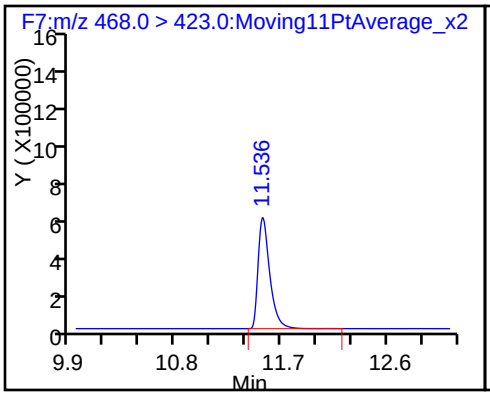
15 Perfluorooctane sulfonic acid (M)



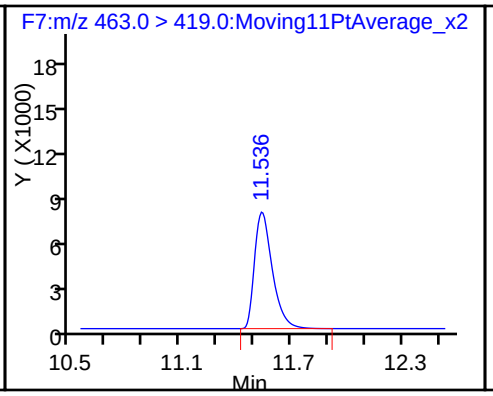
15 Perfluorooctane sulfonic acid



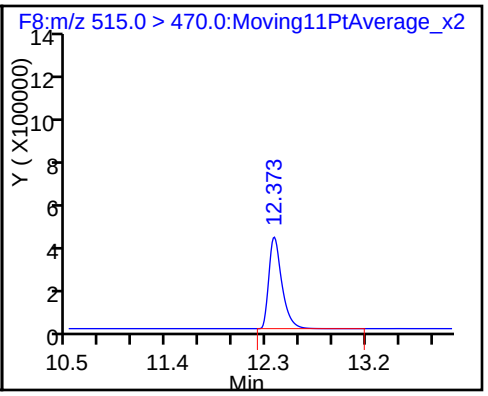
D 17 13C5 PFNA



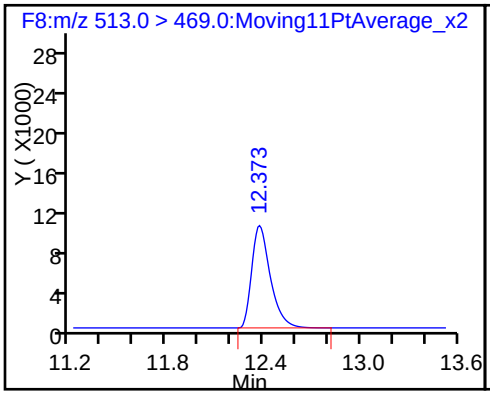
18 Perfluorononanoic acid



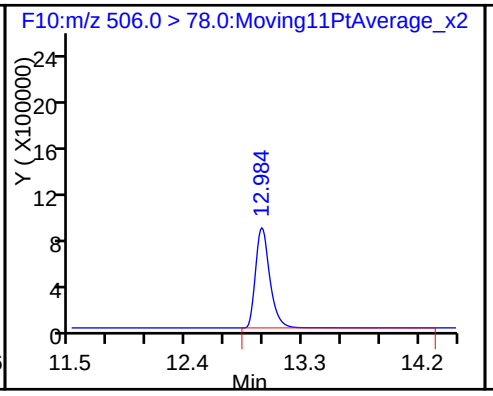
D 19 13C2 PFDA



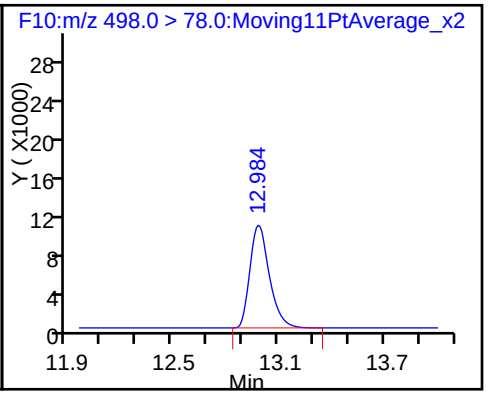
20 Perfluorodecanoic acid



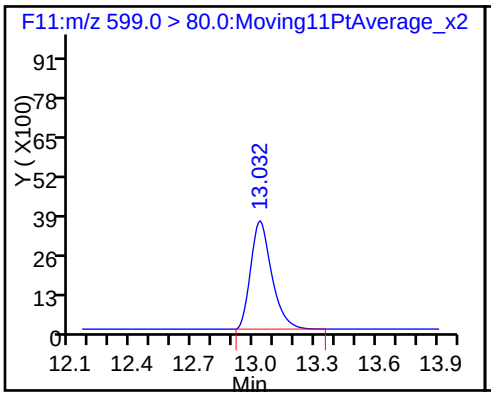
D 23 13C8 FOSA



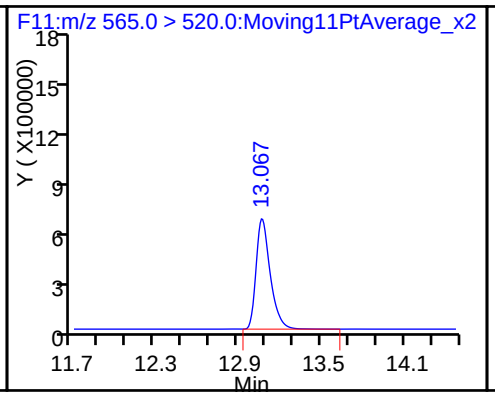
24 Perfluorooctane Sulfonamide



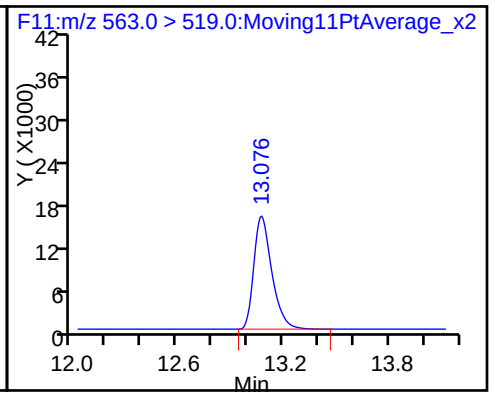
39 Perfluorodecane Sulfonic acid



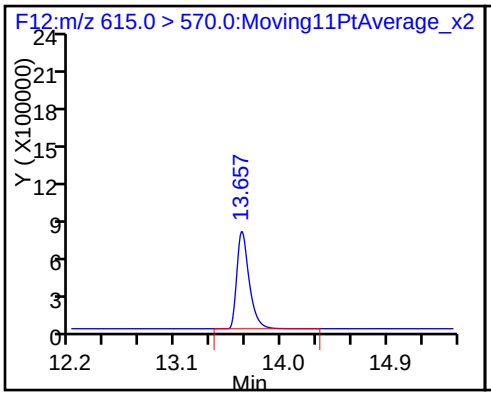
D 26 13C2 PFUnA



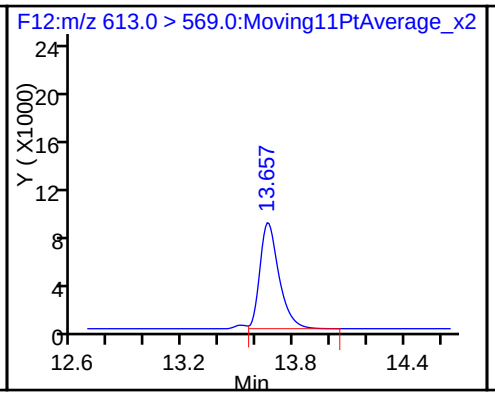
27 Perfluoroundecanoic acid



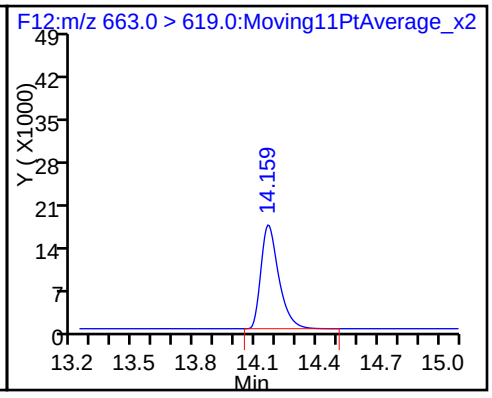
D 28 13C2 PFDoA



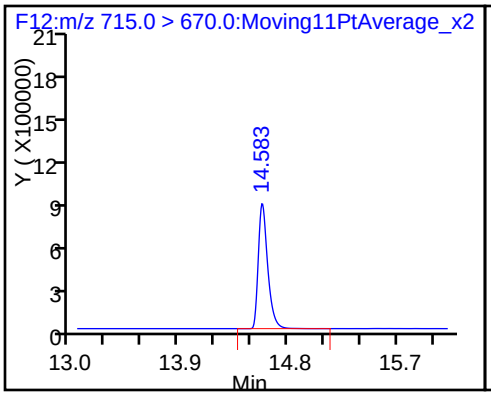
29 Perfluorododecanoic acid



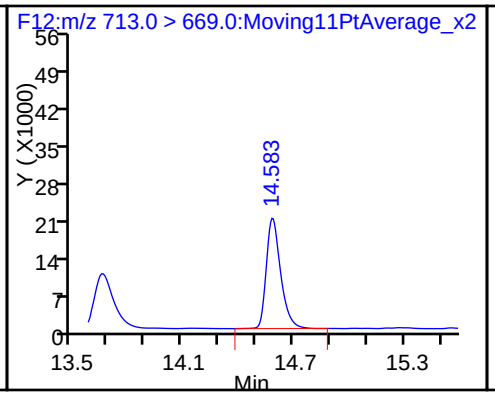
30 Perfluorotridecanoic acid



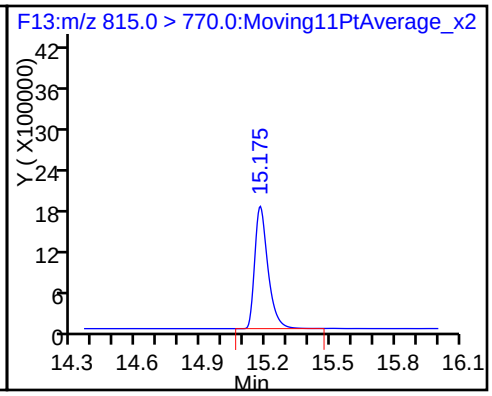
D 33 13C2-PFTeDA



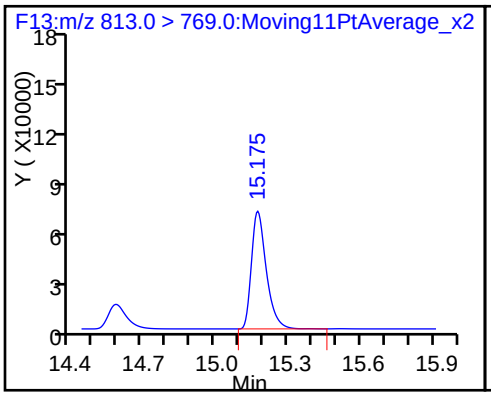
32 Perfluorotetradecanoic acid



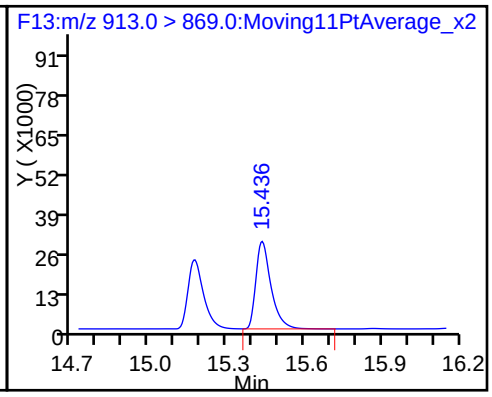
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

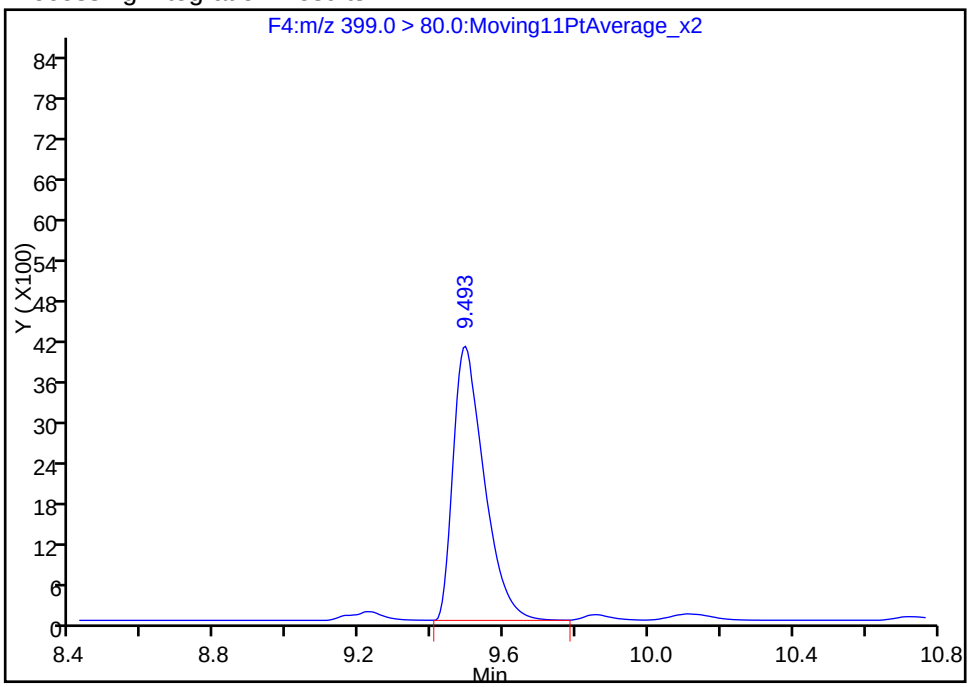
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_005.d
Injection Date: 03-Jun-2016 17:54:05 Instrument ID: A6
Lims ID: Std L2
Client ID:
Operator ID: JRB ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

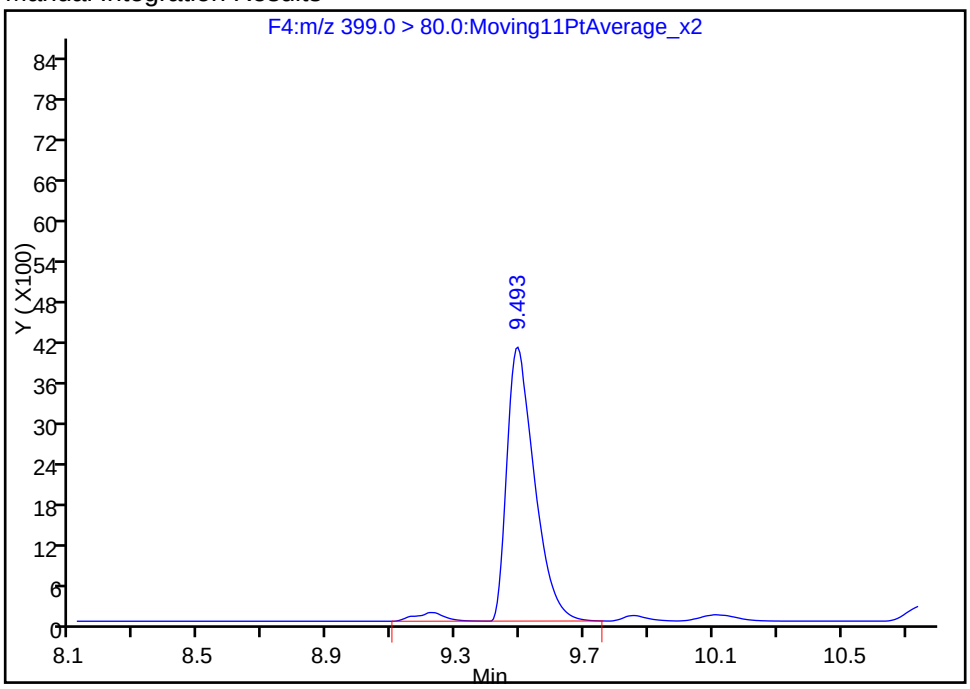
Processing Integration Results

RT: 9.49
Area: 24405
Amount: 1.058265
Amount Units: ng/ml



Manual Integration Results

RT: 9.49
Area: 25172
Amount: 0.866773
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:01:40
Audit Action: Assigned Compound ID Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

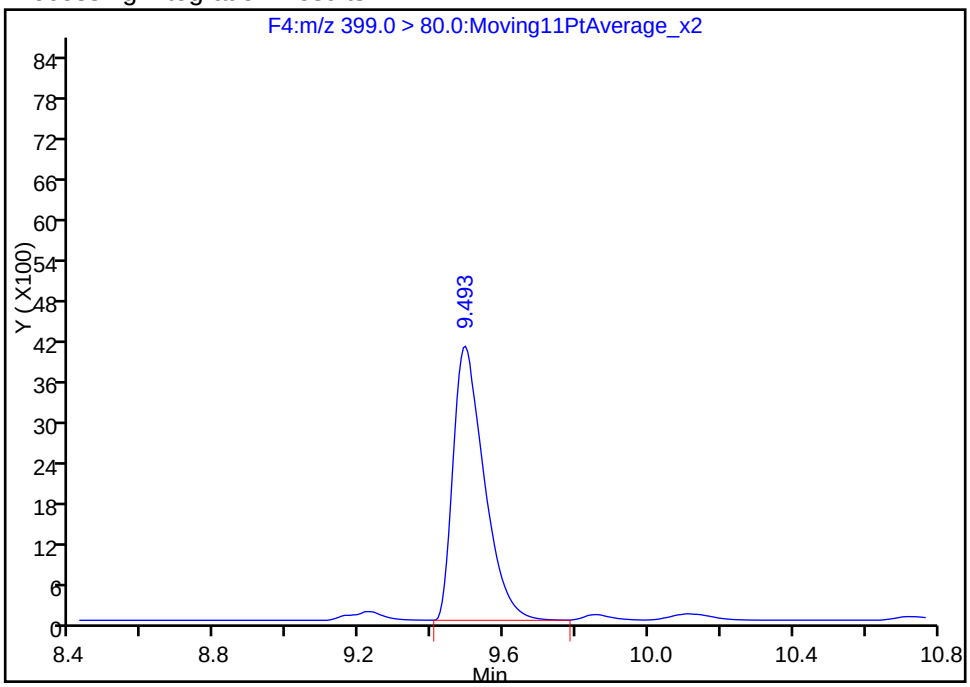
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_005.d
Injection Date: 03-Jun-2016 17:54:05 Instrument ID: A6
Lims ID: Std L2
Client ID:
Operator ID: JRB ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

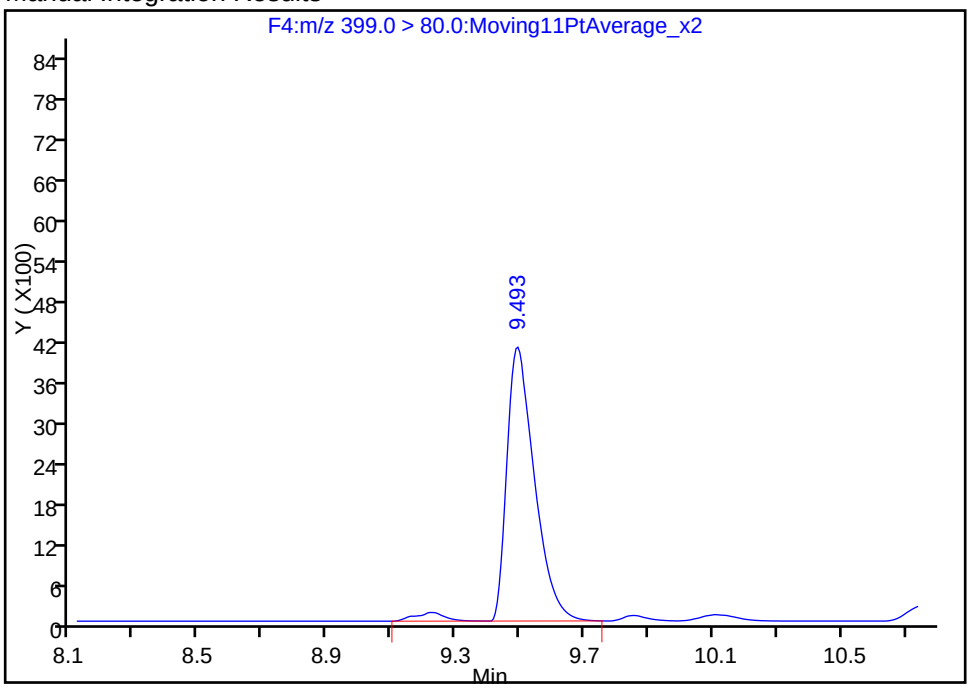
Processing Integration Results

RT: 9.49
Area: 24405
Amount: 1.058265
Amount Units: ng/ml



Manual Integration Results

RT: 9.49
Area: 25172
Amount: 0.866773
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:01:40
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

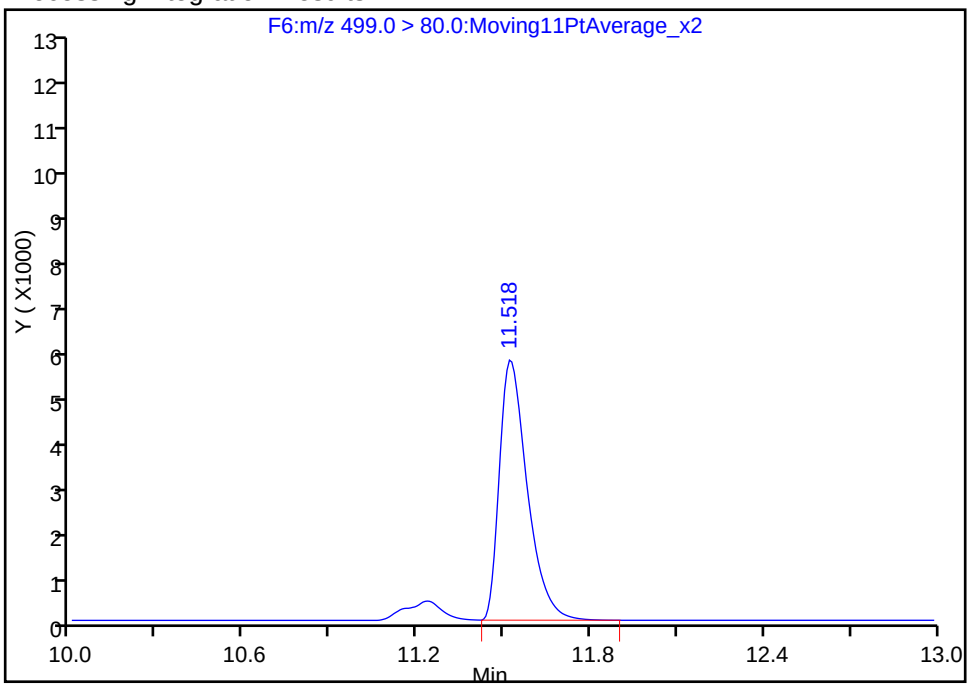
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_005.d
Injection Date: 03-Jun-2016 17:54:05 Instrument ID: A6
Lims ID: Std L2
Client ID:
Operator ID: JRB ALS Bottle#: 2 Worklist Smp#: 5
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

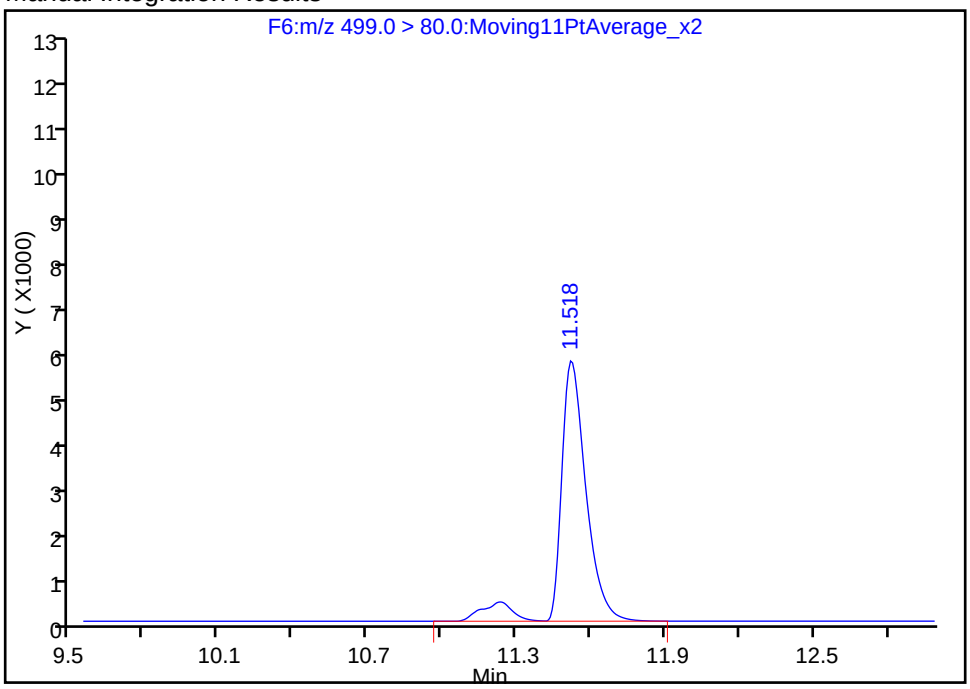
Processing Integration Results

RT: 11.52
Area: 38335
Amount: 0.987467
Amount Units: ng/ml



Manual Integration Results

RT: 11.52
Area: 42124
Amount: 0.826783
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:01:40
Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_006.d
Lims ID: Std L3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 03-Jun-2016 18:15:20 ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L3
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A6*sub11

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 06-Jun-2016 11:40:45 Calib Date: 03-Jun-2016 19:40:28
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:02:13

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.785	5.784	0.001		1419784	52.8		106	3394	
2 Perfluorobutyric acid										
212.9 > 169.0	5.785	5.786	-0.001	1.000	179023	5.09		102	7830	
D 3 13C5-PFPeA										
267.9 > 223.0	6.941	6.939	0.002		3398375	54.3		109	7797	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.941	6.941	0.0	1.000	336933	5.17		103	45.7	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.067	7.069	-0.002	1.000	133903	4.18		94.5		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.067	7.069	-0.002	1.000	133903	NC			50.6	
298.9 > 99.0	7.067	7.069	-0.002	1.000	75378		1.78(0.00-0.00)		97.3	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.214	8.216	-0.002	1.000	308334	4.79		95.8	7830	
D 6 13C2 PFHxA										
315.0 > 270.0	8.214	8.217	-0.003		3508493	53.0		106	55684	
D 8 13C4-PFHpA										
367.0 > 322.0	9.457	9.456	0.001		3766006	51.9		104	160379	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.457	9.457	0.0	1.000	360716	5.14		103	12244	
D 11 18O2 PFHxS										
403.0 > 84.0	9.493	9.492	0.001		1612487	51.3		108	12974	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.493	9.495	-0.002	1.000	106683	4.10		90.1		M
10 Perfluorohexane Sulfonate										M
399.0 > 80.0	9.495	9.495	0.0	1.000	0	NC			57.2	M

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.568	10.569	-0.001		4425597	55.1		110	9951	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.568	10.572	-0.004	1.000	381371	5.21		104	355	
413.0 > 169.0	10.568	10.572	-0.004	1.000	143240		2.66(0.00-0.00)	104	223	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.577	10.581	-0.004	1.000	131824	NC			2426	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.577	10.581	-0.004	1.000	131824	4.92		103		
D 16 13C4 PFOS										
503.0 > 80.0	11.526	11.525	0.001		1971377	51.4		107	55182	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.526	11.527	-0.001	1.000	227335	4.92		106	392	M
499.0 > 99.0	11.526	11.527	-0.001	1.000	120418		1.89(0.00-0.00)	106	2040	M
D 17 13C5 PFNA										
468.0 > 423.0	11.544	11.542	0.002		3989744	56.3		113	12919	
18 Perfluorononanoic acid										
463.0 > 419.0	11.544	11.543	0.001	1.000	295749	5.35		107	1831	
D 19 13C2 PFDA										
515.0 > 470.0	12.373	12.373	0.0		2977215	51.9		104	29918	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.373	12.373	0.0	1.000	336212	5.12		102	20422	
D 23 13C8 FOSA										
506.0 > 78.0	12.984	12.985	-0.001		5722353	50.3		101	3091	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.984	12.987	-0.003	1.000	400018	5.33		107	25936	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.032	13.033	-0.001	1.000	148469	5.39		112		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.032	13.033	-0.001	1.000	148469	NC			10252	
D 26 13C2 PFUnA										
565.0 > 520.0	13.076	13.076	0.0		4393670	54.2		108	77477	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.076	13.077	-0.001	1.000	389128	4.91		98.1	10990	
D 28 13C2 PFDoA										
615.0 > 570.0	13.666	13.663	0.003		5520133	54.7		109	14241	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.666	13.666	0.0	1.000	367538	5.22		104	842	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.167	14.165	0.002	1.000	506263	4.96		99.2	419	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.589	14.589	0.0		4195809	52.6		105	4850	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.589	14.589	0.0	1.000	419971	4.99		99.8	183	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.174	15.177	-0.003		7110984	54.5		109	6739	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.174	15.177	-0.003	1.000	779014	4.76		95.1	762	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.436	15.437	-0.001	1.000	676071	5.03		101	437	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L3_00018 Amount Added: 1.00 Units: mL

Report Date: 06-Jun-2016 11:40:46 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_006.d

Injection Date: 03-Jun-2016 18:15:20 Instrument ID: A6

Lims ID: Std L3

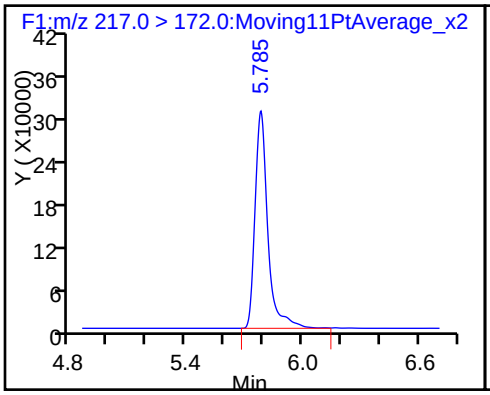
Client ID:

Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 6

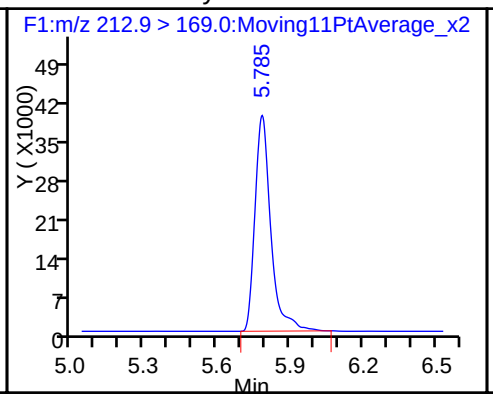
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

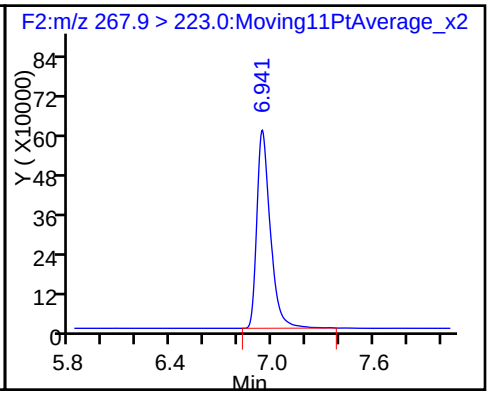
D 1 13C4 PFBA



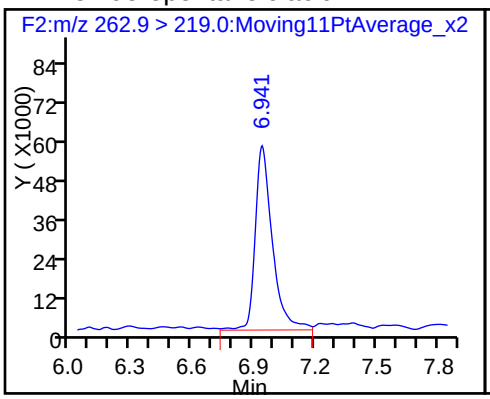
2 Perfluorobutyric acid



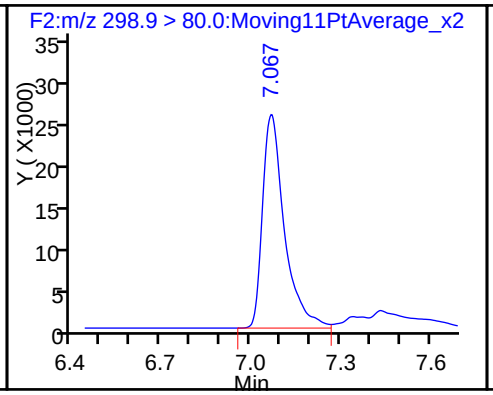
D 3 13C5-PFPeA



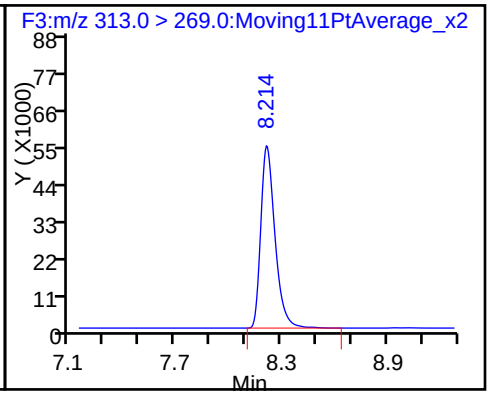
4 Perfluoropentanoic acid



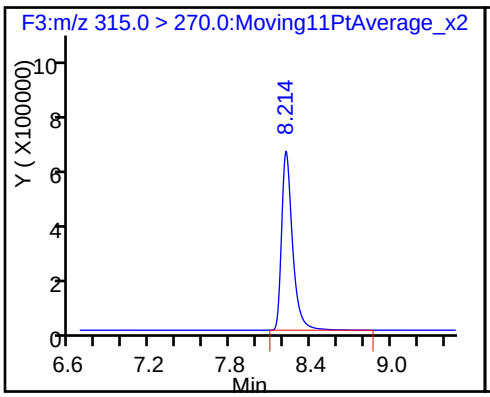
40 Perfluorobutanesulfonic acid



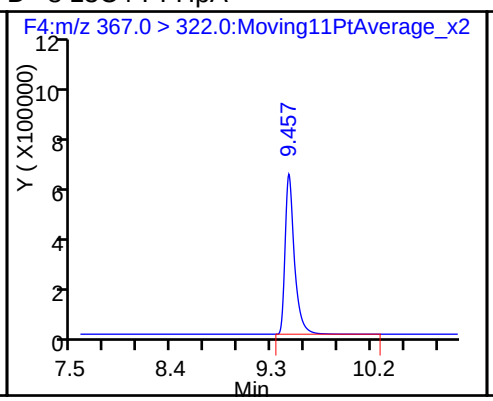
7 Perfluorohexanoic acid



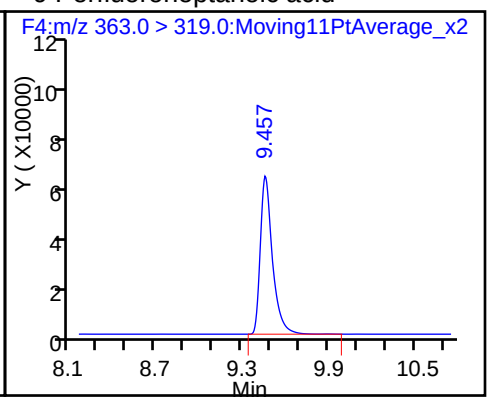
D 6 13C2 PFHxA



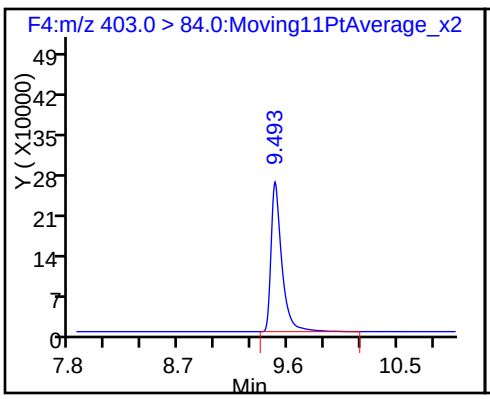
D 8 13C4-PFHpA



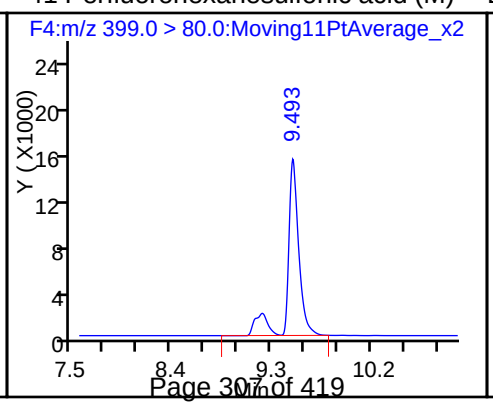
9 Perfluoroheptanoic acid



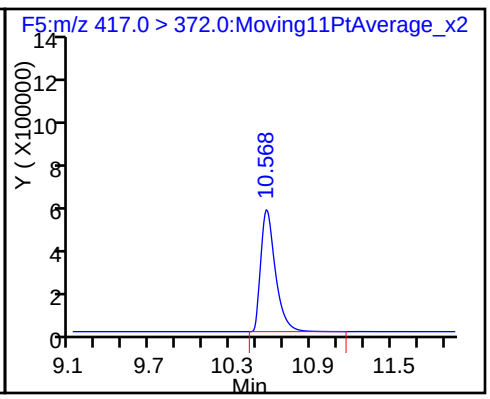
D 11 18O2 PFHxS



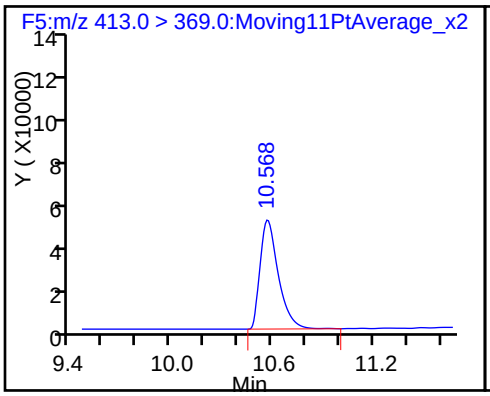
41 Perfluorohexanesulfonic acid (M)



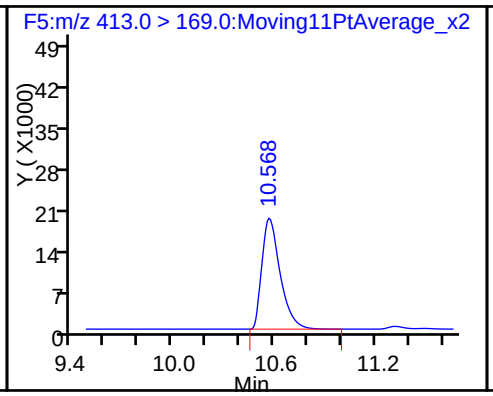
D 12 13C4 PFOA



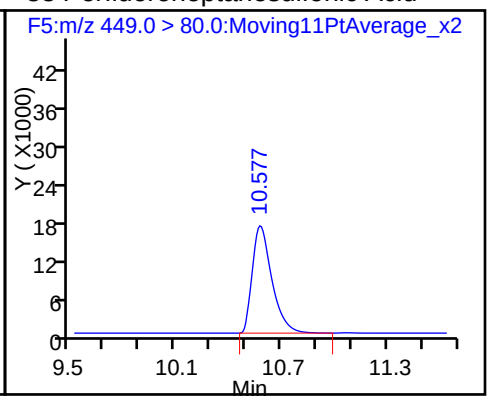
13 Perfluorooctanoic acid



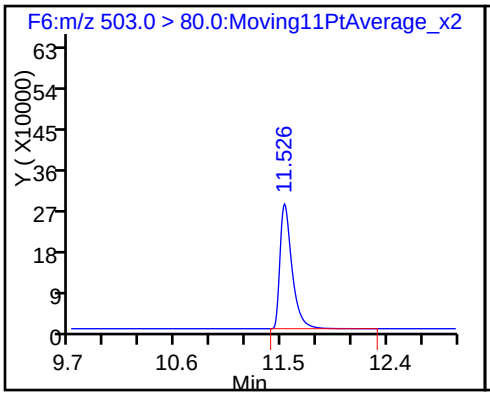
13 Perfluorooctanoic acid



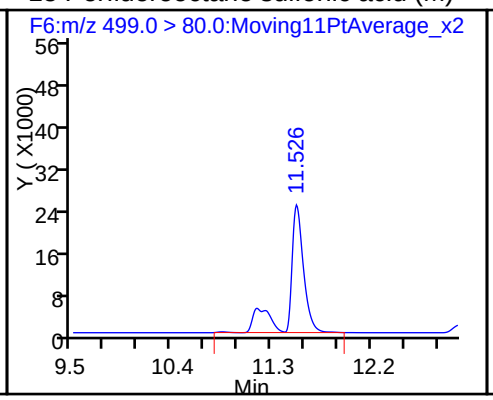
38 Perfluoroheptanesulfonic Acid



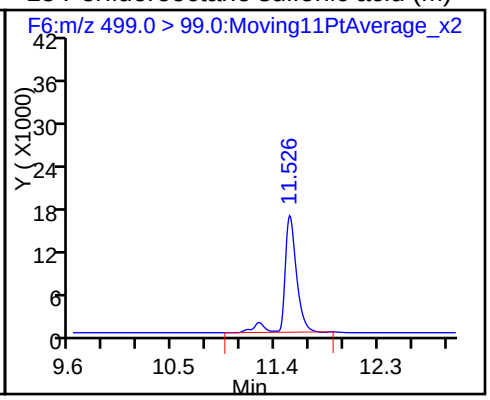
D 16 13C4 PFOS



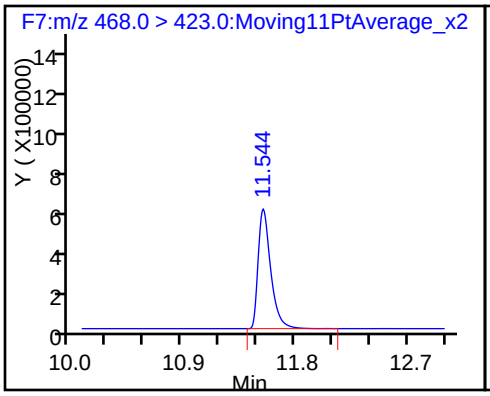
15 Perfluorooctane sulfonic acid (M)



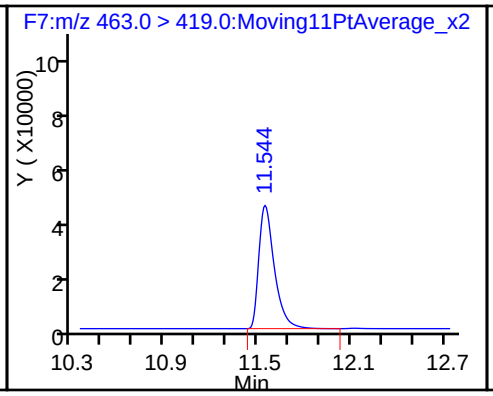
15 Perfluorooctane sulfonic acid (M)



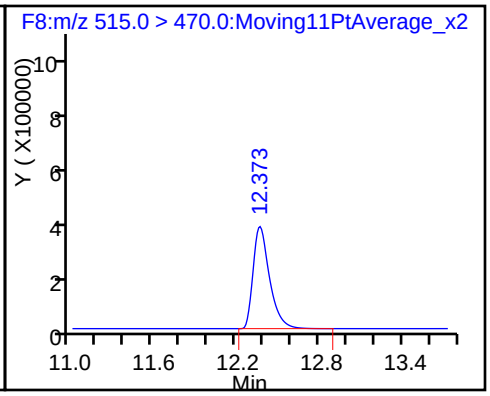
D 17 13C5 PFNA



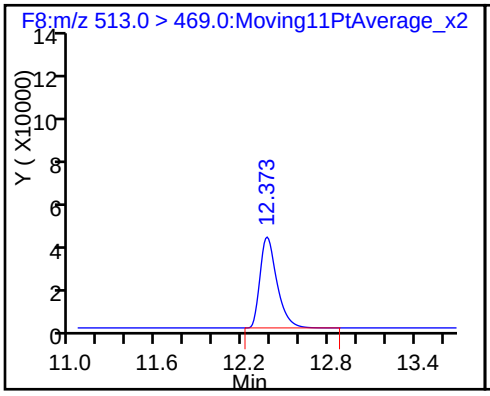
18 Perfluorononanoic acid



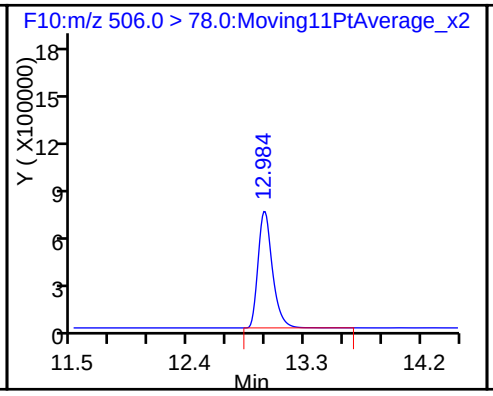
D 19 13C2 PFDA



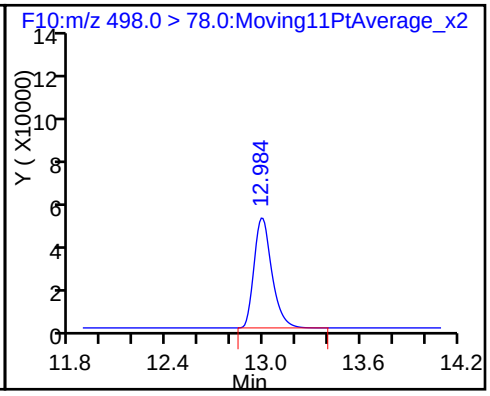
20 Perfluorodecanoic acid



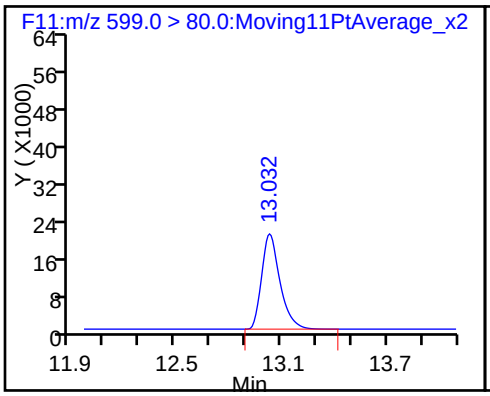
D 23 13C8 FOSA



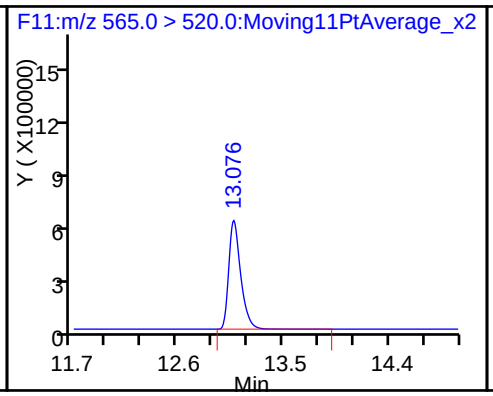
24 Perfluorooctane Sulfonamide



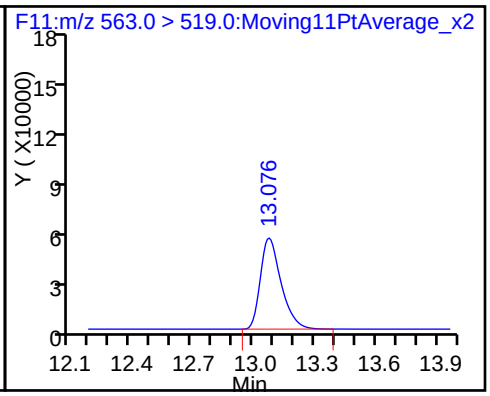
39 Perfluorodecane Sulfonic acid



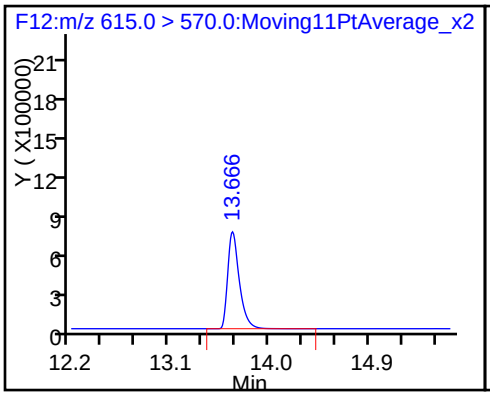
D 26 13C2 PFUnA



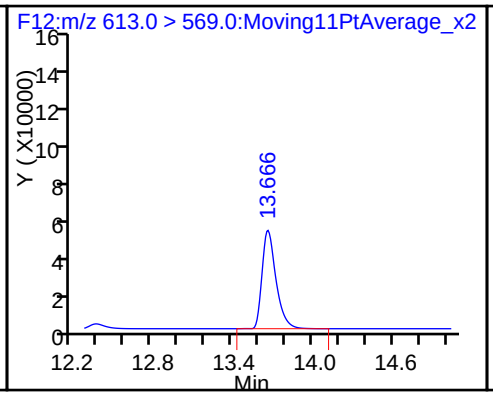
27 Perfluoroundecanoic acid



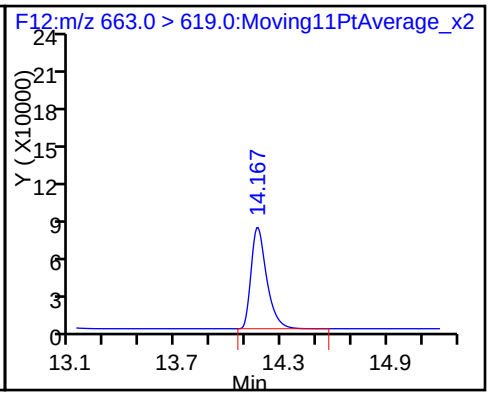
D 28 13C2 PFDoA



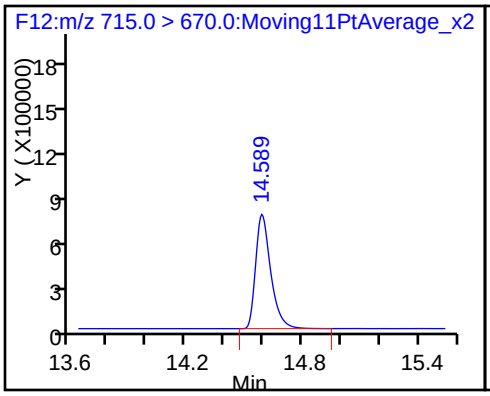
29 Perfluorododecanoic acid



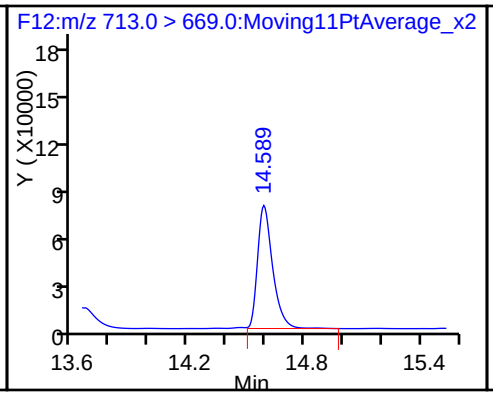
30 Perfluorotridecanoic acid



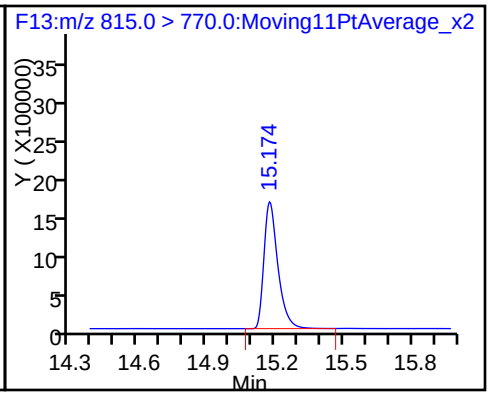
D 33 13C2-PFTeDA



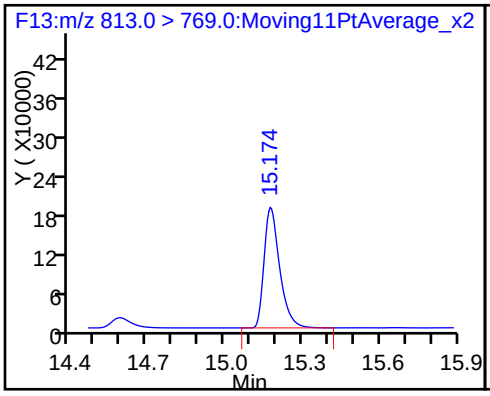
32 Perfluorotetradecanoic acid



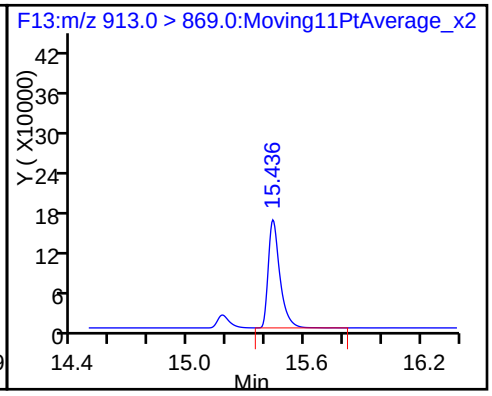
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

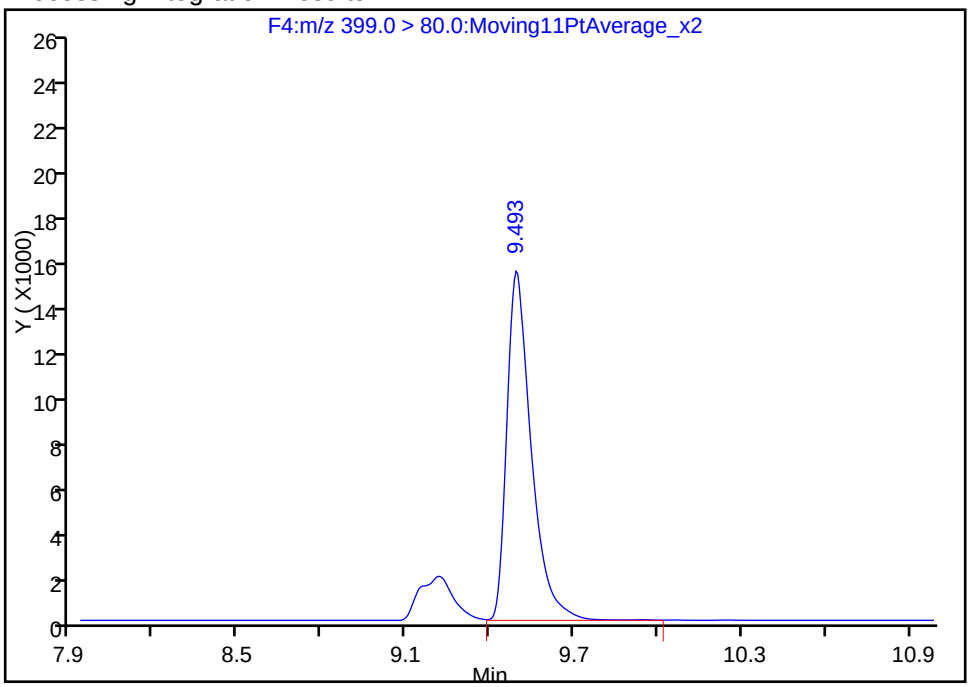
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_006.d
Injection Date: 03-Jun-2016 18:15:20 Instrument ID: A6
Lims ID: Std L3
Client ID:
Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

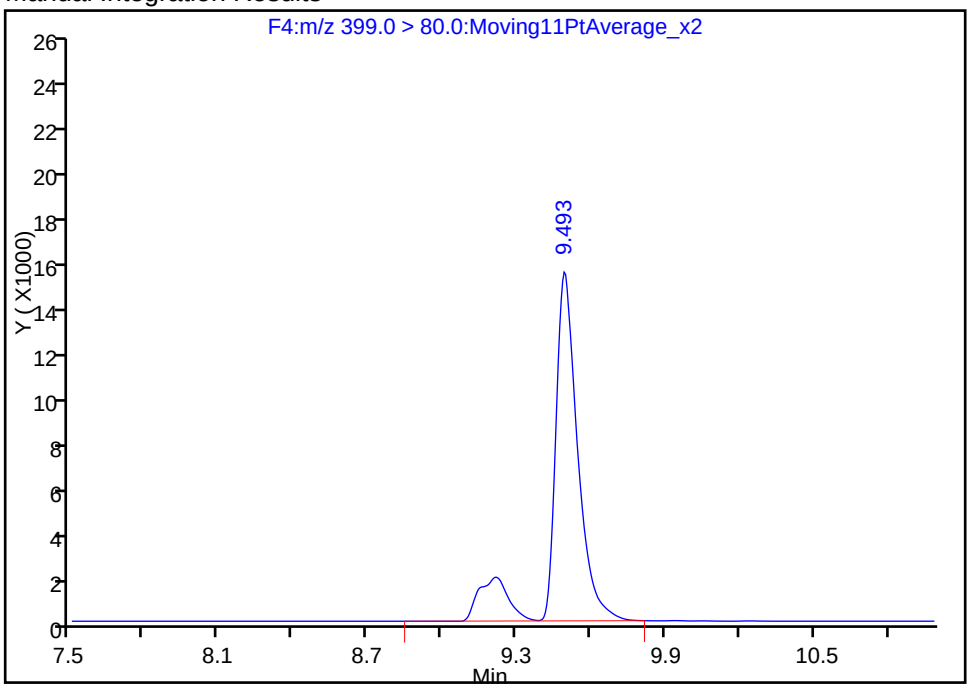
Processing Integration Results

RT: 9.49
Area: 91639
Amount: 4.390002
Amount Units: ng/ml



Manual Integration Results

RT: 9.49
Area: 106683
Amount: 4.101528
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:02:13
Audit Action: Assigned Compound ID Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

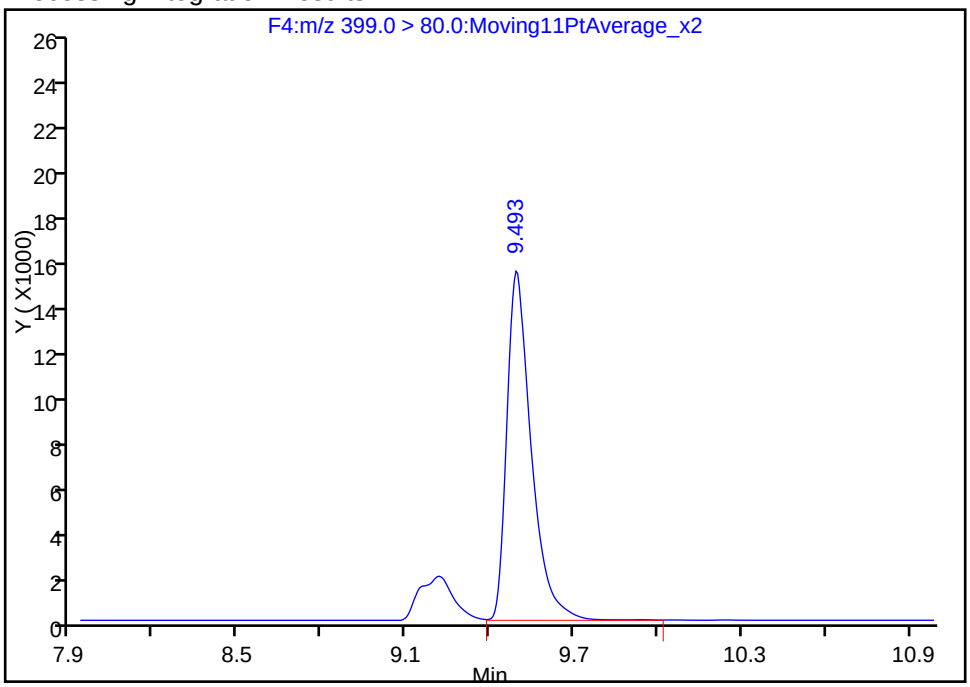
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_006.d
Injection Date: 03-Jun-2016 18:15:20 Instrument ID: A6
Lims ID: Std L3
Client ID:
Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

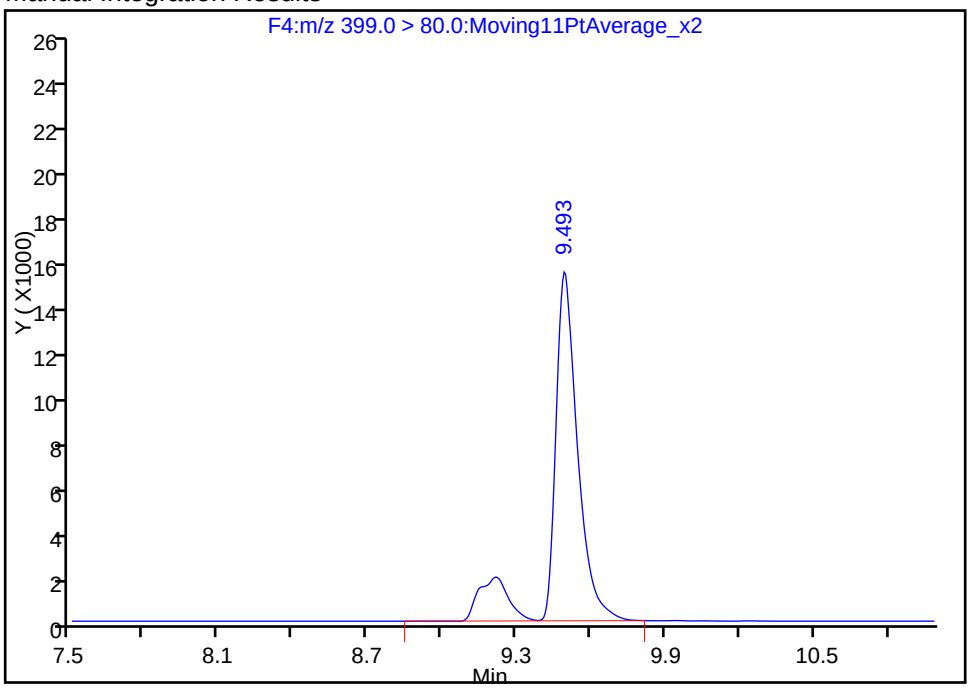
Processing Integration Results

RT: 9.49
Area: 91639
Amount: 4.390002
Amount Units: ng/ml



Manual Integration Results

RT: 9.49
Area: 106683
Amount: 4.101528
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:02:13
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

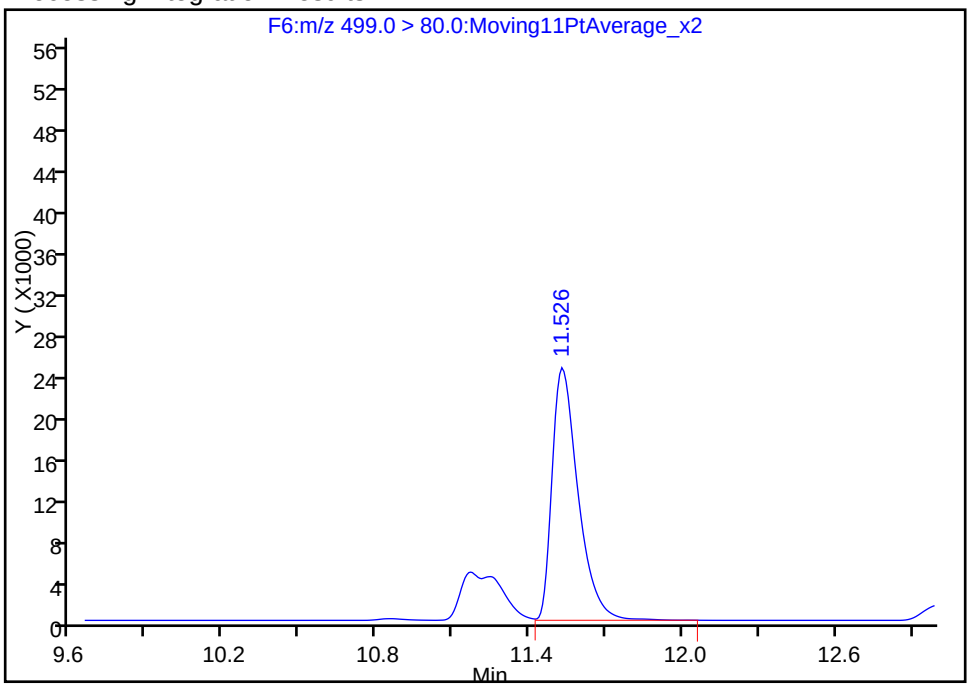
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_006.d
Injection Date: 03-Jun-2016 18:15:20 Instrument ID: A6
Lims ID: Std L3
Client ID:
Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

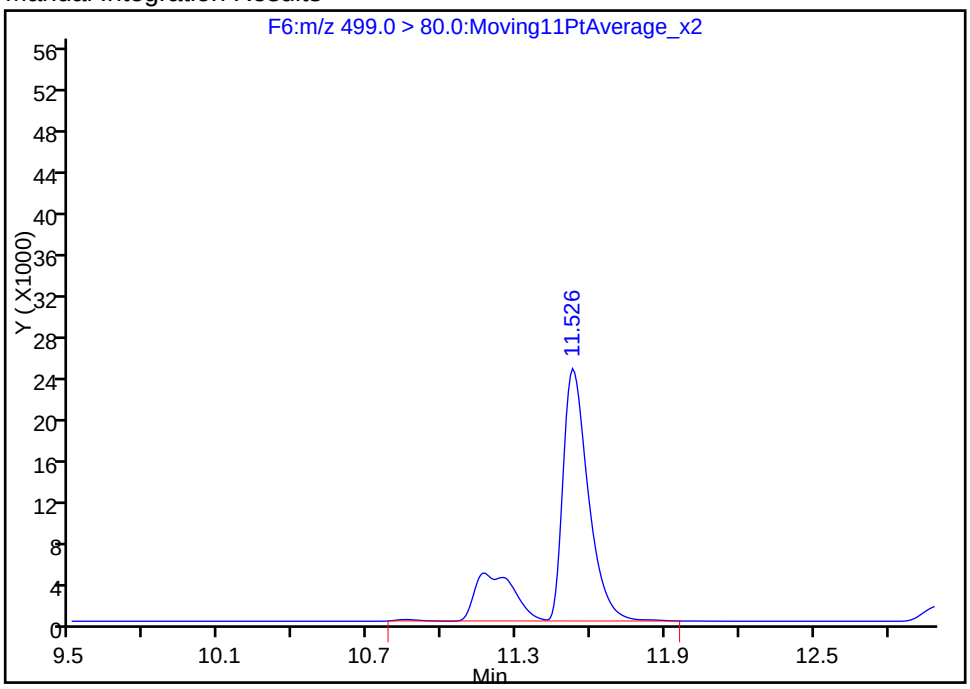
Processing Integration Results

RT: 11.53
Area: 175516
Amount: 4.902654
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 227335
Amount: 4.923365
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:02:13
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

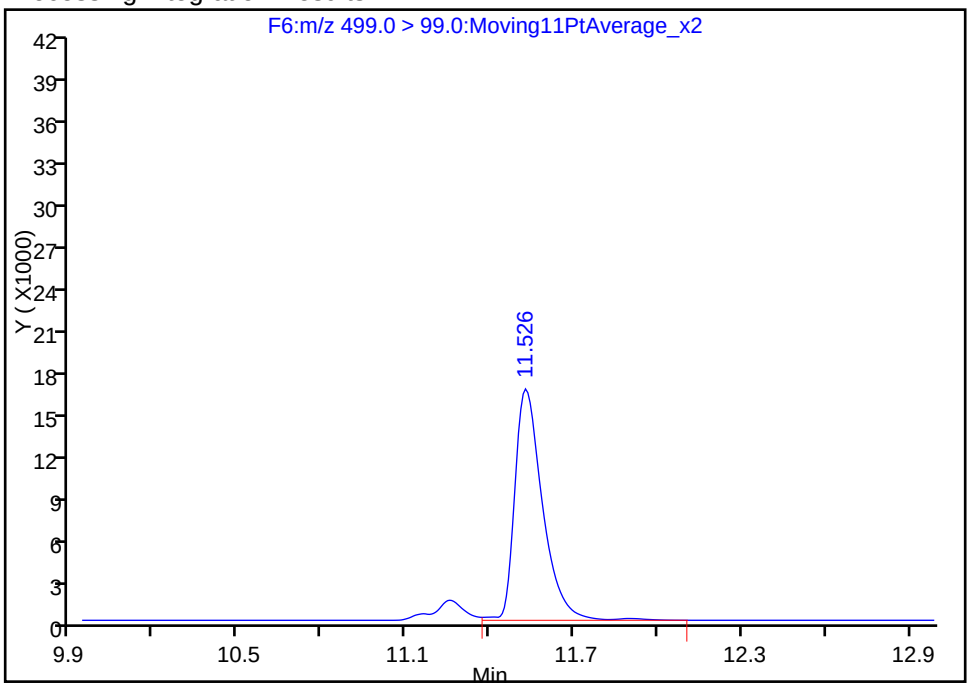
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_006.d
Injection Date: 03-Jun-2016 18:15:20 Instrument ID: A6
Lims ID: Std L3
Client ID:
Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 6
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

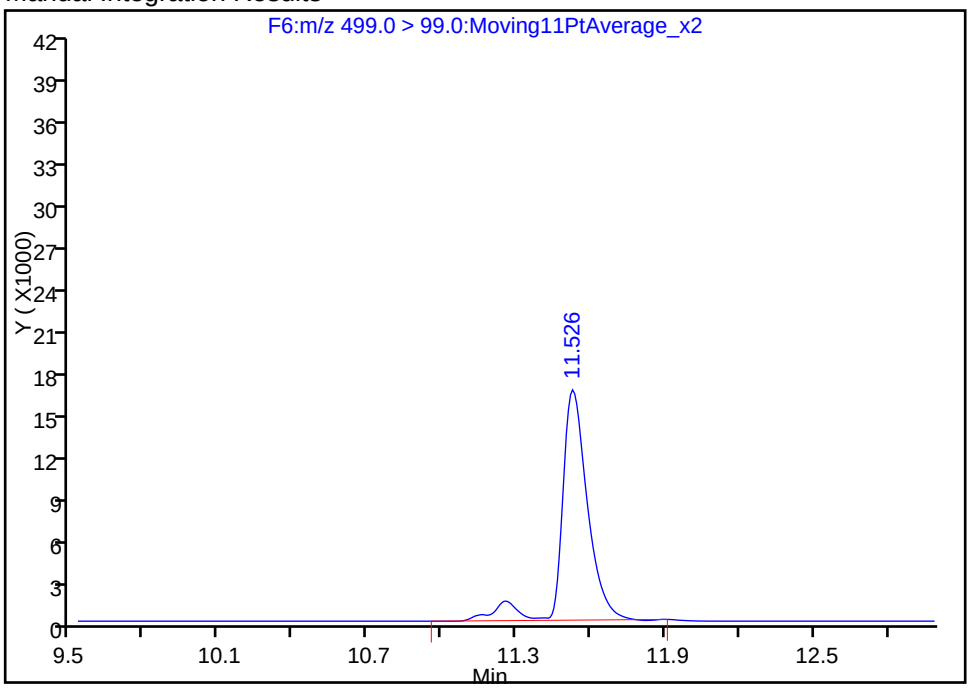
Processing Integration Results

RT: 11.53
Area: 113761
Amount: 4.902654
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 120418
Amount: 4.923365
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:02:13
Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_007.d
Lims ID: Std L4
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 03-Jun-2016 18:36:37 ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L4
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A6*sub11

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 06-Jun-2016 11:40:47 Calib Date: 03-Jun-2016 19:40:28
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 10:54:01

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.788	5.784	0.004		1400768	52.1		104	1519	
2 Perfluorobutyric acid										
212.9 > 169.0	5.788	5.786	0.002	1.000	651668	18.8		93.8	17759	
D 3 13C5-PFPeA										
267.9 > 223.0	6.941	6.939	0.002		3204622	51.2		102	2374	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.946	6.941	0.005	1.000	1123821	18.3		91.4	196	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.071	7.069	0.002	1.000	548826	15.4		87.2		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.071	7.069	0.002	1.000	548826	NC			135	
298.9 > 99.0	7.071	7.069	0.002	1.000	284395		1.93(0.00-0.00)		252	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.220	8.216	0.004	1.000	1197711	18.2		91.0	1113	
D 6 13C2 PFHxA										
315.0 > 270.0	8.220	8.217	0.003		3587651	54.2		108	13921	
D 8 13C4-PFHpA										
367.0 > 322.0	9.457	9.456	0.001		3752872	51.7		103	13778	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.463	9.457	0.006	1.000	1412013	20.2		101	6235	
D 11 18O2 PFHxS										
403.0 > 84.0	9.499	9.492	0.007		1593964	50.7		107	24381	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.493	9.495	-0.002	1.000	423692	16.5		90.5		M
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.493	9.495	-0.002	1.000	360096	NC			742	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.577	10.569	0.008		3969152	49.4		98.9	253098	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.577	10.572	0.005	1.000	1308801	19.9		99.7	508	
413.0 > 169.0	10.577	10.572	0.005	1.000	498076		2.63(0.00-0.00)	99.7	430	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.586	10.581	0.005	1.000	489285	NC			31110	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.586	10.581	0.005	1.000	489285	17.8		93.3		
D 16 13C4 PFOS										
503.0 > 80.0	11.526	11.525	0.001		2026588	52.8		110	141085	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.535	11.527	0.008	1.000	795095	16.8		90.2	570	M
499.0 > 99.0	11.535	11.527	0.008	1.000	385573		2.06(0.00-0.00)	90.2	6911	M
D 17 13C5 PFNA										
468.0 > 423.0	11.544	11.542	0.002		3523227	49.7		99.4	33379	
18 Perfluorononanoic acid										
463.0 > 419.0	11.544	11.543	0.001	1.000	993809	20.3		102	17887	
D 19 13C2 PFDA										
515.0 > 470.0	12.373	12.373	0.0		2968340	51.7		103	179894	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.373	12.373	0.0	1.000	1093082	16.7		83.5	44084	
D 23 13C8 FOSA										
506.0 > 78.0	12.994	12.985	0.009		5958609	52.4		105	2567	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.994	12.987	0.007	1.000	1458806	18.7		93.3	5957	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.041	13.033	0.008	1.000	537885	18.4		95.2		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.041	13.033	0.008	1.000	537885	NC			36453	
D 26 13C2 PFUnA										
565.0 > 520.0	13.085	13.076	0.009		4102038	50.6		101	9942	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.085	13.077	0.008	1.000	1365693	19.8		99.1	64643	
D 28 13C2 PFDoA										
615.0 > 570.0	13.666	13.663	0.003		5033532	49.9		99.8	18403	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.675	13.666	0.009	1.000	1276533	19.9		99.5	3288	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.174	14.165	0.009	1.000	1994716	21.4		107	1008	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.596	14.589	0.007		4249936	53.2		106	8080	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.596	14.589	0.007	1.000	1321903	17.2		86.1	737	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.179	15.177	0.002		6838654	52.5		105	6891	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.179	15.177	0.002	1.000	2409097	19.2		96.2	1696	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.441	15.437	0.004	1.000	2445515	20.0		99.8	1783	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L4_00021 Amount Added: 1.00 Units: mL

Report Date: 06-Jun-2016 11:40:48 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_007.d

Injection Date: 03-Jun-2016 18:36:37 Instrument ID: A6

Lims ID: Std L4

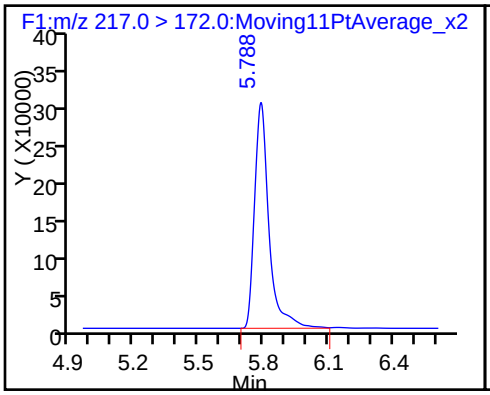
Client ID:

Operator ID: JRB ALS Bottle#: 4 Worklist Smp#: 7

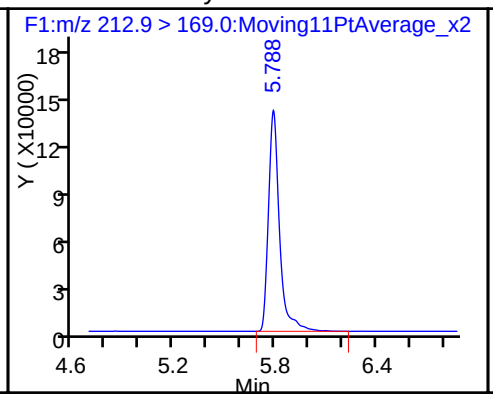
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

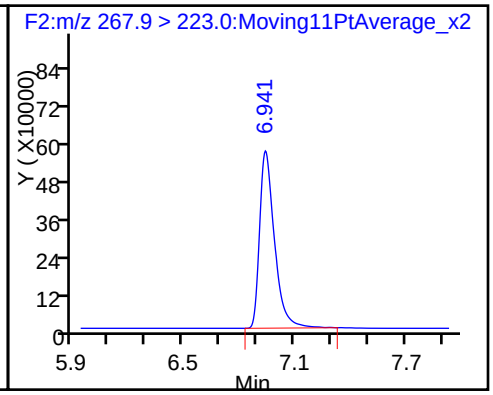
D 1 13C4 PFBA



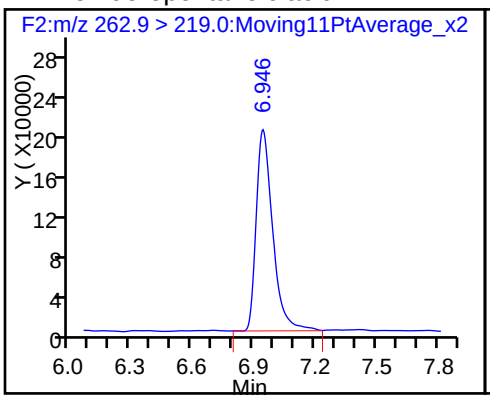
2 Perfluorobutyric acid



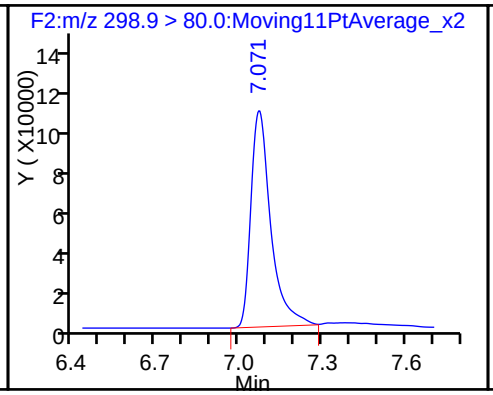
D 3 13C5-PFPeA



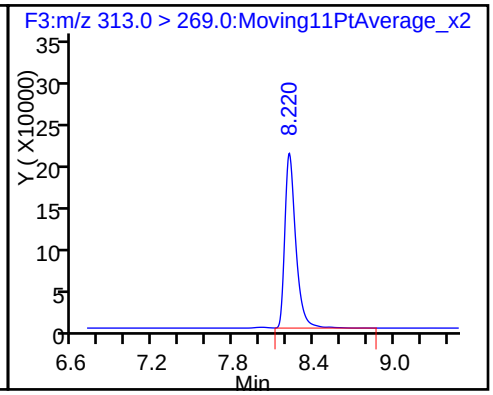
4 Perfluoropentanoic acid



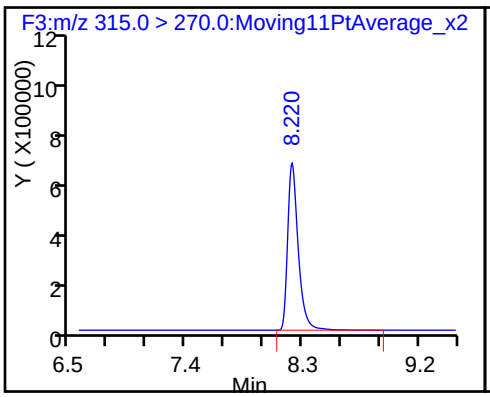
40 Perfluorobutanesulfonic acid



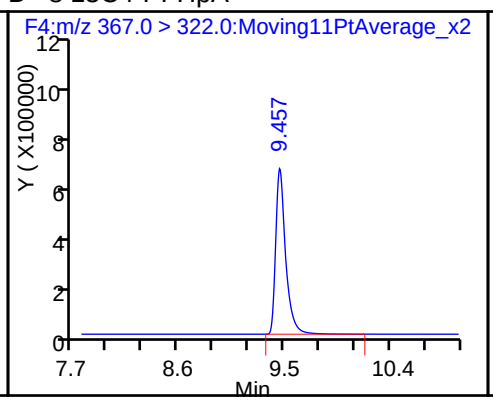
7 Perfluorohexanoic acid



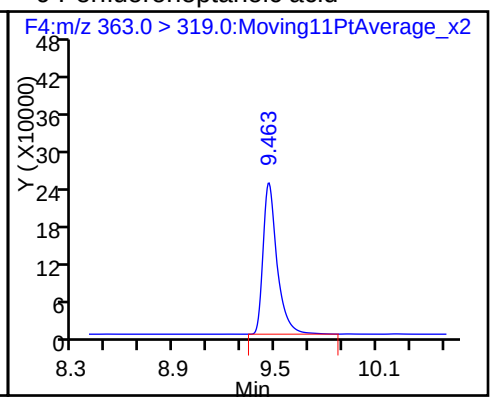
D 6 13C2 PFHxA



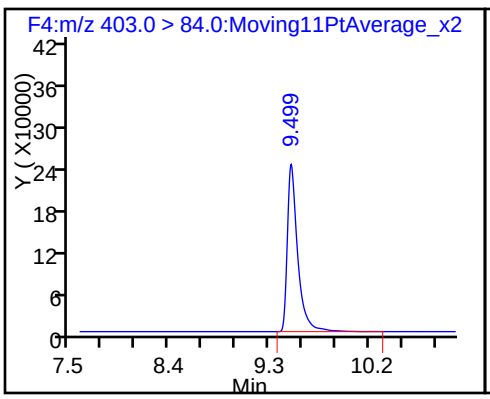
D 8 13C4-PFHpA



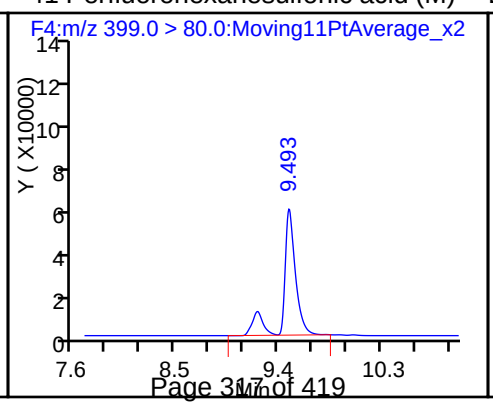
9 Perfluoroheptanoic acid



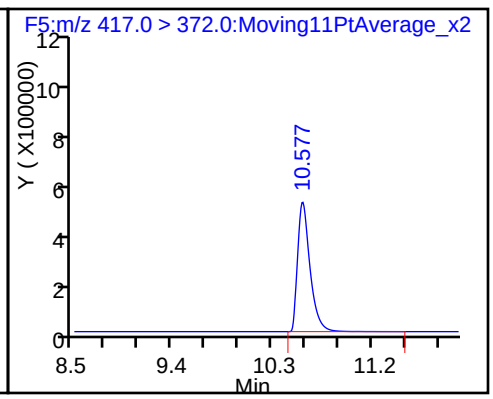
D 11 18O2 PFHxS



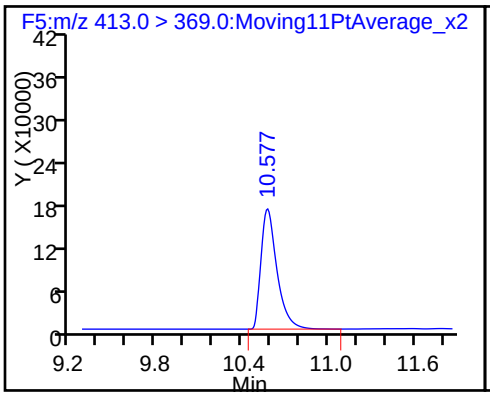
41 Perfluorohexanesulfonic acid (M)



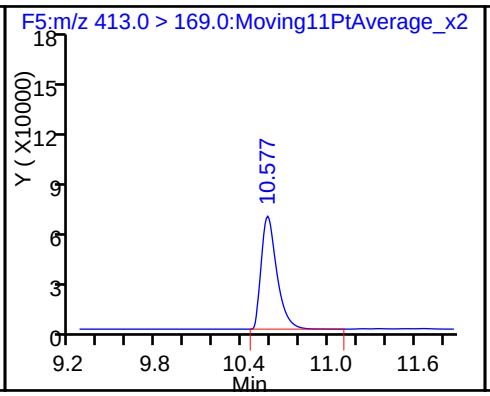
D 12 13C4 PFOA



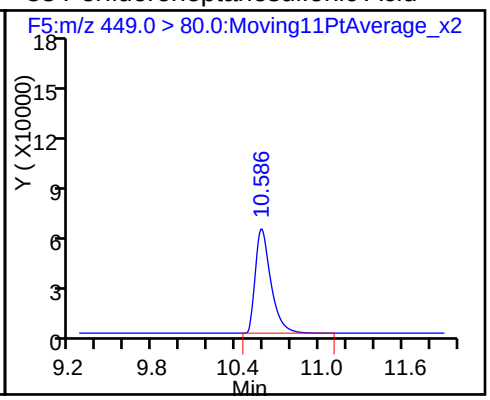
13 Perfluorooctanoic acid



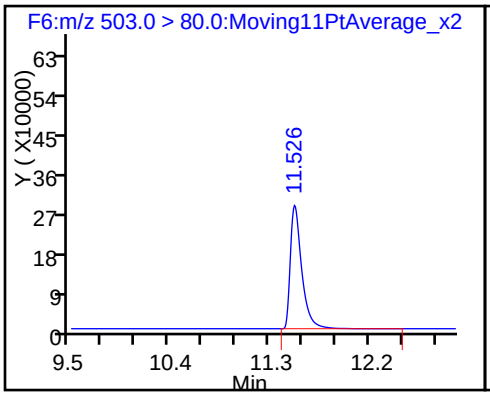
13 Perfluorooctanoic acid



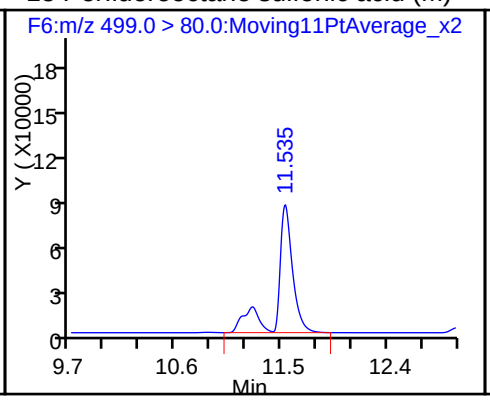
38 Perfluoroheptanesulfonic Acid



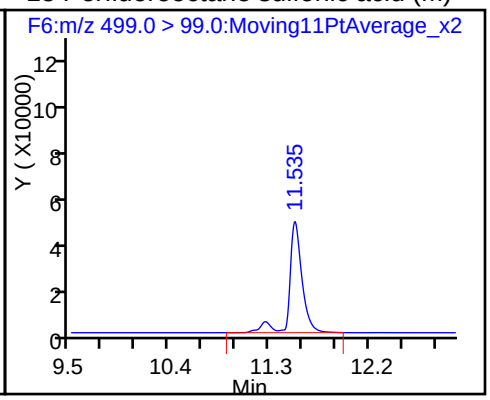
D 16 13C4 PFOS



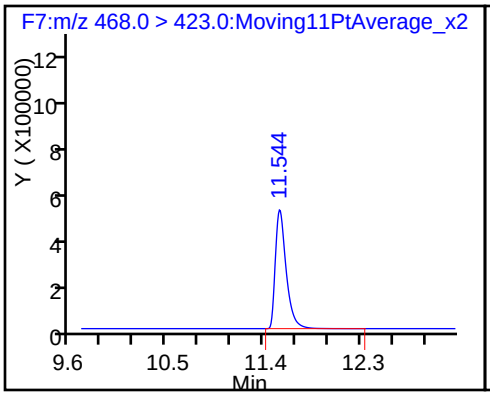
15 Perfluorooctane sulfonic acid (M)



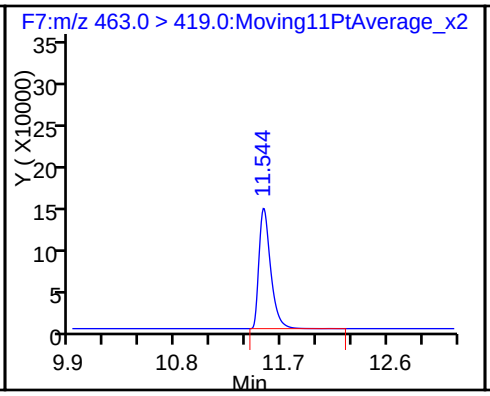
15 Perfluorooctane sulfonic acid (M)



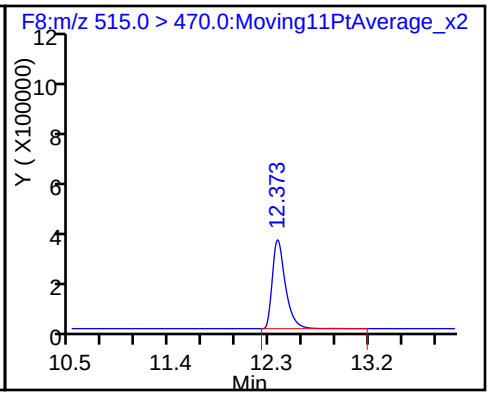
D 17 13C5 PFNA



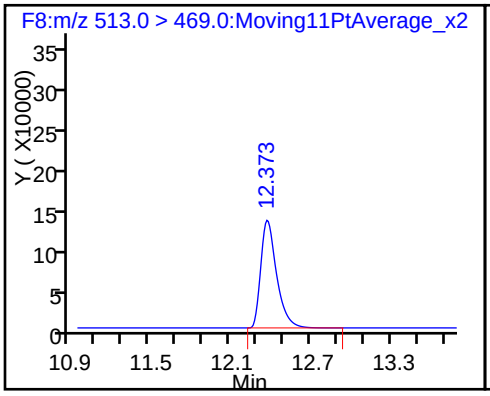
18 Perfluorononanoic acid



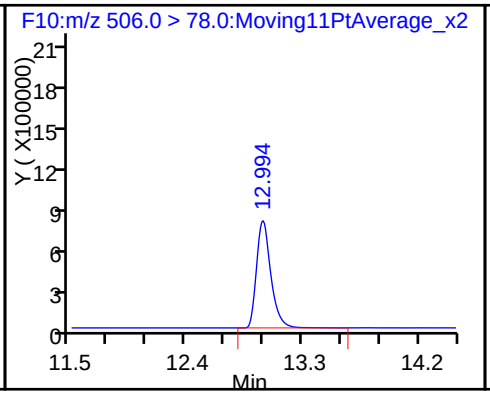
D 19 13C2 PFDA



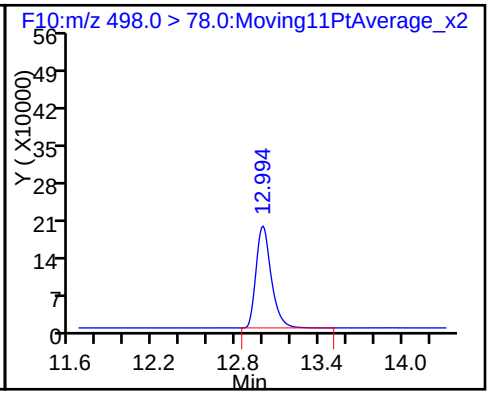
20 Perfluorodecanoic acid



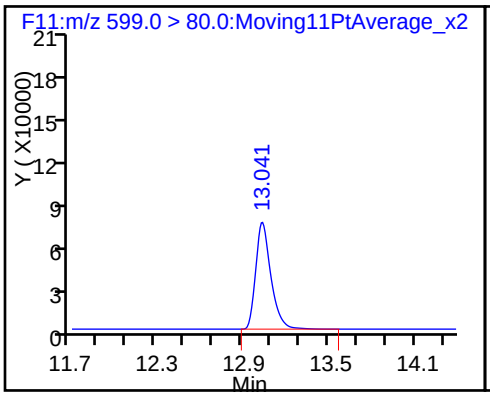
D 23 13C8 FOSA



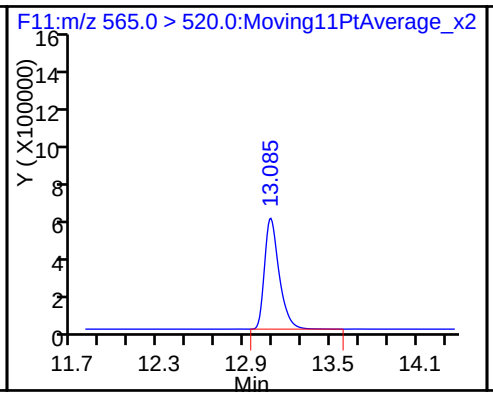
24 Perfluorooctane Sulfonamide



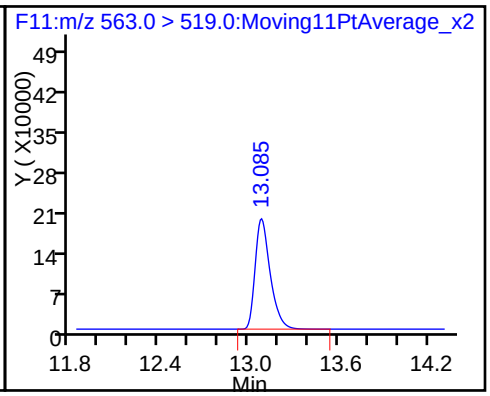
39 Perfluorodecane Sulfonic acid



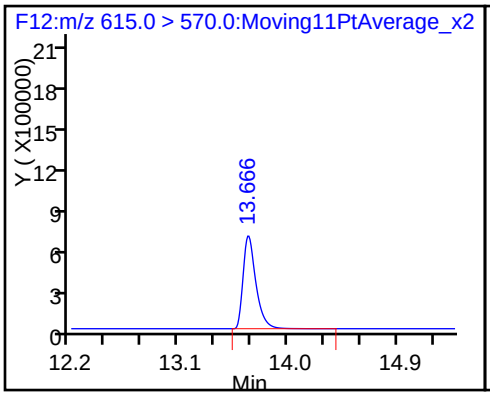
D 26 13C2 PFUnA



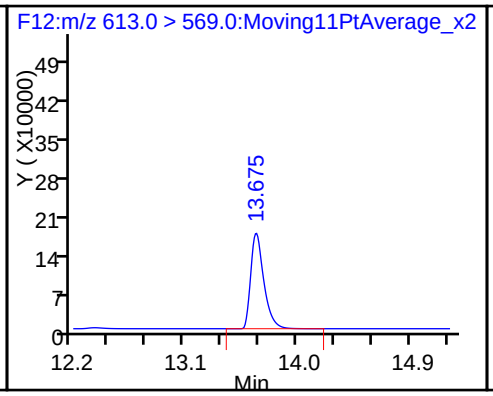
27 Perfluoroundecanoic acid



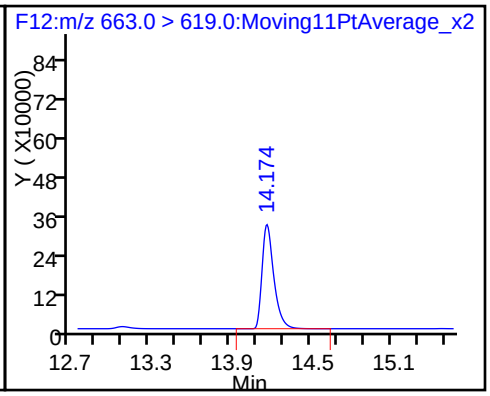
D 28 13C2 PFDoA



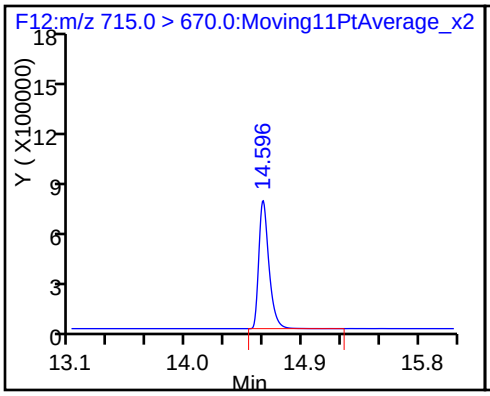
29 Perfluorododecanoic acid



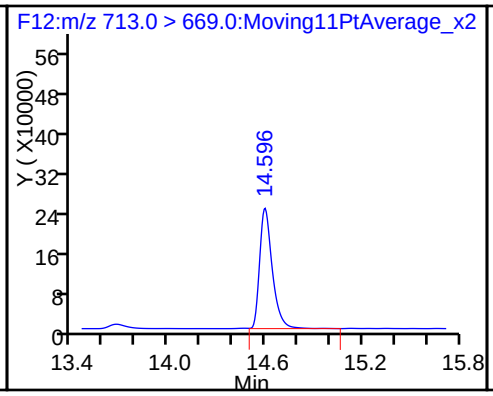
30 Perfluorotridecanoic acid



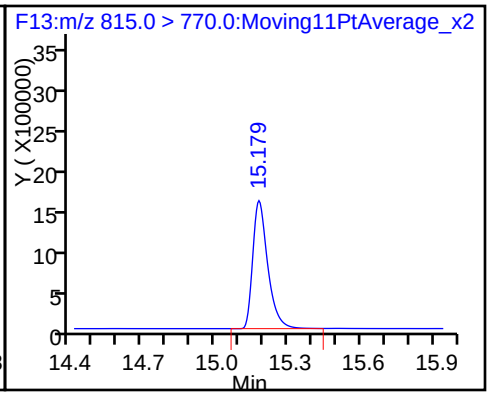
D 33 13C2-PFTeDA



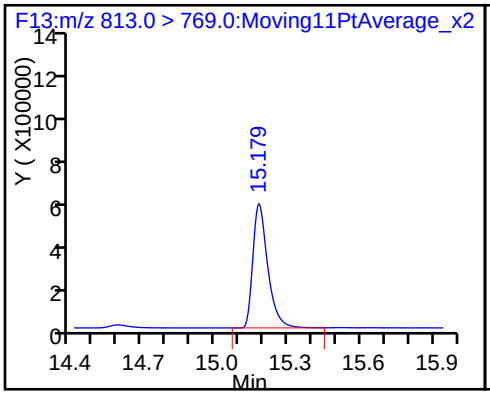
32 Perfluorotetradecanoic acid



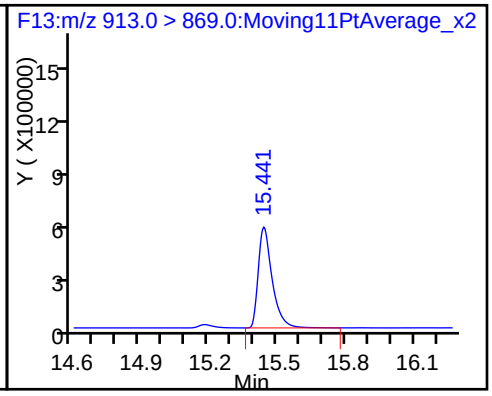
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

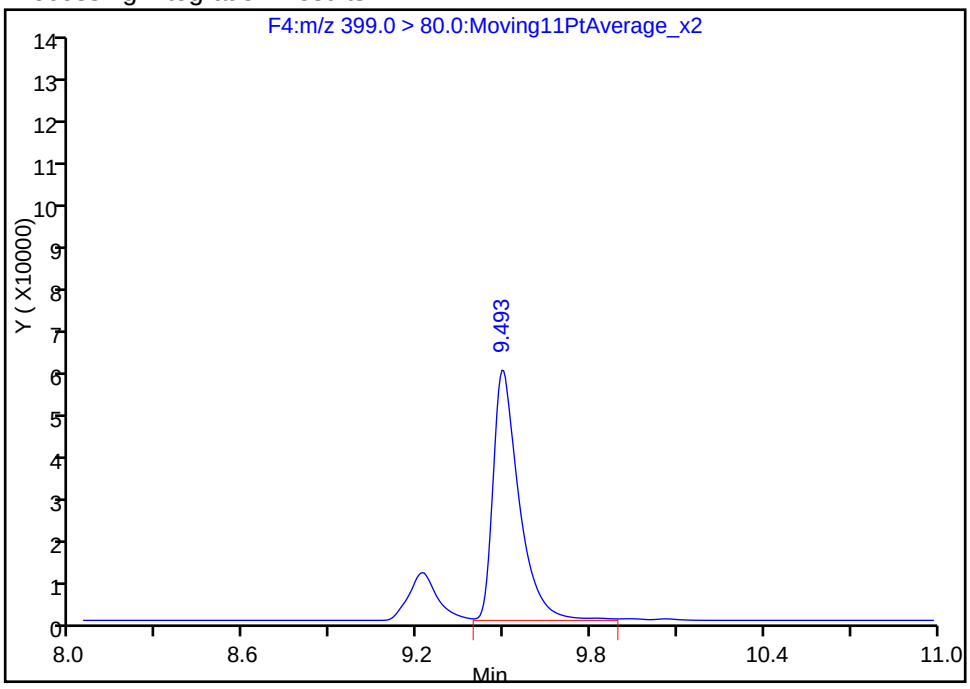
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_007.d
Injection Date: 03-Jun-2016 18:36:37 Instrument ID: A6
Lims ID: Std L4
Client ID:
Operator ID: JRB ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

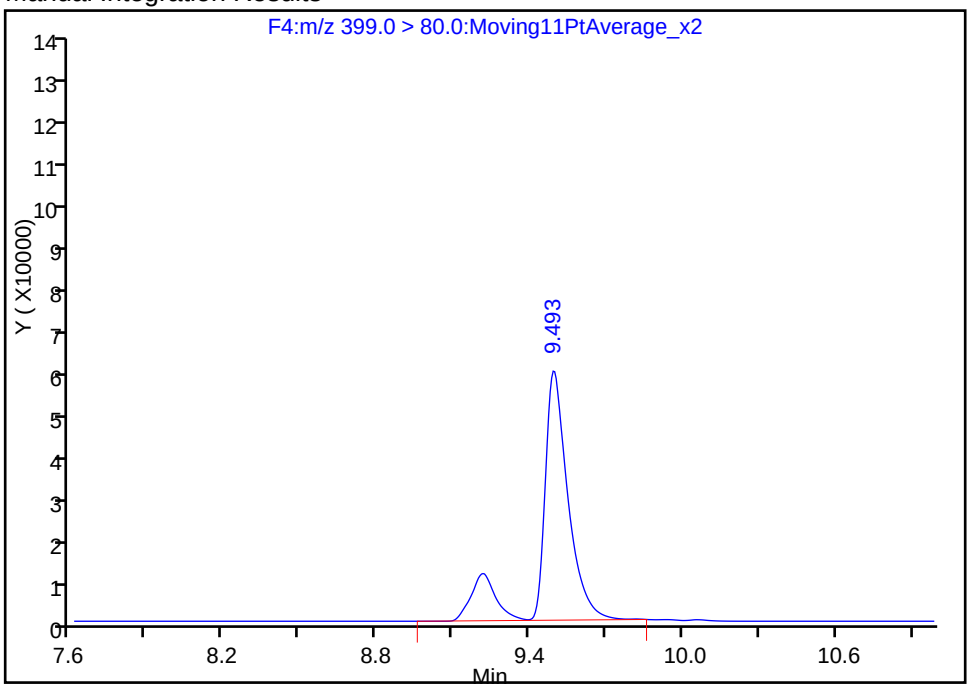
Processing Integration Results

RT: 9.49
Area: 360096
Amount: 17.380488
Amount Units: ng/ml



Manual Integration Results

RT: 9.49
Area: 423692
Amount: 16.478529
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:33:30
Audit Action: Manually Integrated/Assigned Compound ID Audit Reason:

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

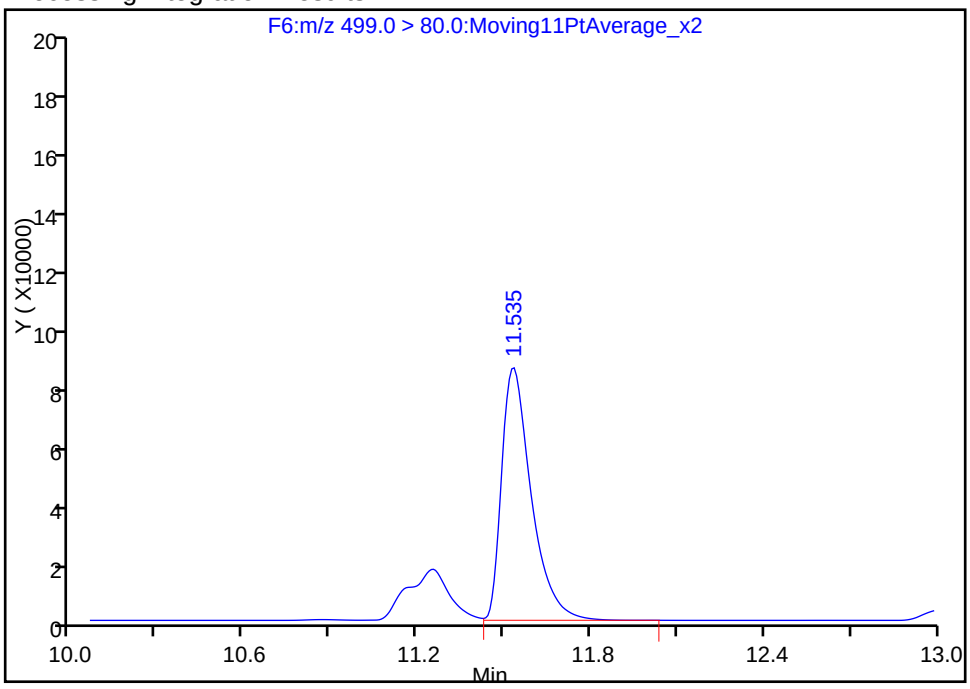
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_007.d
Injection Date: 03-Jun-2016 18:36:37 Instrument ID: A6
Lims ID: Std L4
Client ID:
Operator ID: JRB ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

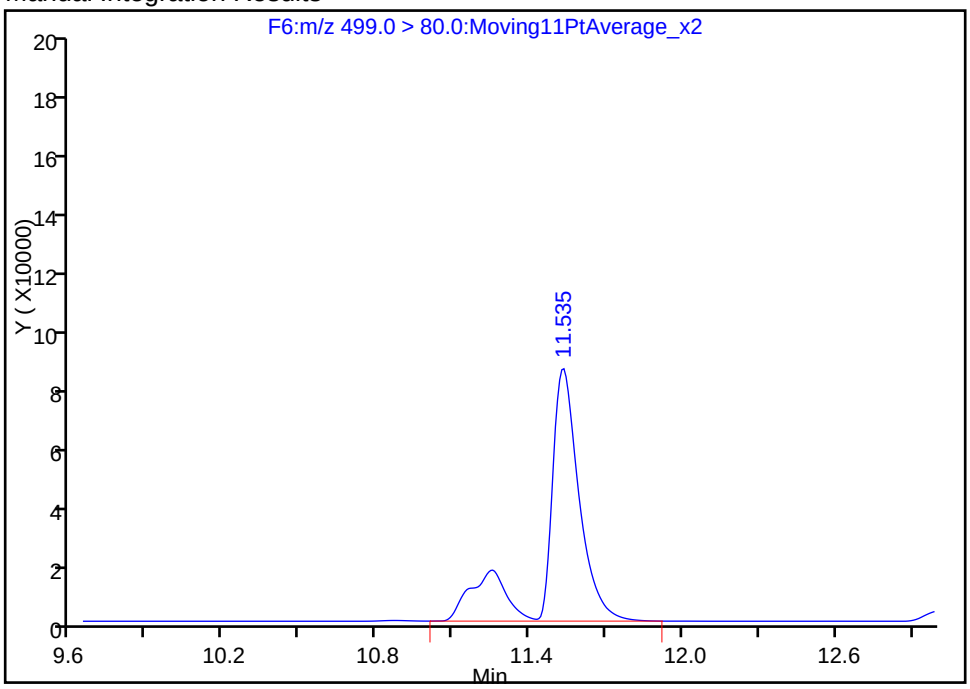
Processing Integration Results

RT: 11.53
Area: 620359
Amount: 16.023209
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 795095
Amount: 16.750161
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:02:55
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

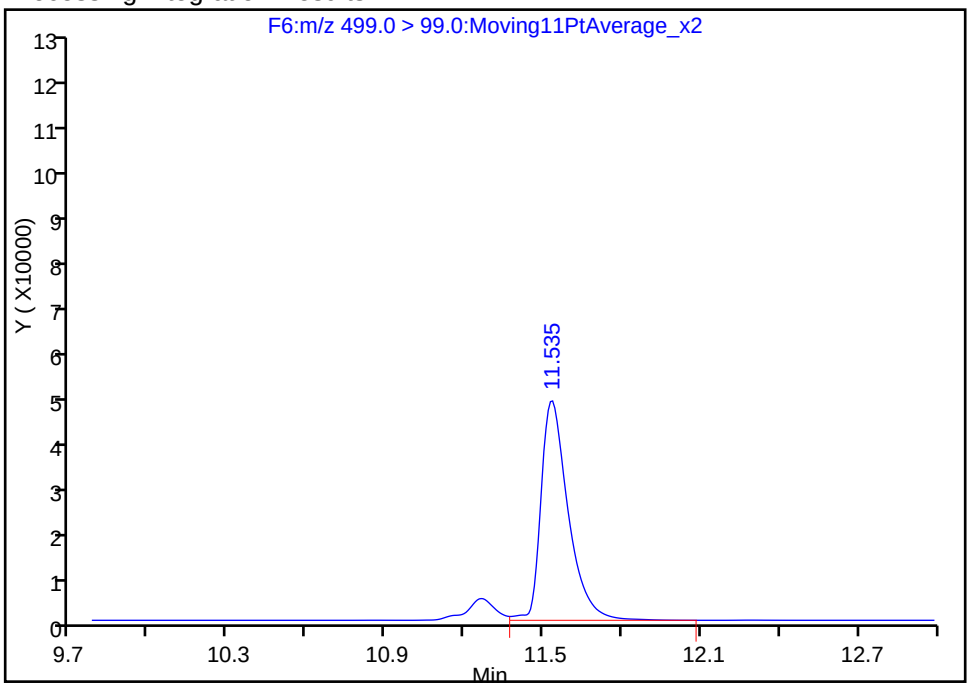
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_007.d
Injection Date: 03-Jun-2016 18:36:37 Instrument ID: A6
Lims ID: Std L4
Client ID:
Operator ID: JRB ALS Bottle#: 4 Worklist Smp#: 7
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

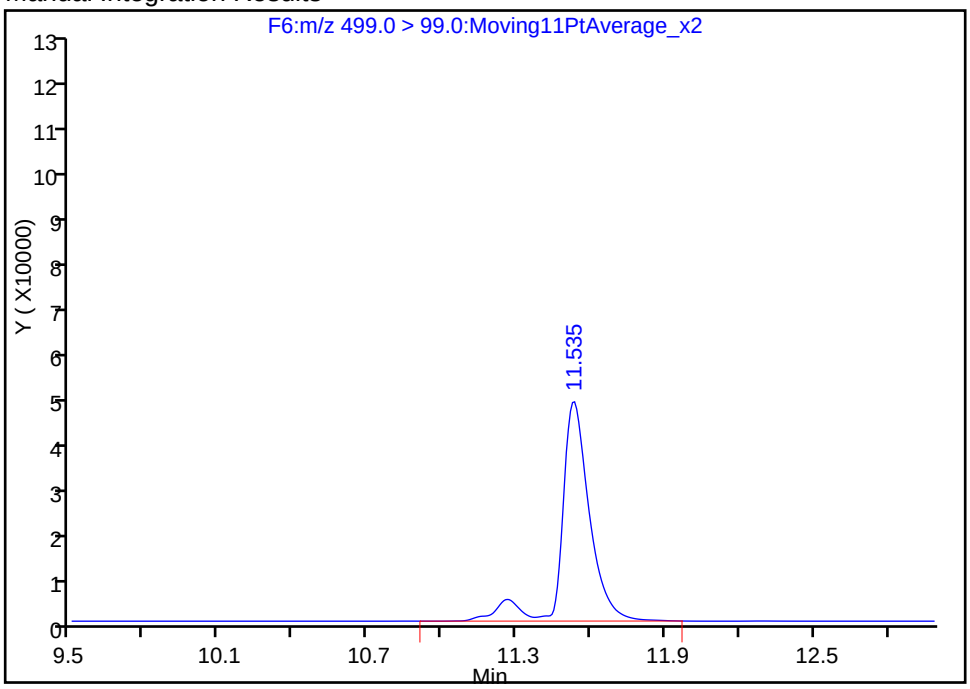
Processing Integration Results

RT: 11.53
Area: 351383
Amount: 16.023209
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 385573
Amount: 16.750161
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:02:55
Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_008.d
Lims ID: Std L5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 03-Jun-2016 18:57:54 ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L5
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A6*sub11

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 06-Jun-2016 11:40:49 Calib Date: 03-Jun-2016 19:40:28
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 10:57:15

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.785	5.784	0.001		1400282	52.1		104	34033	
2 Perfluorobutyric acid										
212.9 > 169.0	5.788	5.786	0.002	1.000	1557786	44.9		89.8	6185	
D 3 13C5-PFPeA										
267.9 > 223.0	6.937	6.939	-0.002		3274783	52.3		105	17282	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.941	6.941	0.0	1.000	2820215	44.9		89.8	502	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.071	7.069	0.002	1.000	1320665	38.9		88.0		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.071	7.069	0.002	1.000	1320665	NC			190	
298.9 > 99.0	7.067	7.069	-0.002	0.999	688767		1.92(0.00-0.00)		853	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.219	8.216	0.003	1.000	2861454	46.8		93.6	1018	
D 6 13C2 PFHxA										
315.0 > 270.0	8.219	8.217	0.002		3332140	50.4		101	16234	
D 8 13C4-PFHpA										
367.0 > 322.0	9.458	9.456	0.002		3514253	48.4		96.8	8353	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.458	9.457	0.001	1.000	3214873	49.0		98.1	32474	
D 11 18O2 PFHxS										
403.0 > 84.0	9.493	9.492	0.001		1483612	47.2		99.7	11236	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.493	9.495	-0.002	1.000	1021016	42.7		93.8		M
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.493	9.495	-0.002	1.000	851972	NC			1231	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.568	10.569	-0.001		3678847	45.8		91.6	16767	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.577	10.572	0.005	1.000	2937982	48.3		96.6	2509	
413.0 > 169.0	10.577	10.572	0.005	1.000	1096033		2.68(0.00-0.00)	96.6	6162	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.586	10.581	0.005	1.000	1185733	NC			7909	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.586	10.581	0.005	1.000	1185733	47.0		98.8		
D 16 13C4 PFOS										
503.0 > 80.0	11.527	11.525	0.002		1855875	48.4		101	10787	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.527	11.527	0.0	1.000	1824798	42.0		90.5	407	M
499.0 > 99.0	11.527	11.527	0.0	1.000	776534		2.35(0.00-0.00)	90.5	61.4	
D 17 13C5 PFNA										
468.0 > 423.0	11.545	11.542	0.003		3375276	47.6		95.2	159163	
18 Perfluorononanoic acid										
463.0 > 419.0	11.545	11.543	0.002	1.000	2189140	46.8		93.6	39144	
D 19 13C2 PFDA										
515.0 > 470.0	12.373	12.373	0.0		2765359	48.2		96.4	37472	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.373	12.373	0.0	1.000	2700743	44.3		88.6	327059	
D 23 13C8 FOSA										
506.0 > 78.0	12.984	12.985	-0.001		5355848	47.1		94.2	2535	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.994	12.987	0.007	1.000	3551181	50.5		101	2732	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.032	13.033	-0.001	1.000	1278184	47.2		98.0		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.032	13.033	-0.001	1.000	1278184	NC			86451	
D 26 13C2 PFUnA										
565.0 > 520.0	13.076	13.076	0.0		3837034	47.3		94.6	11076	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.076	13.077	-0.001	1.000	3012794	47.4		94.9	60713	
D 28 13C2 PFDoA										
615.0 > 570.0	13.666	13.663	0.003		4844461	48.0		96.1	10646	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.666	13.666	0.0	1.000	2821435	45.7		91.4	4124	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.167	14.165	0.002	1.000	4292140	47.9		95.8	2538	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.589	14.589	0.0		3968081	49.7		99.4	4883	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.589	14.589	0.0	1.000	3123427	42.3		84.6	1729	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.180	15.177	0.003		6524409	50.0		100	8488	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.180	15.177	0.003	1.000	5675759	49.0		98.0	4085	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.436	15.437	-0.001	1.000	5859044	49.7		99.4	3526	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L5_00019 Amount Added: 1.00 Units: mL

Report Date: 06-Jun-2016 11:40:50 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_008.d

Injection Date: 03-Jun-2016 18:57:54 Instrument ID: A6

Lims ID: Std L5

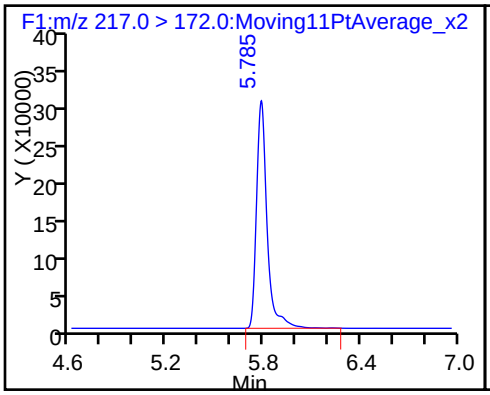
Client ID:

Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 8

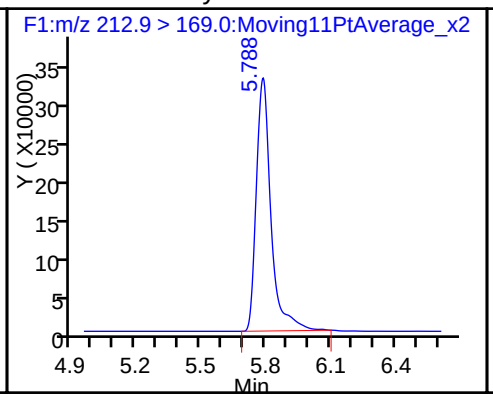
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

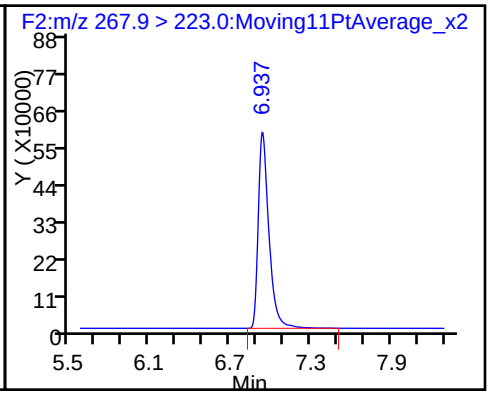
D 1 13C4 PFBA



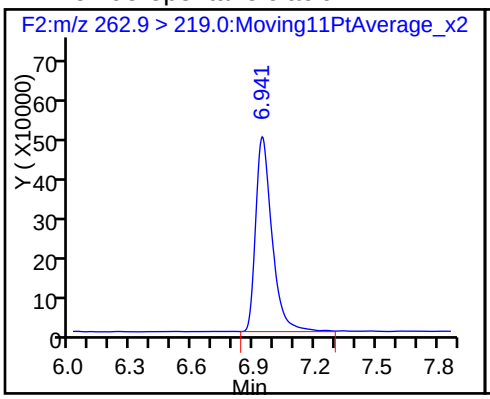
2 Perfluorobutyric acid



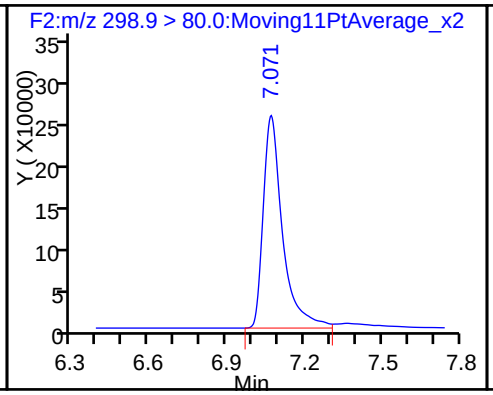
D 3 13C5-PFPeA



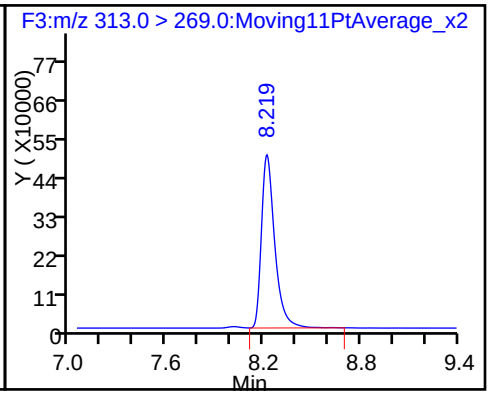
4 Perfluoropentanoic acid



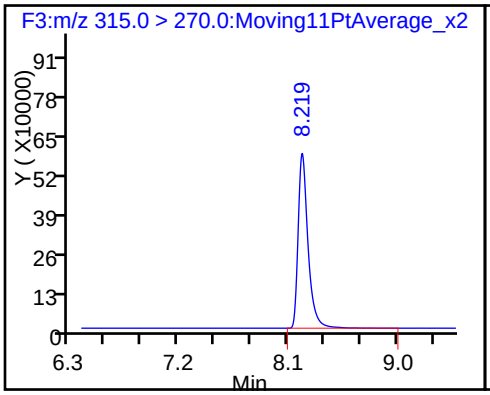
40 Perfluorobutanesulfonic acid



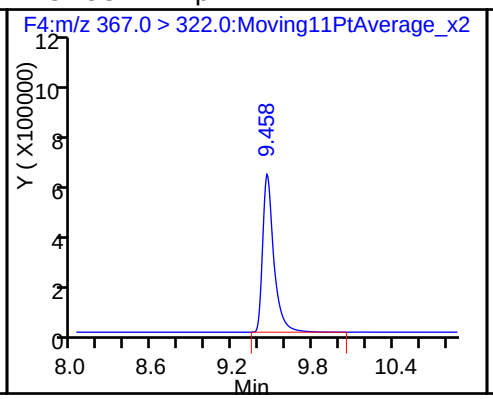
7 Perfluorohexanoic acid



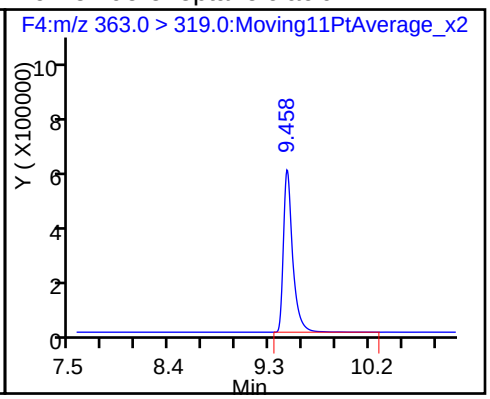
D 6 13C2 PFHxA



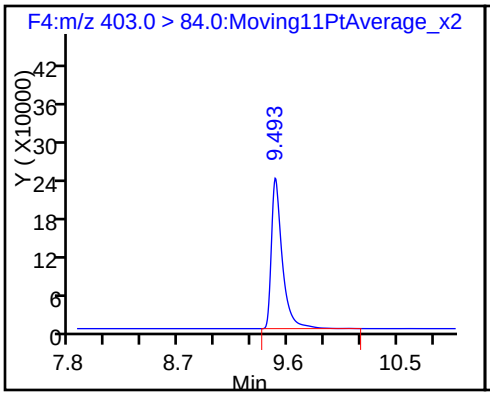
D 8 13C4-PFHpA



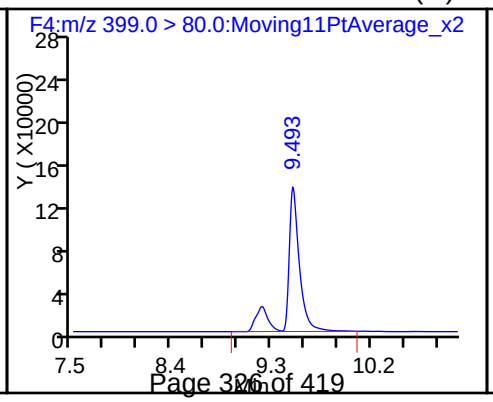
9 Perfluoroheptanoic acid



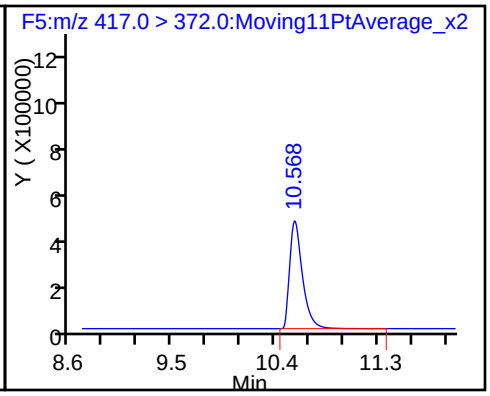
D 11 18O2 PFHxS



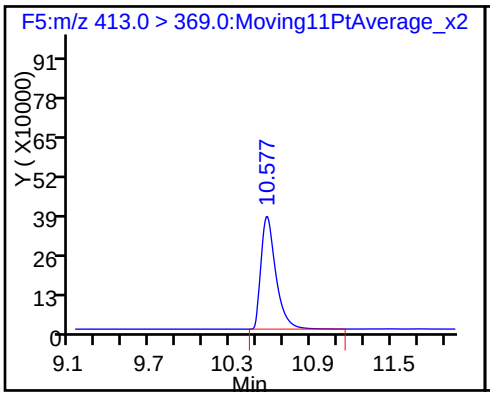
41 Perfluorohexanesulfonic acid (M)



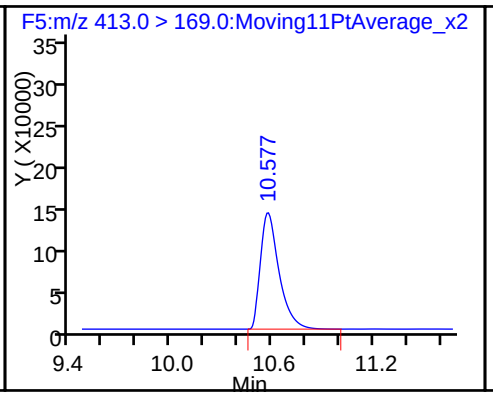
D 12 13C4 PFOA



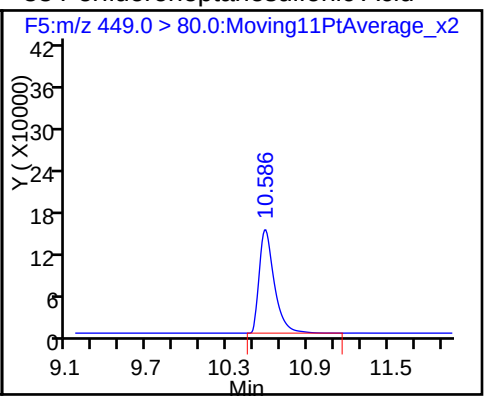
13 Perfluorooctanoic acid



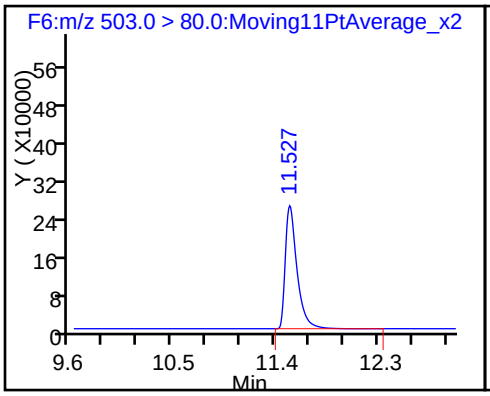
13 Perfluorooctanoic acid



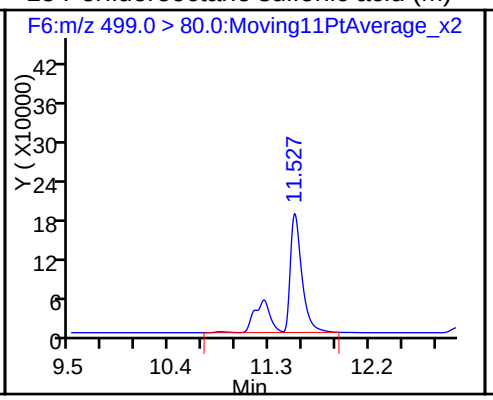
38 Perfluoroheptanesulfonic Acid



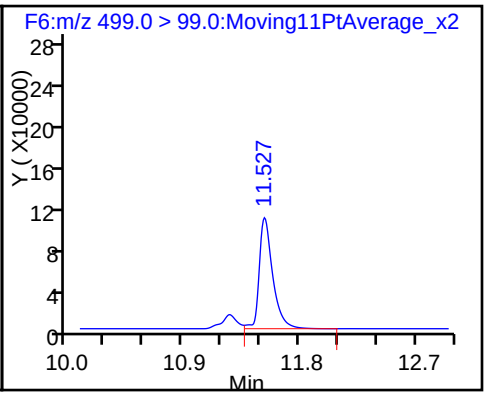
D 16 13C4 PFOS



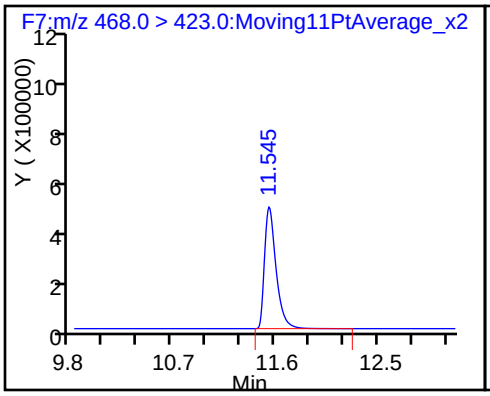
15 Perfluorooctane sulfonic acid (M)



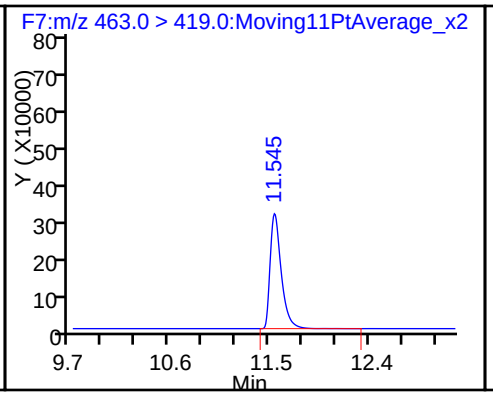
15 Perfluorooctane sulfonic acid



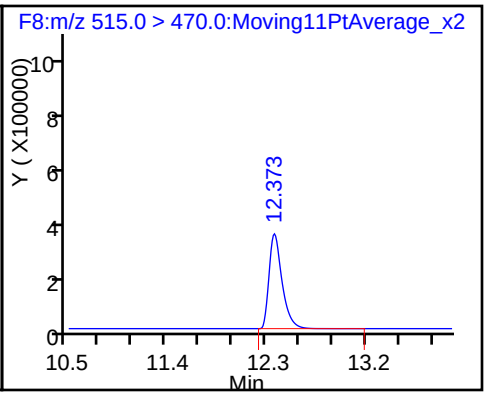
D 17 13C5 PFNA



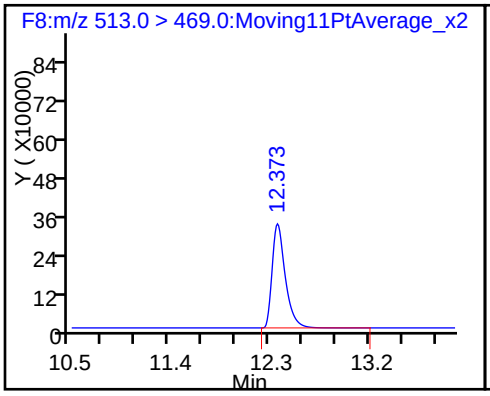
18 Perfluorononanoic acid



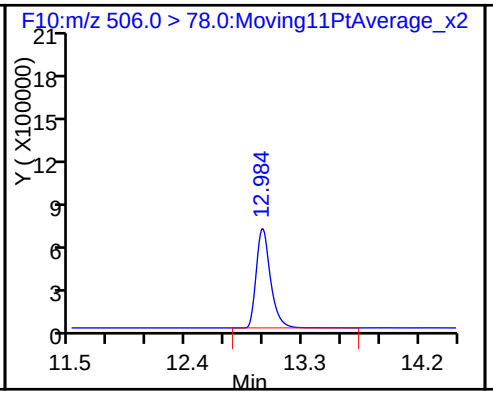
D 19 13C2 PFDA



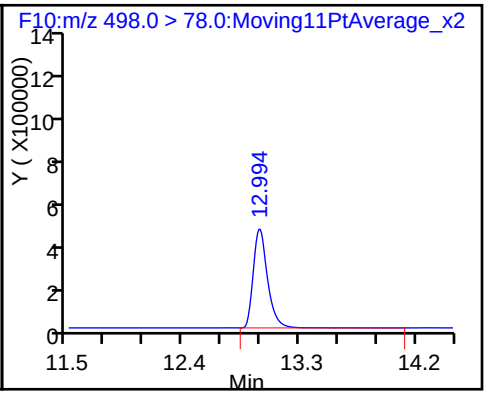
20 Perfluorodecanoic acid



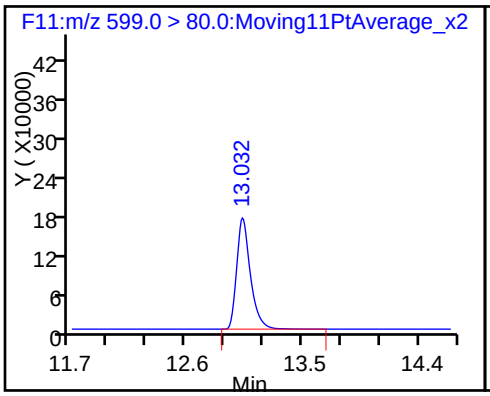
D 23 13C8 FOSA



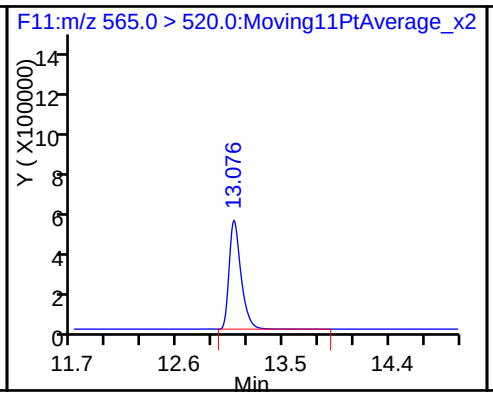
24 Perfluorooctane Sulfonamide



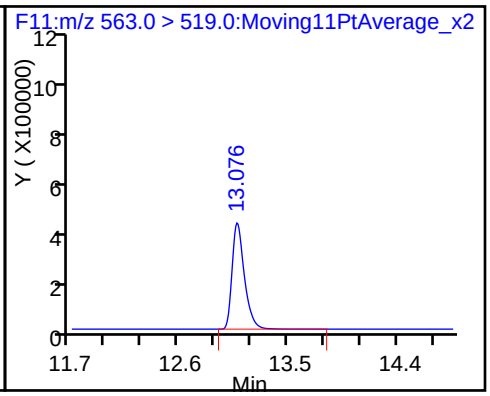
39 Perfluorodecane Sulfonic acid



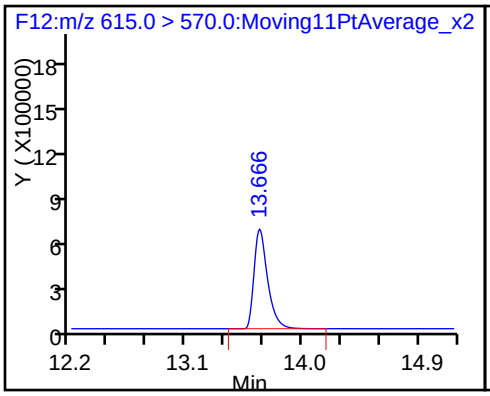
D 26 13C2 PFUnA



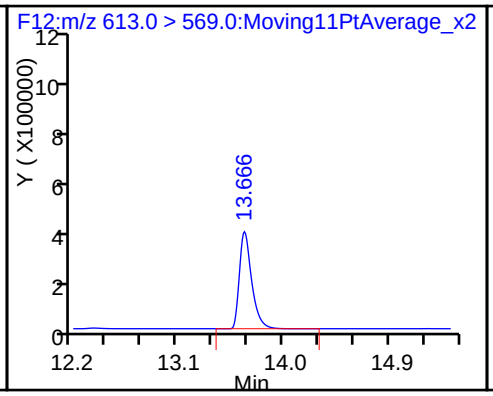
27 Perfluoroundecanoic acid



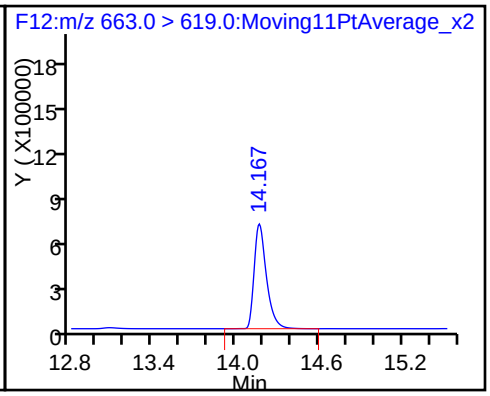
D 28 13C2 PFDoA



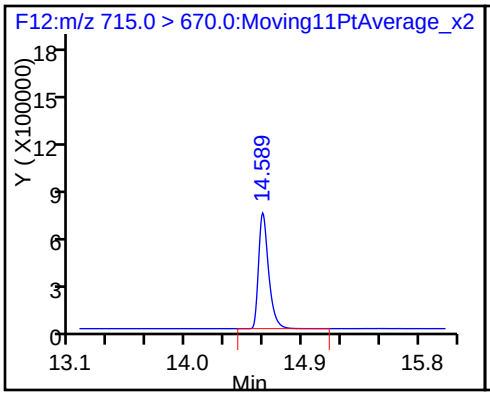
29 Perfluorododecanoic acid



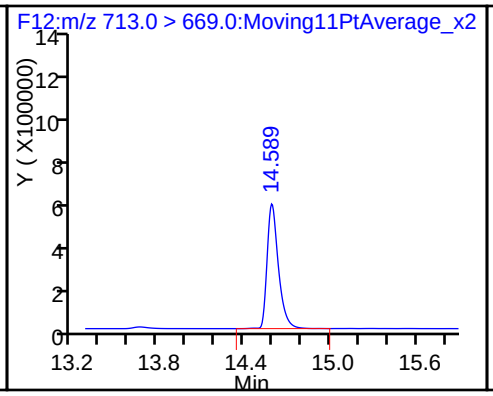
30 Perfluorotridecanoic acid



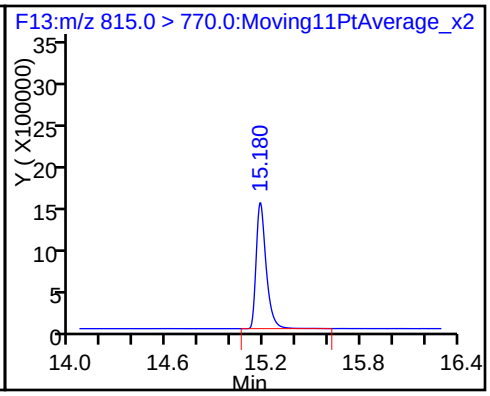
D 33 13C2-PFTeDA



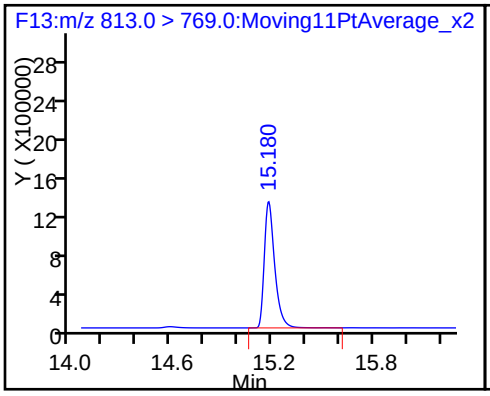
32 Perfluorotetradecanoic acid



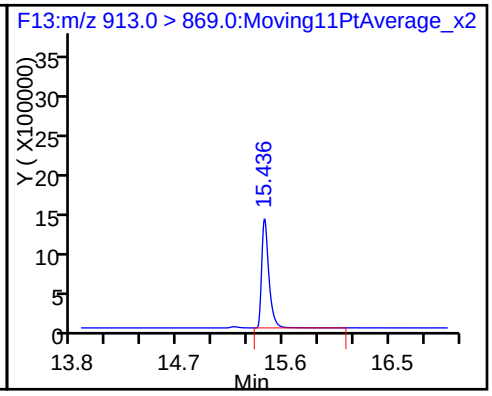
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

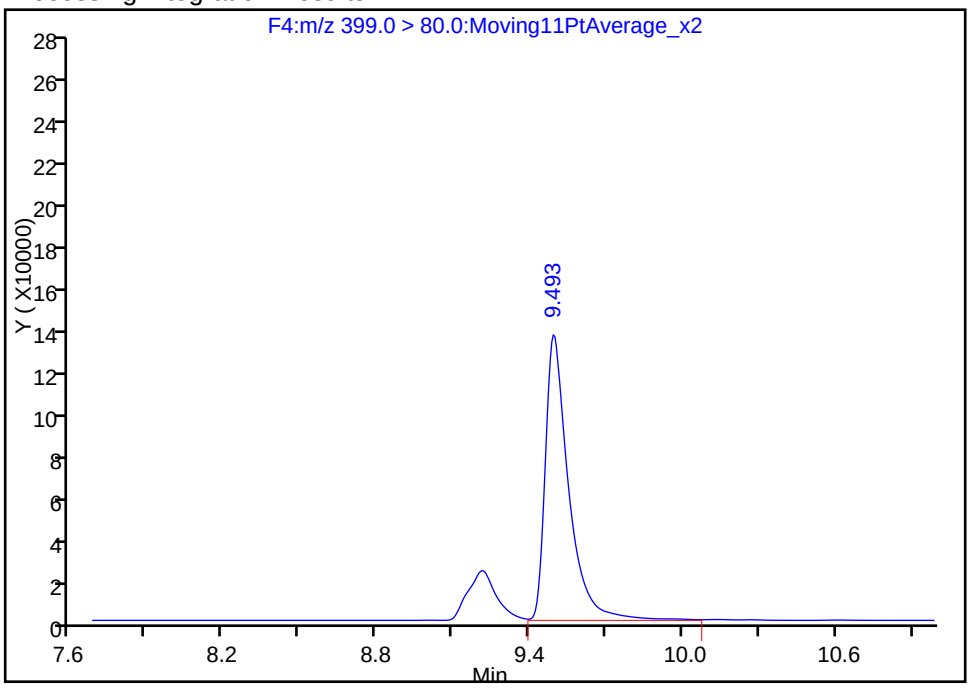
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_008.d
Injection Date: 03-Jun-2016 18:57:54 Instrument ID: A6
Lims ID: Std L5
Client ID:
Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

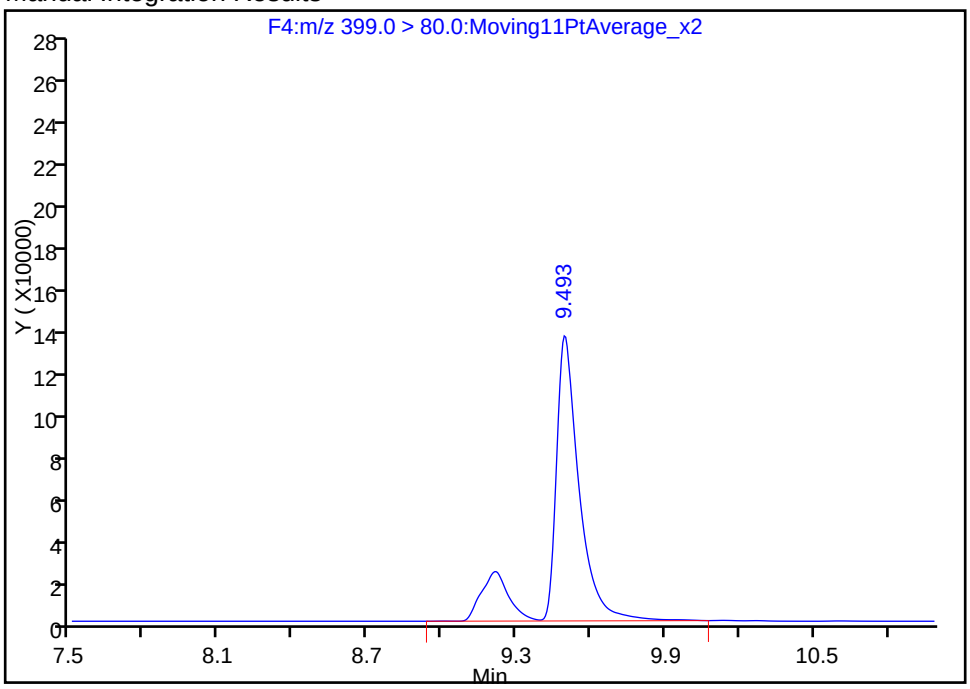
Processing Integration Results

RT: 9.49
Area: 851972
Amount: 43.706431
Amount Units: ng/ml



Manual Integration Results

RT: 9.49
Area: 1021016
Amount: 42.663737
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:03:39
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

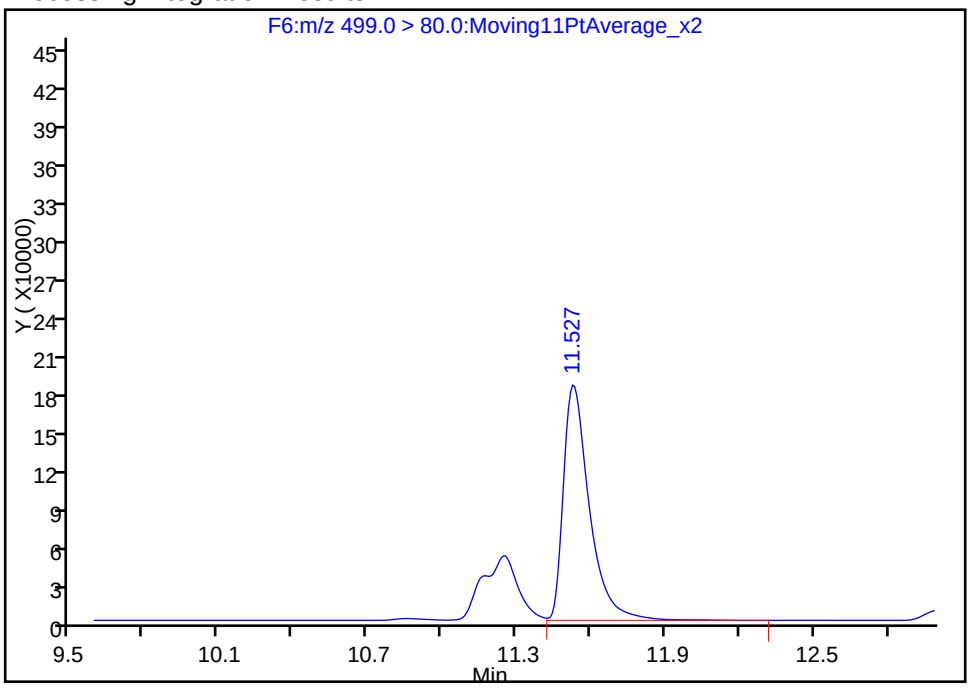
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_008.d
Injection Date: 03-Jun-2016 18:57:54 Instrument ID: A6
Lims ID: Std L5
Client ID:
Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 8
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

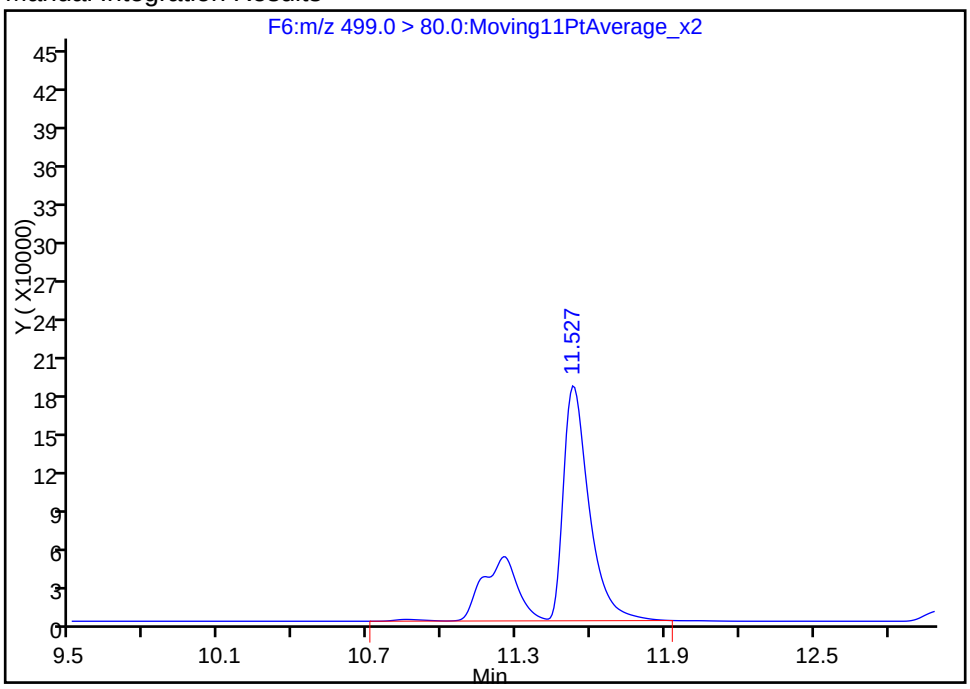
Processing Integration Results

RT: 11.53
Area: 1341245
Amount: 36.356103
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 1824798
Amount: 41.978944
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:03:39
Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_009.d
Lims ID: Std L6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 03-Jun-2016 19:19:10 ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L6
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A6*sub11

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 06-Jun-2016 11:40:51 Calib Date: 03-Jun-2016 19:40:28
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:04:20

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.785	5.784	0.001		1201075	44.7		89.3	21789	
2 Perfluorobutyric acid										
212.9 > 169.0	5.785	5.786	-0.001	1.000	6470507	217.3		109	7976	
D 3 13C5-PFPeA										
267.9 > 223.0	6.941	6.939	0.002		2771254	44.3		88.6	3984	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.941	6.941	0.0	1.000	10622898	199.8		99.9	1394	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.071	7.069	0.002	1.000	5732872	184.4		104		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.071	7.069	0.002	1.000	5732872	NC			10986	
298.9 > 99.0	7.067	7.069	-0.002	0.999	2740506		2.09(0.00-0.00)		1158	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.219	8.216	0.003	1.000	11249940	213.6		107	710	
D 6 13C2 PFHxA										
315.0 > 270.0	8.219	8.217	0.002		2872247	43.4		86.8	30176	
D 8 13C4-PFHpA										
367.0 > 322.0	9.458	9.456	0.002		2810580	38.7		77.4	11297	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.458	9.457	0.001	1.000	11478334	218.9		109	20750	
D 11 18O2 PFHxS										
403.0 > 84.0	9.493	9.492	0.001		1342070	42.7		90.2	21521	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.493	9.495	-0.002	1.000	3987643	184.2		101		M
10 Perfluorohexane Sulfonate										M
399.0 > 80.0	9.495	9.495	0.0	1.000	0	NC			42.6	M

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.568	10.569	-0.001		2902241	36.1		72.3	7774	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.568	10.572	-0.004	1.000	10462425	217.9		109	1932	
413.0 > 169.0	10.568	10.572	-0.004	1.000	3871236		2.70(0.00-0.00)	109	3117	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.577	10.581	-0.004	1.000	3999590	NC			2716	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.577	10.581	-0.004	1.000	3999590	185.7		97.5		
D 16 13C4 PFOS										
503.0 > 80.0	11.527	11.525	0.002		1584944	41.3		86.4	110036	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.527	11.527	0.0	1.000	7201323	194.0		105	339	M
499.0 > 99.0	11.527	11.527	0.0	1.000	3379388		2.13(0.00-0.00)	105	3355	M
D 17 13C5 PFNA										
468.0 > 423.0	11.544	11.542	0.002		2782565	39.2		78.5	8026	
18 Perfluorononanoic acid										
463.0 > 419.0	11.544	11.543	0.001	1.000	8174809	211.9		106	4759	
D 19 13C2 PFDA										
515.0 > 470.0	12.373	12.373	0.0		2306152	40.2		80.4	18451	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.373	12.373	0.0	1.000	10082852	198.2		99.1	6520	
D 23 13C8 FOSA										
506.0 > 78.0	12.984	12.985	-0.001		4446696	39.1		78.2	3746	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.984	12.987	-0.003	1.000	12225896	209.5		105	1343	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.032	13.033	-0.001	1.000	4242771	182.9		94.9		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.032	13.033	-0.001	1.000	4242771	NC			20902	
D 26 13C2 PFUnA										
565.0 > 520.0	13.076	13.076	0.0		3025738	37.3		74.6	7565	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.076	13.077	-0.001	1.000	10665638	214.7		107	9276	
D 28 13C2 PFDoA										
615.0 > 570.0	13.666	13.663	0.003		3882040	38.5		77.0	16859	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.666	13.666	0.0	1.000	11685203	236.1		118	6010	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.167	14.165	0.002	1.000	14241779	198.4		99.2	3142	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.589	14.589	0.0		3530381	44.2		88.4	6817	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.589	14.589	0.0	1.000	11956911	202.1		101	2654	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.179	15.177	0.002		5622192	43.1		86.3	4926	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.179	15.177	0.002	1.000	20068210	220.5		110	3098	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.436	15.437	-0.001	1.000	21825371	231.0		116	3578	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L6_00018 Amount Added: 1.00 Units: mL

Report Date: 06-Jun-2016 11:40:52 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_009.d

Injection Date: 03-Jun-2016 19:19:10 Instrument ID: A6

Lims ID: Std L6

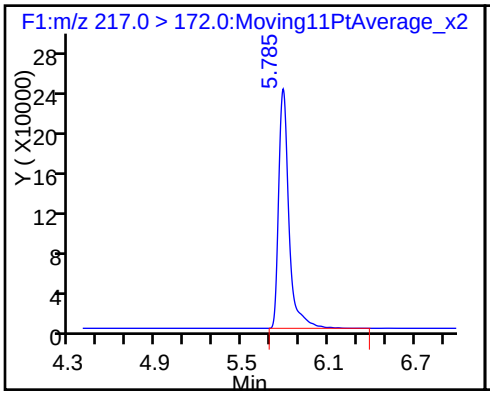
Client ID:

Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 9

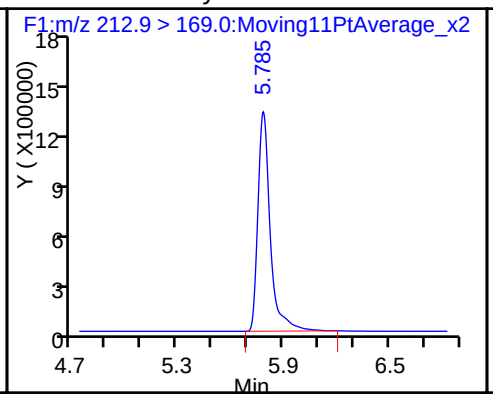
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

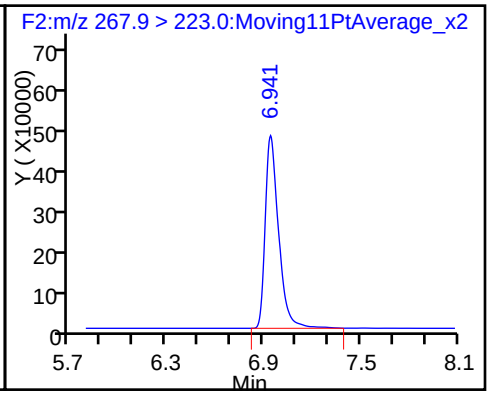
D 1 13C4 PFBA



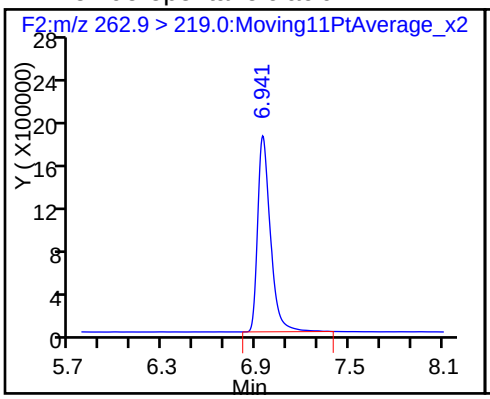
2 Perfluorobutyric acid



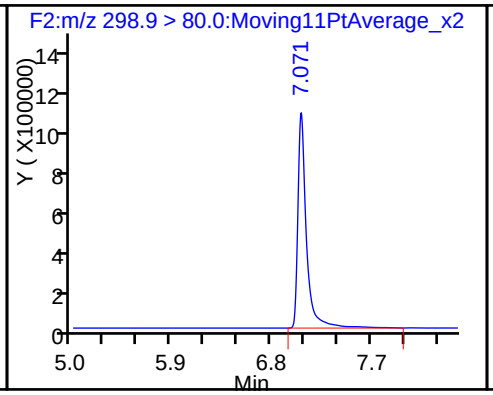
D 3 13C5-PFPeA



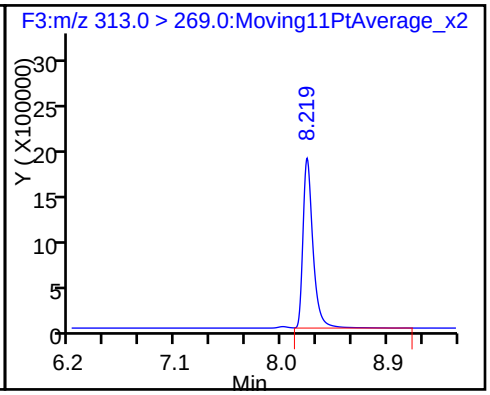
4 Perfluoropentanoic acid



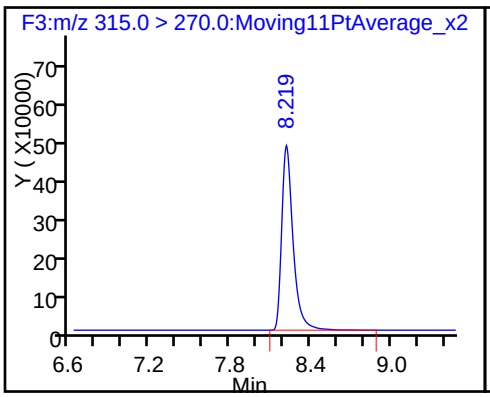
40 Perfluorobutanesulfonic acid



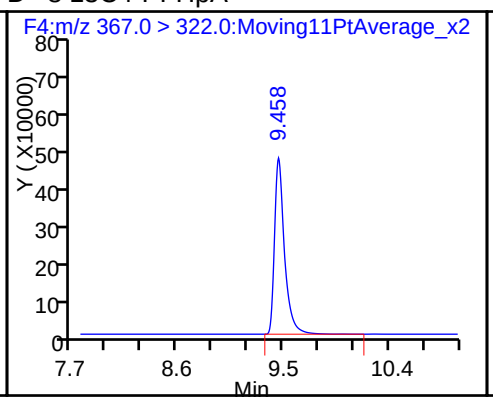
7 Perfluorohexanoic acid



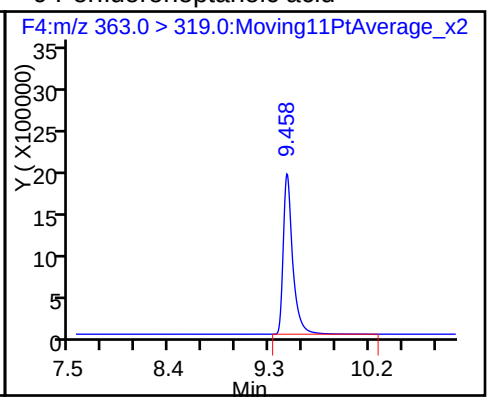
D 6 13C2 PFHxA



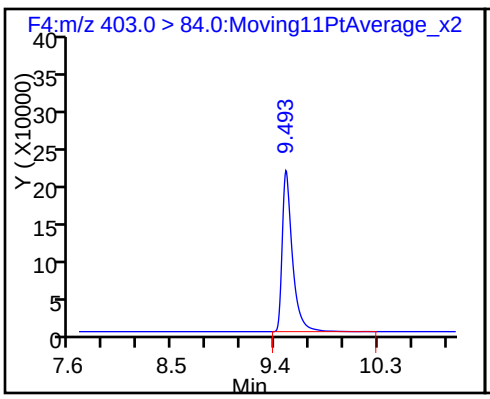
D 8 13C4-PFHpA



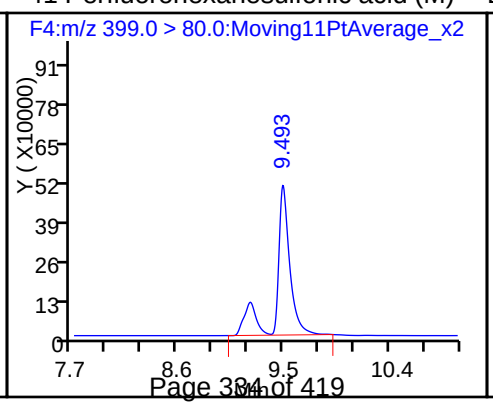
9 Perfluoroheptanoic acid



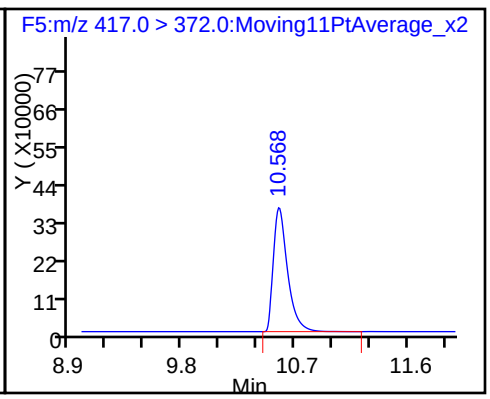
D 11 18O2 PFHxS



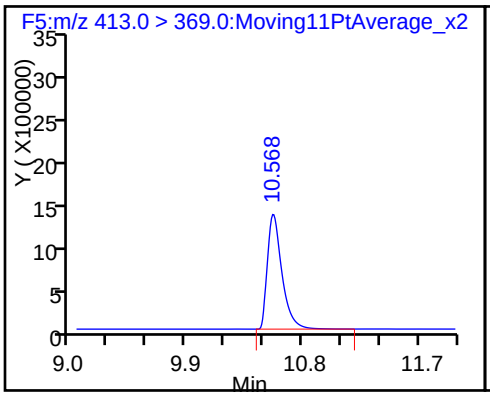
41 Perfluorohexanesulfonic acid (M)



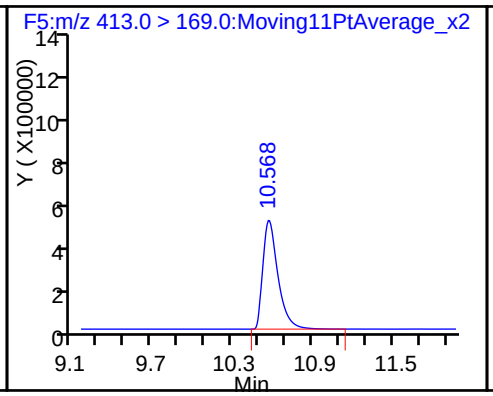
D 12 13C4 PFOA



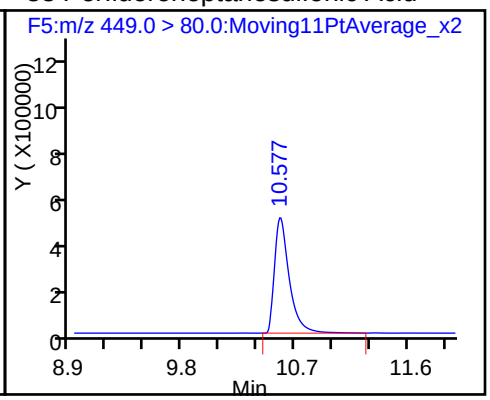
13 Perfluorooctanoic acid



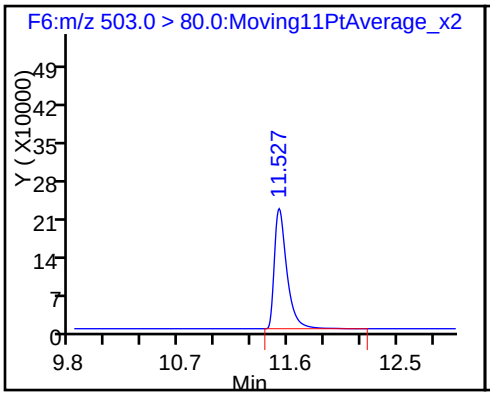
13 Perfluorooctanoic acid



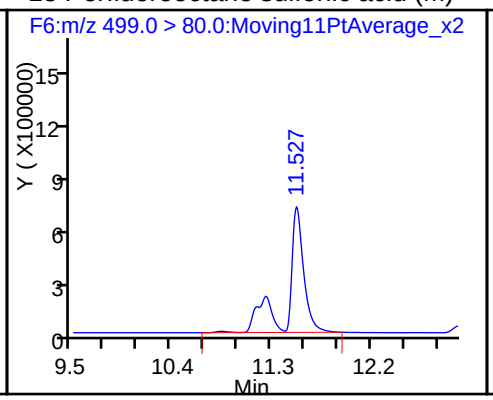
38 Perfluoroheptanesulfonic Acid



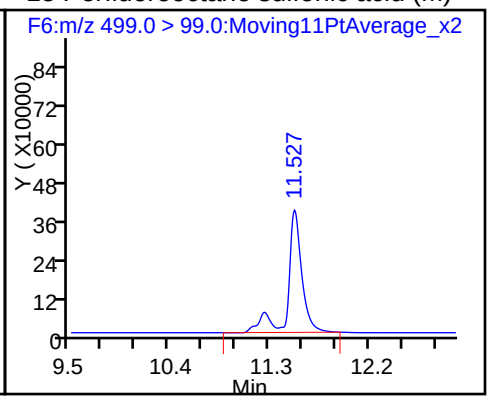
D 16 13C4 PFOS



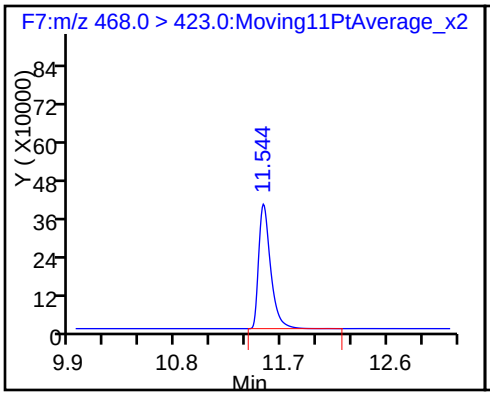
15 Perfluorooctane sulfonic acid (M)



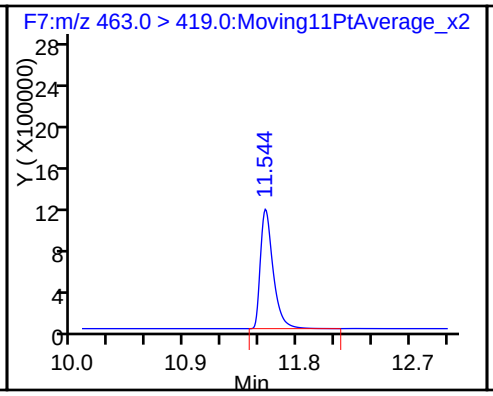
15 Perfluorooctane sulfonic acid (M)



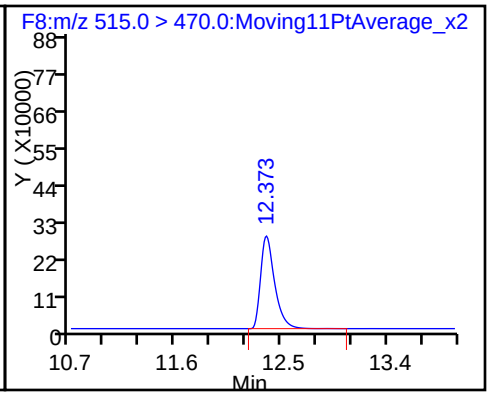
D 17 13C5 PFNA



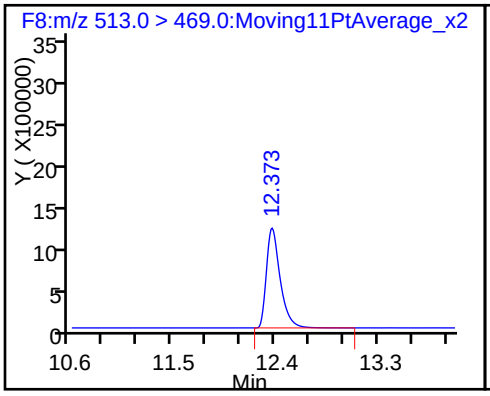
18 Perfluorononanoic acid



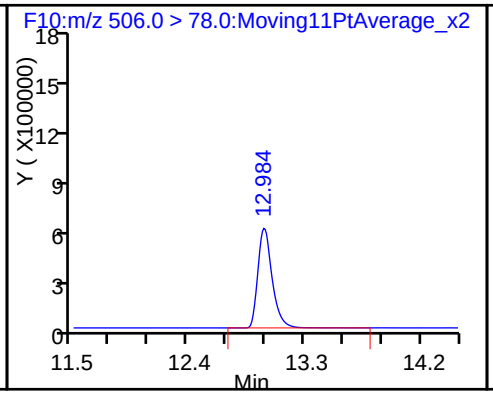
D 19 13C2 PFDA



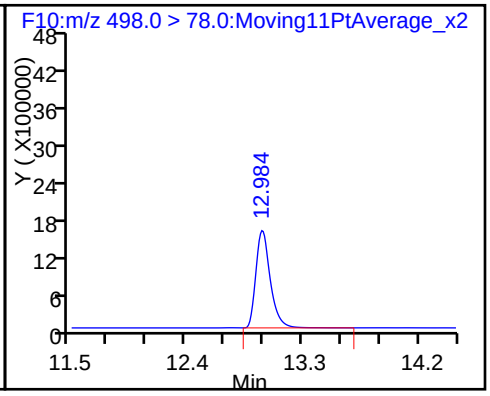
20 Perfluorodecanoic acid



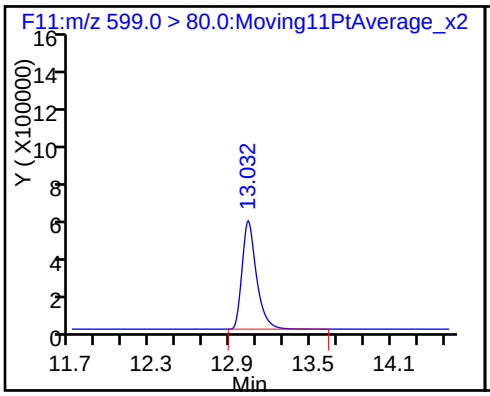
D 23 13C8 FOSA



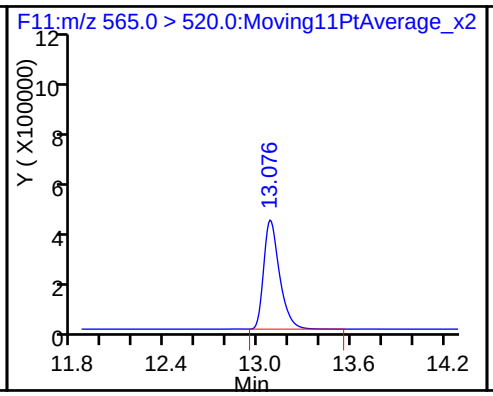
24 Perfluorooctane Sulfonamide



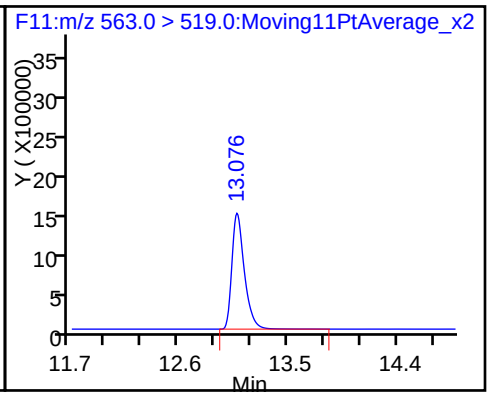
39 Perfluorodecane Sulfonic acid



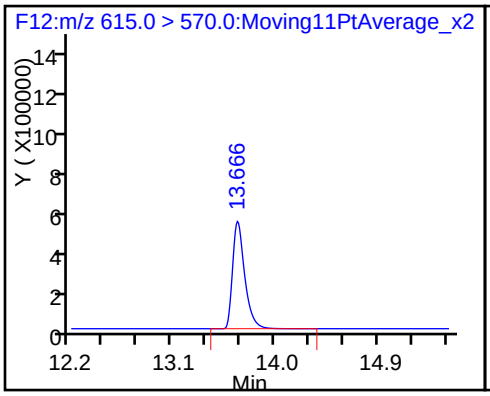
D 26 13C2 PFUnA



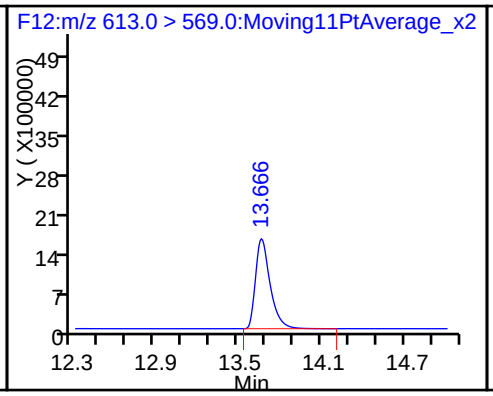
27 Perfluoroundecanoic acid



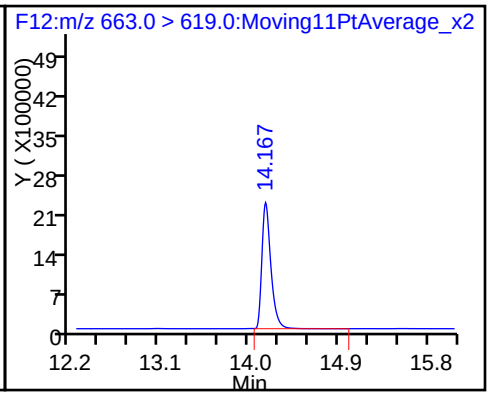
D 28 13C2 PFDoA



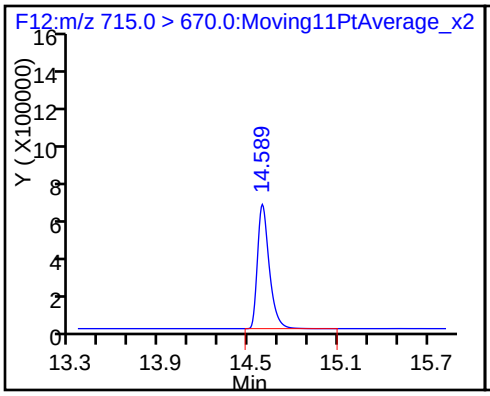
29 Perfluorododecanoic acid



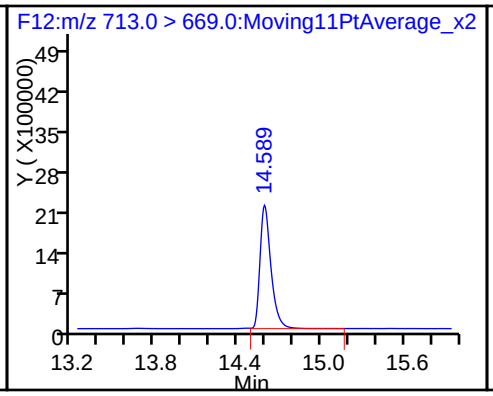
30 Perfluorotridecanoic acid



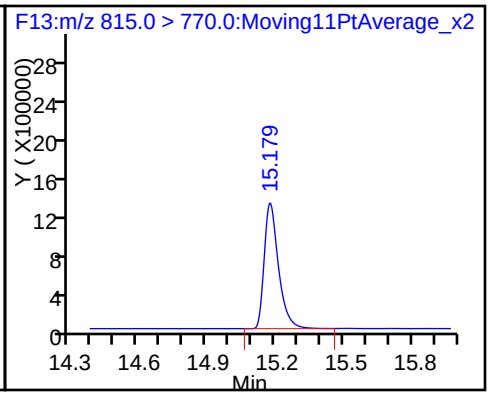
D 33 13C2-PFTeDA



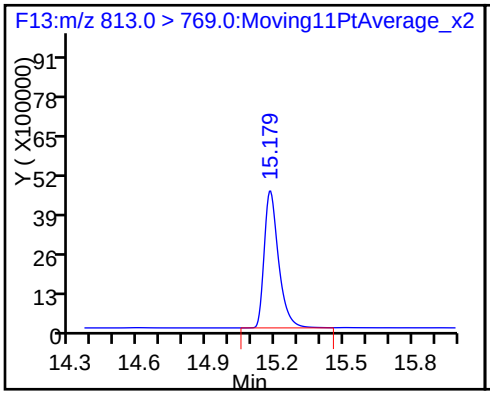
32 Perfluorotetradecanoic acid



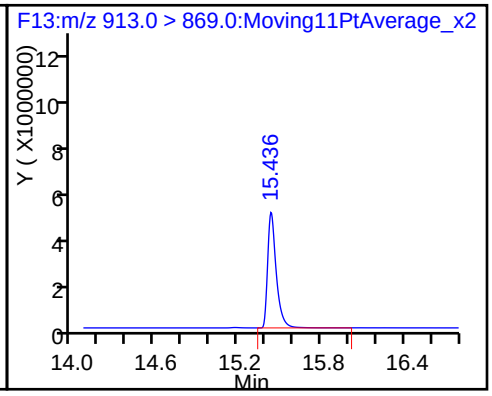
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

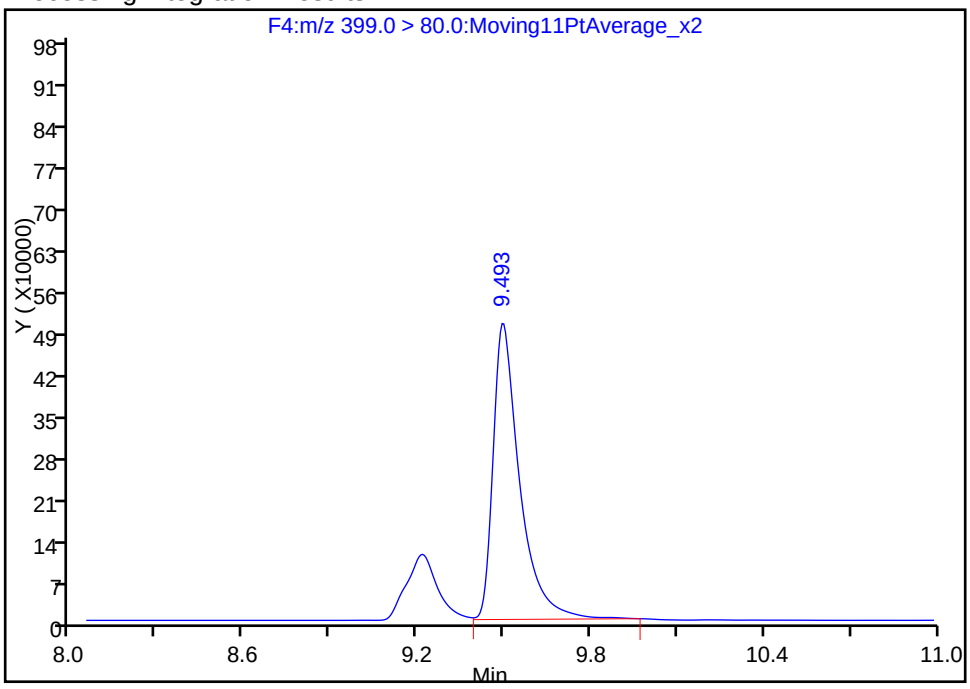
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_009.d
Injection Date: 03-Jun-2016 19:19:10 Instrument ID: A6
Lims ID: Std L6
Client ID:
Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

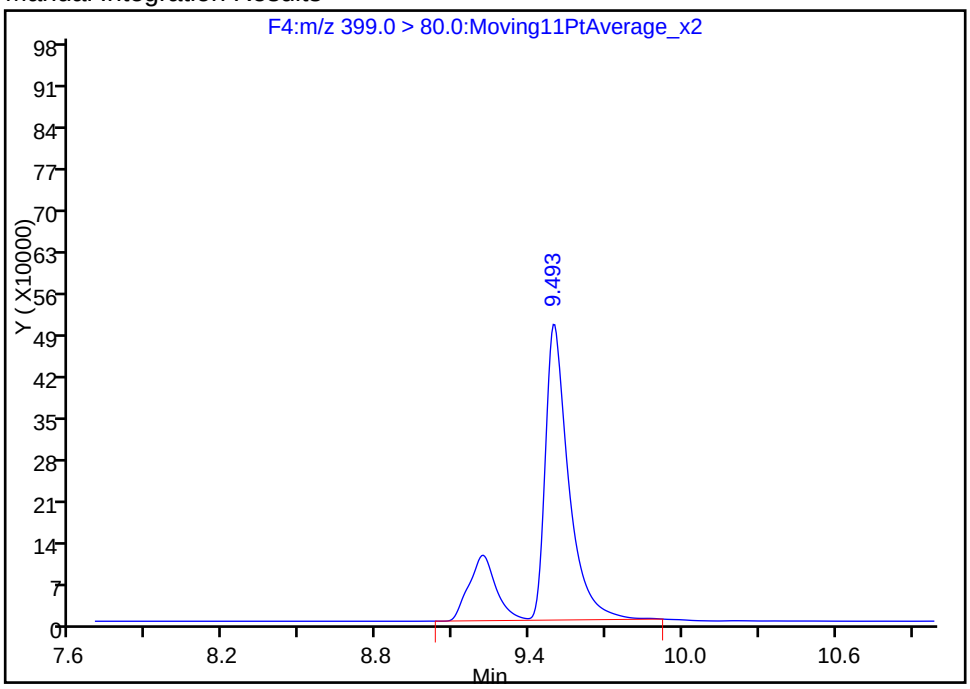
Processing Integration Results

RT: 9.49
Area: 3195031
Amount: 175.3317
Amount Units: ng/ml



Manual Integration Results

RT: 9.49
Area: 3987643
Amount: 184.1992
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:04:20
Audit Action: Assigned Compound ID Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_009.d
Injection Date: 03-Jun-2016 19:19:10 Instrument ID: A6
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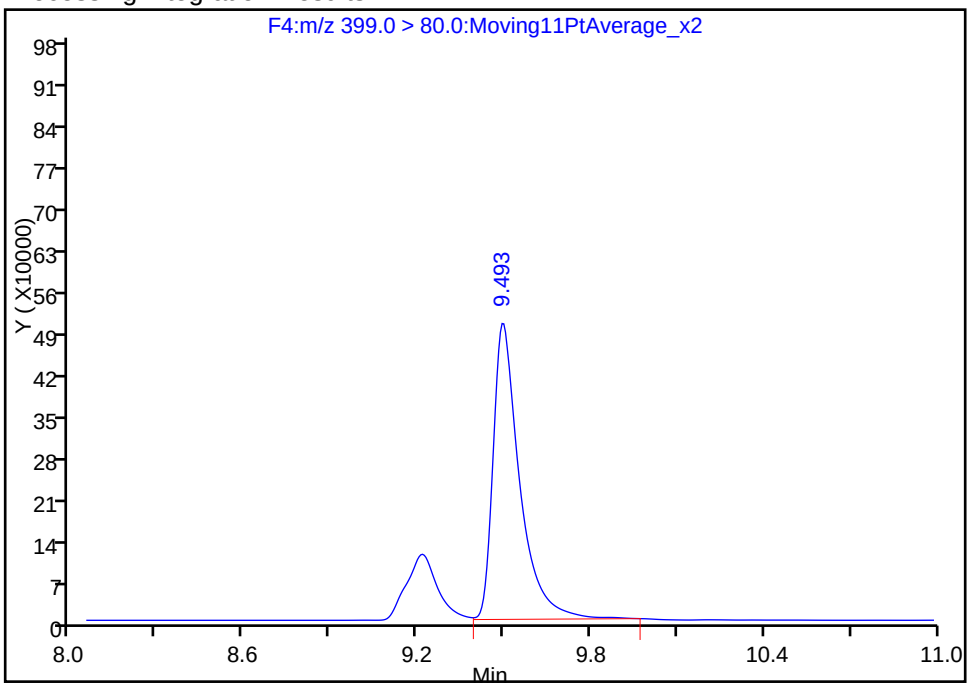
41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

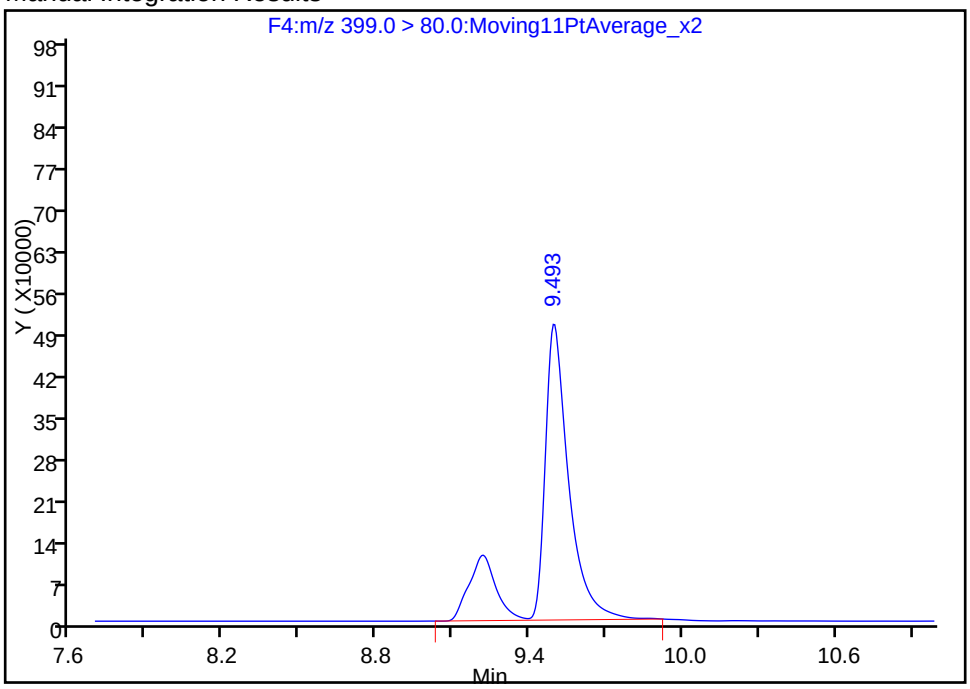
Processing Integration Results

RT: 9.49
Area: 3195031
Amount: 175.3317
Amount Units: ng/ml



Manual Integration Results

RT: 9.49
Area: 3987643
Amount: 184.1992
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:04:20
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

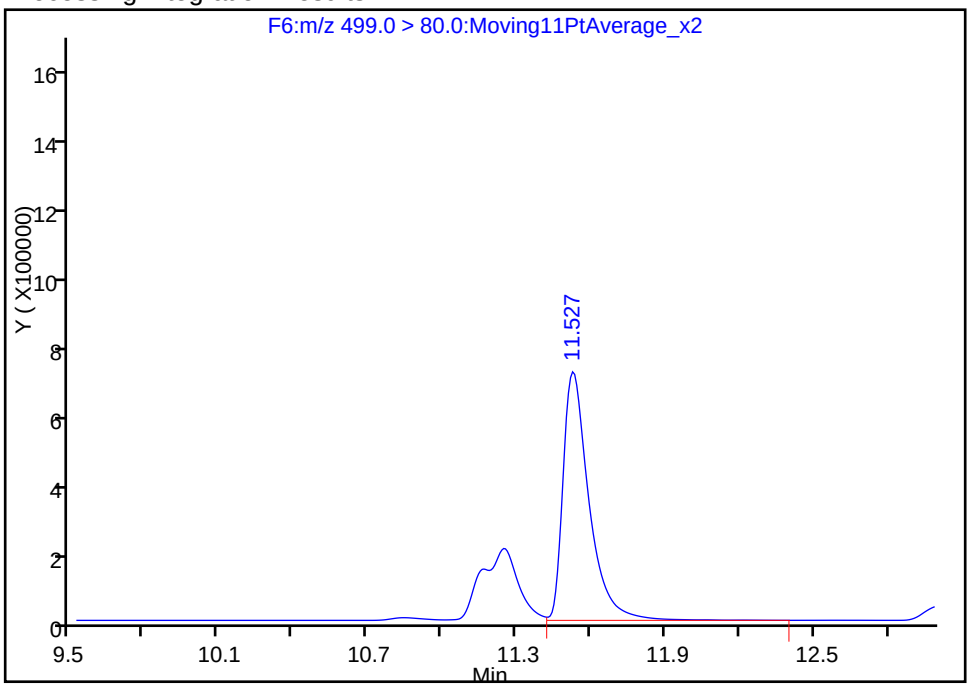
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_009.d
Injection Date: 03-Jun-2016 19:19:10 Instrument ID: A6
Lims ID: Std L6
Client ID:
Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

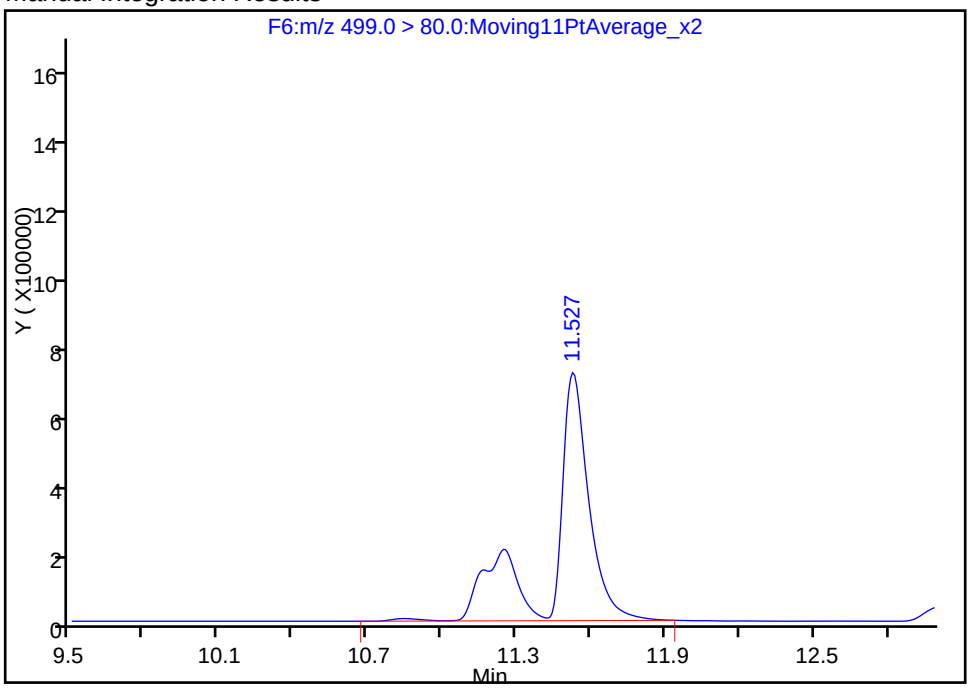
Processing Integration Results

RT: 11.53
Area: 5167653
Amount: 156.6452
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 7201323
Amount: 193.9831
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:04:20
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

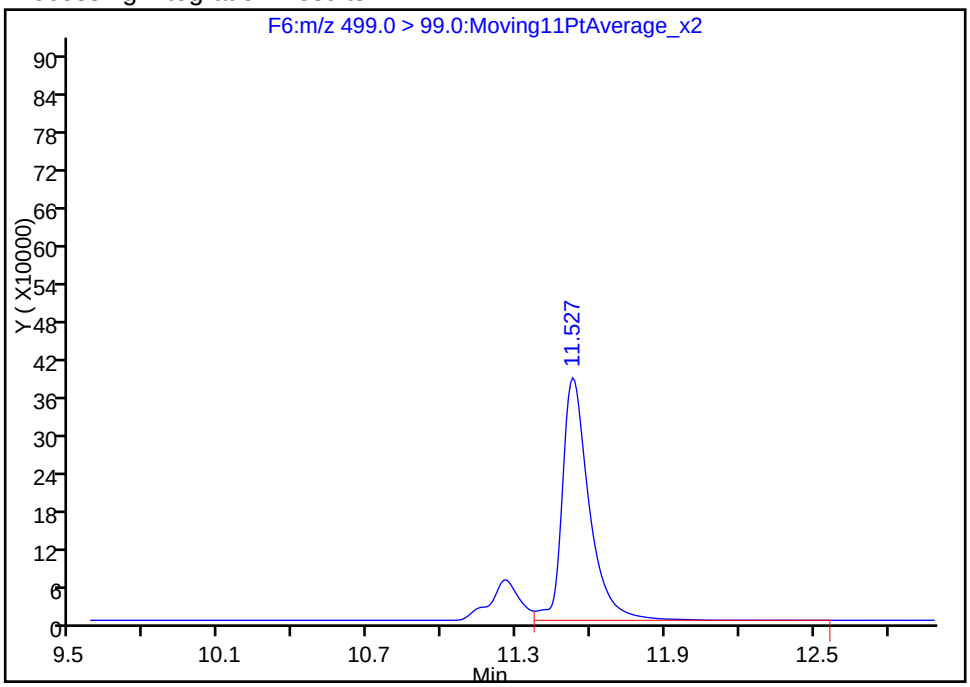
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_009.d
Injection Date: 03-Jun-2016 19:19:10 Instrument ID: A6
Lims ID: Std L6
Client ID:
Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 9
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

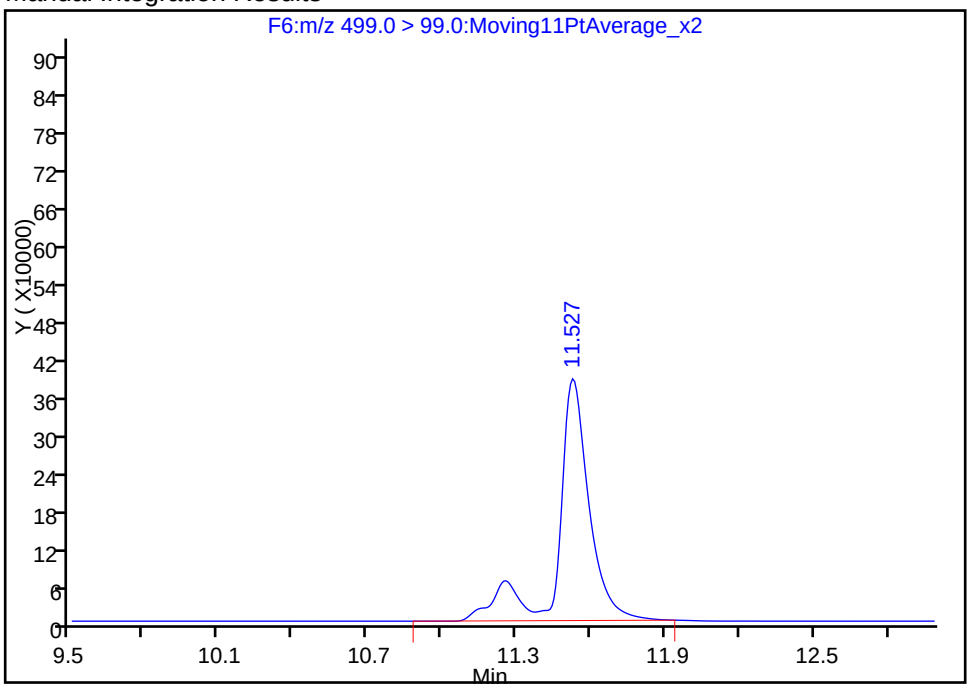
Processing Integration Results

RT: 11.53
Area: 2915477
Amount: 156.6452
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 3379388
Amount: 193.9831
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:04:20
Audit Action: Manually Integrated Audit Reason: Isomers

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d
Lims ID: Std L7
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 03-Jun-2016 19:40:28 ALS Bottle#: 7 Worklist Smp#: 10
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L7
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A6*sub11

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 06-Jun-2016 11:40:53 Calib Date: 03-Jun-2016 19:40:28
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:05:41

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.785	5.784	0.001		1012126	37.6		75.3	1998	
2 Perfluorobutyric acid										
212.9 > 169.0	5.788	5.786	0.002	1.000	12153239	484.4		121	3707	
D 3 13C5-PFPeA										
267.9 > 223.0	6.937	6.939	-0.002		2207013	35.3		70.6	30546	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.941	6.941	0.0	1.000	19004619	448.8		112	2518	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.067	7.069	-0.002	1.000	10194180	435.3		123		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.067	7.069	-0.002	1.000	10194180	NC			22968	
298.9 > 99.0	7.067	7.069	-0.002	1.000	5110083		1.99(0.00-0.00)		3140	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.219	8.216	0.003	1.000	21900721	495.8		124	1946	
D 6 13C2 PFHxA										
315.0 > 270.0	8.219	8.217	0.002		2408590	36.4		72.8	11875	
D 8 13C4-PFHpA										
367.0 > 322.0	9.458	9.456	0.002		2243855	30.9		61.8	31108	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.458	9.457	0.001	1.000	20711312	494.9		124	23490	
D 11 18O2 PFHxS										
403.0 > 84.0	9.493	9.492	0.001		1008805	32.1		67.8	8890	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.499	9.495	0.004	1.000	7646391	469.9		129		M
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.499	9.495	0.004	1.000	5994890	NC			1445	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.568	10.569	-0.001		2388152	29.7		59.5	21304	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.577	10.572	0.005	1.000	18226991	461.4		115	8380	
413.0 > 169.0	10.568	10.572	-0.004	0.999	7045067		2.59(0.00-0.00)	115	4120	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.586	10.581	0.005	1.000	7080563	NC			6877	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.586	10.581	0.005	1.000	7080563	413.8		109		
D 16 13C4 PFOS										
503.0 > 80.0	11.527	11.525	0.002		1258865	32.8		68.6	14166	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.527	11.527	0.0	1.000	13086316	443.8		120	273	M
499.0 > 99.0	11.527	11.527	0.0	1.000	5993191		2.18(0.00-0.00)	120	2004	M
D 17 13C5 PFNA										
468.0 > 423.0	11.545	11.542	0.003		2235984	31.5		63.1	10416	
18 Perfluorononanoic acid										
463.0 > 419.0	11.545	11.543	0.002	1.000	14282710	460.8		115	5574	
21 PFNS (Perflouro-1-nonanesulfonate)										
549.0 > 80.0	11.962	11.962	0.0	1.000	1500	NC			4.2	
D 19 13C2 PFDA										
515.0 > 470.0	12.373	12.373	0.0		1778811	31.0		62.0	10121	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.373	12.373	0.0	1.000	17999747	458.8		115	6339	
D 23 13C8 FOSA										
506.0 > 78.0	12.984	12.985	-0.001		3759095	33.1		66.1	2460	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.984	12.987	-0.003	1.000	24069881	488.0		122	1654	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.031	13.033	-0.002	1.000	6818278	369.8		95.9		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.031	13.033	-0.002	1.000	6818278	NC			4829	
D 26 13C2 PFUnA										
565.0 > 520.0	13.075	13.076	-0.001		2472427	30.5		61.0	28511	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.075	13.077	-0.002	1.000	18646354	460.0		115	5840	
D 28 13C2 PFDoA										
615.0 > 570.0	13.664	13.663	0.001		3229930	32.0		64.0	8840	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.664	13.666	-0.002	1.000	20268214	492.2		123	5246	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.165	14.165	0.0	1.000	25656651	429.6		107	3420	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.594	14.589	0.005		2927207	36.7		73.3	4090	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.594	14.589	0.005	1.000	21548508	437.6		109	3388	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.178	15.177	0.001		4937522	37.9		75.8	5814	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.178	15.177	0.001	1.000	37181605	492.7		123	3487	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.439	15.437	0.002	1.000	40595102	516.5		129	4892	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L7_00018 Amount Added: 1.00 Units: mL

Report Date: 06-Jun-2016 11:40:54 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Injection Date: 03-Jun-2016 19:40:28 Instrument ID: A6

Lims ID: Std L7

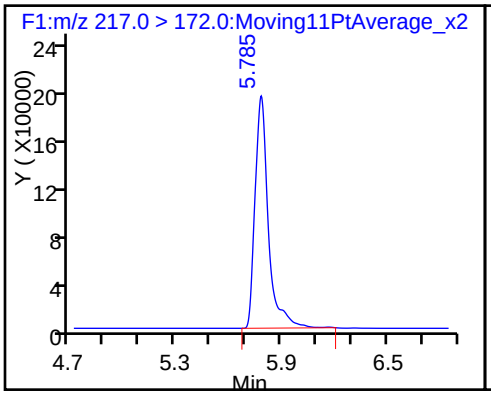
Client ID:

Operator ID: JRB ALS Bottle#: 7 Worklist Smp#: 10

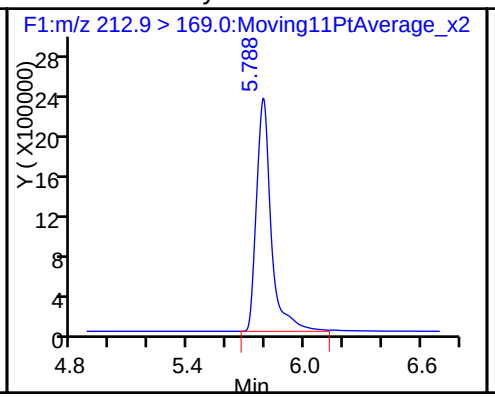
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

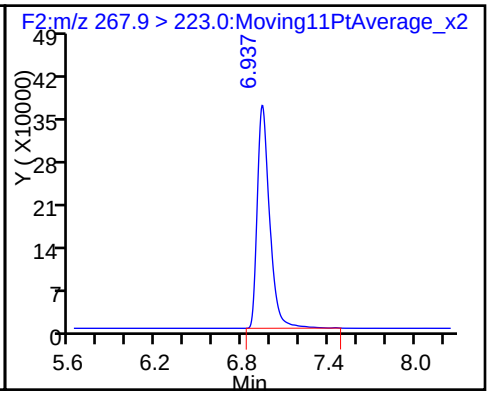
D 1 13C4 PFBA



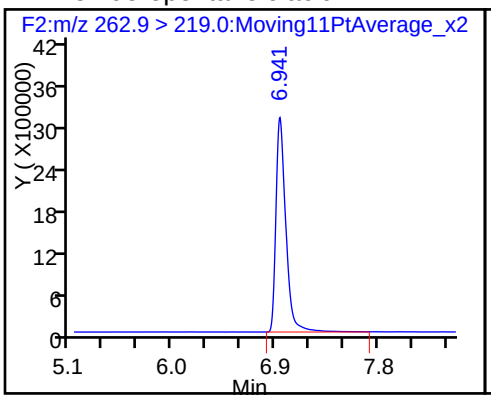
2 Perfluorobutyric acid



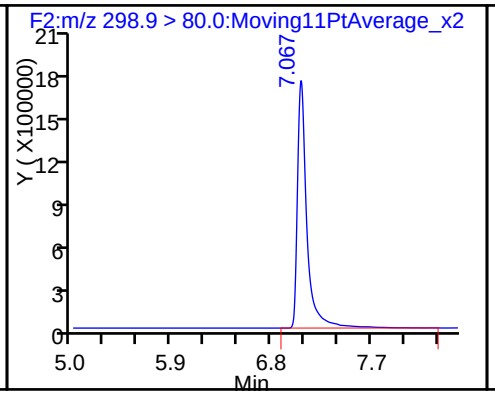
D 3 13C5-PFPeA



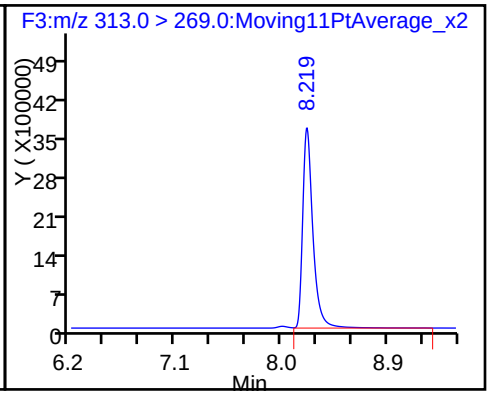
4 Perfluoropentanoic acid



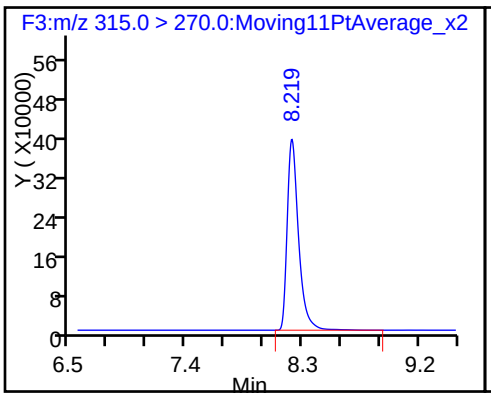
40 Perfluorobutanesulfonic acid



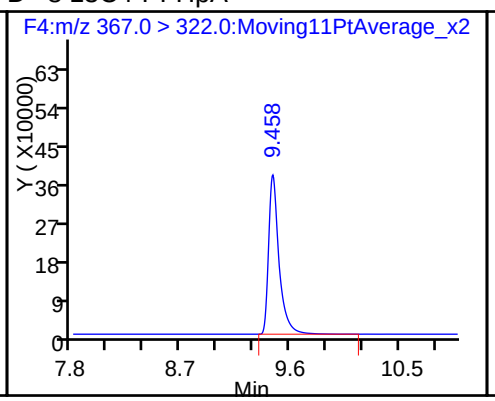
7 Perfluorohexanoic acid



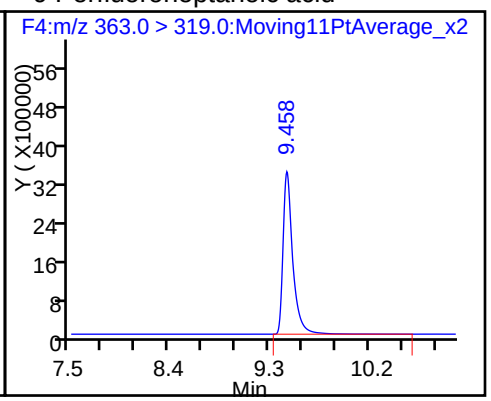
D 6 13C2 PFHxA



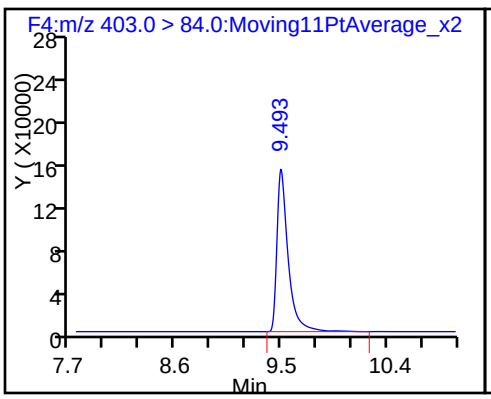
D 8 13C4-PFHpA



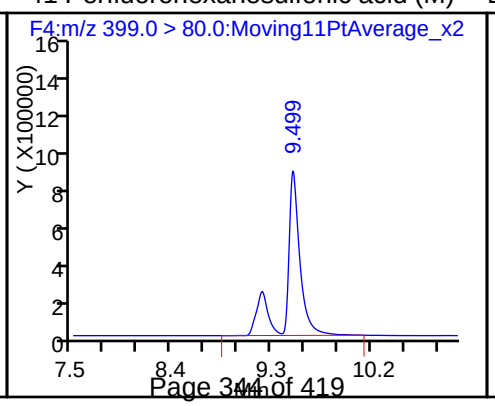
9 Perfluoroheptanoic acid



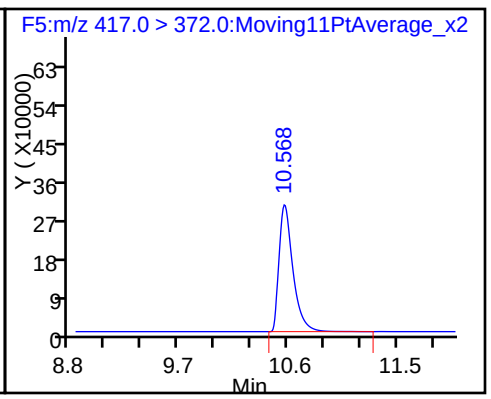
D 11 18O2 PFHxS



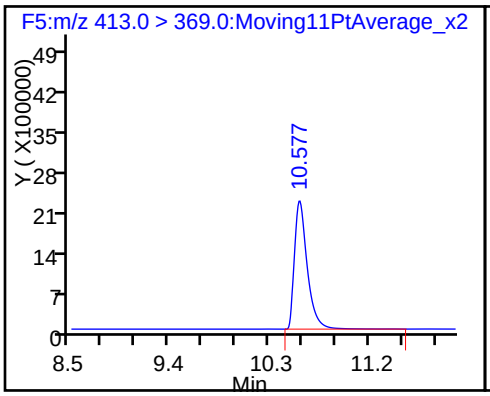
41 Perfluorohexanesulfonic acid (M)



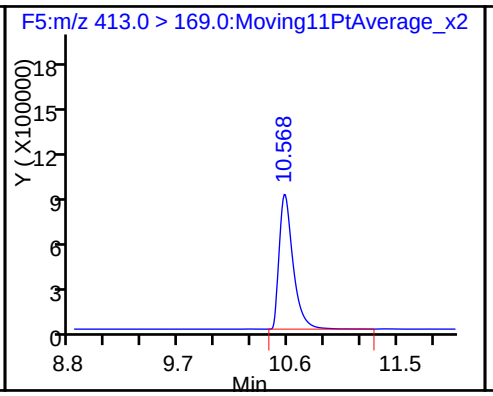
D 12 13C4 PFOA



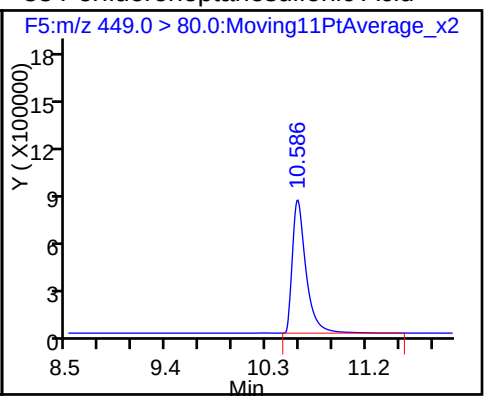
13 Perfluorooctanoic acid



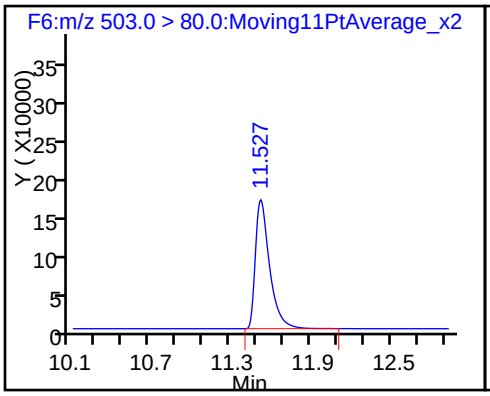
13 Perfluorooctanoic acid



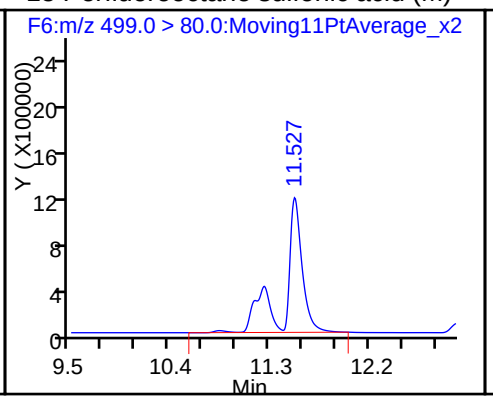
38 Perfluoroheptanesulfonic Acid



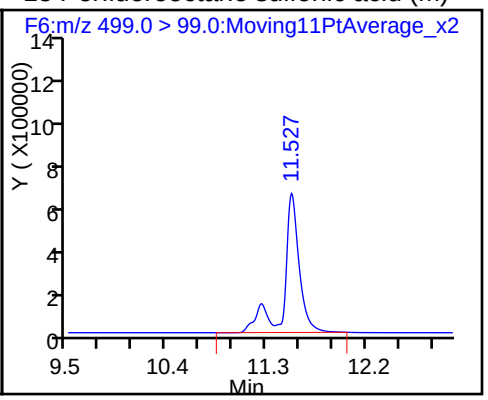
D 16 13C4 PFOS



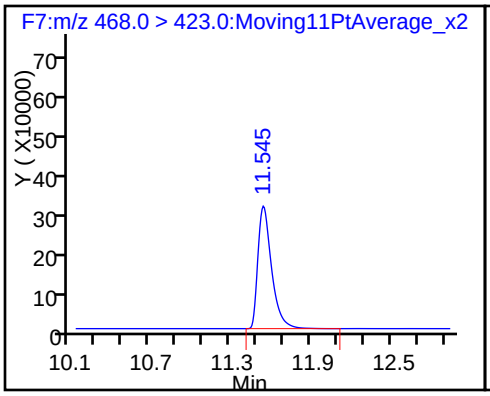
15 Perfluorooctane sulfonic acid (M)



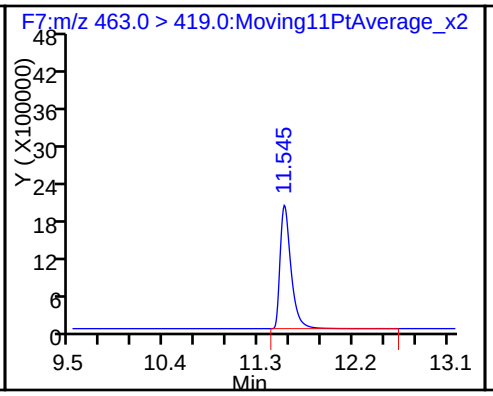
15 Perfluorooctane sulfonic acid (M)



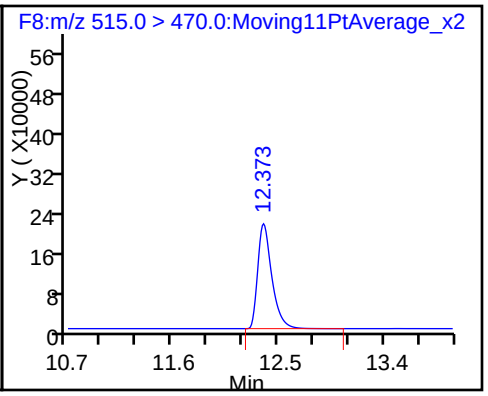
D 17 13C5 PFNA



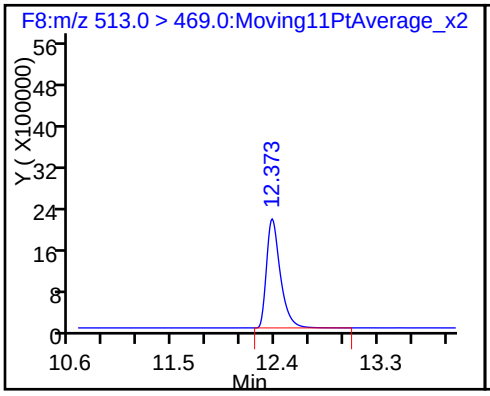
18 Perfluorononanoic acid



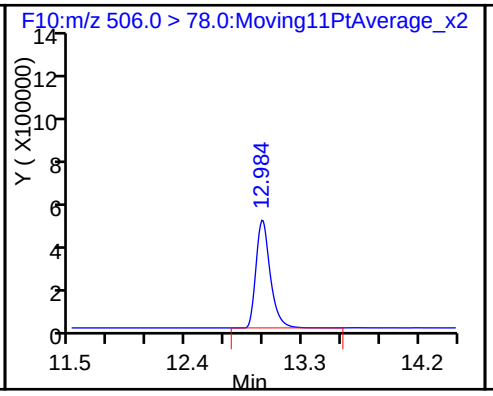
D 19 13C2 PFDA



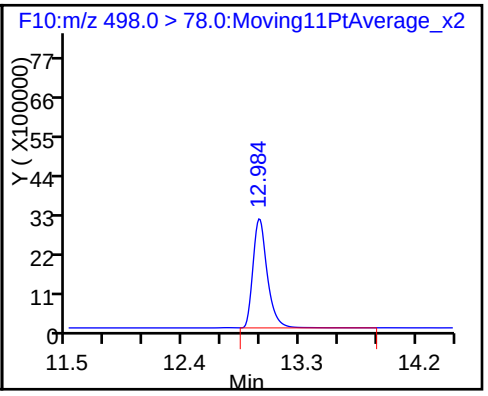
20 Perfluorodecanoic acid



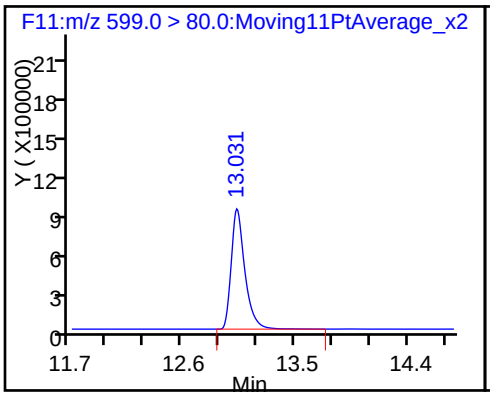
D 23 13C8 FOSA



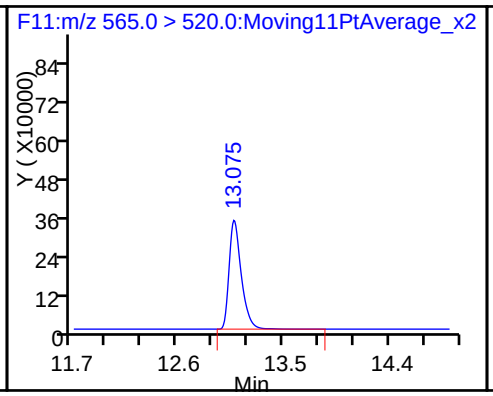
24 Perfluorooctane Sulfonamide



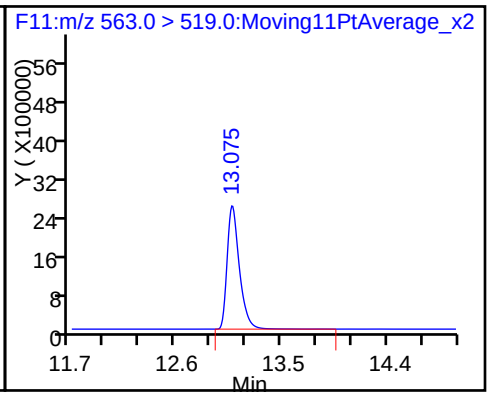
39 Perfluorodecane Sulfonic acid



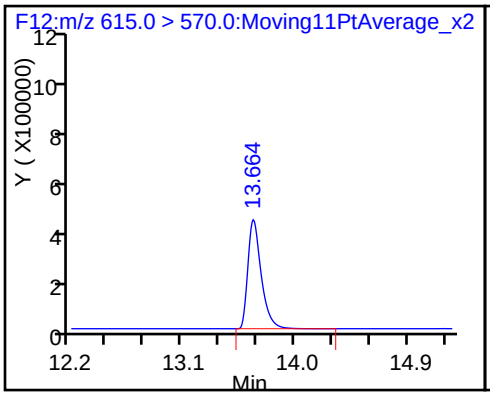
D 26 13C2 PFUnA



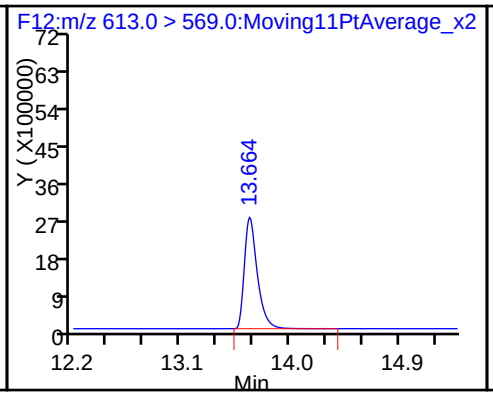
27 Perfluoroundecanoic acid



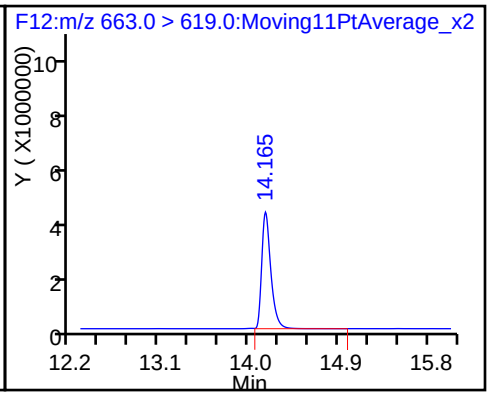
D 28 13C2 PFDoA



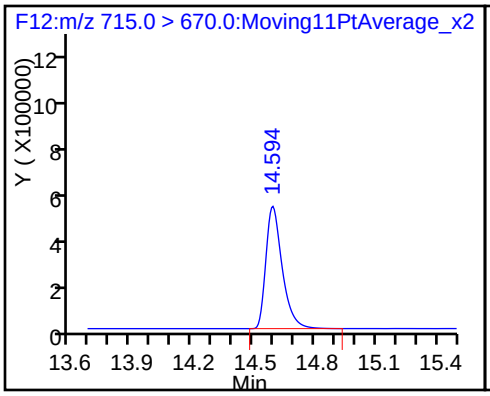
29 Perfluorododecanoic acid



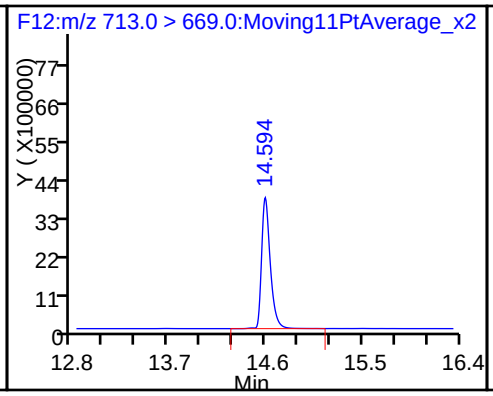
30 Perfluorotridecanoic acid



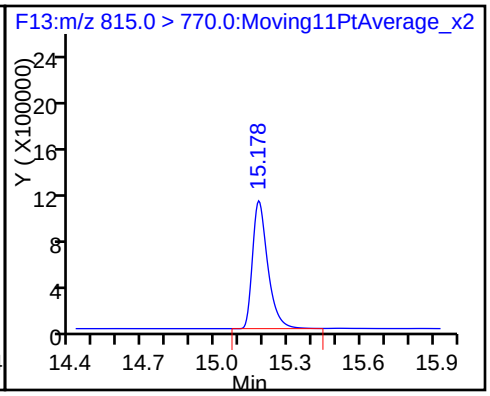
D 33 13C2-PFTeDA



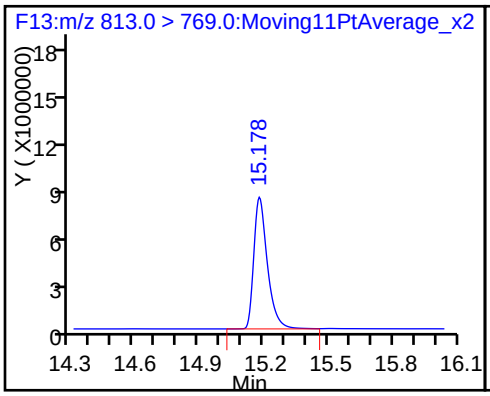
32 Perfluorotetradecanoic acid



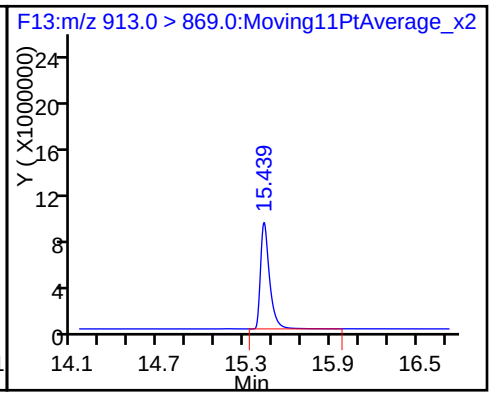
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

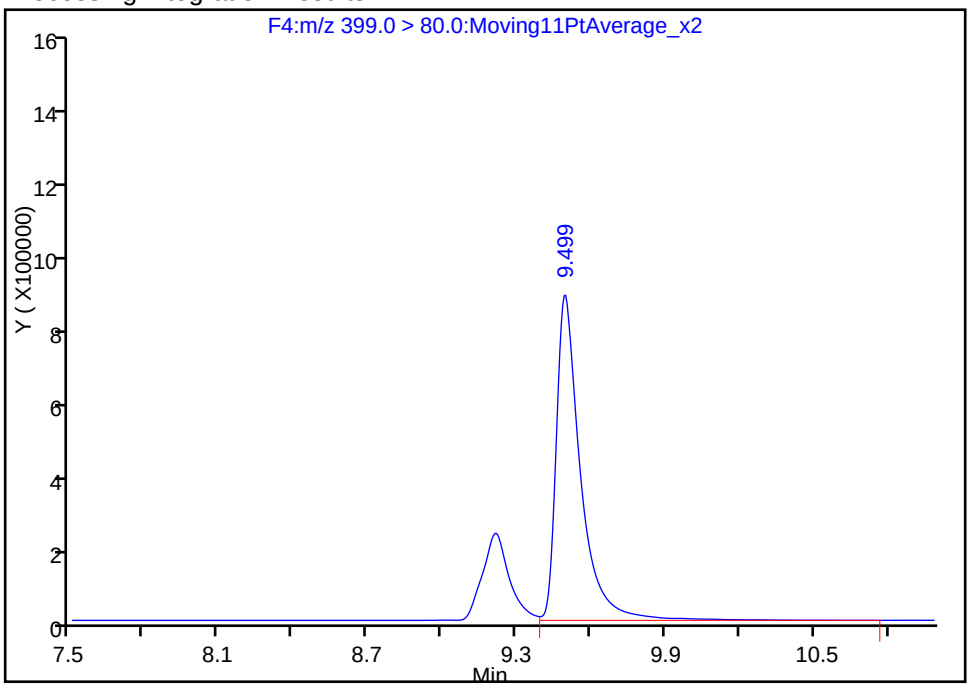
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d
Injection Date: 03-Jun-2016 19:40:28 Instrument ID: A6
Lims ID: Std L7
Client ID:
Operator ID: JRB ALS Bottle#: 7 Worklist Smp#: 10
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

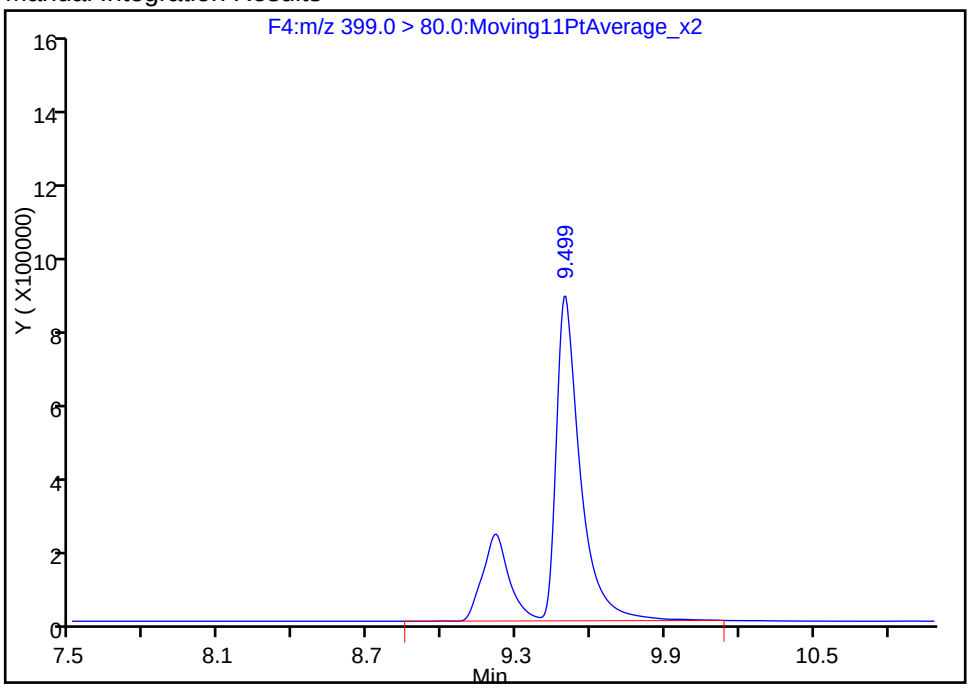
Processing Integration Results

RT: 9.50
Area: 5994890
Amount: 371.6601
Amount Units: ng/ml



Manual Integration Results

RT: 9.50
Area: 7646391
Amount: 469.8897
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:05:41
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

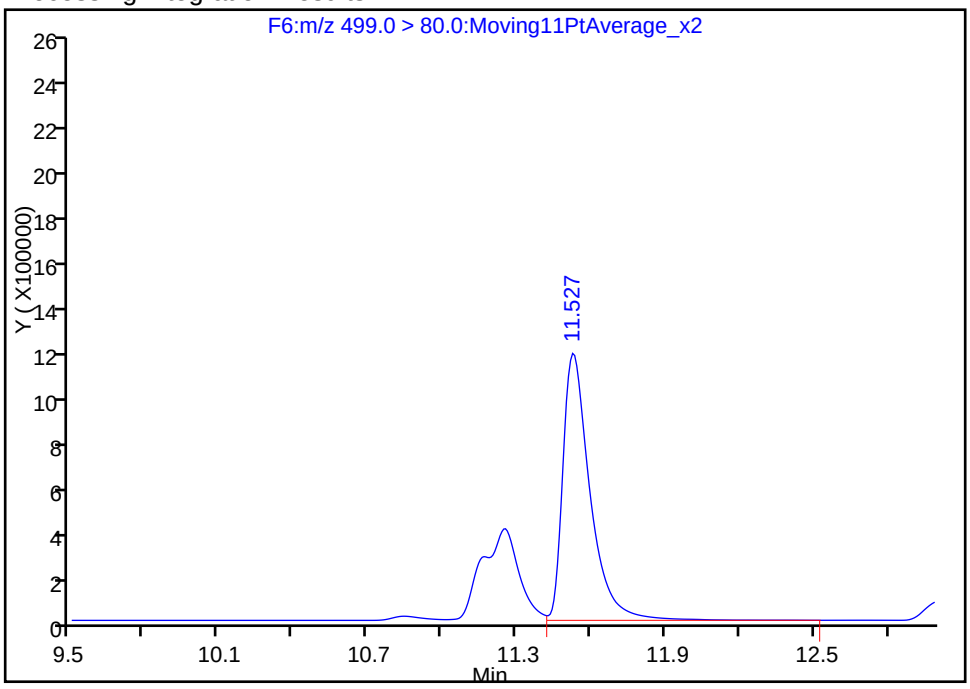
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d
Injection Date: 03-Jun-2016 19:40:28 Instrument ID: A6
Lims ID: Std L7
Client ID:
Operator ID: JRB ALS Bottle#: 7 Worklist Smp#: 10
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

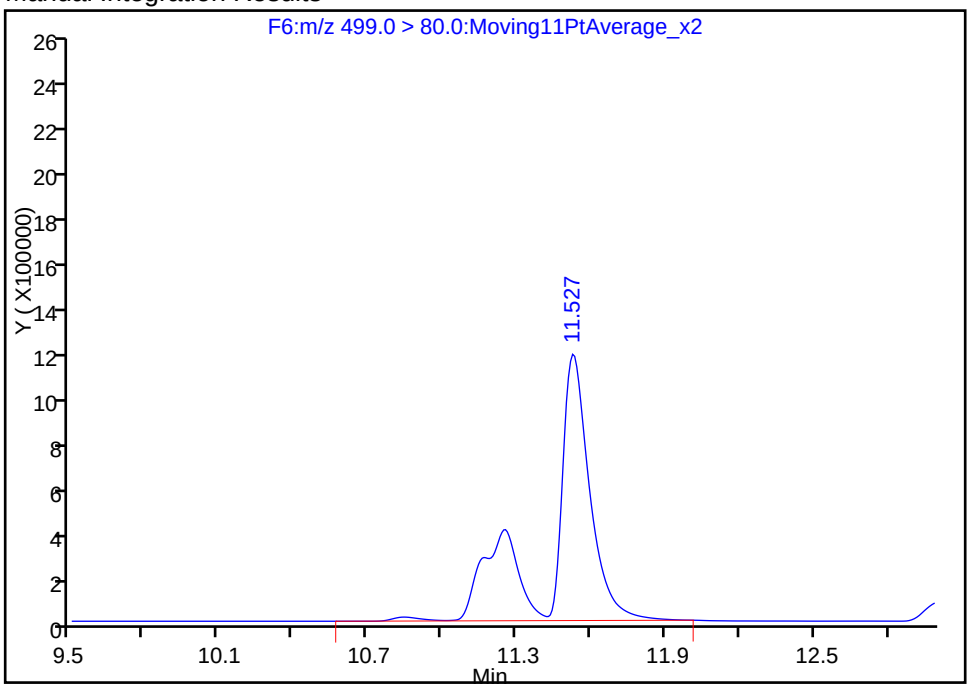
Processing Integration Results

RT: 11.53
Area: 9003998
Amount: 325.6075
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 13086316
Amount: 443.8167
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:05:41
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

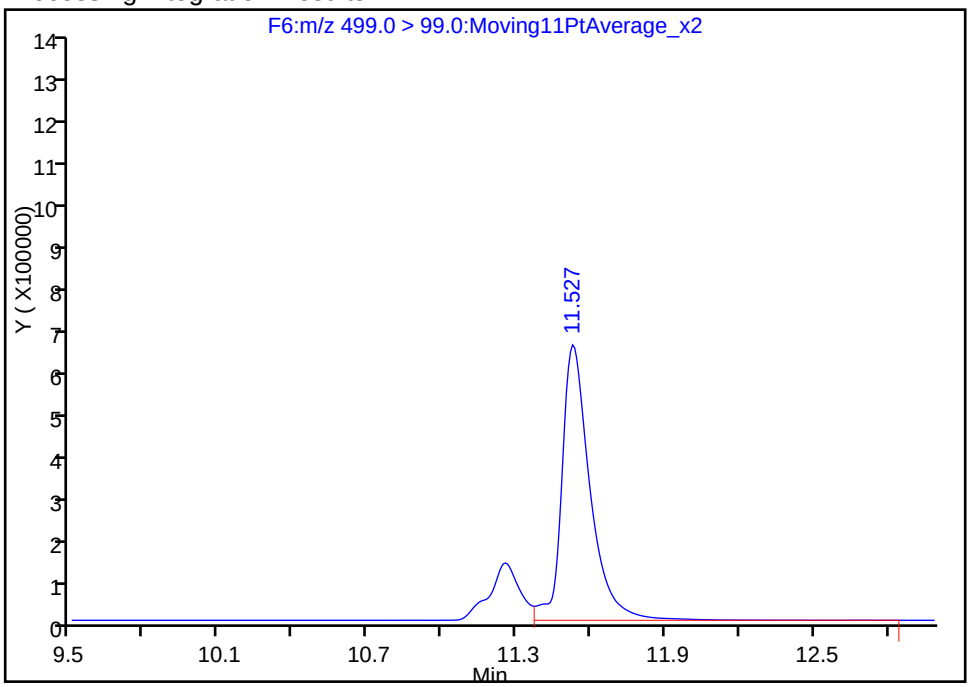
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d
Injection Date: 03-Jun-2016 19:40:28 Instrument ID: A6
Lims ID: Std L7
Client ID:
Operator ID: JRB ALS Bottle#: 7 Worklist Smp#: 10
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

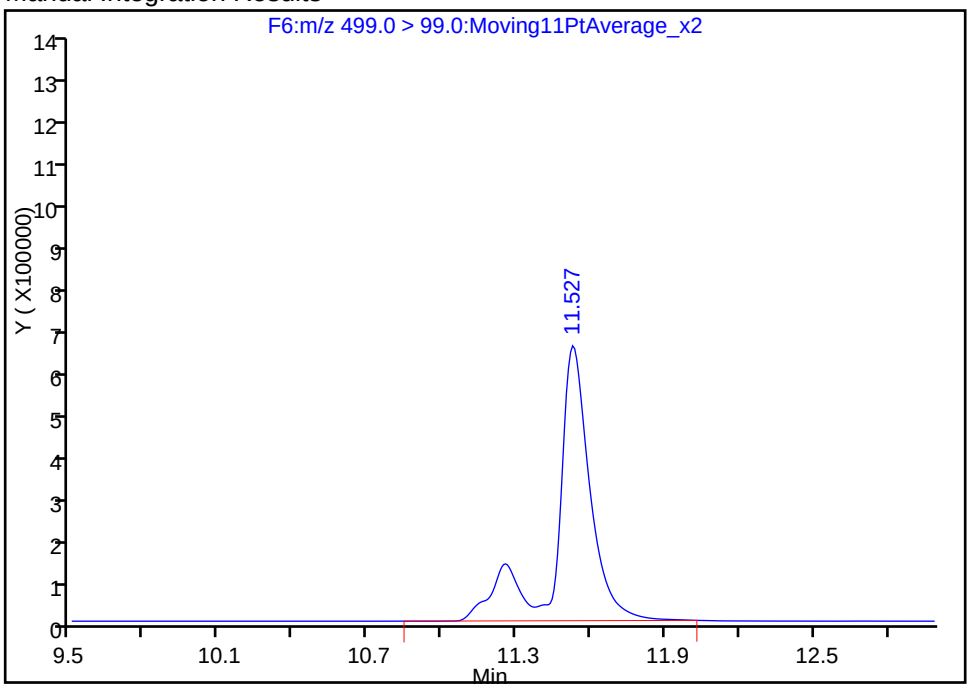
Processing Integration Results

RT: 11.53
Area: 4978260
Amount: 325.6075
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 5993191
Amount: 443.8167
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:05:41
Audit Action: Manually Integrated Audit Reason: Isomers

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Lab Sample ID: ICV 320-112504/12 Calibration Date: 06/03/2016 20:23

Instrument ID: A6 Calib Start Date: 06/03/2016 17:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 06/03/2016 19:40

Lab File ID: 03JUN2016A6A_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.239	1.430		57.7	50.0	15.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9593	1.038		54.1	50.0	8.2	25.0
Perfluorobutanesulfonic acid (PFBS)	L1ID		1.157		47.2	44.3	6.6	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9171	1.020		55.6	50.0	11.2	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9326	1.076		57.7	50.0	15.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.7630	0.8748		54.2	47.3	14.7	25.0
Perfluorooctanoic acid (PFOA)	AveID	0.8017	0.9442		57.1	50.0	17.8	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.120	1.194		50.9	47.8	6.7	25.0
Perfluorononanoic acid (PFNA)	AveID	0.6931	0.7941		57.3	50.0	14.6	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.103	1.300		58.9	50.0	17.9	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.6561	0.6857		52.3	50.0	4.5	25.0
Perfluorodecanesulfonic acid (PFDS)	L2ID		0.8422		58.3	48.3	20.7	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		0.9449		57.2	50.0	14.4	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.6374	0.7532		59.1	50.0	18.2	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9245	1.058		57.2	50.0	14.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.7622	0.8082		53.0	50.0	6.0	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.464		61.5	50.0	23.1	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	1.217	1.485		61.0	50.0	22.0	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_012.d
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 03-Jun-2016 20:23:01 ALS Bottle#: 8 Worklist Smp#: 12
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: ICV ICV
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A4*sub6

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 06-Jun-2016 11:40:56 Calib Date: 03-Jun-2016 19:40:28
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 10:55:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.788	5.784	0.004		1385637	51.5		103	6900	
2 Perfluorobutyric acid										
212.9 > 169.0	5.788	5.786	0.002	1.000	1981137	57.7			12936	
D 3 13C5-PFPeA										
267.9 > 223.0	6.941	6.939	0.002		3155069	50.4		101	7378	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.941	6.941	0.0	1.000	3275580	54.1			553	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.067	7.069	-0.002	1.000	1628284	47.2				
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.067	7.069	-0.002	1.000	1628284	NC			643	
298.9 > 99.0	7.071	7.069	0.002	1.001	793367		2.05(0.00-0.00)		933	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.219	8.216	0.003	1.000	3340334	55.6			4443	
D 6 13C2 PFHxA										
315.0 > 270.0	8.219	8.217	0.002		3276243	49.5		99.0	8006	
D 8 13C4-PFHpA										
367.0 > 322.0	9.458	9.456	0.002		3390207	46.7		93.4	15569	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.458	9.457	0.001	1.000	3649359	57.7			27179	
D 11 18O2 PFHxS										
403.0 > 84.0	9.493	9.492	0.001		1504499	47.8		101	5451	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.493	9.495	-0.002	1.000	1314717	54.2				
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.493	9.495	-0.002	1.000	1314717	NC			1557	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.568	10.569	-0.001		3805888	47.4		94.8	27081	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.568	10.572	-0.004	1.000	3593653	57.1			2337	
413.0 > 169.0	10.577	10.572	0.005	1.001	1256401		2.86(0.00-0.00)		1991	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.577	10.581	-0.004	1.000	1288382	NC			6252	
D 16 13C4 PFOS										
503.0 > 80.0	11.527	11.525	0.002		1783133	46.5		97.2	124638	
15 Perfluorooctane sulfonic acid										
499.0 > 80.0	11.527	11.527	0.0	1.000	2127280	50.9			576	
499.0 > 99.0	11.527	11.527	0.0	1.000	1129498		1.88(0.00-0.00)		15715	
D 17 13C5 PFNA										
468.0 > 423.0	11.544	11.542	0.002		3253972	45.9		91.8	13653	
18 Perfluorononanoic acid										
463.0 > 419.0	11.544	11.543	0.001	1.000	2583824	57.3			73314	
D 19 13C2 PFDA										
515.0 > 470.0	12.373	12.373	0.0		2416412	42.1		84.2	8324	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.373	12.373	0.0	1.000	3141271	58.9			12676	
D 23 13C8 FOSA										
506.0 > 78.0	12.984	12.985	-0.001		5655453	49.7		99.5	3959	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.994	12.987	0.007	1.000	3877669	52.3			5983	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.032	13.033	-0.001	1.000	1515848	58.3				
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.032	13.033	-0.001	1.000	1515848	NC			10264	
D 26 13C2 PFUnA										
565.0 > 520.0	13.076	13.076	0.0		3847966	47.4		94.9	45203	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.076	13.077	-0.001	1.000	3635775	57.2			14661	
D 28 13C2 PFDoA										
615.0 > 570.0	13.666	13.663	0.003		4708330	46.7		93.4	15216	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.666	13.666	0.0	1.000	3546519	59.1			5424	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.167	14.165	0.002	1.000	4979535	57.2			3193	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.589	14.589	0.0		4014020	50.3		101	13394	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.589	14.589	0.0	1.000	3805256	53.0			1816	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.179	15.177	0.002		6376975	48.9		97.8	7934	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.179	15.177	0.002	1.000	6895121	61.5			4512	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.436	15.437	-0.001	1.000	6991019	61.0			4012	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFCIC_00017 Amount Added: 1.00 Units: mL

Report Date: 06-Jun-2016 11:40:57 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_012.d

Injection Date: 03-Jun-2016 20:23:01 Instrument ID: A6

Lims ID: ICV

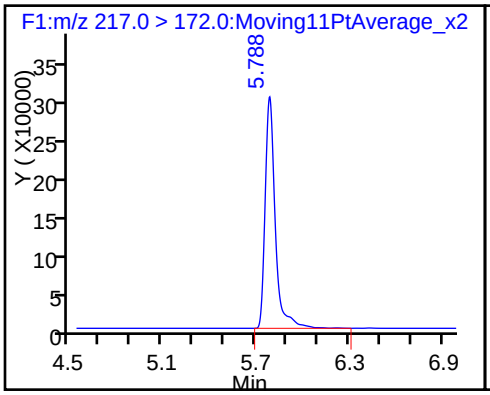
Client ID:

Operator ID: JRB ALS Bottle#: 8 Worklist Smp#: 12

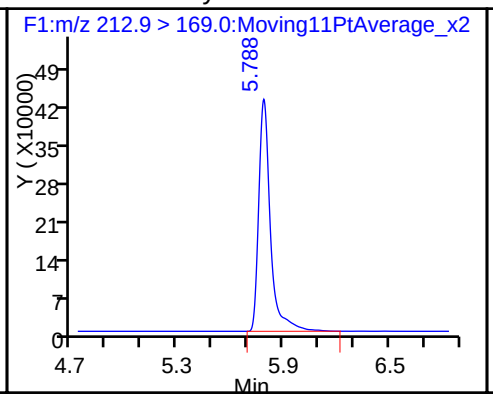
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

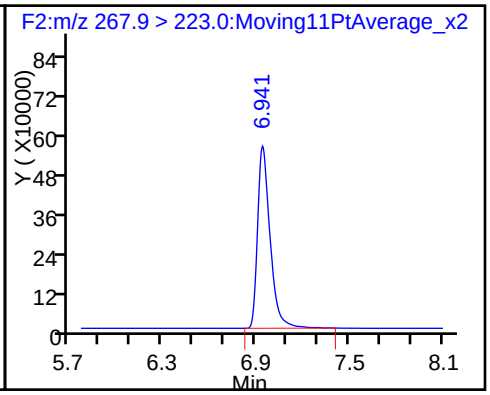
D 1 13C4 PFBA



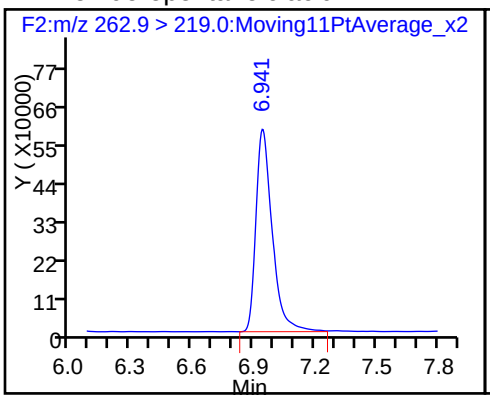
2 Perfluorobutyric acid



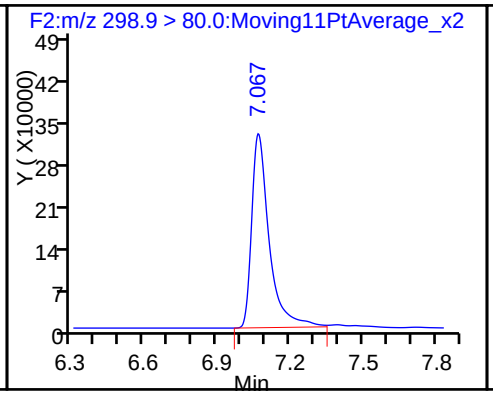
D 3 13C5-PFPeA



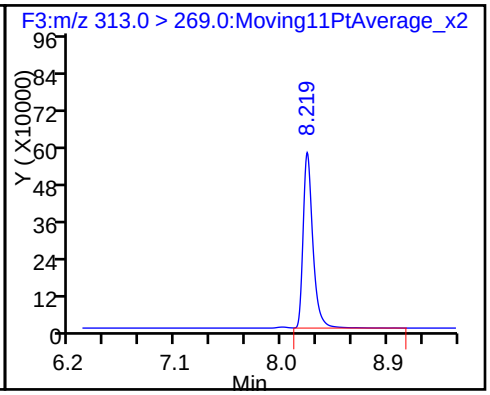
4 Perfluoropentanoic acid



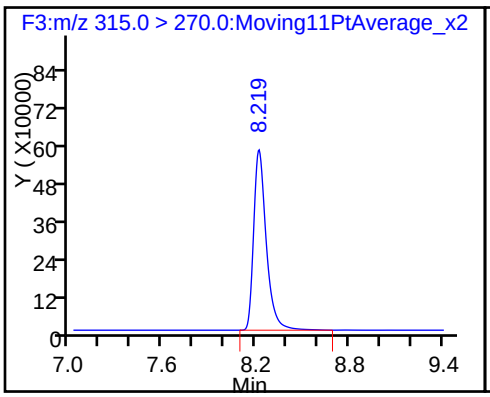
40 Perfluorobutanesulfonic acid



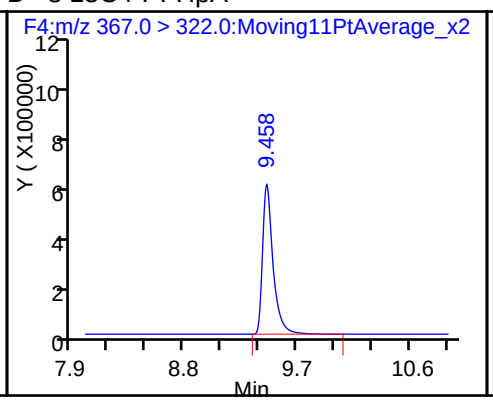
7 Perfluorohexanoic acid



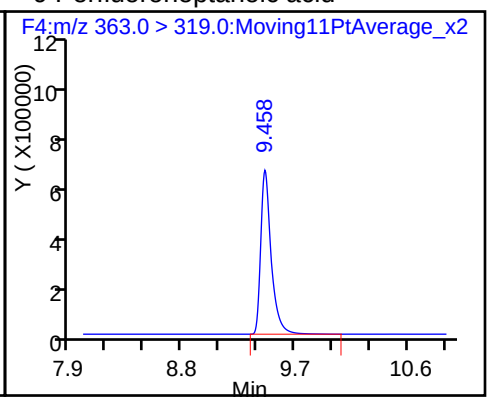
D 6 13C2 PFHxA



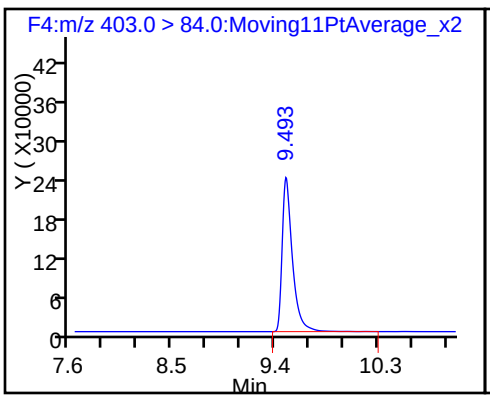
D 8 13C4-PFHpA



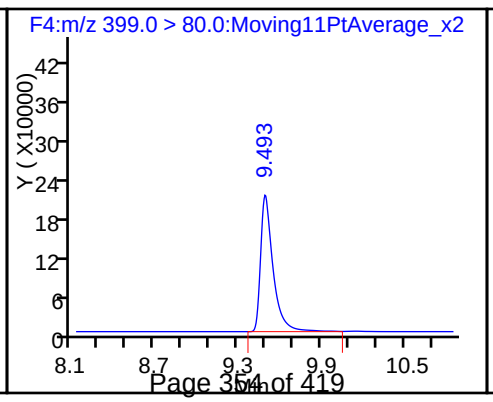
9 Perfluoroheptanoic acid



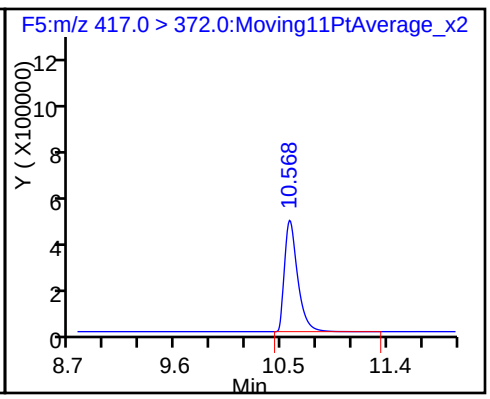
D 11 18O2 PFHxS



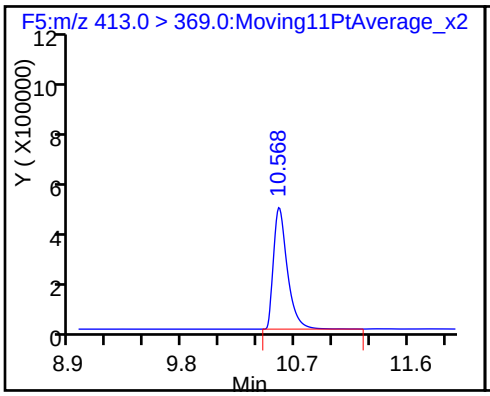
41 Perfluorohexanesulfonic acid



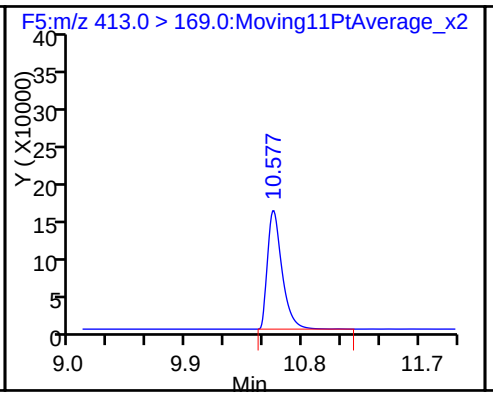
D 12 13C4 PFOA



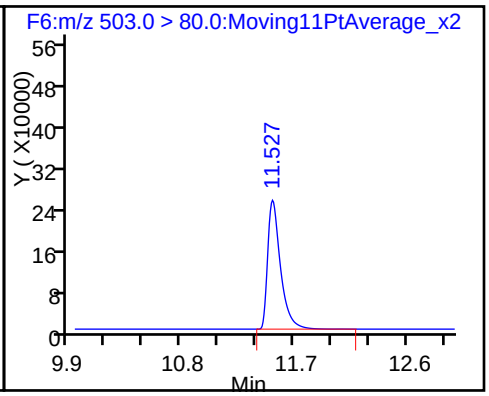
13 Perfluorooctanoic acid



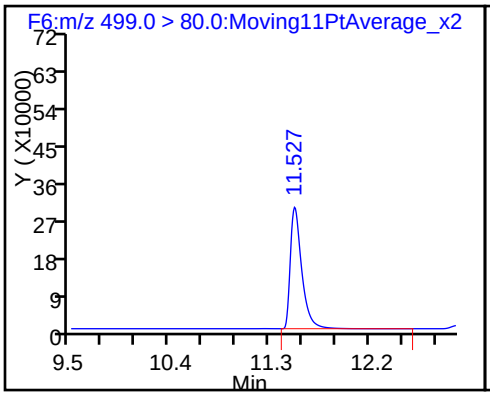
13 Perfluorooctanoic acid



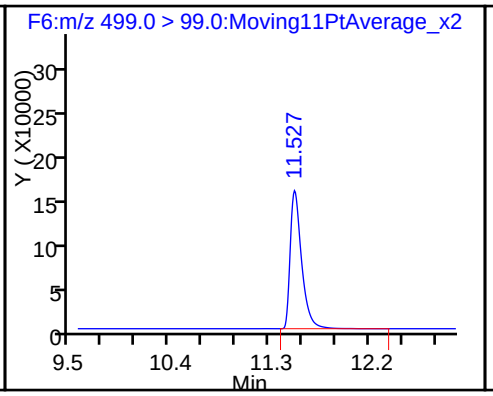
D 16 13C4 PFOS



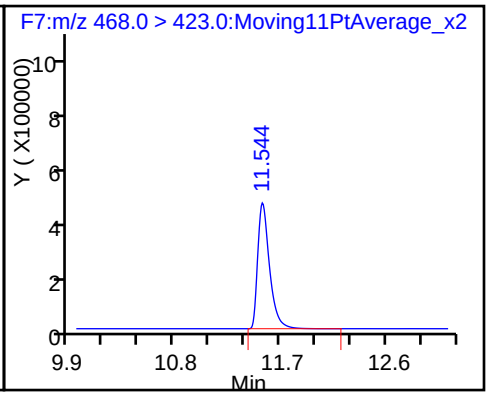
15 Perfluorooctane sulfonic acid



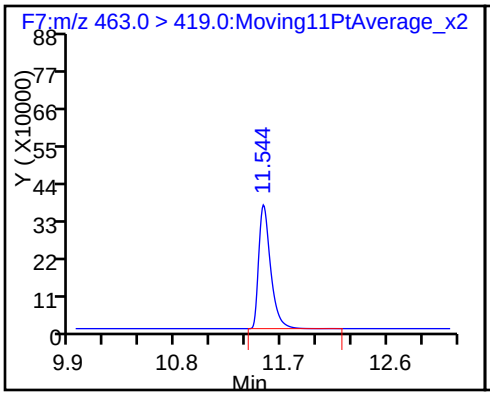
15 Perfluorooctane sulfonic acid



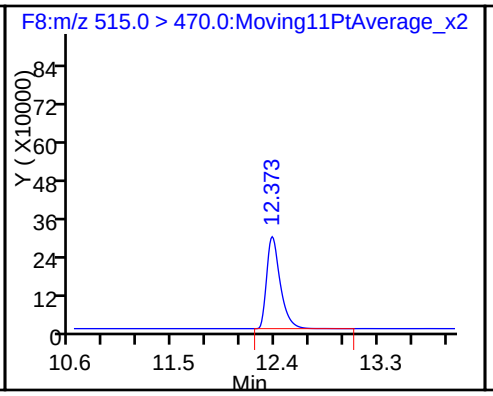
D 17 13C5 PFNA



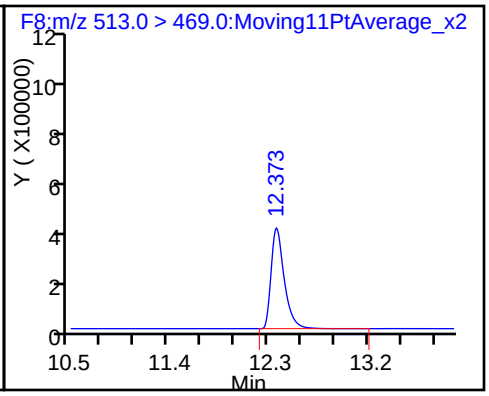
18 Perfluorononanoic acid



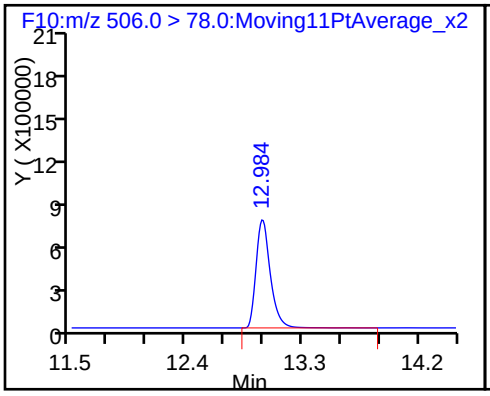
D 19 13C2 PFDA



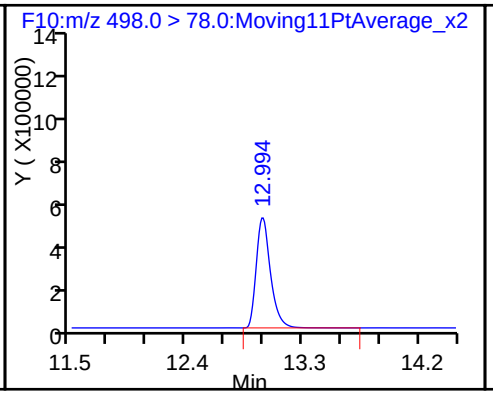
20 Perfluorodecanoic acid



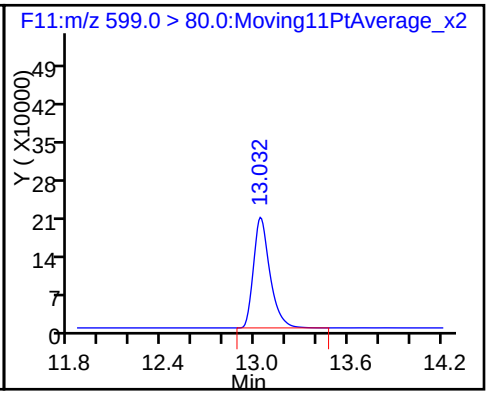
D 23 13C8 FOSA



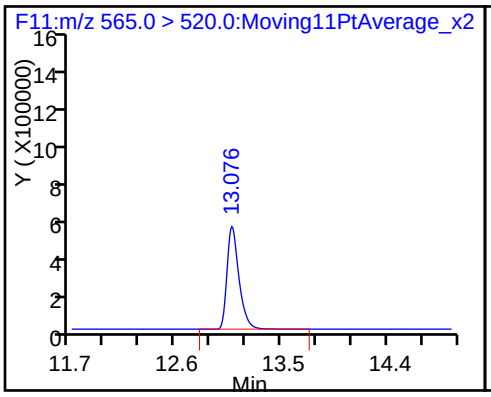
24 Perfluorooctane Sulfonamide



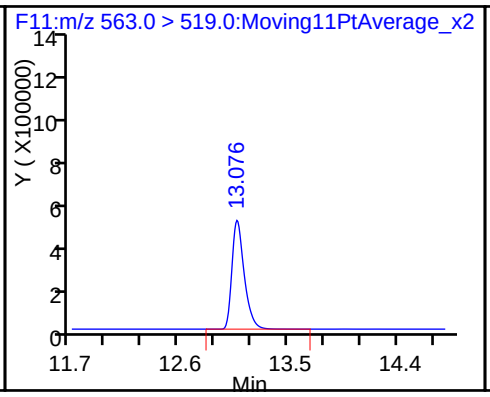
39 Perfluorodecane Sulfonic acid



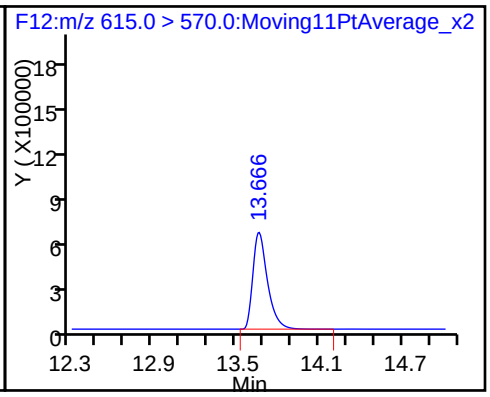
D 26 13C2 PFUnA



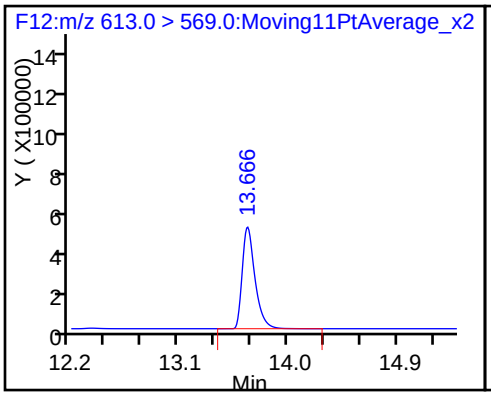
27 Perfluoroundecanoic acid



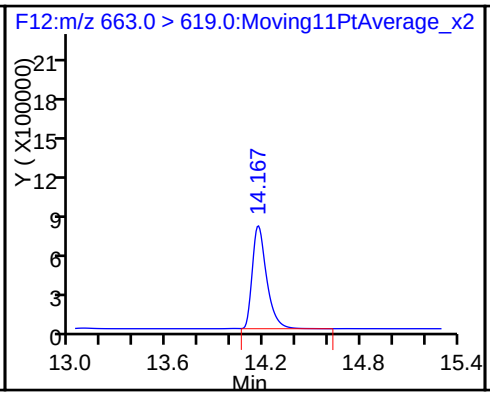
D 28 13C2 PFDoA



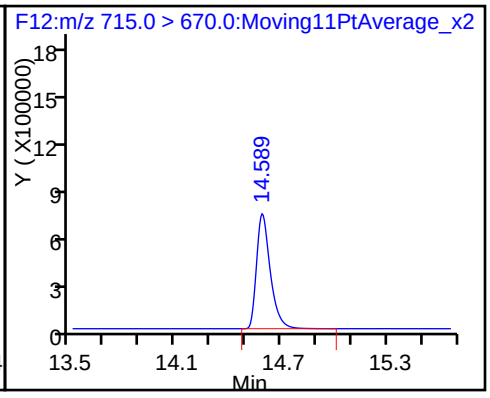
29 Perfluorododecanoic acid



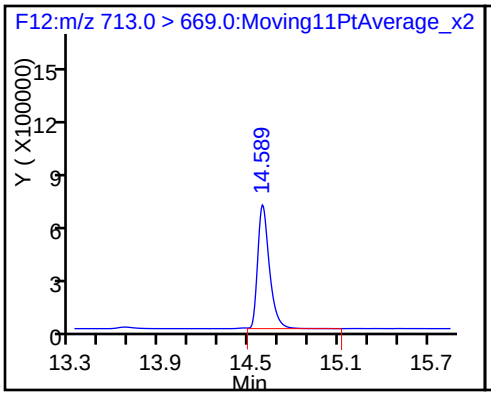
30 Perfluorotridecanoic acid



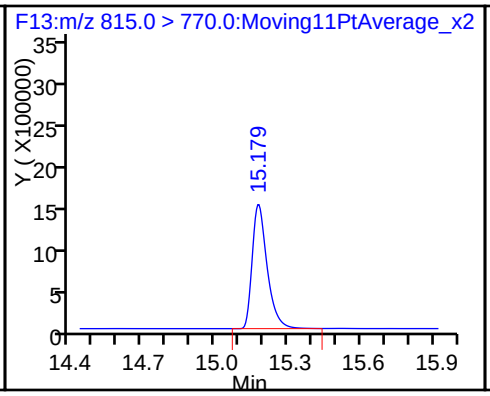
D 33 13C2-PFTeDA



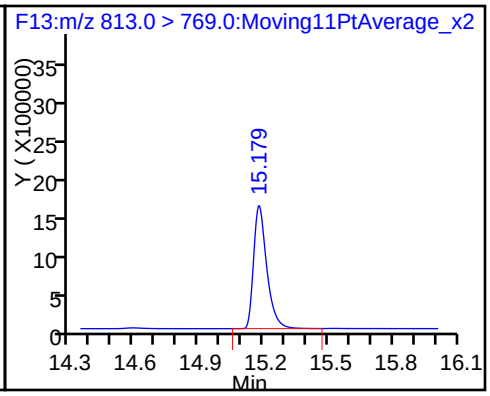
32 Perfluorotetradecanoic acid



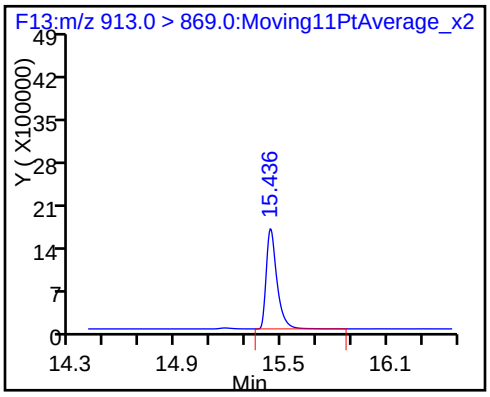
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Lab Sample ID: CCV 320-112504/25 Calibration Date: 06/04/2016 00:59

Instrument ID: A6 Calib Start Date: 06/03/2016 17:32

GC Column: Acquity ID: 2.10(mm) Calib End Date: 06/03/2016 19:40

Lab File ID: 03JUN2016A6A_025.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	1.239	1.238		49.9	50.0	-0.1	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9593	0.8382		43.7	50.0	-12.6	25.0
Perfluorobutanesulfonic acid (PFBS)	L1ID		0.9532		38.9	44.2	-11.9	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9171	0.8970		48.9	50.0	-2.2	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9326	0.9144		49.0	50.0	-2.0	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	0.7630	0.7375		44.0	45.5	-3.3	25.0
Perfluorooctanoic acid (PFOA)	AveID	0.8017	0.7786		47.1	50.0	-2.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.6497	0.6174		45.2	47.6	-5.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	1.120	1.028		42.6	46.4	-8.2	25.0
Perfluorononanoic acid (PFNA)	AveID	0.6931	0.6450		46.5	50.0	-7.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.103	1.019		46.2	50.0	-7.6	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.6561	0.6541		49.8	50.0	-0.3	25.0
Perfluorodecanesulfonic acid (PFDS)	L2ID		0.6751		46.7	48.2	-3.1	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		0.8313		50.3	50.0	0.5	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.6374	0.6576		51.6	50.0	3.2	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9245	0.9179		49.6	50.0	-0.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.7622	0.7125		46.7	50.0	-6.5	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		1.200		50.2	50.0	0.4	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	1.217	1.217		50.0	50.0	0.0	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_025.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 04-Jun-2016 00:59:36 ALS Bottle#: 5 Worklist Smp#: 25
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5 CCV L5
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6
Sublist: chrom-PFAC_A6*sub5

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 06-Jun-2016 11:41:12 Calib Date: 03-Jun-2016 19:40:28
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:27:55

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.785	5.784	0.001		1365648	50.8		102	3638	
2 Perfluorobutyric acid										
212.9 > 169.0	5.785	5.786	-0.001	1.000	1690159	49.9		99.9	4963	
D 3 13C5-PFPeA										
267.9 > 223.0	6.941	6.939	0.002		3347509	53.5		107	4325	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.941	6.941	0.0	1.000	2805939	43.7		87.4	459	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.071	7.069	0.002	1.000	1371867	38.9		88.1		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.071	7.069	0.002	1.000	1371867	NC			217	
298.9 > 99.0	7.067	7.069	-0.002	0.999	687691		1.99(0.00-0.00)		303	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.219	8.216	0.003	1.000	3002938	48.9		97.8	1153	
D 6 13C2 PFHxA										
315.0 > 270.0	8.219	8.217	0.002		3347611	50.6		101	10224	
D 8 13C4-PFHpA										
367.0 > 322.0	9.458	9.456	0.002		3530142	48.6		97.2	18028	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.464	9.457	0.007	1.000	3227959	49.0		98.0	36210	
D 11 18O2 PFHxS										
403.0 > 84.0	9.499	9.492	0.007		1540155	49.0		104	121416	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.499	9.495	0.004	1.000	1092642	44.0		96.7		M
10 Perfluorohexane Sulfonate										M
399.0 > 80.0	9.495	9.495	0.0	1.000	0	NC			50.8	M

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
417.0 > 372.0	10.568	10.569	-0.001		3911941	48.7		97.4	7870	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.577	10.572	0.005	1.000	3045961	47.1		94.1	2147	
413.0 > 169.0	10.577	10.572	0.005	1.000	1093084		2.79(0.00-0.00)		2407	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.586	10.581	0.005	1.000	1165944	NC			8176	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.586	10.581	0.005	1.000	1165944	45.2		95.0		
D 16 13C4 PFOS										
503.0 > 80.0	11.527	11.525	0.002		1896441	49.4		103	3375	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.527	11.527	0.0	1.000	1891820	42.6		91.8	629	M
499.0 > 99.0	11.527	11.527	0.0	1.000	961386		1.97(0.00-0.00)		22407	M
D 17 13C5 PFNA										
468.0 > 423.0	11.545	11.542	0.003		3408591	48.1		96.1	25338	
18 Perfluorononanoic acid										
463.0 > 419.0	11.545	11.543	0.002	1.000	2198374	46.5		93.0	62486	
D 19 13C2 PFDA										
515.0 > 470.0	12.383	12.373	0.010		2745114	47.8		95.7	20533	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.383	12.373	0.010	1.000	2798213	46.2		92.4	30654	
D 23 13C8 FOSA										
506.0 > 78.0	12.994	12.985	0.009		5521451	48.6		97.1	2768	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.994	12.987	0.007	1.000	3611453	49.8		99.7	3704	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.032	13.033	-0.001	1.000	1291051	46.7		96.9		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.032	13.033	-0.001	1.000	1291051	NC			13361	
D 26 13C2 PFUnA										
565.0 > 520.0	13.076	13.076	0.0		3961905	48.8		97.7	22247	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.085	13.077	0.008	1.000	3293616	50.3		101	28893	
D 28 13C2 PFDoA										
615.0 > 570.0	13.666	13.663	0.003		4672617	46.3		92.7	15804	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.666	13.666	0.0	1.000	3072485	51.6		103	5511	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.167	14.165	0.002	1.000	4288770	49.6		99.3	2841	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.589	14.589	0.0		4273216	53.5		107	5209	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.589	14.589	0.0	1.000	3329094	46.7		93.5	1542	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.180	15.177	0.003		6644740	51.0		102	12424	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.180	15.177	0.003	1.000	5605352	50.2		100	4434	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.436	15.437	-0.001	1.000	5685837	50.0		100	3546	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

LCPFC-L5_00019 Amount Added: 1.00 Units: mL

Report Date: 06-Jun-2016 11:41:12 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_025.d

Injection Date: 04-Jun-2016 00:59:36 Instrument ID: A6

Lims ID: CCV L5

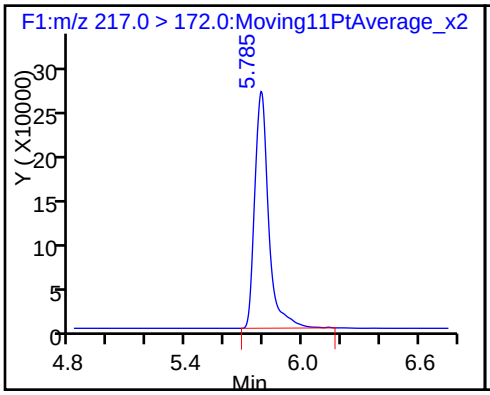
Client ID:

Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 25

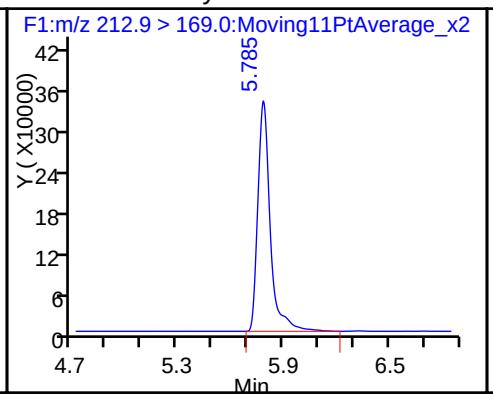
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

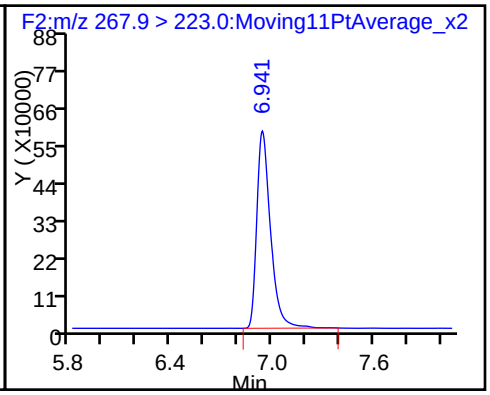
D 1 13C4 PFBA



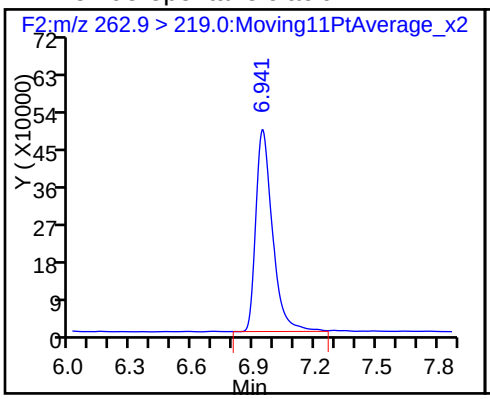
2 Perfluorobutyric acid



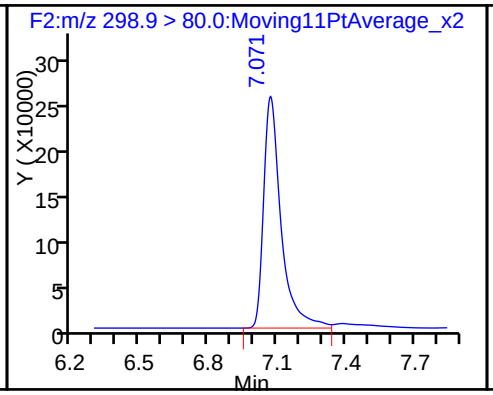
D 3 13C5-PFPeA



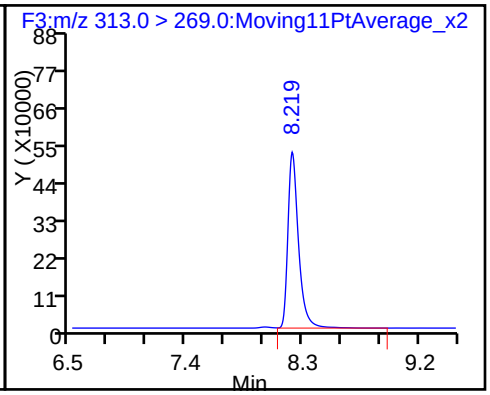
4 Perfluoropentanoic acid



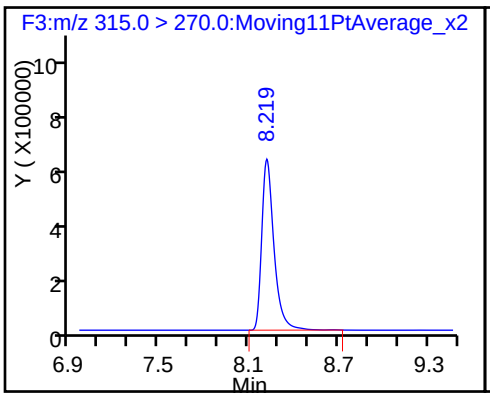
40 Perfluorobutanesulfonic acid



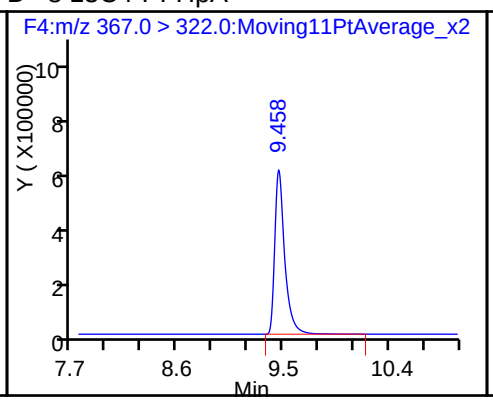
7 Perfluorohexanoic acid



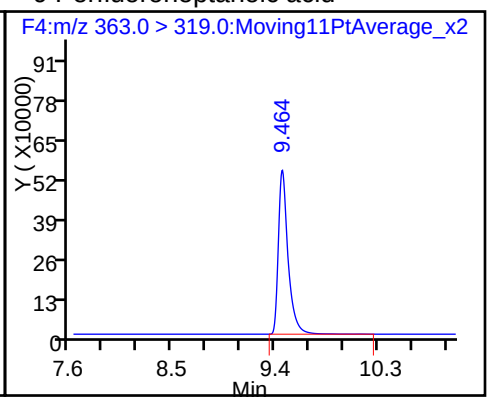
D 6 13C2 PFHxA



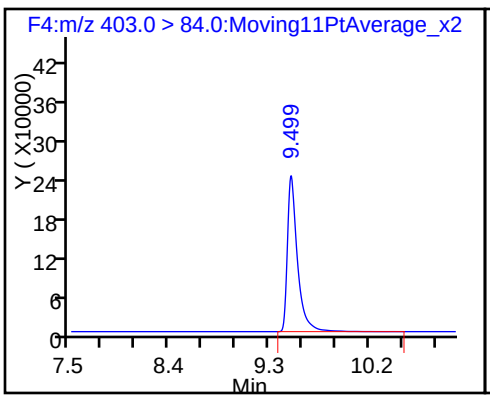
D 8 13C4-PFHpA



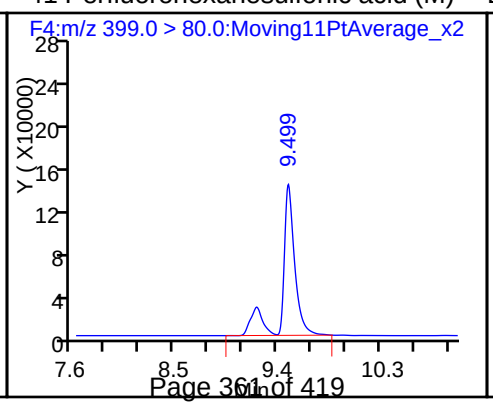
9 Perfluoroheptanoic acid



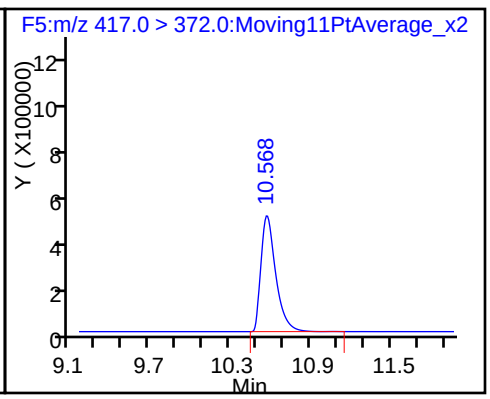
D 11 18O2 PFHxS



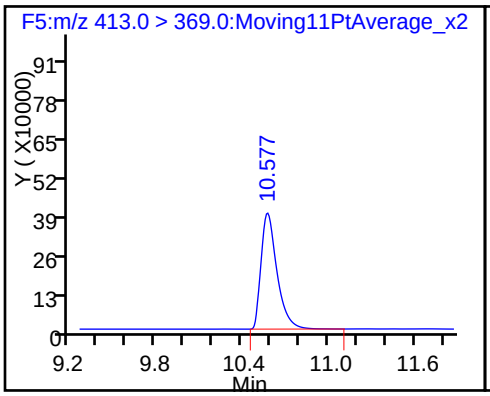
41 Perfluorohexanesulfonic acid (M)



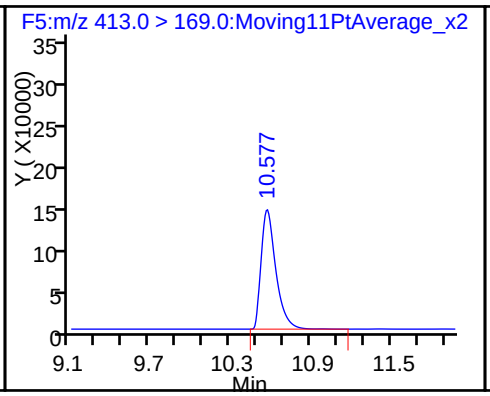
D 12 13C4 PFOA



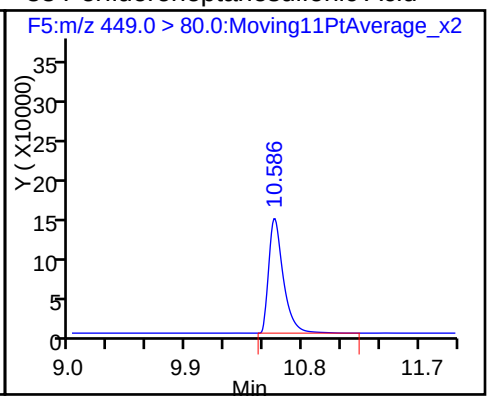
13 Perfluorooctanoic acid



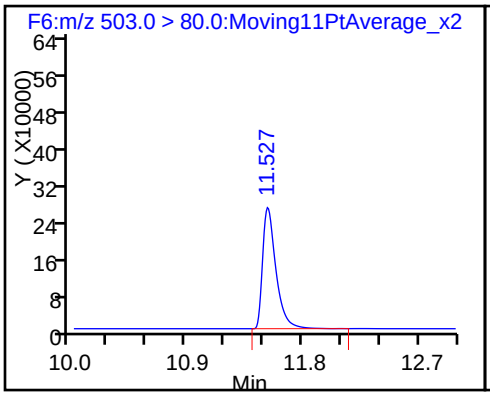
13 Perfluorooctanoic acid



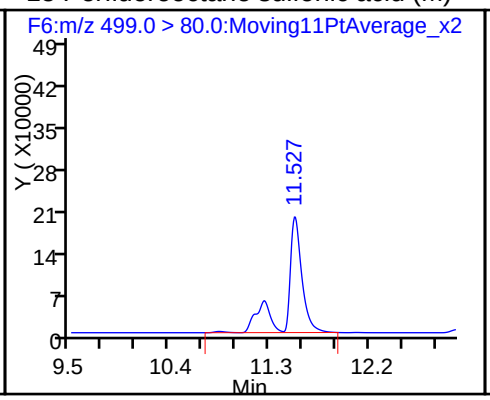
38 Perfluoroheptanesulfonic Acid



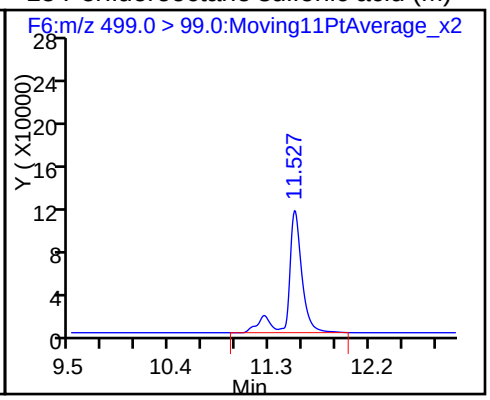
D 16 13C4 PFOS



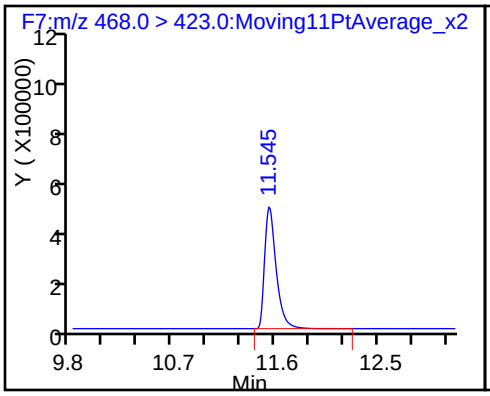
15 Perfluorooctane sulfonic acid (M)



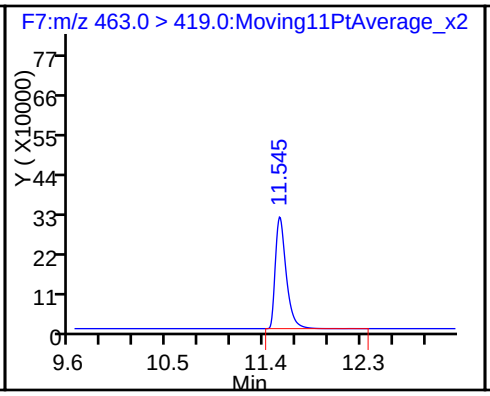
15 Perfluorooctane sulfonic acid (M)



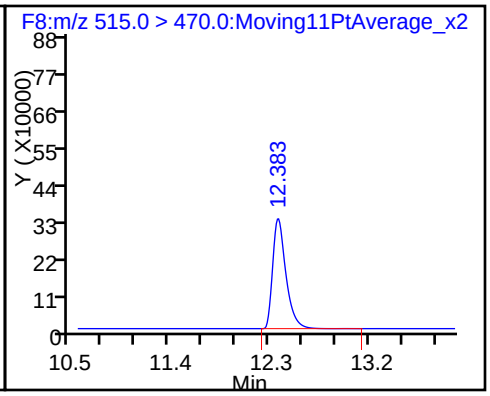
D 17 13C5 PFNA



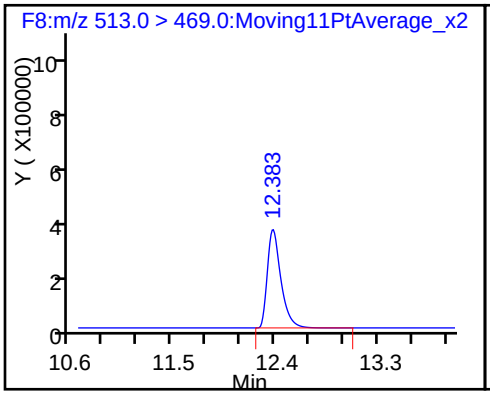
18 Perfluorononanoic acid



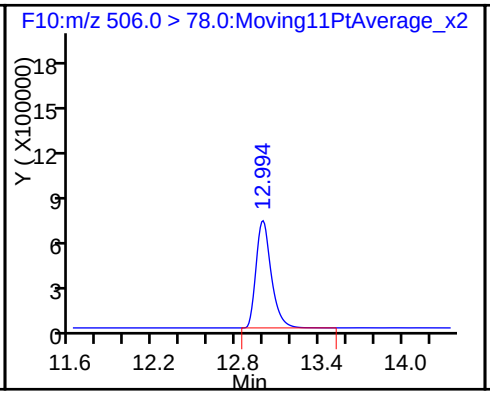
D 19 13C2 PFDA



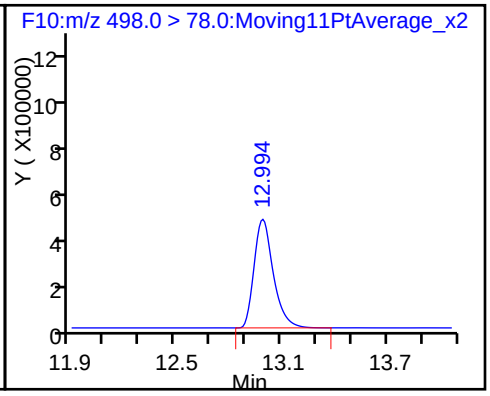
20 Perfluorodecanoic acid



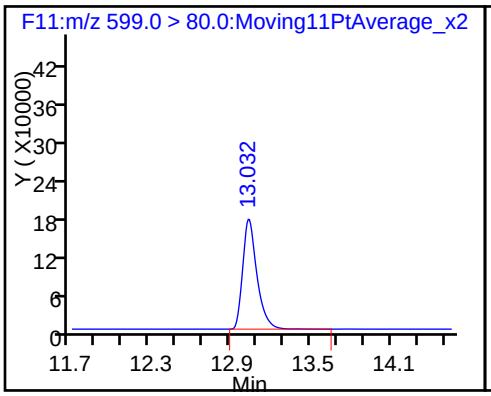
D 23 13C8 FOSA



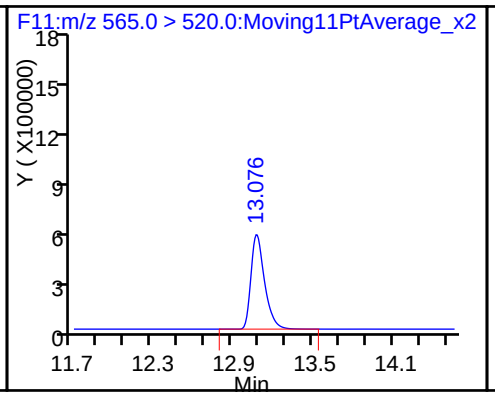
24 Perfluorooctane Sulfonamide



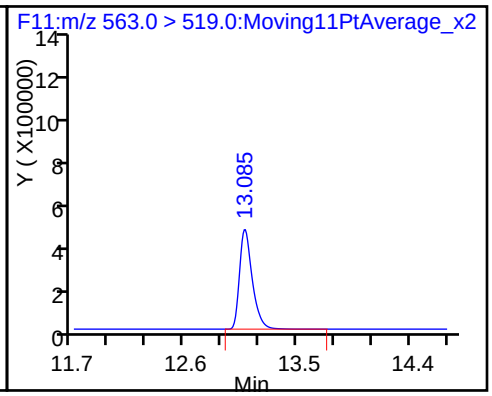
39 Perfluorodecane Sulfonic acid



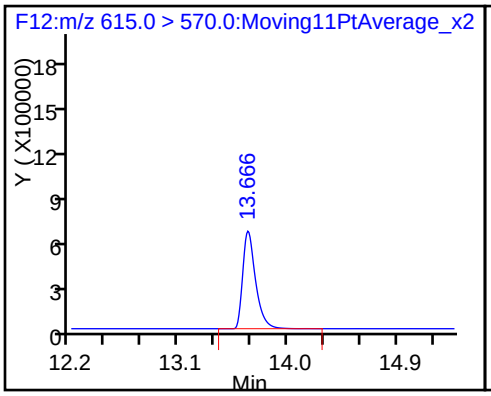
D 26 13C2 PFUnA



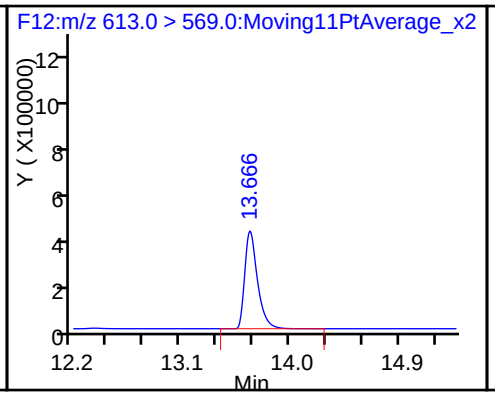
27 Perfluoroundecanoic acid



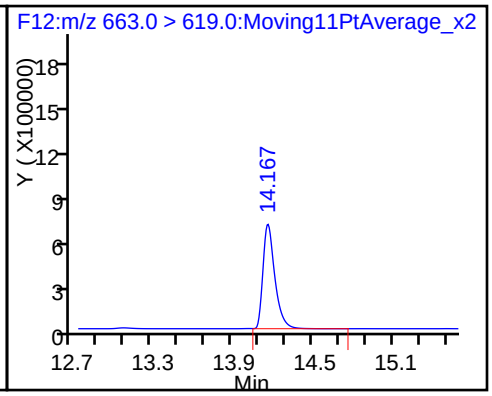
D 28 13C2 PFDoA



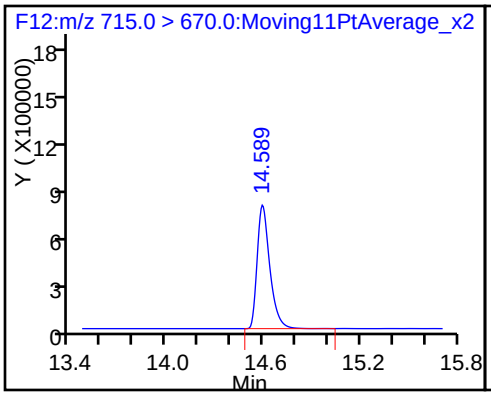
29 Perfluorododecanoic acid



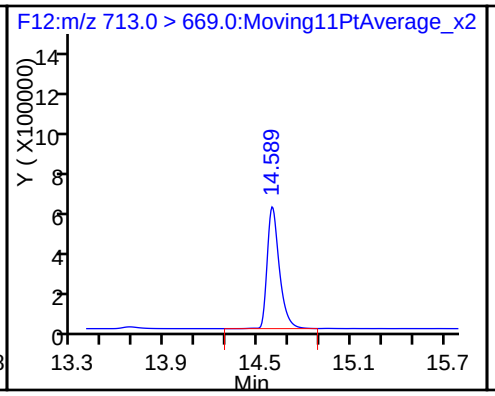
30 Perfluorotridecanoic acid



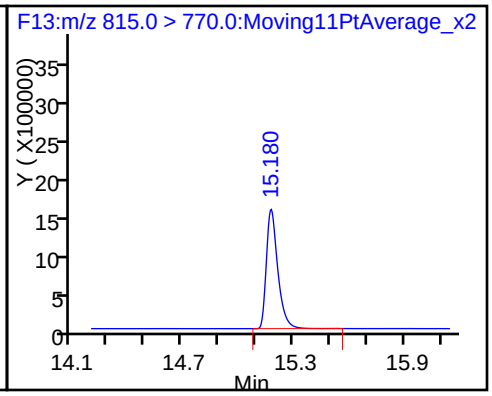
D 33 13C2-PFTeDA



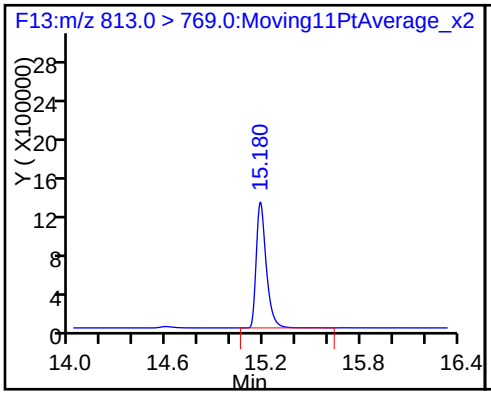
32 Perfluorotetradecanoic acid



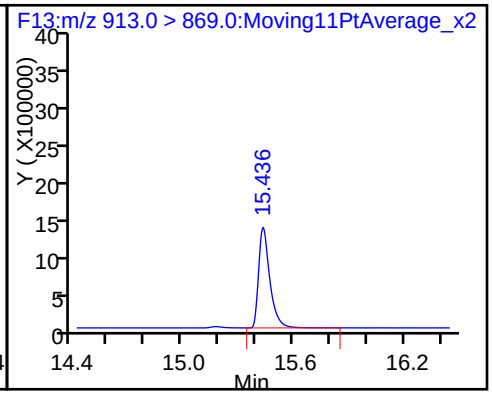
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

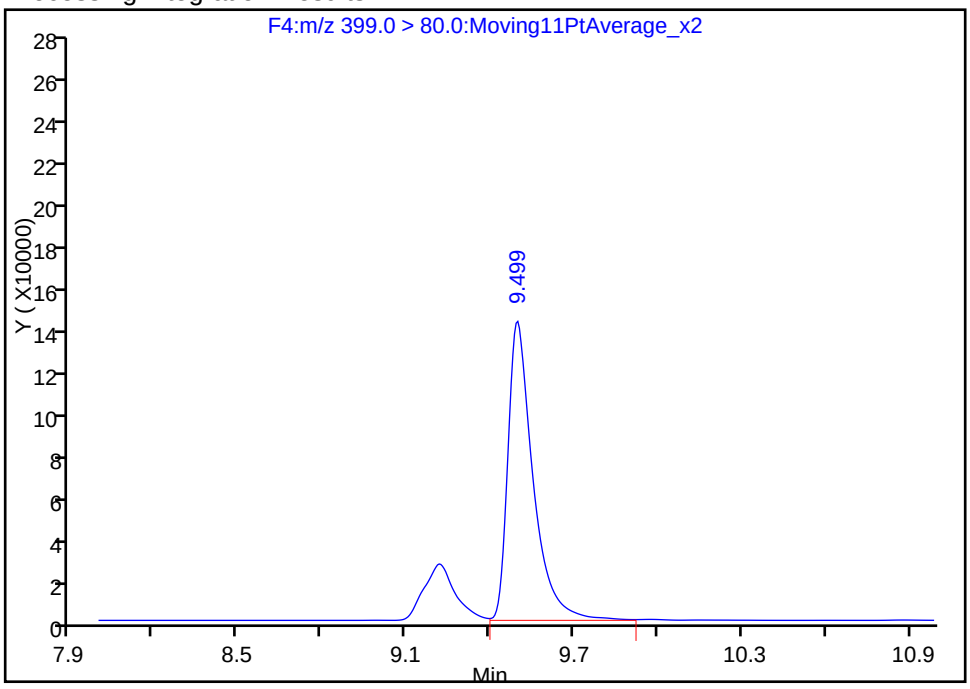
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_025.d
Injection Date: 04-Jun-2016 00:59:36 Instrument ID: A6
Lims ID: CCV L5
Client ID:
Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 25
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

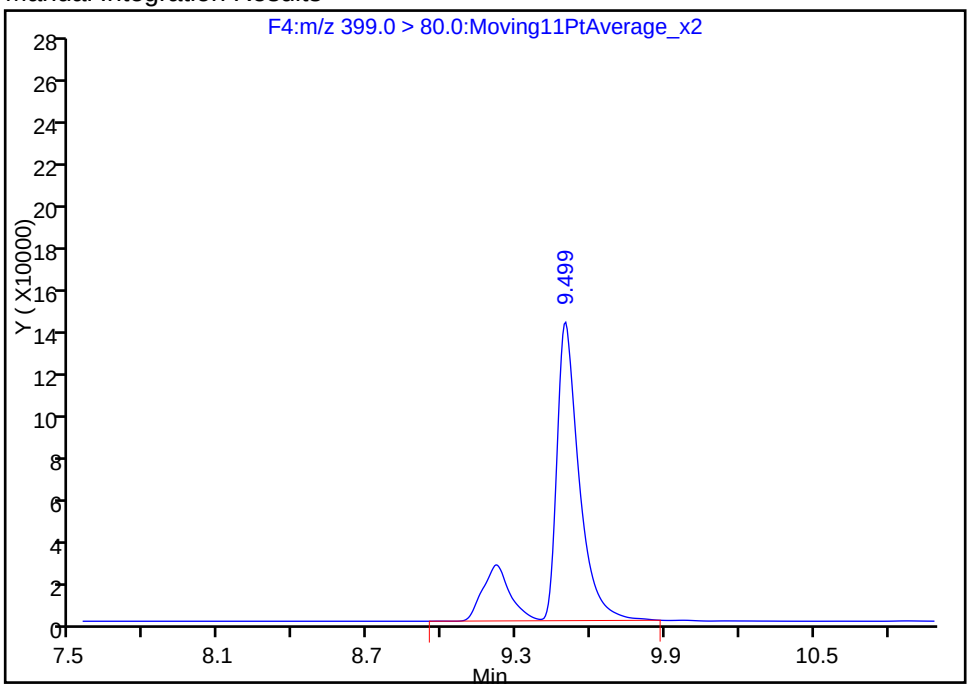
Processing Integration Results

RT: 9.50
Area: 897976
Amount: 36.144896
Amount Units: ng/ml



Manual Integration Results

RT: 9.50
Area: 1092642
Amount: 43.980498
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:27:55
Audit Action: Assigned Compound ID Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

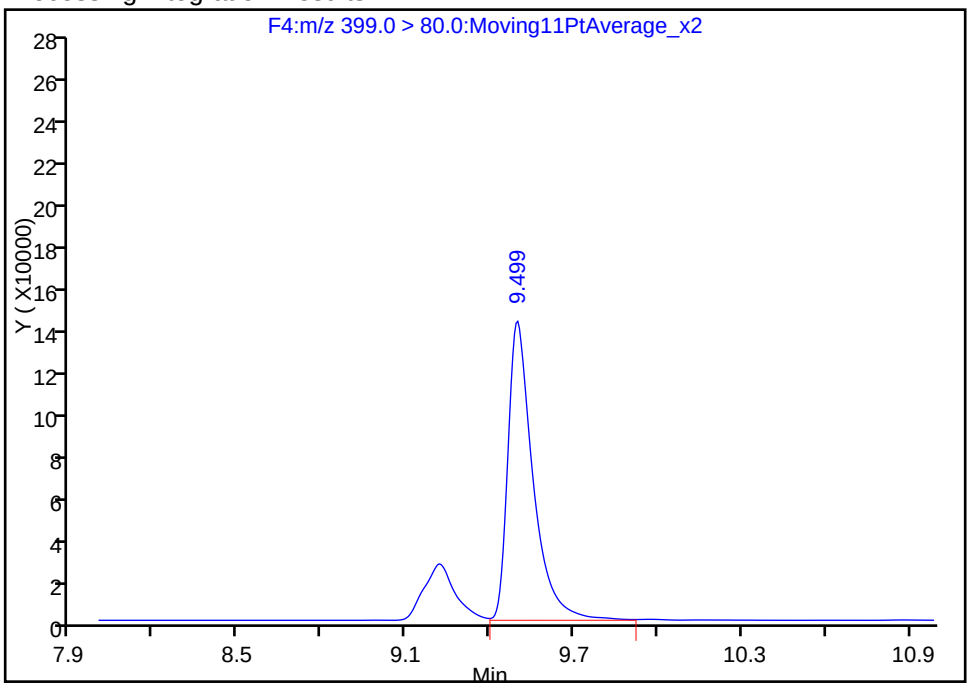
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_025.d
Injection Date: 04-Jun-2016 00:59:36 Instrument ID: A6
Lims ID: CCV L5
Client ID:
Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 25
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

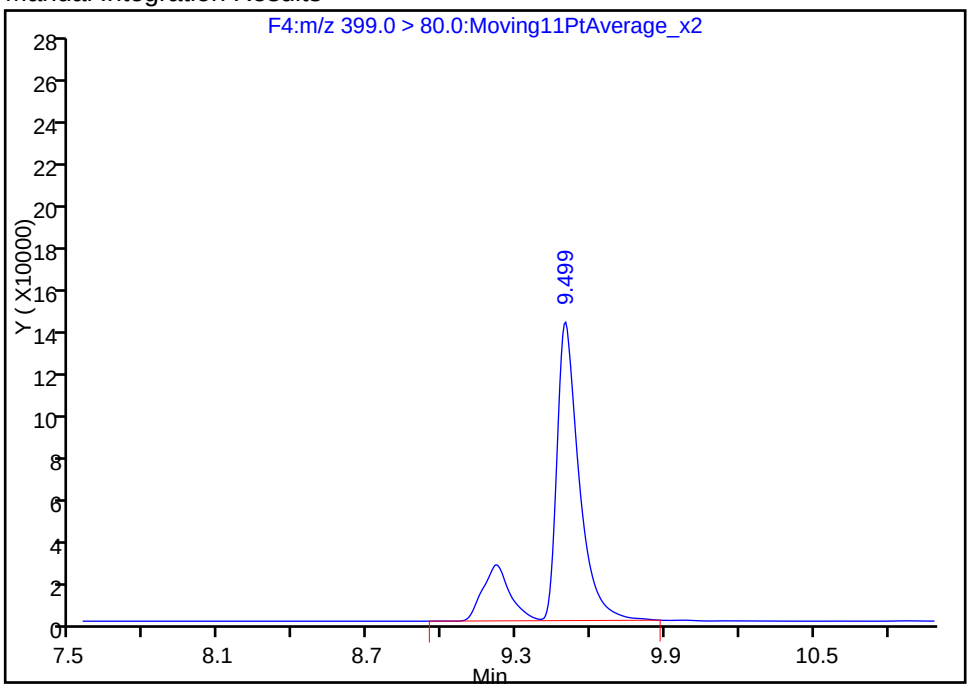
Processing Integration Results

RT: 9.50
Area: 897976
Amount: 36.144896
Amount Units: ng/ml



Manual Integration Results

RT: 9.50
Area: 1092642
Amount: 43.980498
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:27:55
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

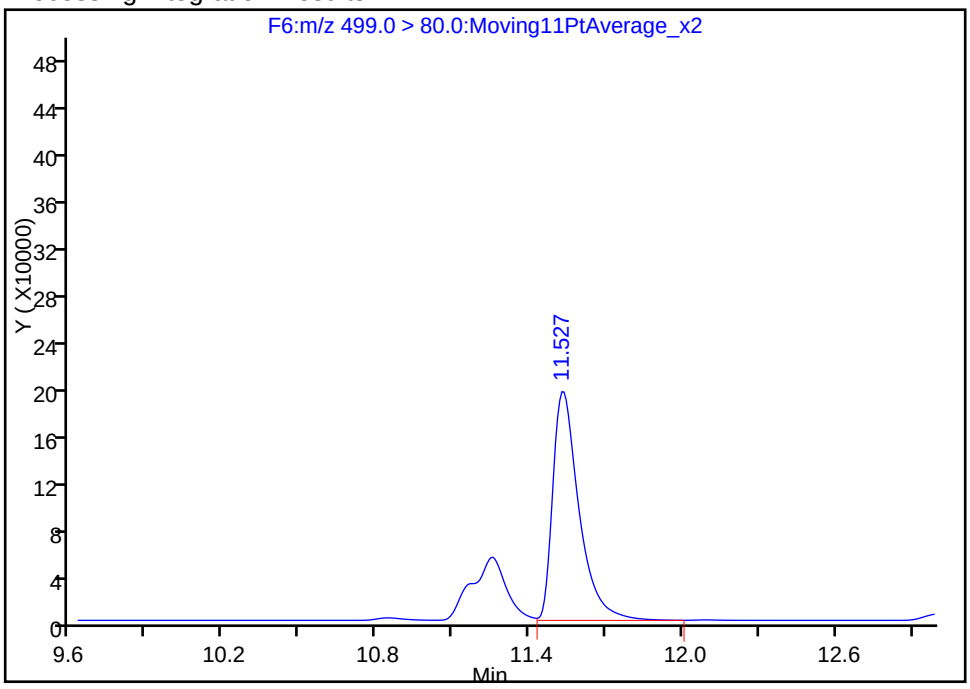
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_025.d
Injection Date: 04-Jun-2016 00:59:36 Instrument ID: A6
Lims ID: CCV L5
Client ID:
Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 25
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

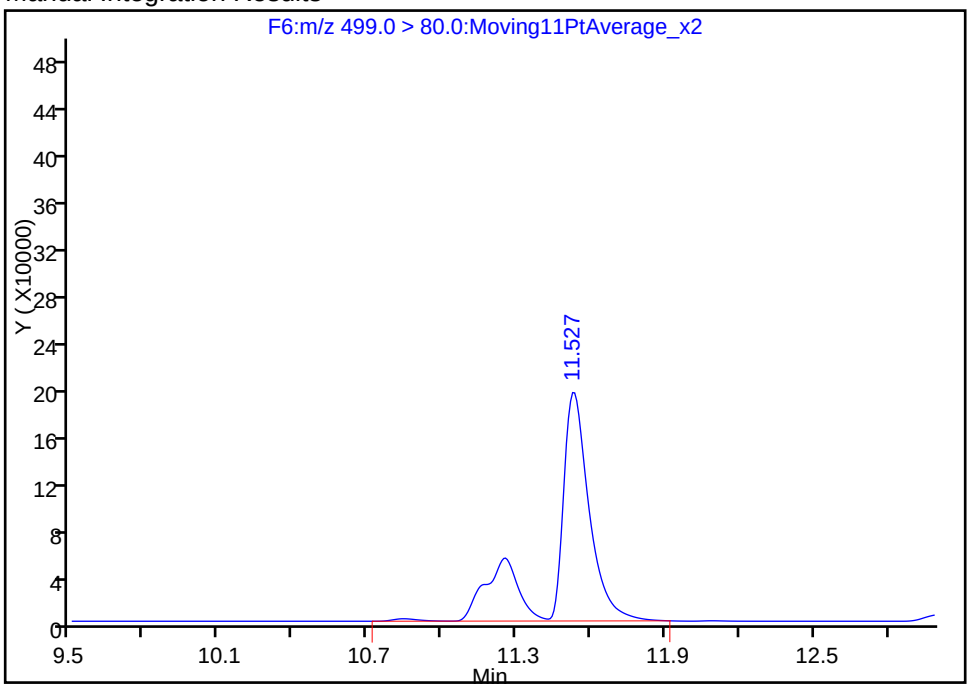
Processing Integration Results

RT: 11.53
Area: 1386037
Amount: 31.203329
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 1891820
Amount: 42.589831
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:27:55
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

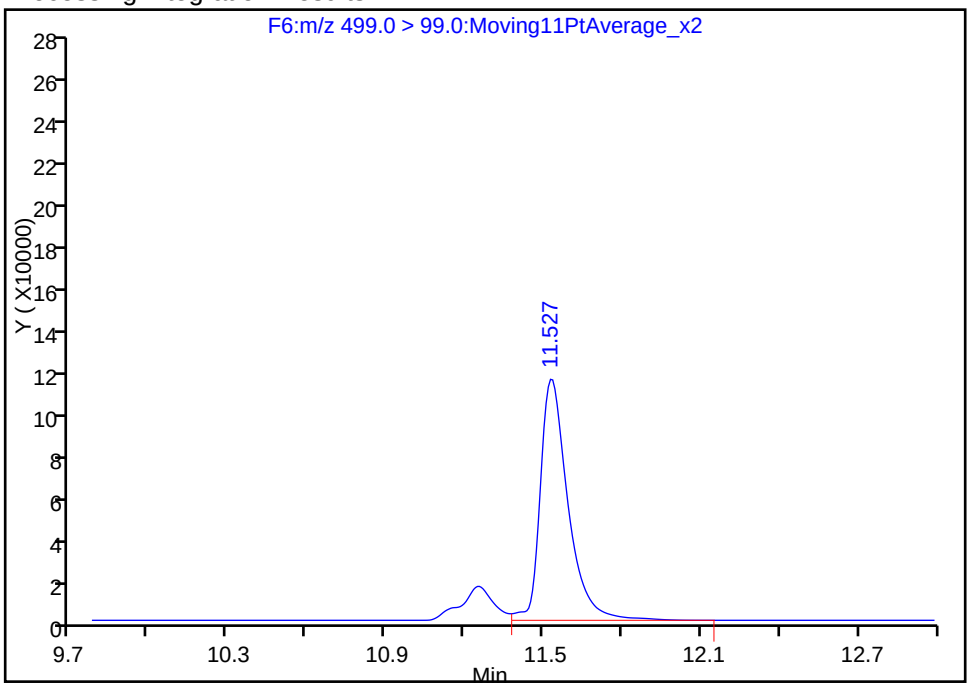
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_025.d
Injection Date: 04-Jun-2016 00:59:36 Instrument ID: A6
Lims ID: CCV L5
Client ID:
Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 25
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

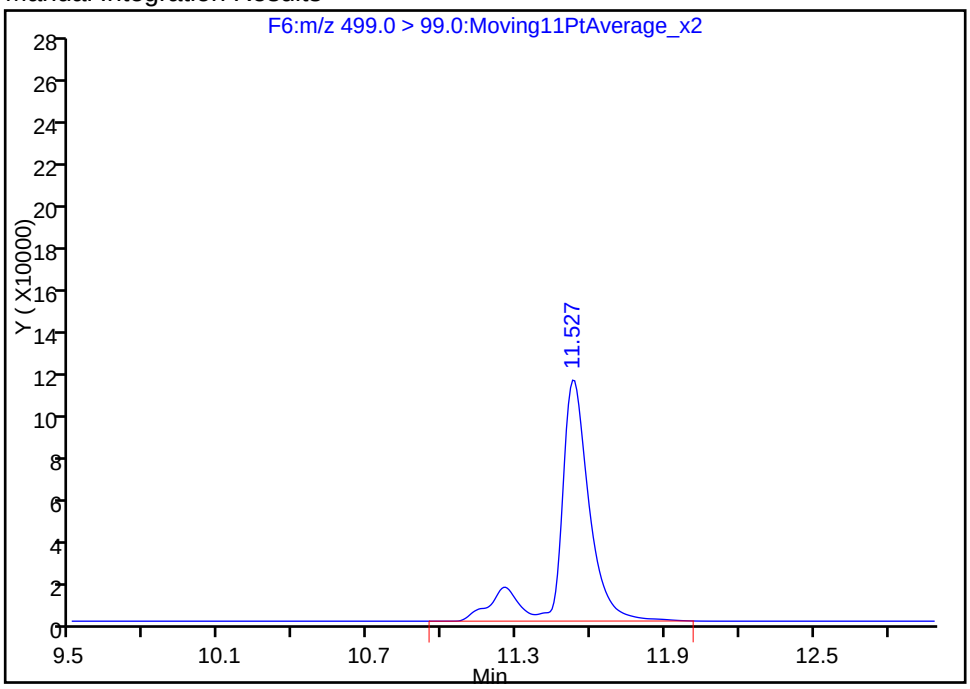
Processing Integration Results

RT: 11.53
Area: 829492
Amount: 31.203329
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 961386
Amount: 42.589831
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:27:55
Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-19198-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-112069/1-A

Matrix: Water | Lab File ID: 03JUN2016A6A_015.d

Analysis Method: WS-LC-0025 | Date Collected:

Extraction Method: 3535 | Date Extracted: 06/01/2016 11:06

Sample wt/vol: 500(mL) | Date Analyzed: 06/03/2016 21:26

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 112504 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	2.5	2.0	0.92
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.0	U	2.5	2.0	0.80
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	2.5	2.0	0.87
375-95-1	Perfluorononanoic acid (PFNA)	2.0	U	2.5	2.0	0.65
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	3.0	U	4.0	3.0	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	2.0	U	2.5	2.0	0.75

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	107		25-150
STL00990	13C4 PFOA	116		25-150
STL00991	13C4 PFOS	112		25-150
STL01892	13C4-PFHpA	116		25-150
STL00995	13C5 PFNA	117		25-150
STL00994	18O2 PFHxS	116		25-150

Report Date: 06-Jun-2016 11:41:00 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_015.d
Lims ID: MB 320-112069/1-A
Client ID:
Sample Type: MB
Inject. Date: 03-Jun-2016 21:26:52 ALS Bottle#: 14 Worklist Smp#: 15
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-112069/1-a BOX 85
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 06-Jun-2016 11:40:56 Calib Date: 03-Jun-2016 19:40:28
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:17:18

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.785	5.784	0.001		1516401	56.4		113	49065	
2 Perfluorobutyric acid										
212.9 > 169.0	5.782	5.786	-0.004	1.000	8737	0.2324			1315	
D 3 13C5-PFPeA										
267.9 > 223.0	6.941	6.939	0.002		3704283	59.2		118	12048	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.951	6.941	0.010	1.000	13355	0.1879			2.0	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.214	8.216	-0.002	1.000	6448	0.0994			52.5	
D 6 13C2 PFHxA										
315.0 > 270.0	8.220	8.217	0.003		3537643	53.5		107	16370	
D 8 13C4-PFHpA										
367.0 > 322.0	9.457	9.456	0.001		4210638	58.0		116	5103	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.469	9.457	0.012	1.000	3498	0.0445			223	
D 11 18O2 PFHxS										
403.0 > 84.0	9.493	9.492	0.001		1721995	54.7		116	23381	
41 Perfluorohexanesulfonic acid										
399.0 > 80.0	9.504	9.495	0.009	1.000	1528	0.0550				
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.504	9.495	0.009	1.000	1528	NC			12.8	
D 12 13C4 PFOA										
417.0 > 372.0	10.568	10.569	-0.001		4670150	58.2		116	76216	
13 Perfluorooctanoic acid										
413.0 > 369.0	10.577	10.572	0.005	1.000	9724	0.1259			5.9	
413.0 > 169.0	10.568	10.572	-0.004	0.999	3099		3.14(0.00-0.00)		10.6	
D 16 13C4 PFOS										
503.0 > 80.0	11.527	11.525	0.002		2063149	53.8		112	58075	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 17 13C5 PFNA										
468.0 > 423.0	11.544	11.542	0.002		4152690	58.6		117	100500	
18 Perfluorononanoic acid										
463.0 > 419.0	11.544	11.543	0.001	1.000	1881	0.0327			150	
D 19 13C2 PFDA										
515.0 > 470.0	12.373	12.373	0.0		2957449	51.5		103	180205	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.373	12.373	0.0	1.000	11013	0.1688			687	
D 23 13C8 FOSA										
506.0 > 78.0	12.994	12.985	0.009		1716396	15.1		30.2	11823	
D 26 13C2 PFUnA										
565.0 > 520.0	13.076	13.076	0.0		4563435	56.3		113	40404	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.085	13.077	0.008	1.000	41370	0.0528			1994	
D 28 13C2 PFDoA										
615.0 > 570.0	13.675	13.663	0.012		5586538	55.4		111	26403	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.675	13.666	0.009	1.000	5204	0.0731			12.3	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.174	14.165	0.009	1.000	7942	0.0769			15.9	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.589	14.589	0.0		4582106	57.4		115	12441	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.589	14.589	0.0	1.000	64374	0.7559			36.0	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.169	15.177	-0.008		7016303	53.8		108	14778	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.174	15.177	-0.003	1.000	199682	0.2351			243	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.431	15.437	-0.006	1.000	55102	0.4053			33.1	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Report Date: 06-Jun-2016 11:41:00 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_015.d

Injection Date: 03-Jun-2016 21:26:52 Instrument ID: A6

Lims ID: MB 320-112069/1-A

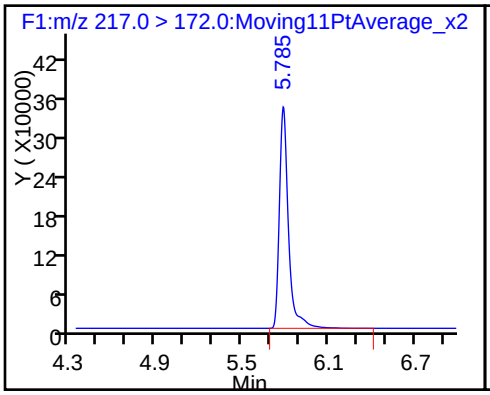
Client ID:

Operator ID: JRB ALS Bottle#: 14 Worklist Smp#: 15

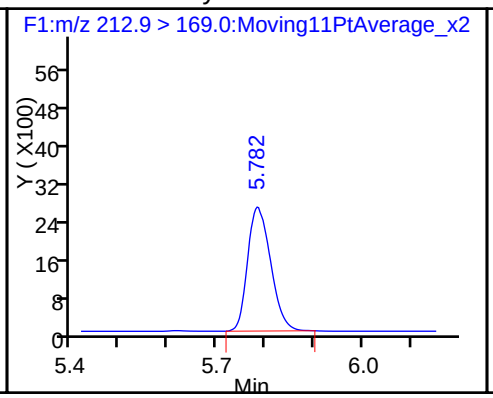
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

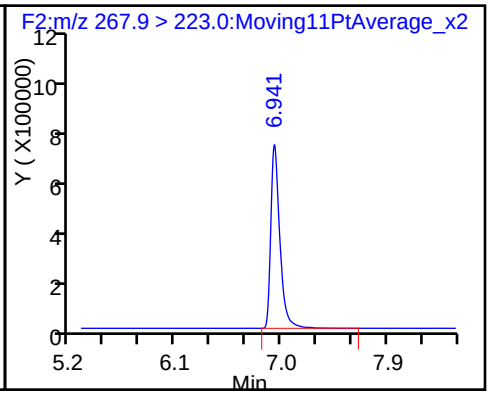
D 1 13C4 PFBA



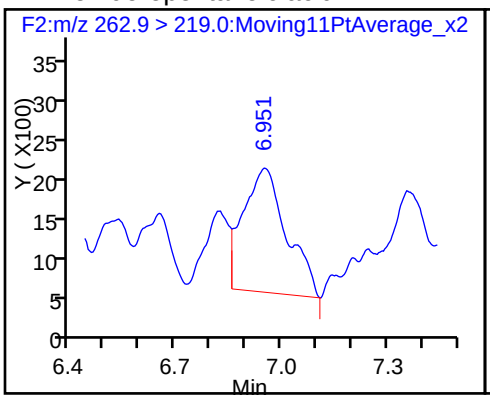
2 Perfluorobutyric acid



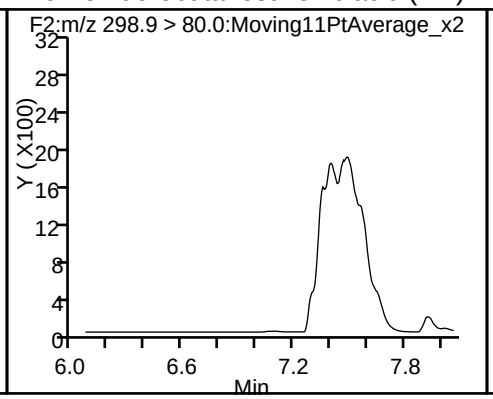
D 3 13C5-PFPeA



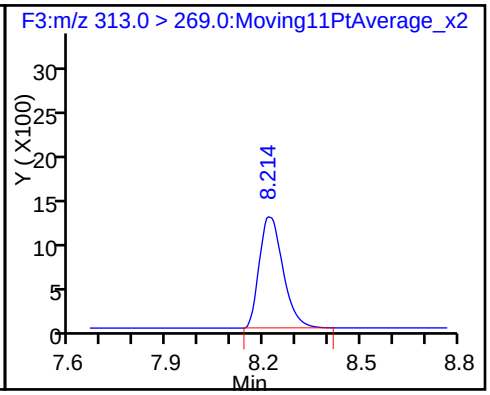
4 Perfluoropentanoic acid



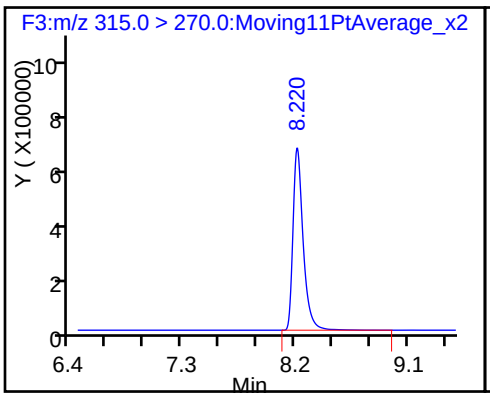
40 Perfluorobutanesulfonic acid (ND)



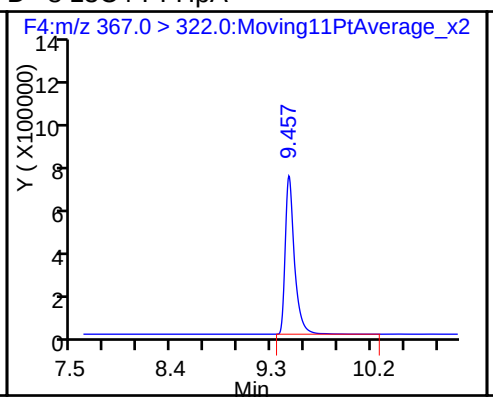
7 Perfluorohexanoic acid



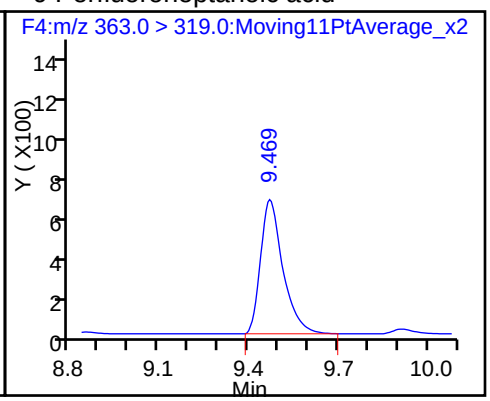
D 6 13C2 PFHxA



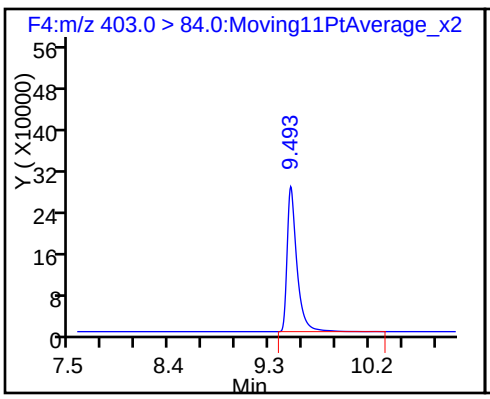
D 8 13C4-PFHpA



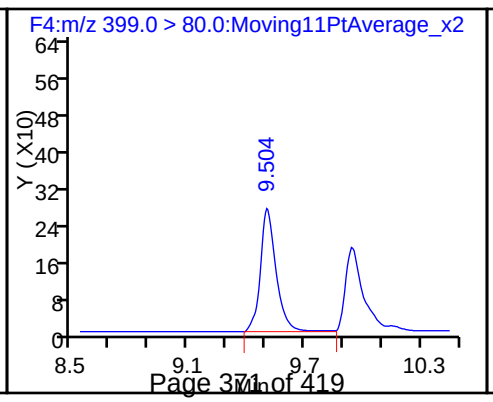
9 Perfluoroheptanoic acid



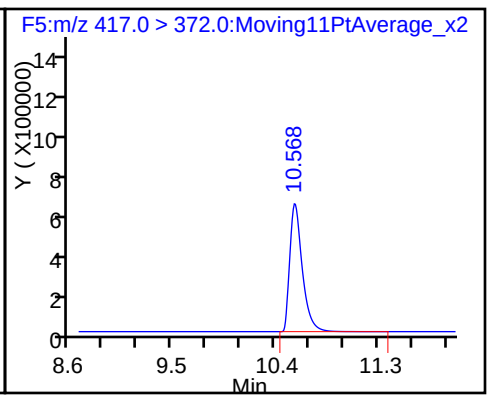
D 11 18O2 PFHxS



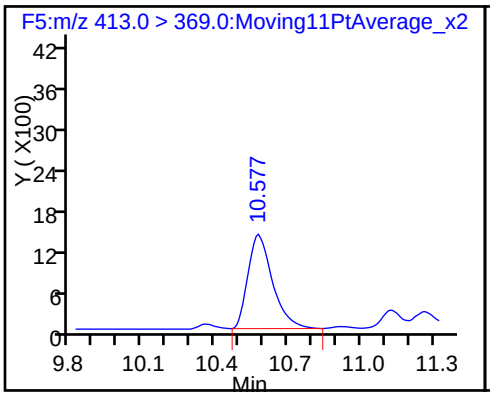
41 Perfluorohexanesulfonic acid



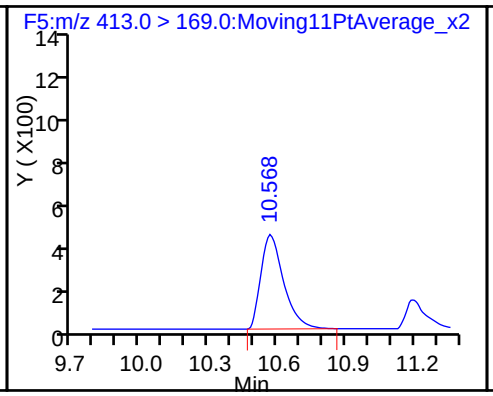
D 12 13C4 PFOA



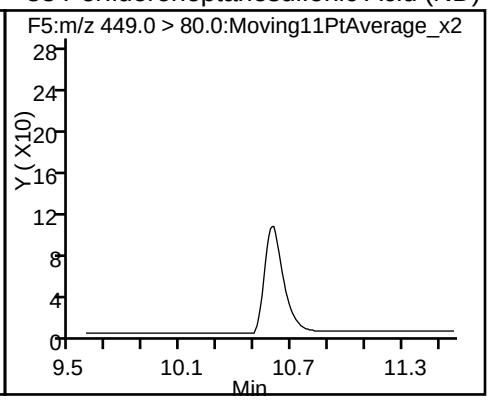
13 Perfluorooctanoic acid



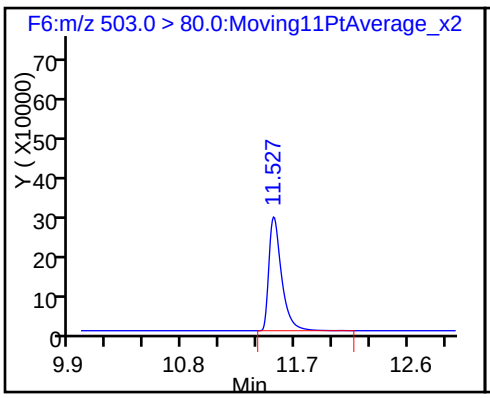
13 Perfluorooctanoic acid



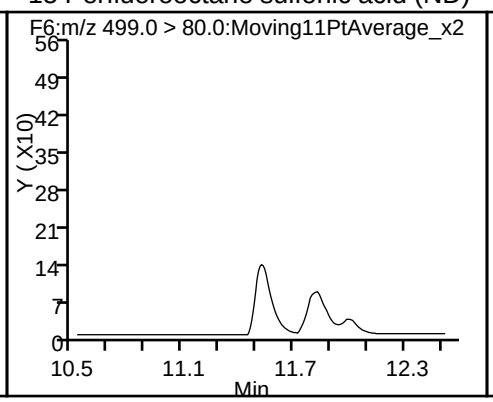
38 Perfluoroheptanesulfonic Acid (ND)



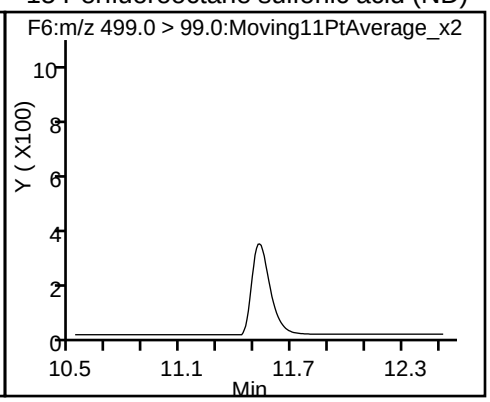
D 16 13C4 PFOS



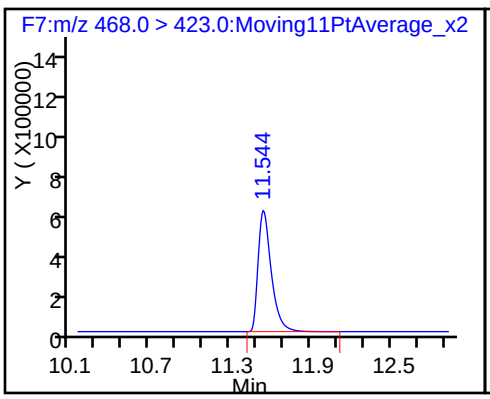
15 Perfluorooctane sulfonic acid (ND)



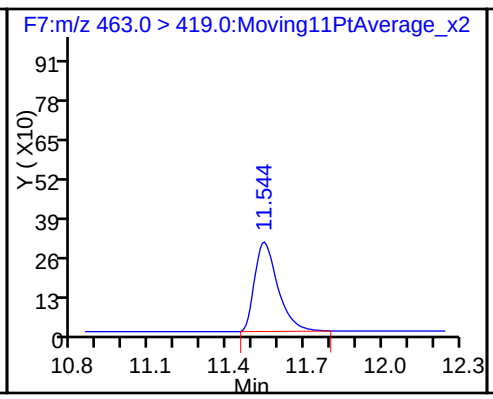
15 Perfluorooctane sulfonic acid (ND)



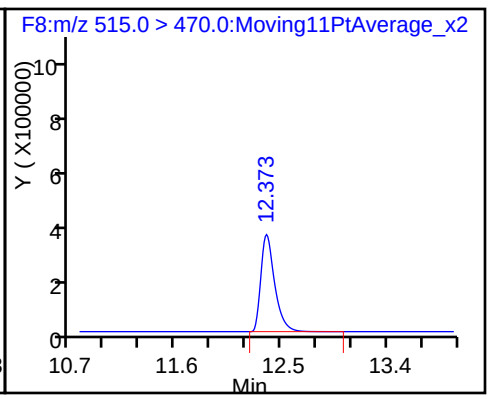
D 17 13C5 PFNA



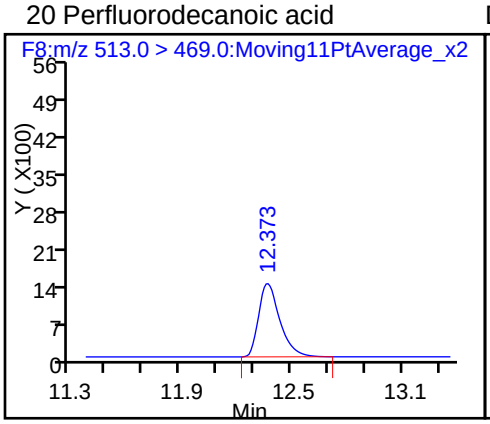
18 Perfluorononanoic acid



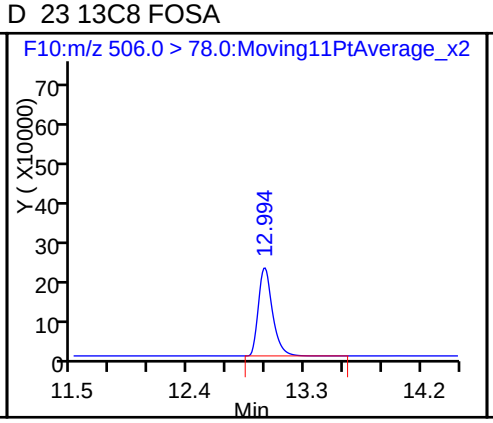
D 19 13C2 PFDA



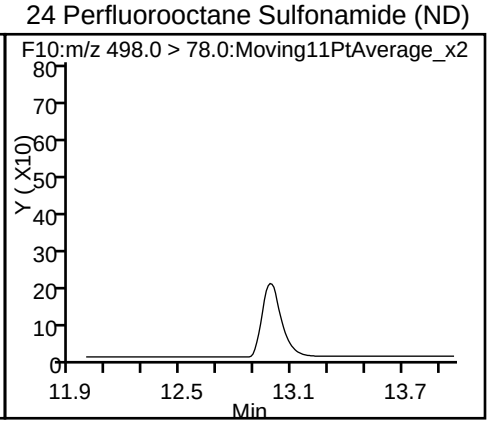
20 Perfluorodecanoic acid



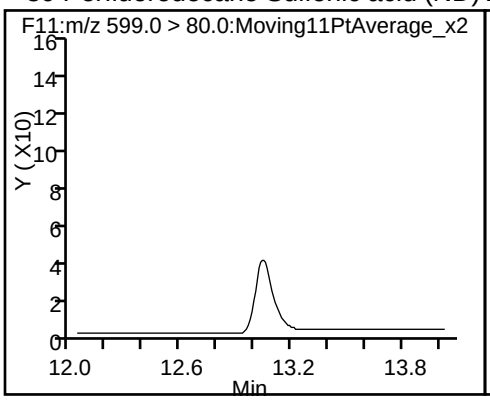
D 23 13C8 FOSA



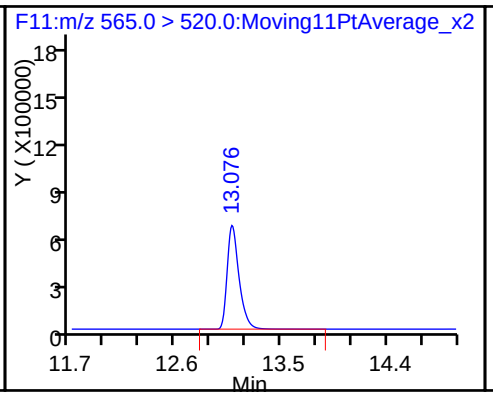
24 Perfluorooctane Sulfonamide (ND)



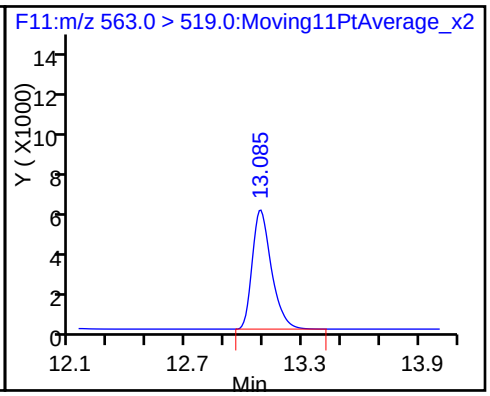
39 Perfluorodecane Sulfonic acid (ND)



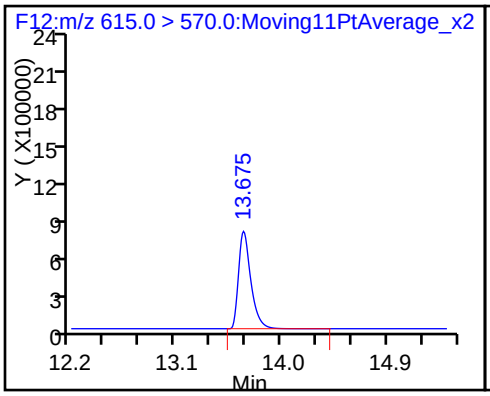
D 26 13C2 PFUnA



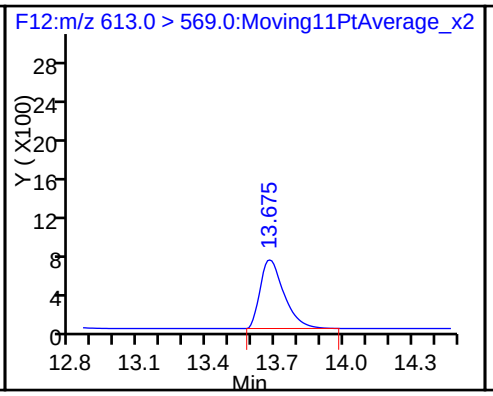
27 Perfluoroundecanoic acid



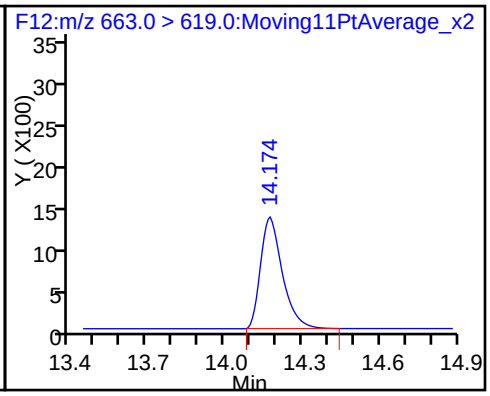
D 28 13C2 PFDoA



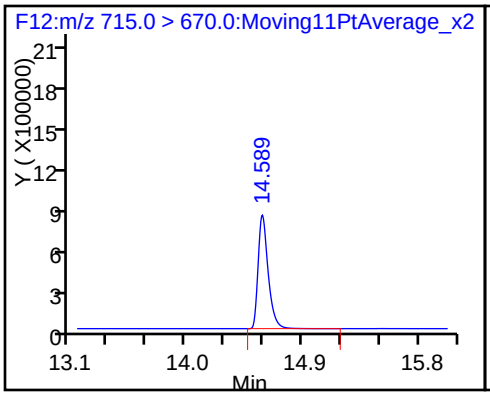
29 Perfluorododecanoic acid



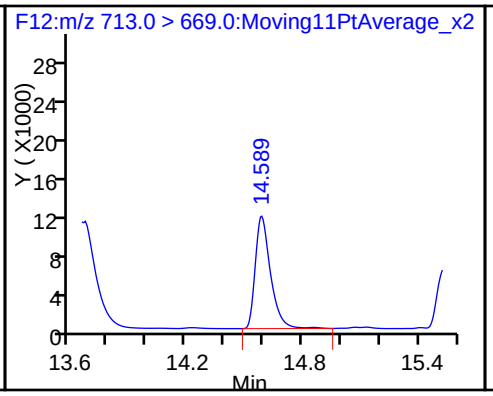
30 Perfluorotridecanoic acid



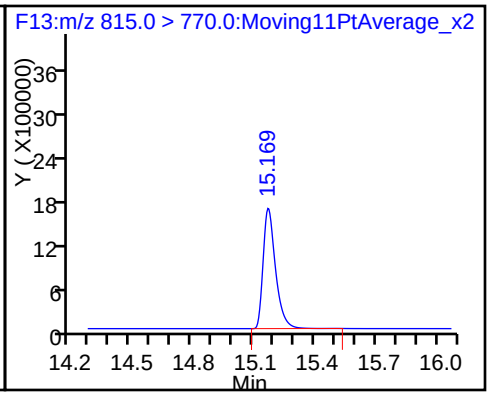
D 33 13C2-PFTeDA



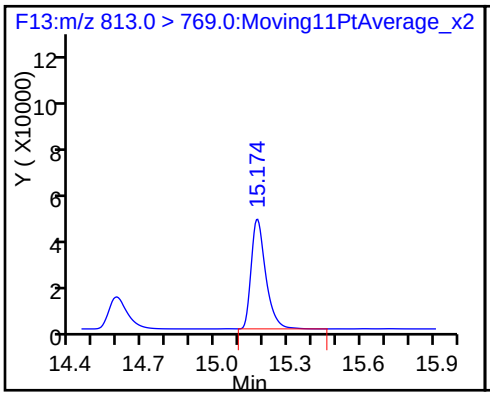
32 Perfluorotetradecanoic acid



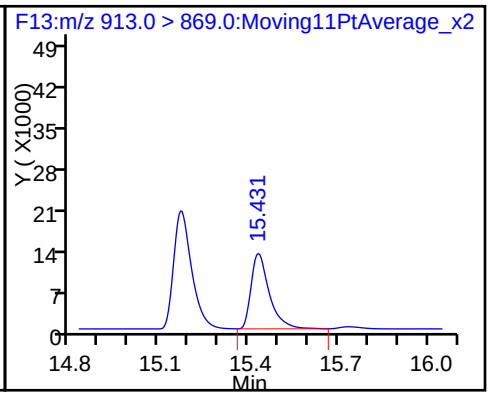
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-19198-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-112069/2-A

Matrix: Water | Lab File ID: 03JUN2016A6A_016.d

Analysis Method: WS-LC-0025 | Date Collected:

Extraction Method: 3535 | Date Extracted: 06/01/2016 11:06

Sample wt/vol: 500(mL) | Date Analyzed: 06/03/2016 21:48

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 112504 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	35.9		2.5	2.0	0.92
375-85-9	Perfluoroheptanoic acid (PFHpA)	44.8		2.5	2.0	0.80
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	37.5	M	2.5	2.0	0.87
375-95-1	Perfluorononanoic acid (PFNA)	45.3		2.5	2.0	0.65
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	38.5	M	4.0	3.0	1.3
335-67-1	Perfluorooctanoic acid (PFOA)	39.7		2.5	2.0	0.75

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	108		25-150
STL00990	13C4 PFOA	116		25-150
STL00991	13C4 PFOS	117		25-150
STL01892	13C4-PFHpA	111		25-150
STL00995	13C5 PFNA	104		25-150
STL00994	18O2 PFHxS	115		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_016.d
Lims ID: LCS 320-112069/2-A
Client ID:
Sample Type: LCS
Inject. Date: 03-Jun-2016 21:48:09 ALS Bottle#: 15 Worklist Smp#: 16
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-112069/2-a
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 06-Jun-2016 11:40:56 Calib Date: 03-Jun-2016 19:40:28
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:16:22

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.785	5.784	0.001		1452056	54.0		108	61774	
2 Perfluorobutyric acid										
212.9 > 169.0	5.788	5.786	0.002	1.000	792056	22.0		110	17200	
D 3 13C5-PFPeA										
267.9 > 223.0	6.941	6.939	0.002		3579758	57.2		114	4541	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.946	6.941	0.005	1.000	1419231	20.7		103	262	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.071	7.069	0.002	1.000	688282	17.9		101		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.071	7.069	0.002	1.000	688282	NC			121	
298.9 > 99.0	7.071	7.069	0.002	1.000	331951		2.07(0.00-0.00)		143	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.219	8.216	0.003	1.000	1526557	23.3		116	968	
D 6 13C2 PFHxA										
315.0 > 270.0	8.219	8.217	0.002		3579218	54.1		108	16419	
D 8 13C4-PFHpA										
367.0 > 322.0	9.458	9.456	0.002		4034627	55.6		111	11419	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.458	9.457	0.001	1.000	1683943	22.4		112	26586	
D 11 18O2 PFHxS										
403.0 > 84.0	9.493	9.492	0.001		1707747	54.3		115	3788	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.493	9.495	-0.002	1.000	516606	18.8		103		M
10 Perfluorohexane Sulfonate										
399.0 > 80.0	9.493	9.495	-0.002	1.000	448054	NC			938	
D 12 13C4 PFOA										
417.0 > 372.0	10.568	10.569	-0.001		4661874	58.1		116	8595	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
413.0 > 369.0	10.568	10.572	-0.004	1.000	1531972	19.9		99.3	1605	
413.0 > 169.0	10.577	10.572	0.005	1.001	599752		2.55(0.00-0.00)		1121	
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.577	10.581	-0.004	1.000	641871	NC			41239	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.577	10.581	-0.004	1.000	641871	21.9		115		
D 16 13C4 PFOS										
503.0 > 80.0	11.527	11.525	0.002		2153749	56.1		117	6625	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.527	11.527	0.0	1.000	971744	19.3		104	1067	M
499.0 > 99.0	11.527	11.527	0.0	1.000	503349		1.93(0.00-0.00)		7706	M
D 17 13C5 PFNA										
468.0 > 423.0	11.545	11.542	0.003		3691112	52.0		104	52856	
18 Perfluorononanoic acid										
463.0 > 419.0	11.545	11.543	0.002	1.000	1159151	22.7		113	42066	
D 19 13C2 PFDA										
515.0 > 470.0	12.373	12.373	0.0		2966674	51.7		103	15062	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.373	12.373	0.0	1.000	1352096	20.7		103	55034	
D 23 13C8 FOSA										
506.0 > 78.0	12.994	12.985	0.009		1600201	14.1		28.1	17327	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.984	12.987	-0.003	1.000	514549	24.5		123	5187	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.032	13.033	-0.001	1.000	655610	21.0		109		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.032	13.033	-0.001	1.000	655610	NC			29845	
D 26 13C2 PFUnA										
565.0 > 520.0	13.076	13.076	0.0		4309461	53.1		106	202811	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.076	13.077	-0.001	1.000	1685962	23.4		117	14110	
D 28 13C2 PFDoA										
615.0 > 570.0	13.666	13.663	0.003		5483168	54.4		109	28872	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.666	13.666	0.0	1.000	1542098	22.1		110	3066	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.167	14.165	0.002	1.000	2144533	21.2		106	2092	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.589	14.589	0.0		4415323	55.3		111	8446	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.596	14.589	0.007	1.000	1667432	19.9		99.7	709	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.175	15.177	-0.002		6246533	47.9		95.8	7676	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.179	15.177	0.002	1.000	2524149	18.5		92.3	3484	
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.436	15.437	-0.001	1.000	1979784	14.8		74.2	1785	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 06-Jun-2016 11:41:02 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_016.d

Injection Date: 03-Jun-2016 21:48:09 Instrument ID: A6

Lims ID: LCS 320-112069/2-A

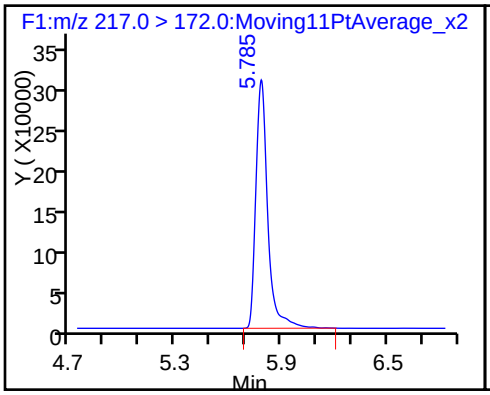
Client ID:

Operator ID: JRB ALS Bottle#: 15 Worklist Smp#: 16

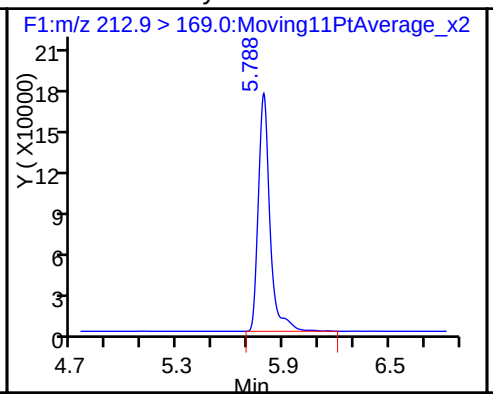
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

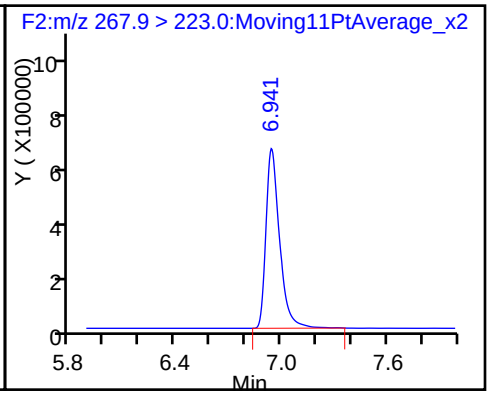
D 1 13C4 PFBA



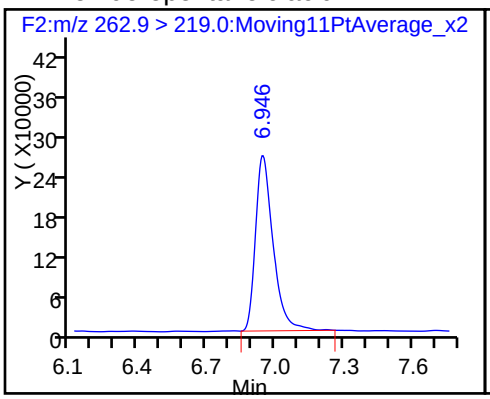
2 Perfluorobutyric acid



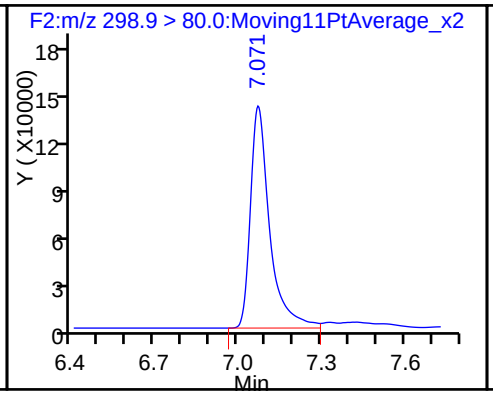
D 3 13C5-PFPeA



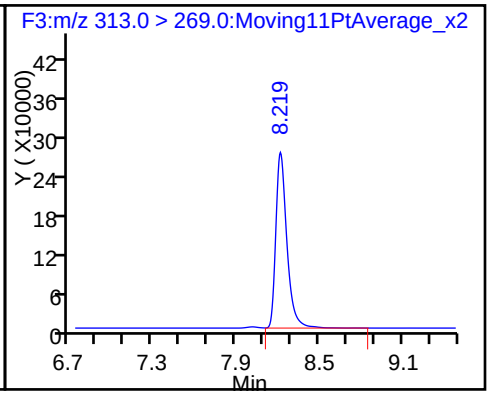
4 Perfluoropentanoic acid



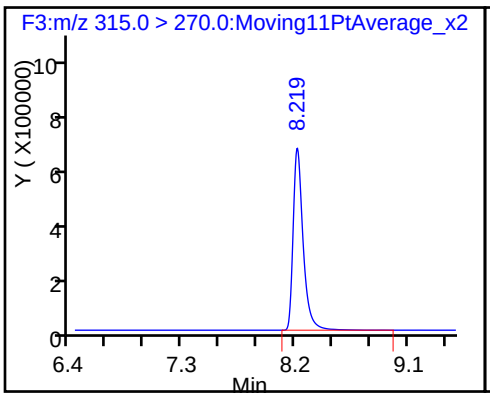
40 Perfluorobutanesulfonic acid



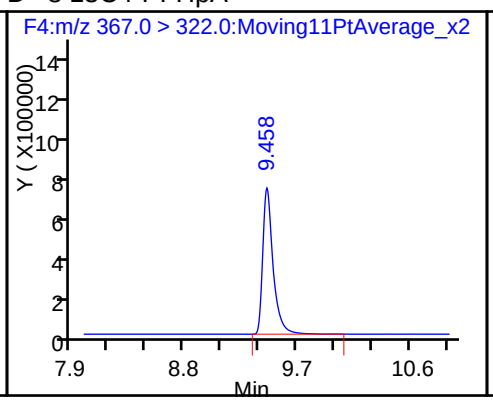
7 Perfluorohexanoic acid



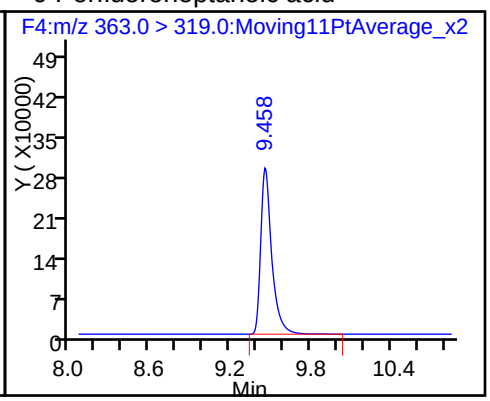
D 6 13C2 PFHxA



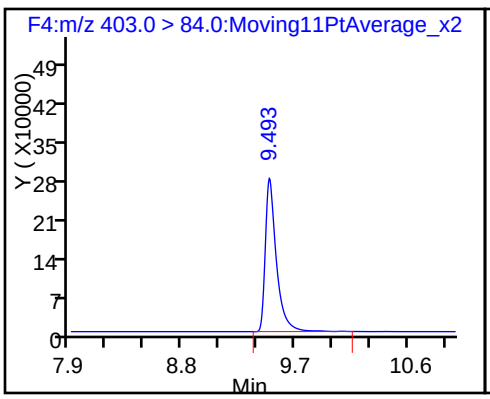
D 8 13C4-PFHpA



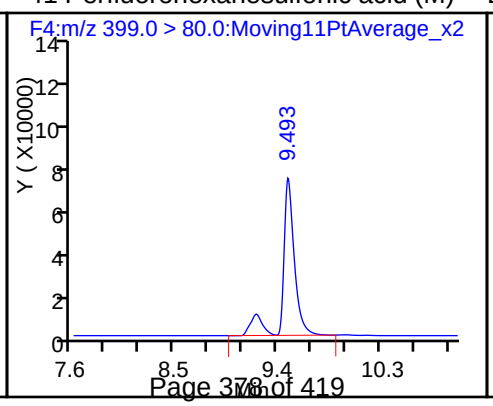
9 Perfluoroheptanoic acid



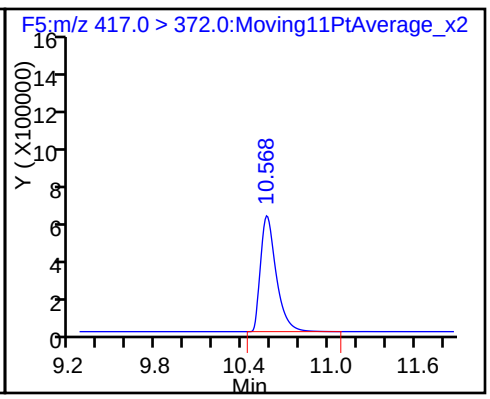
D 11 18O2 PFHxS



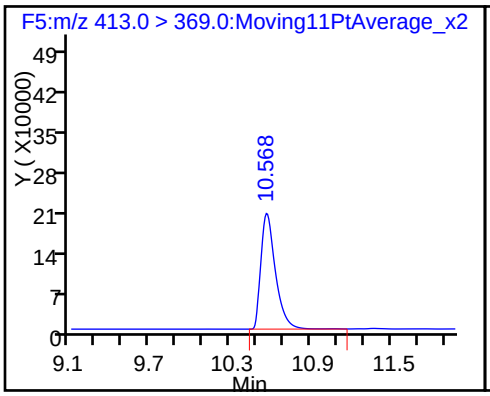
41 Perfluorohexanesulfonic acid (M)



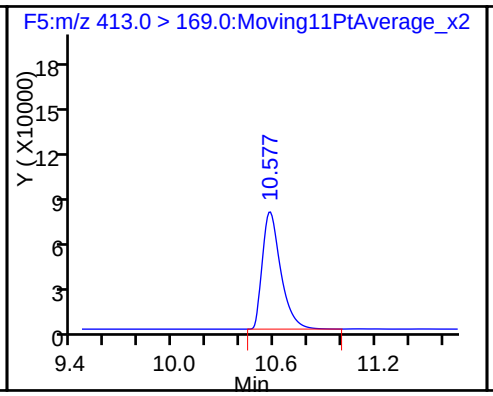
D 12 13C4 PFOA



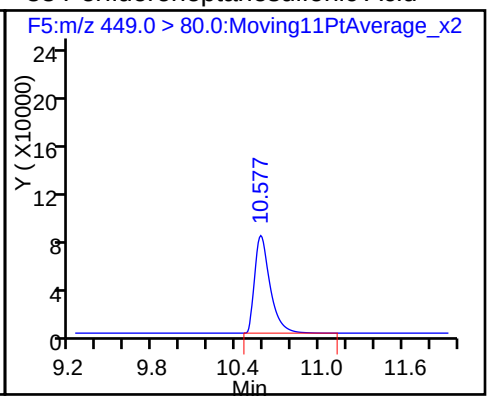
13 Perfluorooctanoic acid



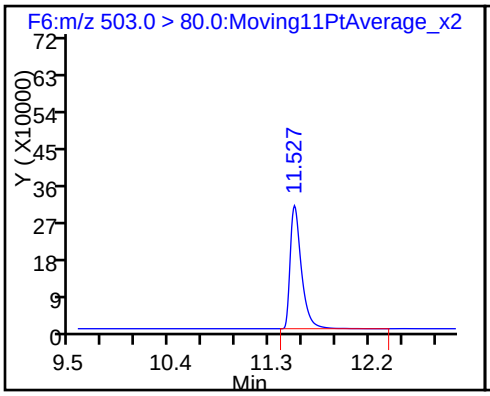
13 Perfluorooctanoic acid



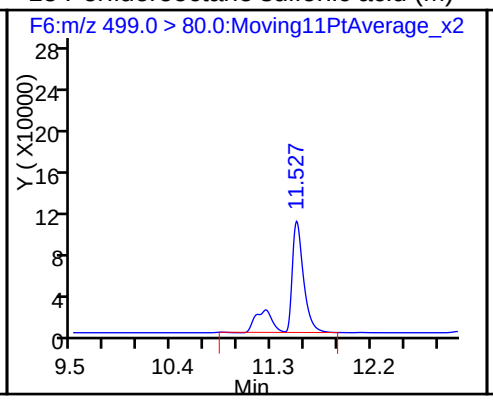
38 Perfluoroheptanesulfonic Acid



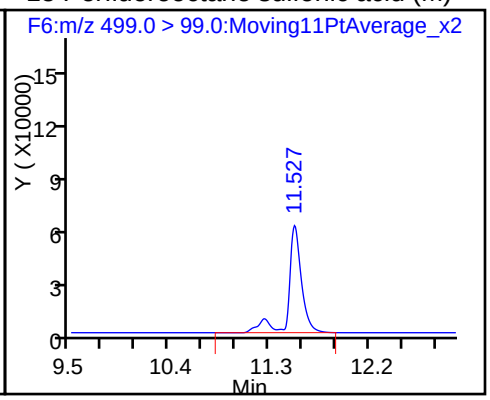
D 16 13C4 PFOS



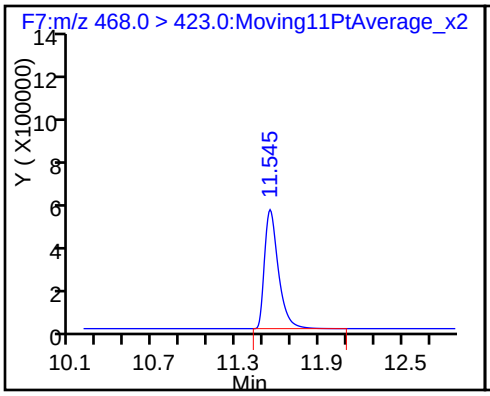
15 Perfluorooctane sulfonic acid (M)



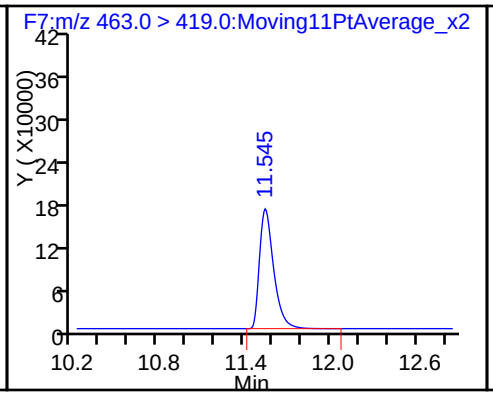
15 Perfluorooctane sulfonic acid (M)



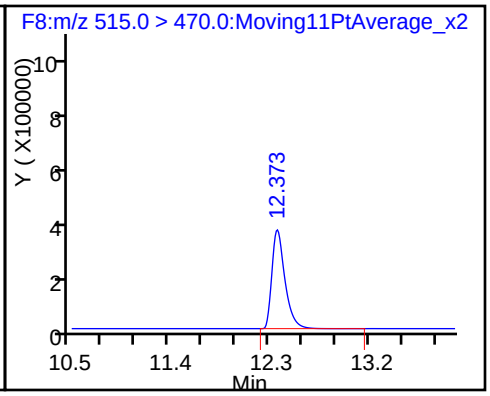
D 17 13C5 PFNA



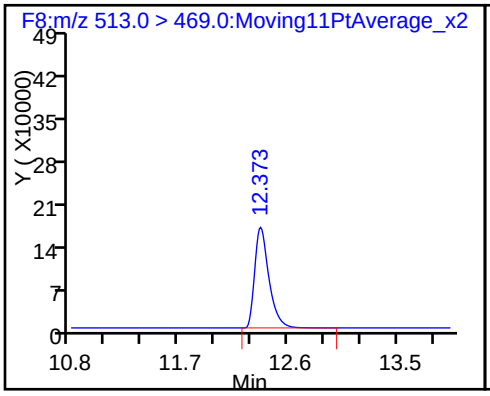
18 Perfluorononanoic acid



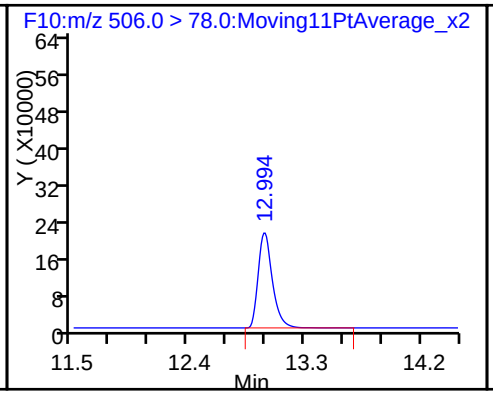
D 19 13C2 PFDA



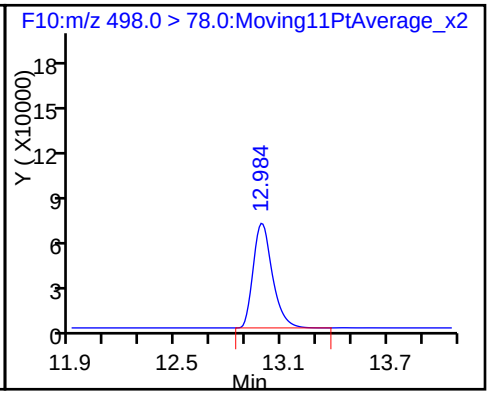
20 Perfluorodecanoic acid



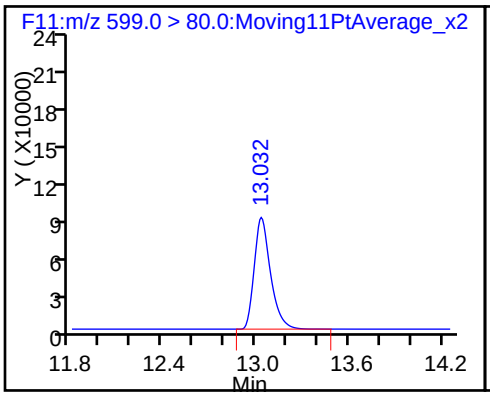
D 23 13C8 FOSA



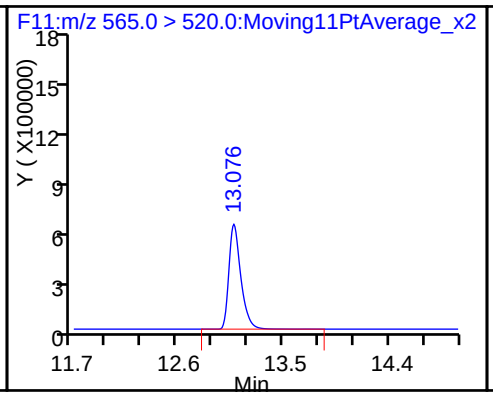
24 Perfluorooctane Sulfonamide



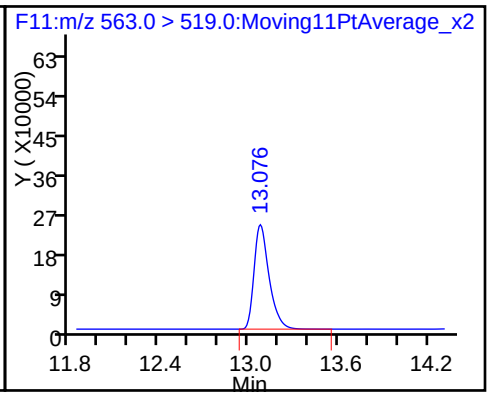
39 Perfluorodecane Sulfonic acid



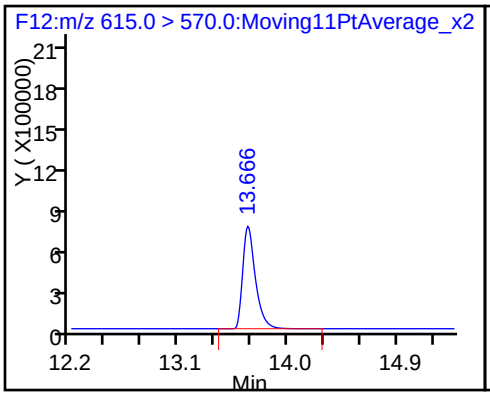
D 26 13C2 PFUnA



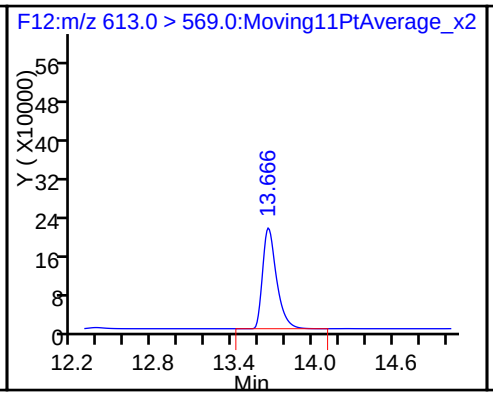
27 Perfluoroundecanoic acid



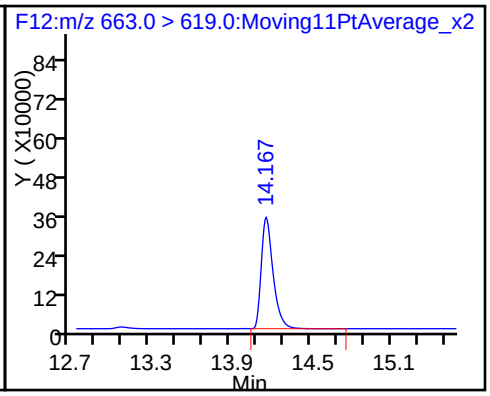
D 28 13C2 PFDoA



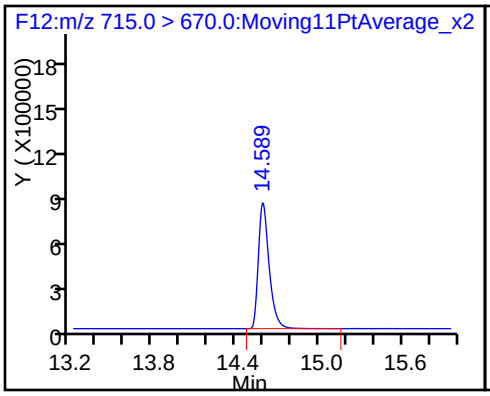
29 Perfluorododecanoic acid



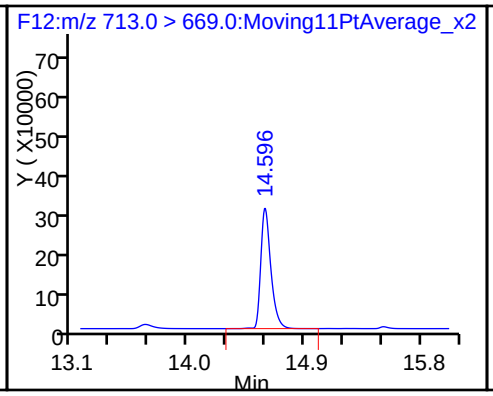
30 Perfluorotridecanoic acid



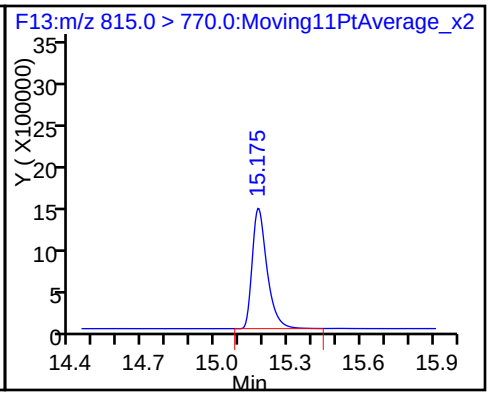
D 33 13C2-PFTeDA



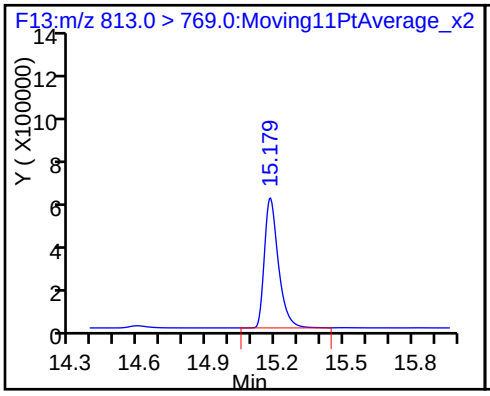
32 Perfluorotetradecanoic acid



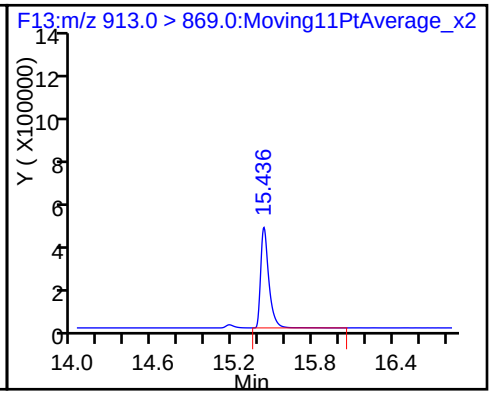
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

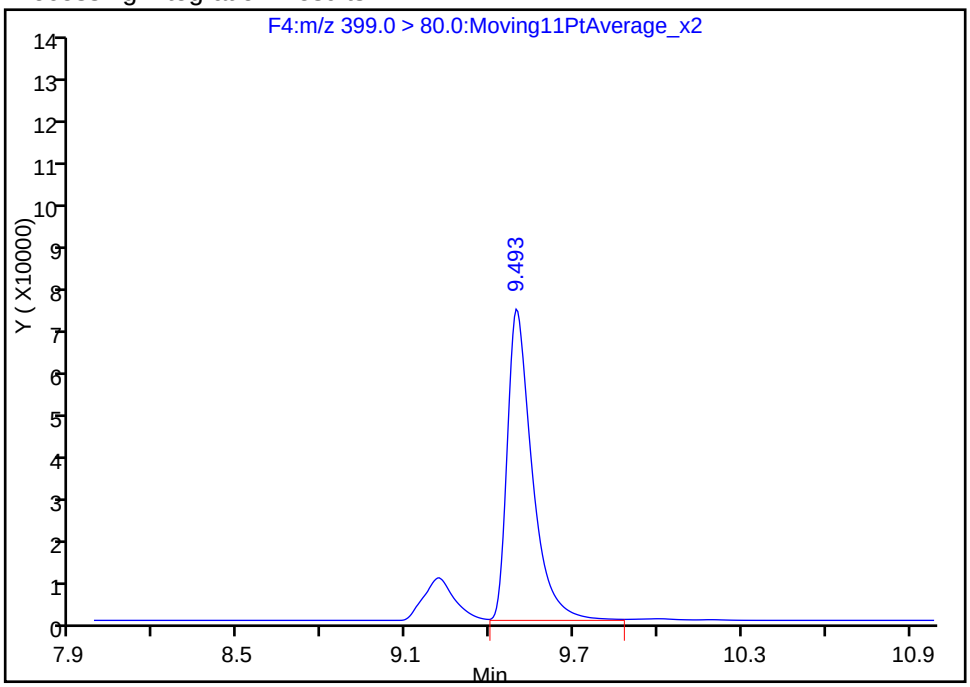
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_016.d
Injection Date: 03-Jun-2016 21:48:09 Instrument ID: A6
Lims ID: LCS 320-112069/2-A
Client ID:
Operator ID: JRB ALS Bottle#: 15 Worklist Smp#: 16
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

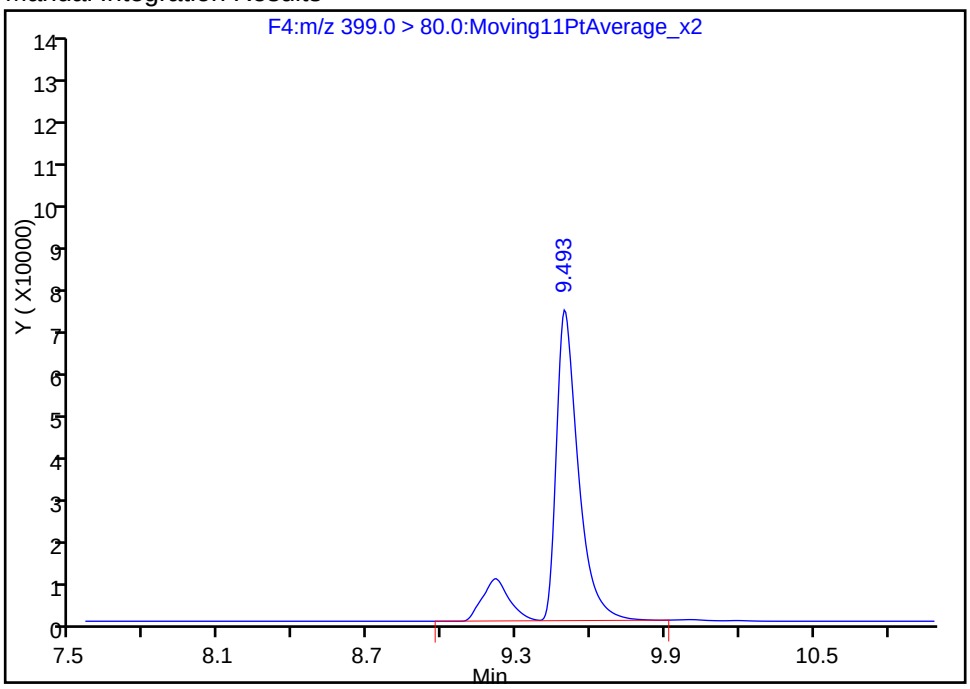
Processing Integration Results

RT: 9.49
Area: 448054
Amount: 16.264979
Amount Units: ng/ml



Manual Integration Results

RT: 9.49
Area: 516606
Amount: 18.753511
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:18:12
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

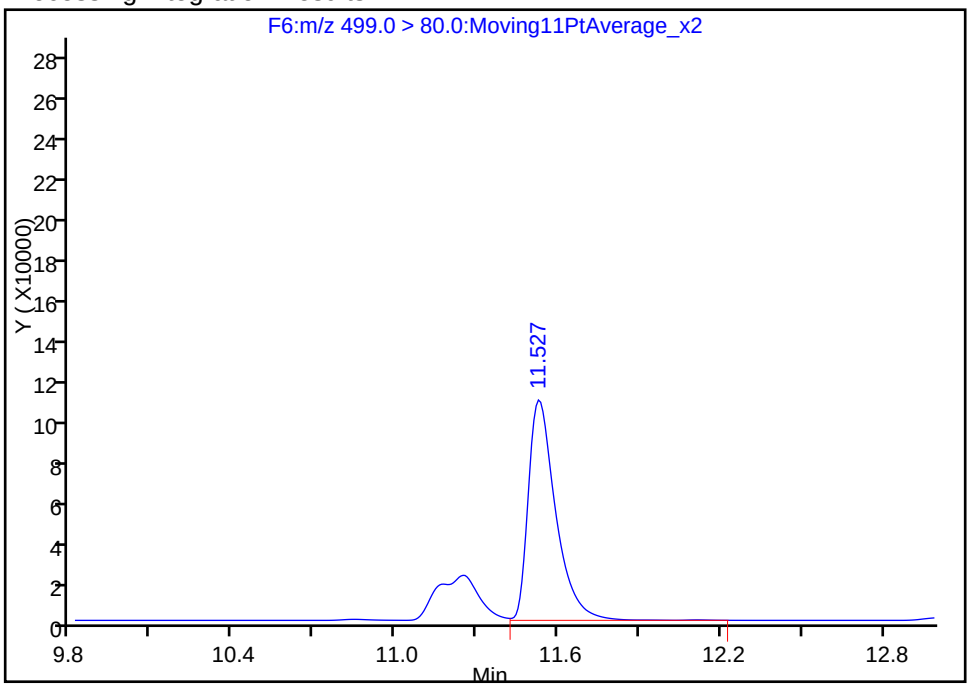
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_016.d
Injection Date: 03-Jun-2016 21:48:09 Instrument ID: A6
Lims ID: LCS 320-112069/2-A
Client ID:
Operator ID: JRB ALS Bottle#: 15 Worklist Smp#: 16
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

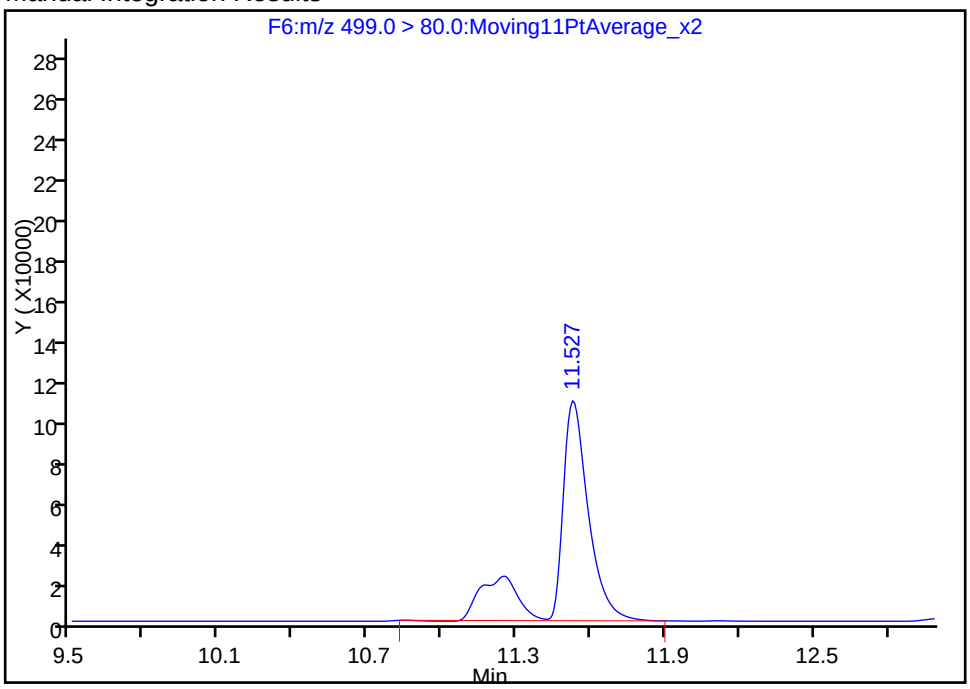
Processing Integration Results

RT: 11.53
Area: 754799
Amount: 14.962414
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 971744
Amount: 19.262924
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:18:12
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

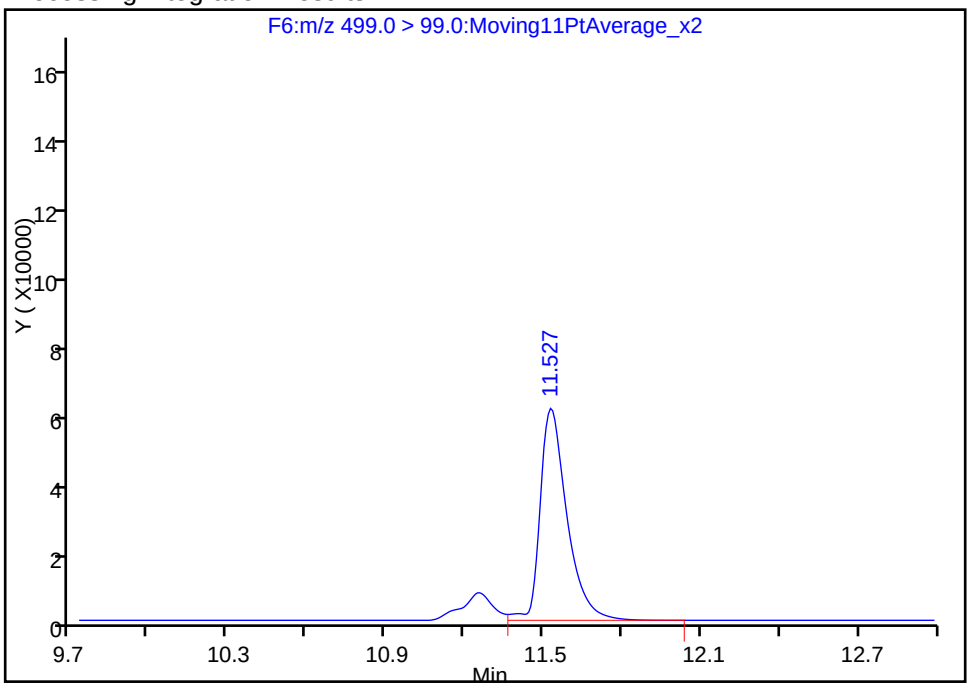
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_016.d
Injection Date: 03-Jun-2016 21:48:09 Instrument ID: A6
Lims ID: LCS 320-112069/2-A
Client ID:
Operator ID: JRB ALS Bottle#: 15 Worklist Smp#: 16
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

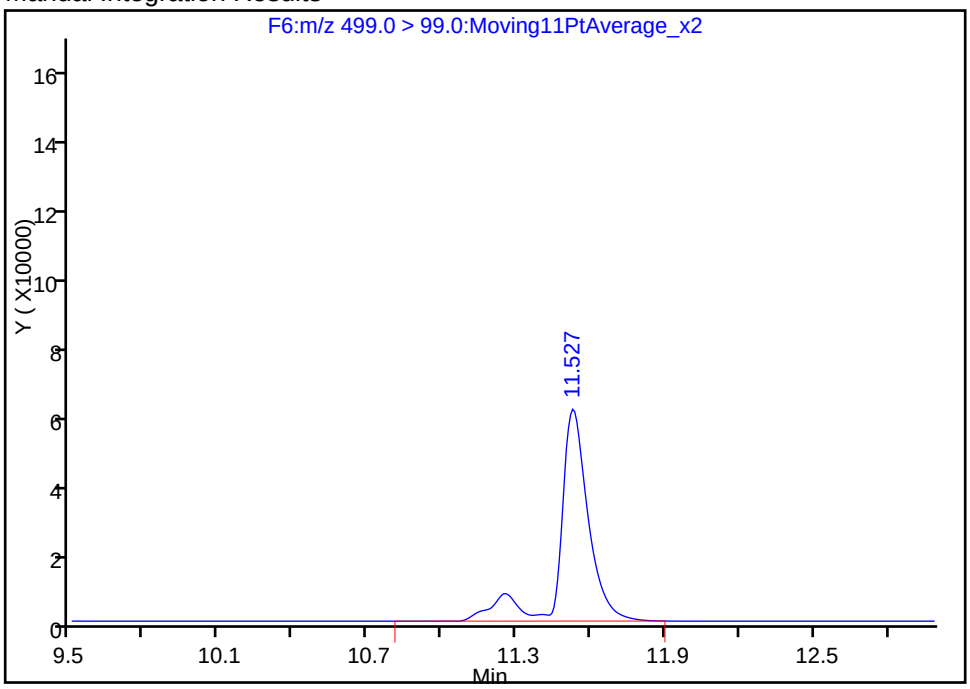
Processing Integration Results

RT: 11.53
Area: 439588
Amount: 14.962414
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 503349
Amount: 19.262924
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:18:12
Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-19198-1

SDG No.:

Client Sample ID: DW-57 MS | Lab Sample ID: 320-19198-1 MS

Matrix: Water | Lab File ID: 03JUN2016A6A_018.d

Analysis Method: WS-LC-0025 | Date Collected: 05/26/2016 11:01

Extraction Method: 3535 | Date Extracted: 06/01/2016 11:06

Sample wt/vol: 532.3(mL) | Date Analyzed: 06/03/2016 22:30

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 112504 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	34.8		2.3	1.9	0.86
375-85-9	Perfluoroheptanoic acid (PFHpA)	45.1		2.3	1.9	0.75
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	72.4	M	2.3	1.9	0.82
375-95-1	Perfluorononanoic acid (PFNA)	44.0		2.3	1.9	0.61
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	189	M 4	3.8	2.8	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	59.6	M	2.3	1.9	0.70

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	79		25-150
STL00990	13C4 PFOA	61		25-150
STL00991	13C4 PFOS	102		25-150
STL01892	13C4-PFHpA	72		25-150
STL00995	13C5 PFNA	49		25-150
STL00994	18O2 PFHxS	117		25-150

Report Date: 06-Jun-2016 11:41:04 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_018.d

Injection Date: 03-Jun-2016 22:30:42 Instrument ID: A6

Lims ID: 320-19198-A-1-A MS

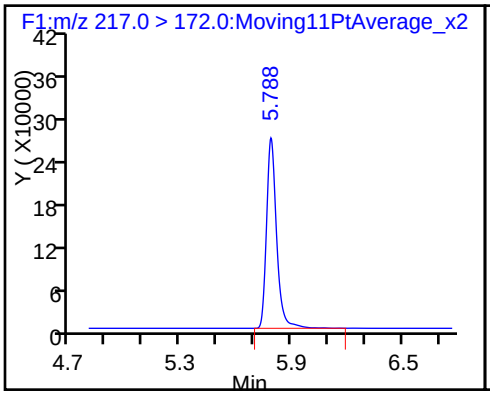
Client ID: DW-57

Operator ID: JRB ALS Bottle#: 17 Worklist Smp#: 18

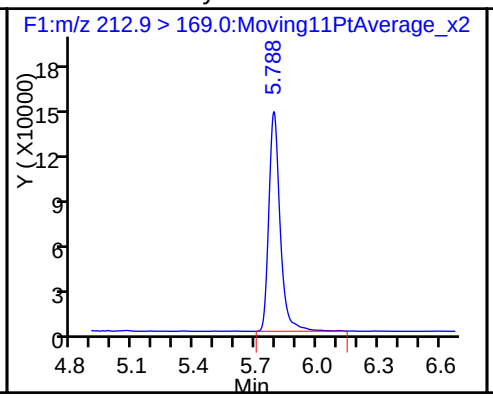
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

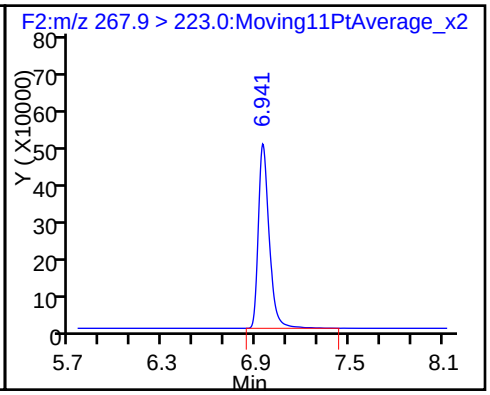
D 1 13C4 PFBA



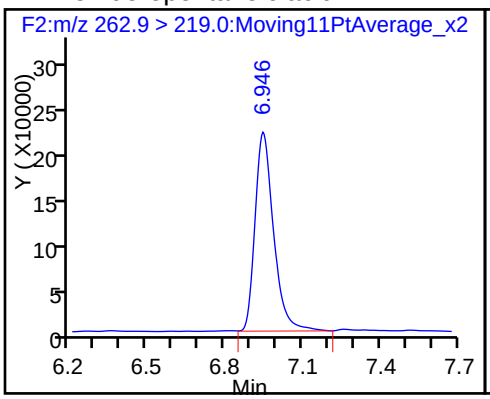
2 Perfluorobutyric acid



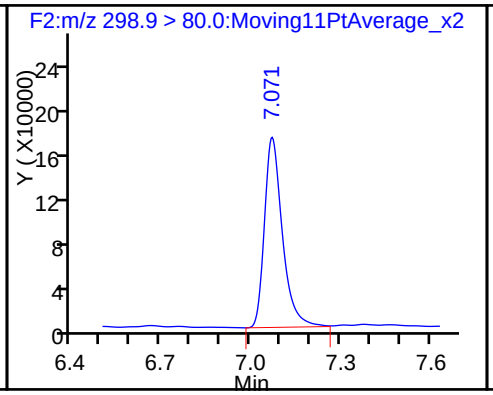
D 3 13C5-PFPeA



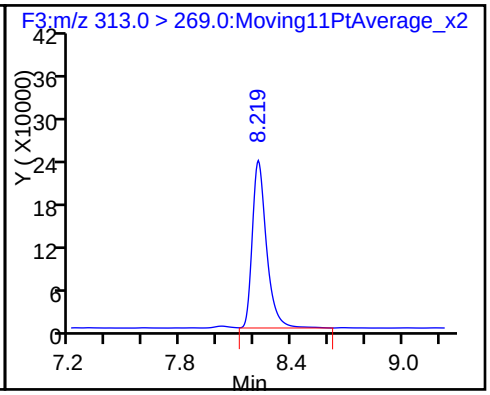
4 Perfluoropentanoic acid



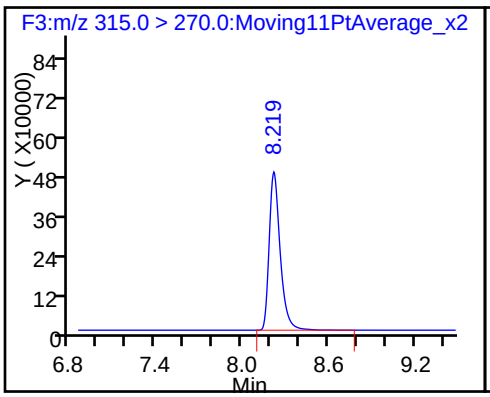
40 Perfluorobutanesulfonic acid



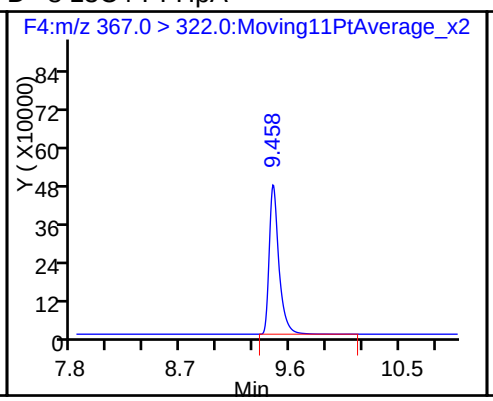
7 Perfluorohexanoic acid



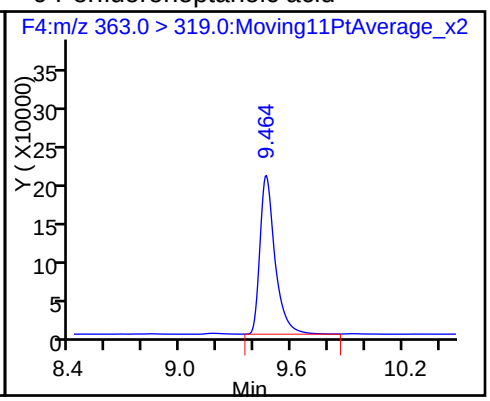
D 6 13C2 PFHxA



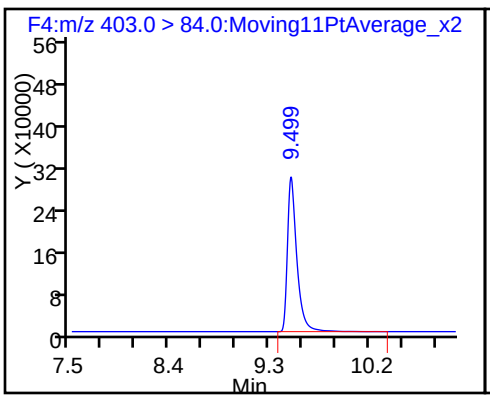
D 8 13C4-PFHpA



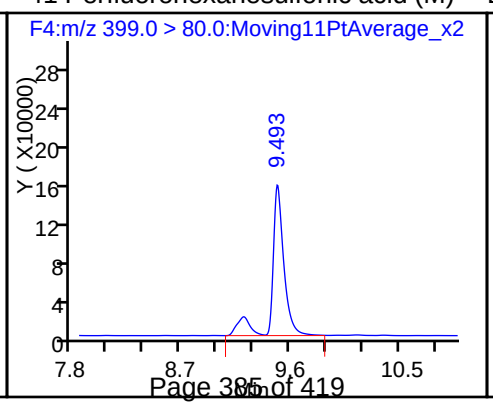
9 Perfluoroheptanoic acid



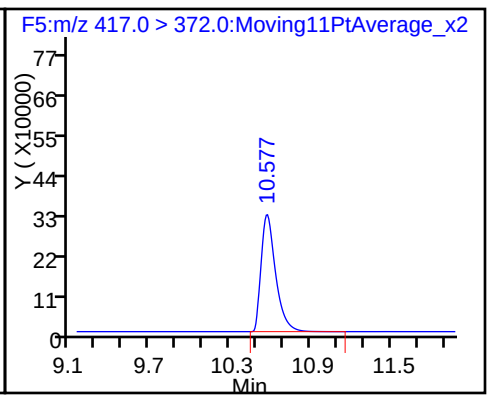
D 11 18O2 PFHxS



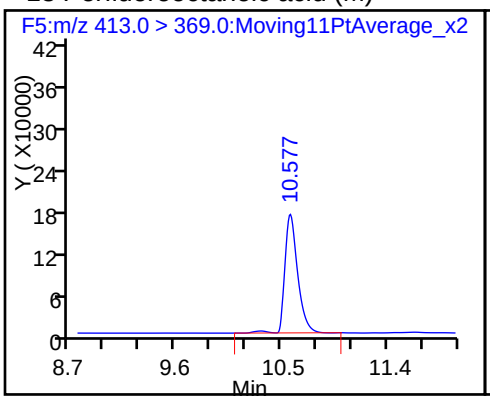
41 Perfluorohexanesulfonic acid (M)



D 12 13C4 PFOA



13 Perfluorooctanoic acid (M)



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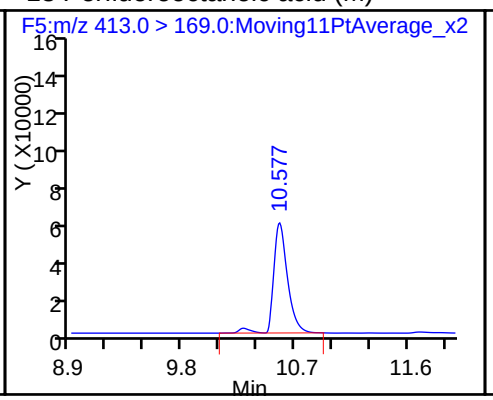
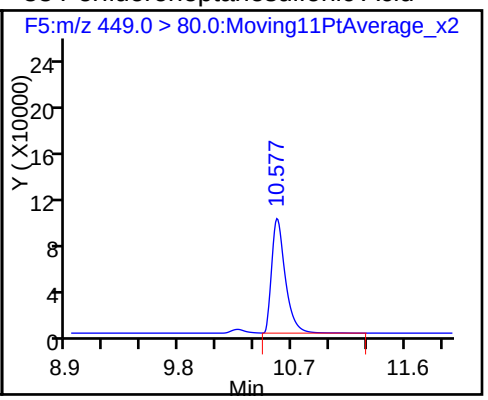
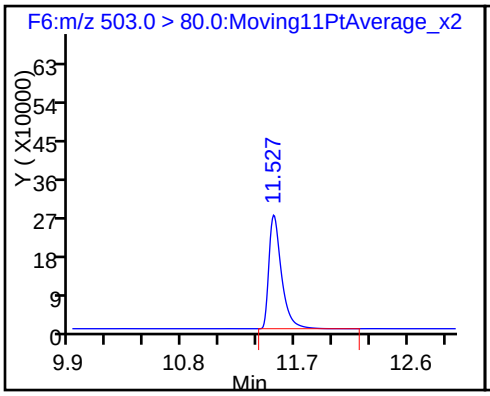


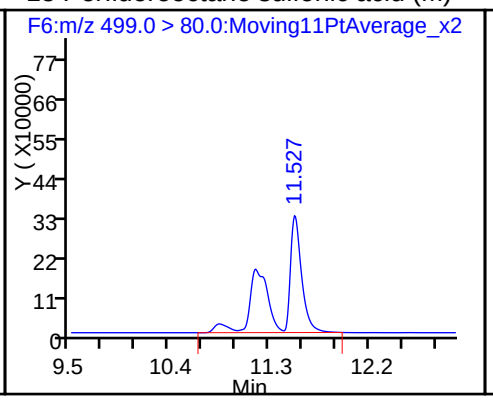
38 Perfluoroheptanesulfonic Acid



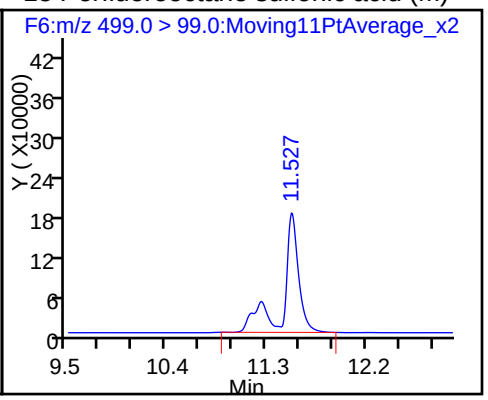
D 16 13C4 PFOS



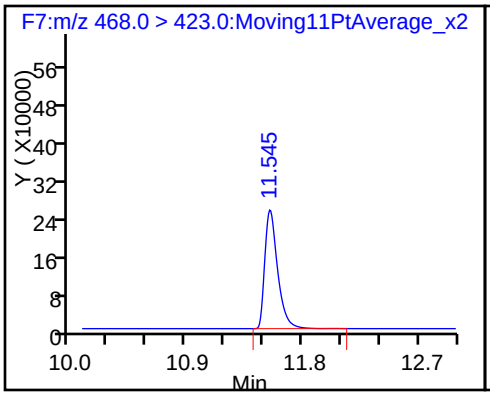
15 Perfluorooctane sulfonic acid (M)



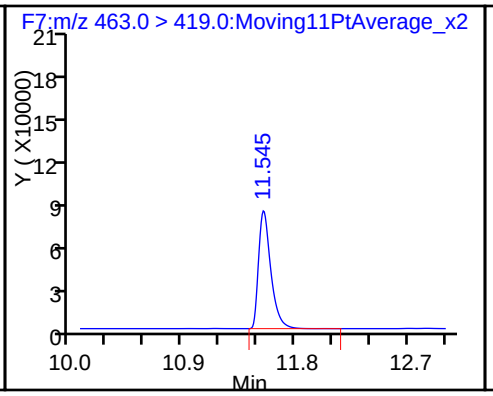
15 Perfluorooctane sulfonic acid (M)



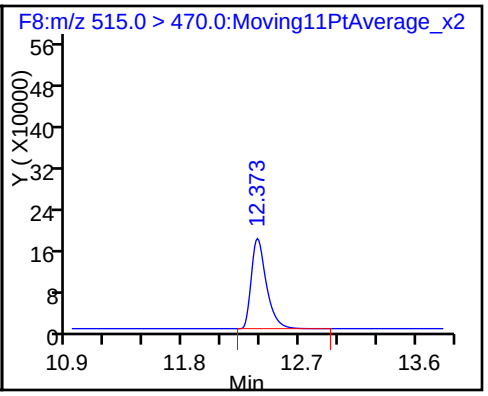
D 17 13C5 PFNA



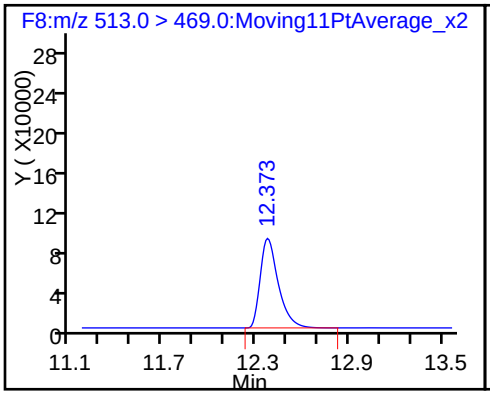
18 Perfluorononanoic acid



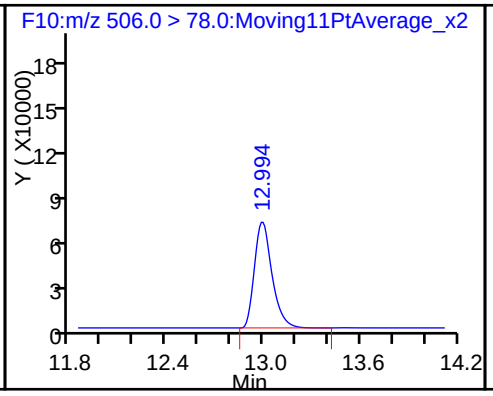
D 19 13C2 PFDA



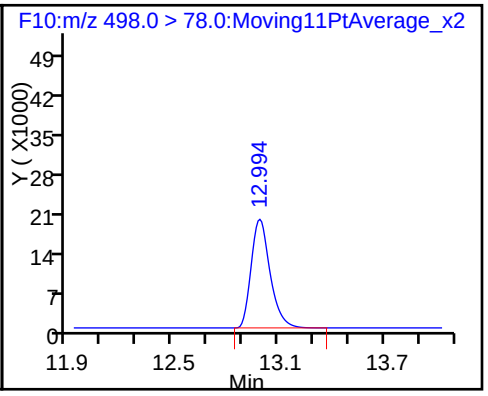
20 Perfluorodecanoic acid



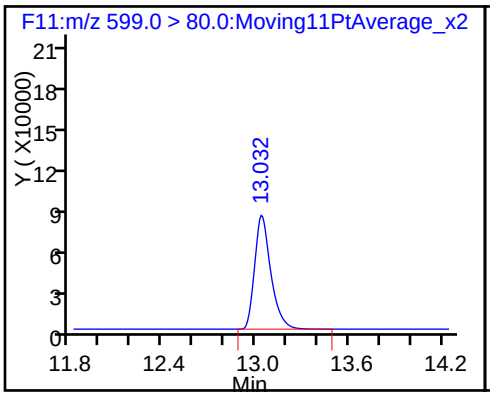
D 23 13C8 FOSA



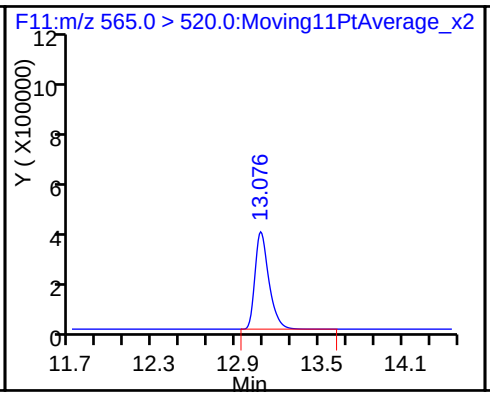
24 Perfluorooctane Sulfonamide



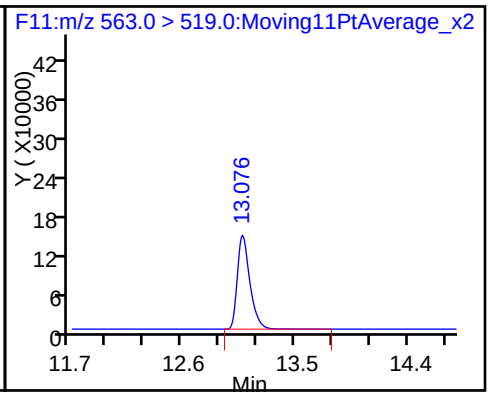
39 Perfluorodecane Sulfonic acid



D 26 13C2 PFUnA



27 Perfluoroundecanoic acid



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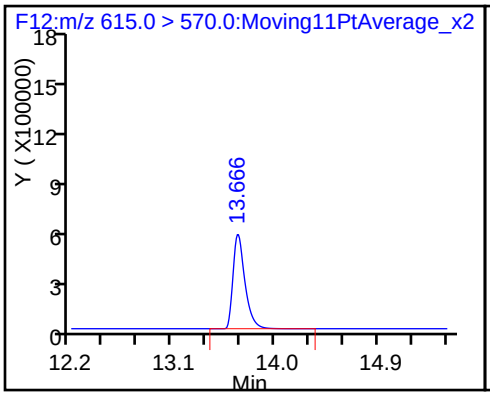
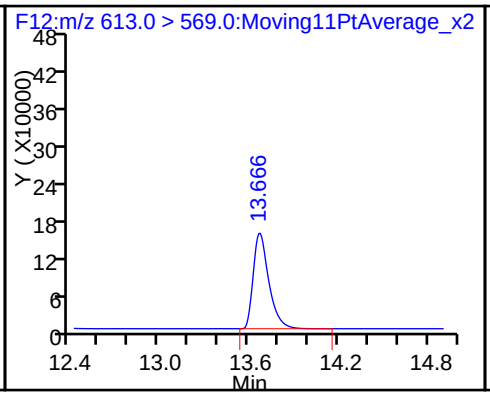
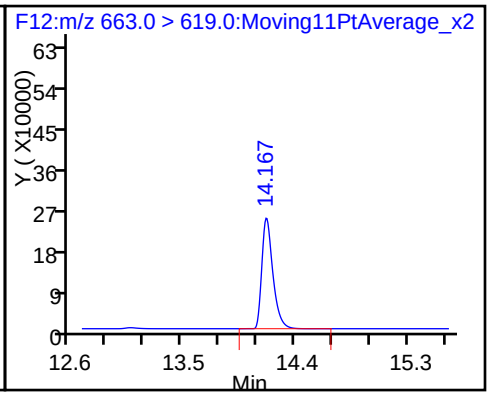


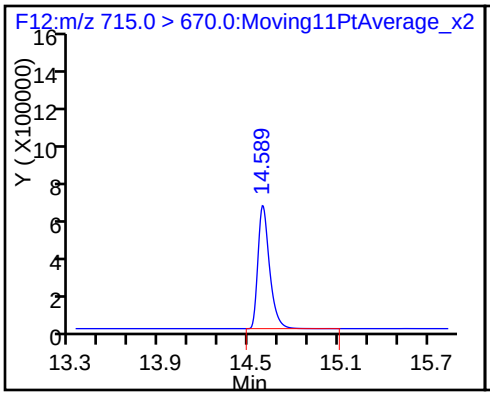
29 Perfluorododecanoic acid



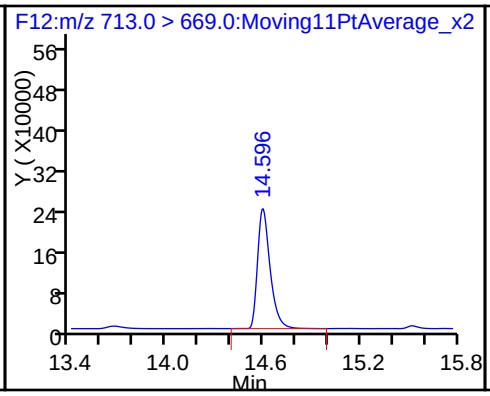
30 Perfluorotridecanoic acid



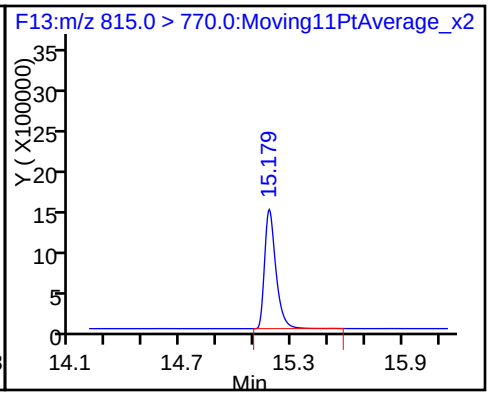
D 33 13C2-PFTeDA



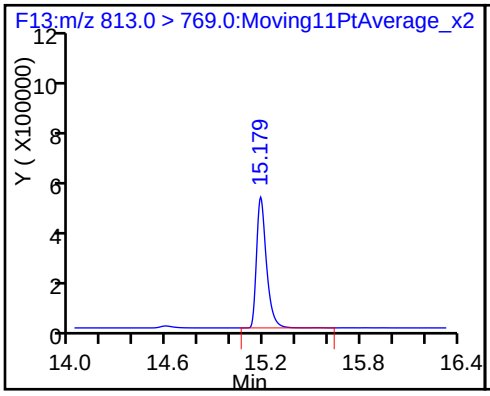
32 Perfluorotetradecanoic acid



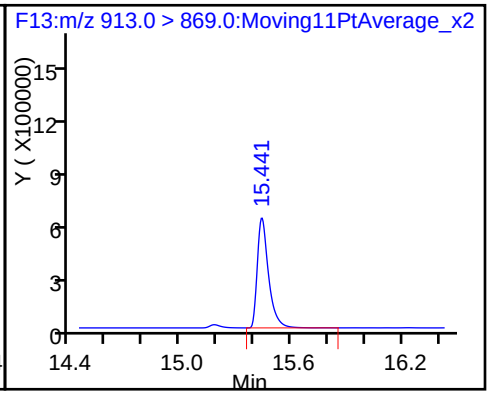
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

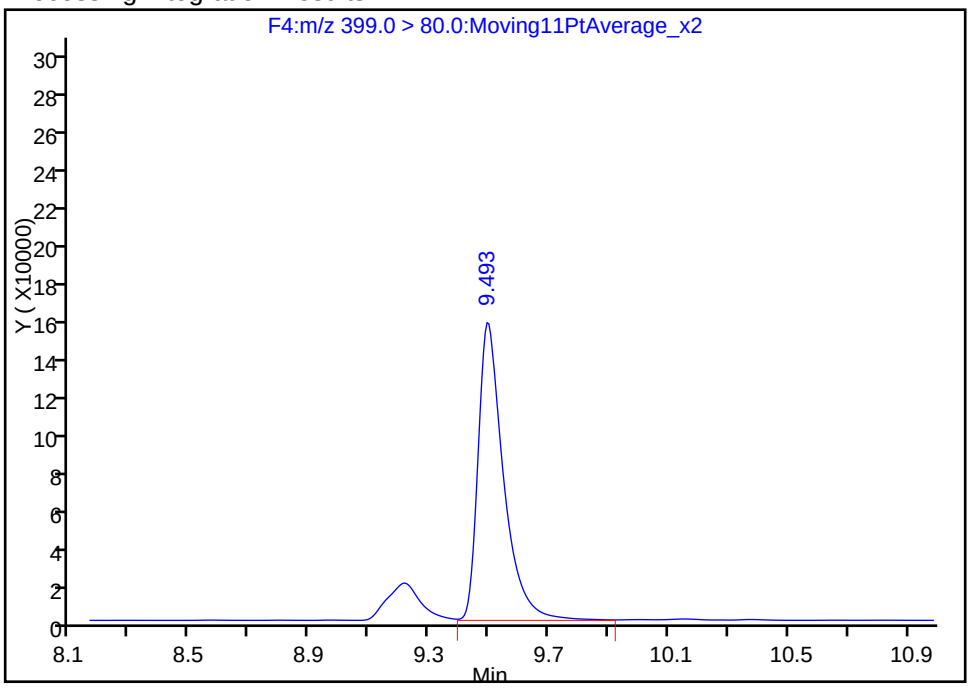
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_018.d				
Injection Date:	03-Jun-2016 22:30:42	Instrument ID:	A6		
Lims ID:	320-19198-A-1-A MS				
Client ID:	DW-57				
Operator ID:	JRB	ALS Bottle#:	17	Worklist Smp#:	18
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F4:MRM		

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

Processing Integration Results

RT: 9.49
Area: 935984
Amount: 33.216721
Amount Units: ng/ml



Manual Integration Results

RT: 9.49
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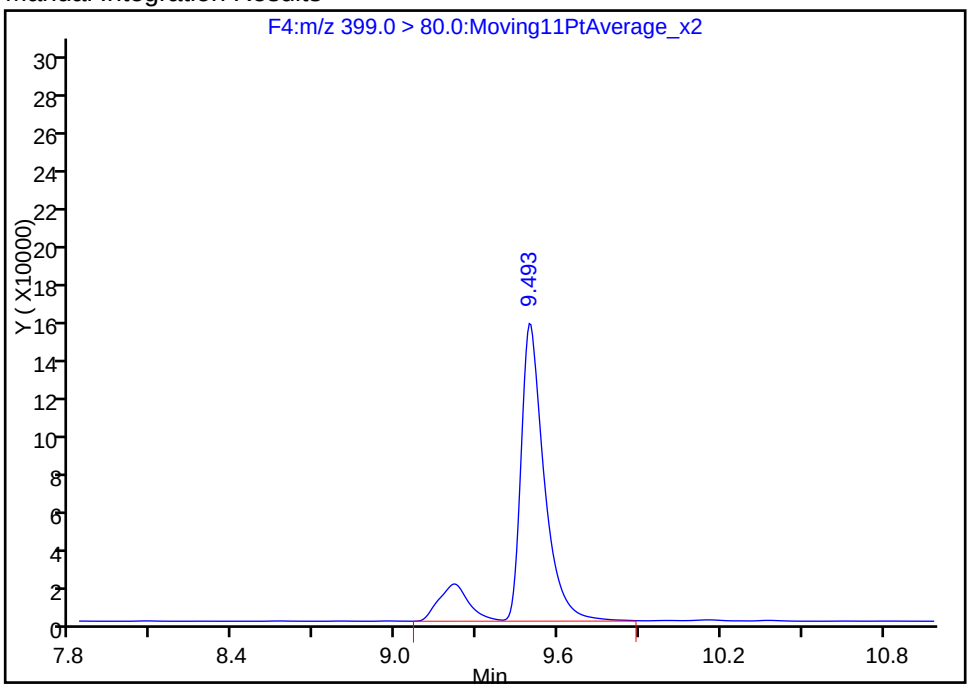
Amount: 38.528470
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:20:25

Audit Action: Assigned Compound ID Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

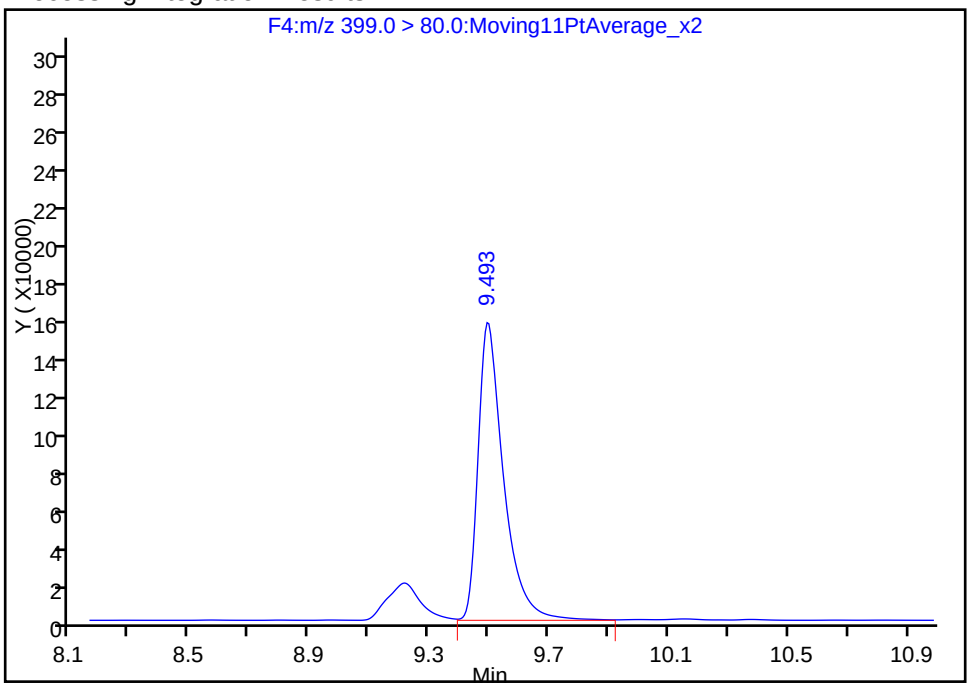
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_018.d				
Injection Date:	03-Jun-2016 22:30:42	Instrument ID:	A6		
Lims ID:	320-19198-A-1-A MS				
Client ID:	DW-57				
Operator ID:	JRB	ALS Bottle#:	17	Worklist Smp#:	18
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F4:MRM		

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

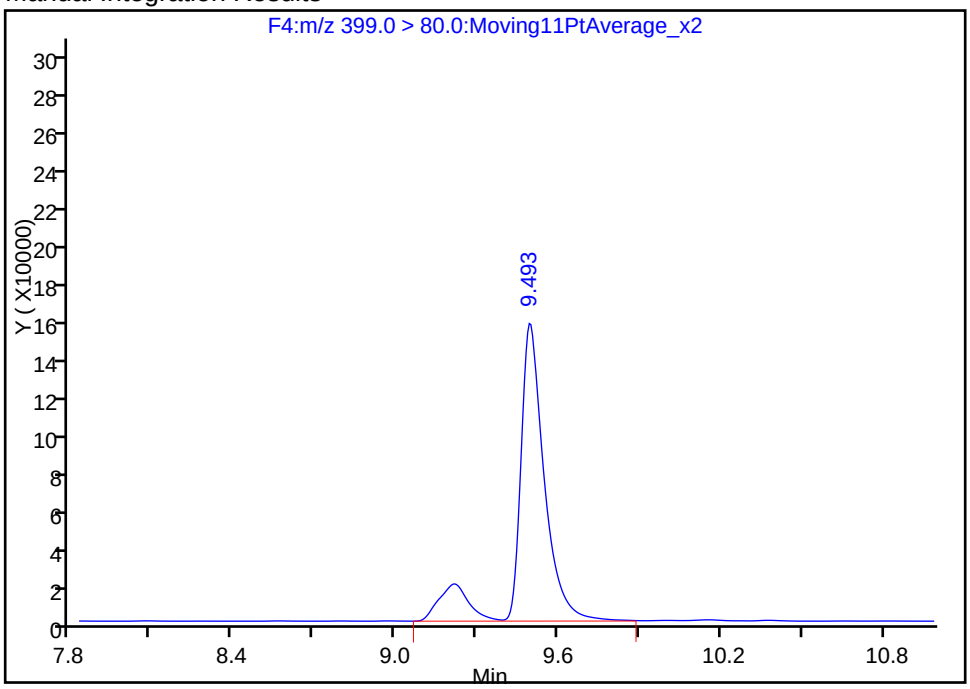
Processing Integration Results

RT: 9.49
Area: 935984
Amount: 33.216721
Amount Units: ng/ml



Manual Integration Results

RT: 9.49
Area: 1085659
Amount: 38.528470
Amount Units: ng/ml



Reviewer: barnettj, 06-Jun-2016 11:30:07

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_018.d				
Injection Date:	03-Jun-2016 22:30:42	Instrument ID:	A6		
Lims ID:	320-19198-A-1-A MS				
Client ID:	DW-57				
Operator ID:	JRB	ALS Bottle#:	17	Worklist Smp#:	18
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F6:MRM		

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

Processing Integration Results

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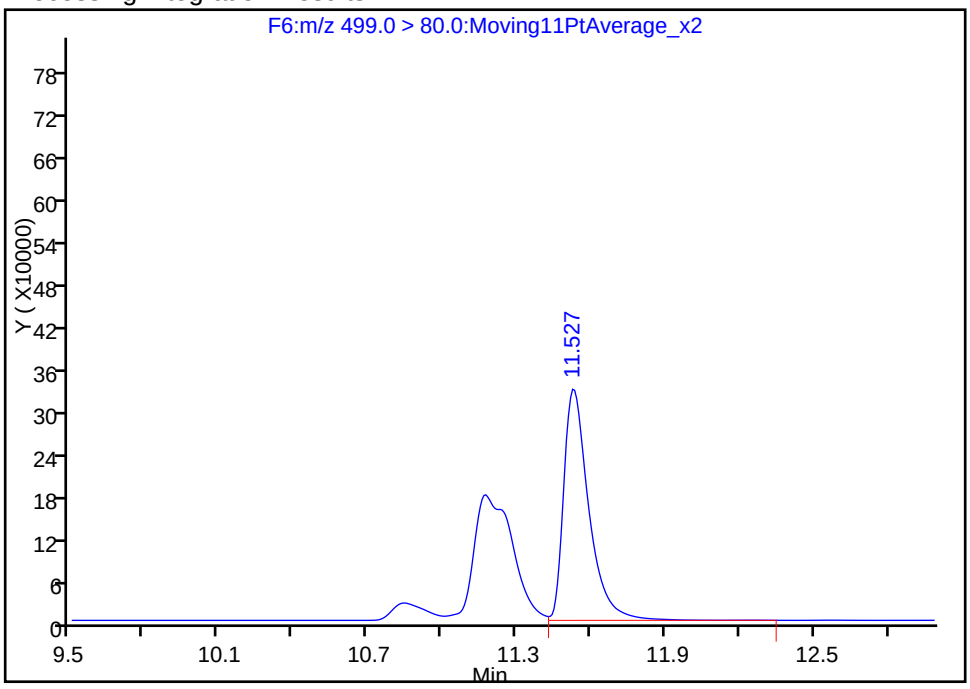
Amount: 52.651202
Amount Units: ng/ml



Manual Integration Results

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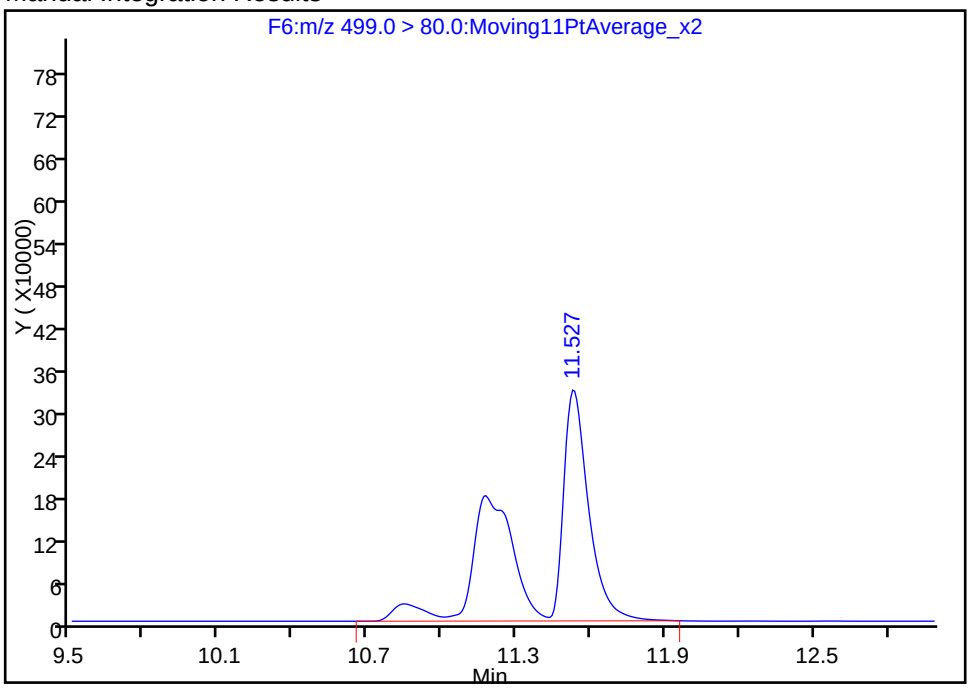
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:20:25

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

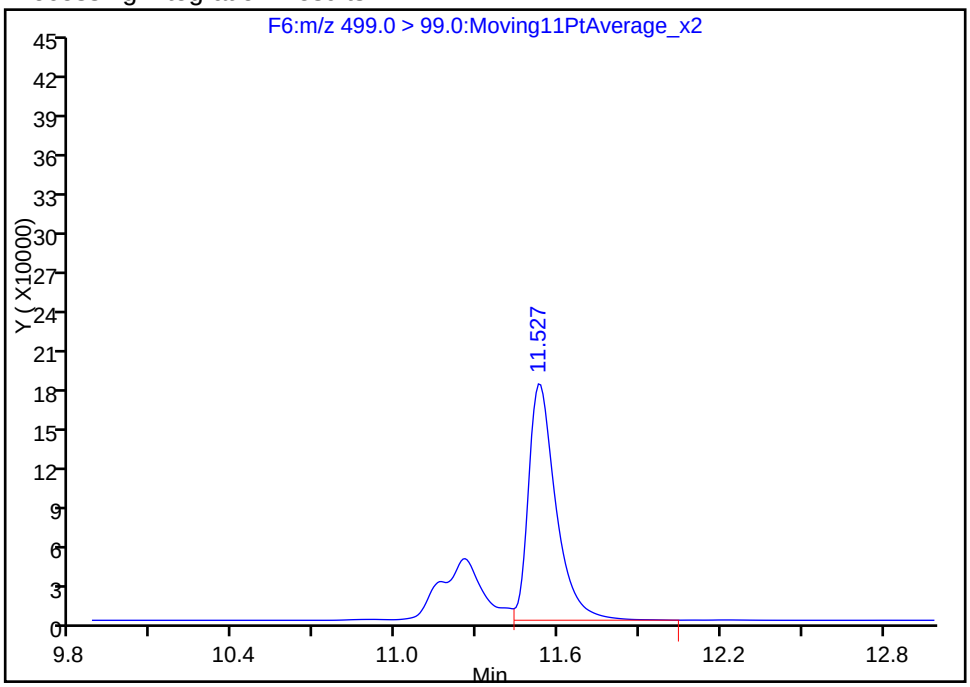
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_018.d
Injection Date: 03-Jun-2016 22:30:42 Instrument ID: A6
Lims ID: 320-19198-A-1-A MS
Client ID: DW-57
Operator ID: JRB ALS Bottle#: 17 Worklist Smp#: 18
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

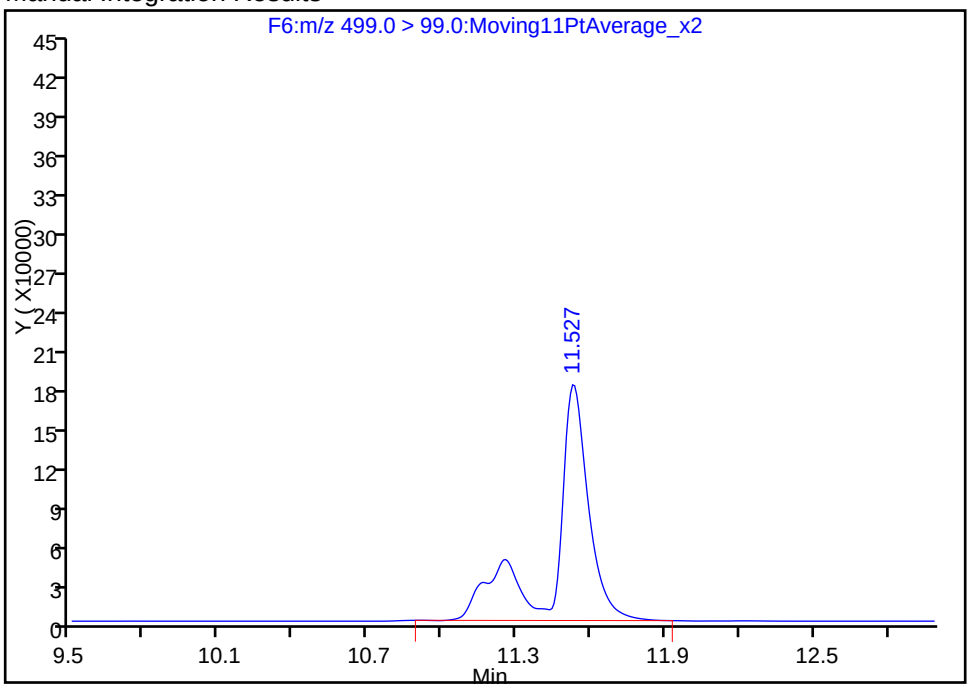
Processing Integration Results

RT: 11.53
Area: 1274490
Amount: 52.651202
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 1759263
Amount: 100.8433
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:20:25
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

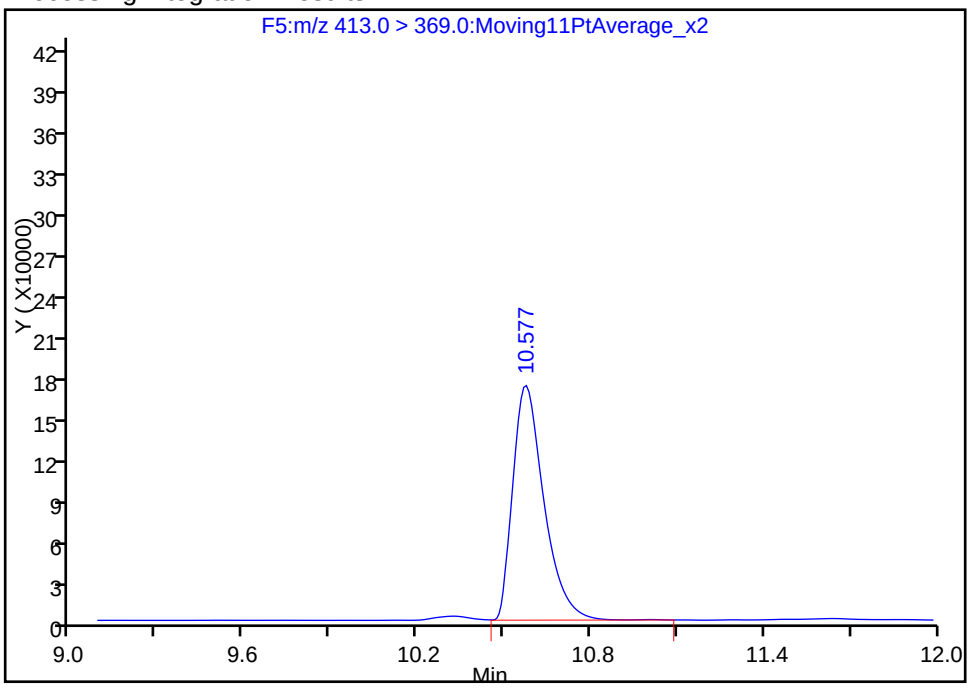
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_018.d				
Injection Date:	03-Jun-2016 22:30:42	Instrument ID:	A6		
Lims ID:	320-19198-A-1-A MS				
Client ID:	DW-57				
Operator ID:	JRB	ALS Bottle#:	17	Worklist Smp#:	18
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F5:MRM		

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

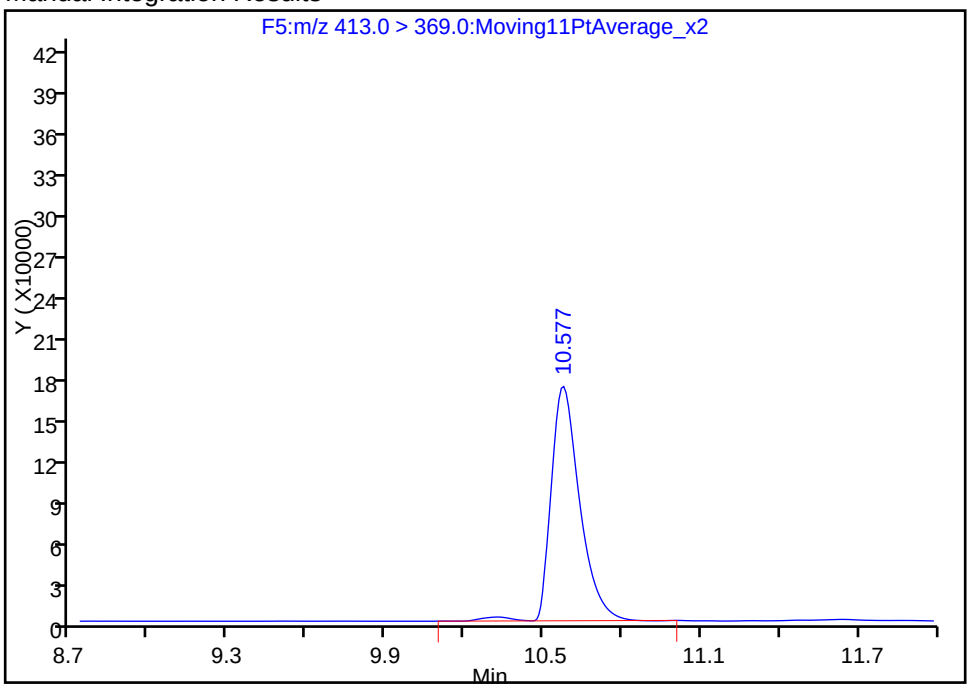
Processing Integration Results

RT: 10.58
Area: 1280665
Amount: 32.394011
Amount Units: ng/ml



Manual Integration Results

RT: 10.58
Area: 1294684
Amount: 31.743392
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:20:25

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

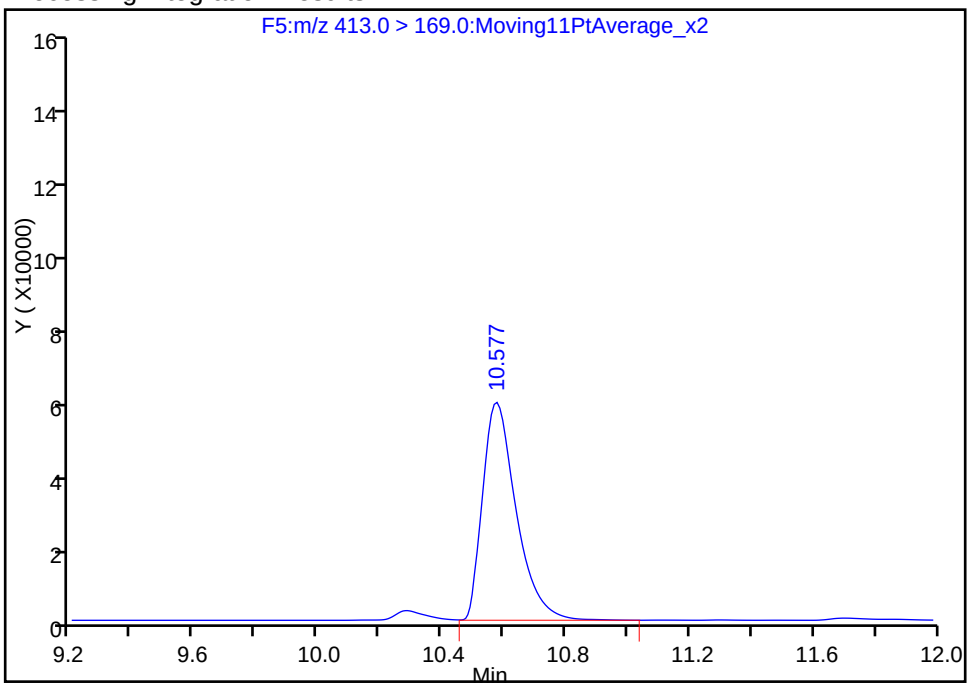
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_018.d				
Injection Date:	03-Jun-2016 22:30:42	Instrument ID:	A6		
Lims ID:	320-19198-A-1-A MS				
Client ID:	DW-57				
Operator ID:	JRB	ALS Bottle#:	17	Worklist Smp#:	18
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F5:MRM		

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

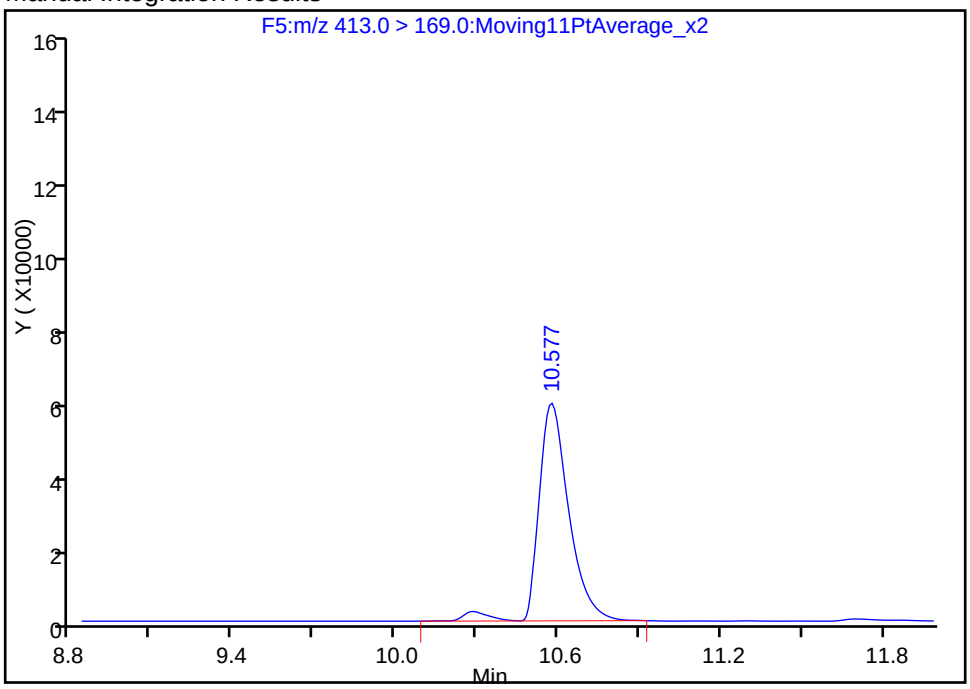
Processing Integration Results

RT: 10.58
Area: 430161
Amount: 32.394011
Amount Units: ng/ml



Manual Integration Results

RT: 10.58
Area: 443994
Amount: 31.743392
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:20:25

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-19198-1

SDG No.:

Client Sample ID: DW-57 MSD | Lab Sample ID: 320-19198-1 MSD

Matrix: Water | Lab File ID: 03JUN2016A6A_019.d

Analysis Method: WS-LC-0025 | Date Collected: 05/26/2016 11:01

Extraction Method: 3535 | Date Extracted: 06/01/2016 11:06

Sample wt/vol: 525.8(mL) | Date Analyzed: 06/03/2016 22:51

Con. Extract Vol.: 1.00(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 112504 | Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	38.0		2.4	1.9	0.87
375-85-9	Perfluoroheptanoic acid (PFHpA)	46.4		2.4	1.9	0.76
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	73.8	M	2.4	1.9	0.83
375-95-1	Perfluorononanoic acid (PFNA)	41.9		2.4	1.9	0.62
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	198	M 4	3.8	2.9	1.2
335-67-1	Perfluorooctanoic acid (PFOA)	54.8	M	2.4	1.9	0.71

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00993	13C2 PFHxA	83		25-150
STL00990	13C4 PFOA	69		25-150
STL00991	13C4 PFOS	107		25-150
STL01892	13C4-PFHpA	79		25-150
STL00995	13C5 PFNA	55		25-150
STL00994	18O2 PFHxS	121		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_019.d
Lims ID: 320-19198-A-1-B MSD
Client ID: DW-57
Sample Type: MSD
Inject. Date: 03-Jun-2016 22:51:58 ALS Bottle#: 18 Worklist Smp#: 19
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-19198-a-1-b msd
Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C
Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\PFAC_A6.m
Limit Group: LC PFC_DOD ICAL
Last Update: 06-Jun-2016 11:40:56 Calib Date: 03-Jun-2016 19:40:28
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_010.d

Column 1 : Acquity BEH C18 (2.10 mm) Det: F1:MRM
Process Host: XAWRK047

First Level Reviewer: westendorfc Date: 04-Jun-2016 11:21:33

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
217.0 > 172.0	5.782	5.784	-0.002		1079871	40.1		80.3	7931	
2 Perfluorobutyric acid										
212.9 > 169.0	5.785	5.786	-0.001	1.000	659854	24.6		123	1488	
D 3 13C5-PFPeA										
267.9 > 223.0	6.941	6.939	0.002		2764549	44.2		88.4	4501	
4 Perfluoropentanoic acid										
262.9 > 219.0	6.941	6.941	0.0	1.000	1323235	24.9		125	321	
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.067	7.069	-0.002	1.000	811457	20.0		113		
5 Perfluorobutane Sulfonate										
298.9 > 80.0	7.067	7.069	-0.002	1.000	811457	NC			122	
298.9 > 99.0	7.067	7.069	-0.002	1.000	390929		2.08(0.00-0.00)		450	
7 Perfluorohexanoic acid										
313.0 > 269.0	8.219	8.216	0.003	1.000	1323513	26.3		132	767	
D 6 13C2 PFHxA										
315.0 > 270.0	8.214	8.217	-0.003		2741217	41.4		82.8	38978	
D 8 13C4-PFHpA										
367.0 > 322.0	9.458	9.456	0.002		2863732	39.4		78.9	8408	
9 Perfluoroheptanoic acid										
363.0 > 319.0	9.458	9.457	0.001	1.000	1303457	24.4		122	1062	
D 11 18O2 PFHxS										
403.0 > 84.0	9.493	9.492	0.001		1804019	57.4		121	8495	
41 Perfluorohexanesulfonic acid										M
399.0 > 80.0	9.493	9.495	-0.002	1.000	1129755	38.8		213		M
10 Perfluorohexane Sulfonate										M
399.0 > 80.0	9.495	9.495	0.0	1.000	0	NC			138	M
D 12 13C4 PFOA										
417.0 > 372.0	10.568	10.569	-0.001		2775161	34.6		69.1	61506	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										M
413.0 > 369.0	10.568	10.572	-0.004	1.000	1321953	28.8		144	718	M
413.0 > 169.0	10.568	10.572	-0.004	1.000	486447		2.72(0.00-0.00)		1744	M
14 Perfluoroheptane Sulfonate										
449.0 > 80.0	10.577	10.581	-0.004	1.000	844023	NC			611	
38 Perfluoroheptanesulfonic Acid										
449.0 > 80.0	10.577	10.581	-0.004	1.000	844023	31.8		167		
D 16 13C4 PFOS										
503.0 > 80.0	11.527	11.525	0.002		1954239	50.9		107	12218	
15 Perfluorooctane sulfonic acid										M
499.0 > 80.0	11.527	11.527	0.0	1.000	4755407	103.9		560	8433	M
499.0 > 99.0	11.527	11.527	0.0	1.000	1915939		2.48(0.00-0.00)		8039	M
D 17 13C5 PFNA										
468.0 > 423.0	11.544	11.542	0.002		1937731	27.3		54.6	70355	
18 Perfluorononanoic acid										
463.0 > 419.0	11.544	11.543	0.001	1.000	591275	22.0		110	21586	
21 PFNS (Perflouro-1-nonanesulfonate)										
549.0 > 80.0	12.001	11.962	0.039	1.000	2581	NC			19.4	
D 19 13C2 PFDA										
515.0 > 470.0	12.362	12.373	-0.011		1618800	28.2		56.4	99762	
20 Perfluorodecanoic acid										
513.0 > 469.0	12.373	12.373	0.0	1.000	792540	22.2		111	48637	
D 23 13C8 FOSA										
506.0 > 78.0	12.984	12.985	-0.001		565887	4.98		10.0	14912	
24 Perfluorooctane Sulfonamide										
498.0 > 78.0	12.994	12.987	0.007	1.000	180043	24.2		121	3937	
39 Perfluorodecane Sulfonic acid										
599.0 > 80.0	13.032	13.033	-0.001	1.000	644363	22.7		118		
25 Perfluorodecane Sulfonate										
599.0 > 80.0	13.032	13.033	-0.001	1.000	644363	NC			44162	
D 26 13C2 PFUnA										
565.0 > 520.0	13.076	13.076	0.0		3100074	38.2		76.4	6057	
27 Perfluoroundecanoic acid										
563.0 > 519.0	13.076	13.077	-0.001	1.000	1149788	22.1		111	32808	
D 28 13C2 PFDoA										
615.0 > 570.0	13.675	13.663	0.012		4185113	41.5		83.0	23910	
29 Perfluorododecanoic acid										
613.0 > 569.0	13.675	13.666	0.009	1.000	1226590	23.0		115	9291	
30 Perfluorotridecanoic acid										
663.0 > 619.0	14.174	14.165	0.009	1.000	1570202	20.3		101	3494	
D 33 13C2-PFTeDA										
715.0 > 670.0	14.596	14.589	0.007		3682308	46.1		92.3	16215	
32 Perfluorotetradecanoic acid										
713.0 > 669.0	14.596	14.589	0.007	1.000	1373339	21.5		108	616	
D 35 13C2-PFHxDA										
815.0 > 770.0	15.179	15.177	0.002		6504496	49.9		99.8	11436	
34 Perfluorohexadecanoic acid										
813.0 > 769.0	15.179	15.177	0.002	1.000	2665948	26.0		130	2592	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
913.0 > 869.0	15.436	15.437	-0.001	1.000	2401964	23.6		118	1701	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 06-Jun-2016 11:41:05 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_019.d

Injection Date: 03-Jun-2016 22:51:58 Instrument ID: A6

Lims ID: 320-19198-A-1-B MSD

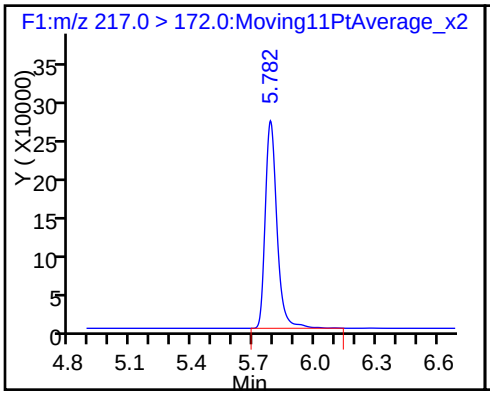
Client ID: DW-57

Operator ID: JRB ALS Bottle#: 18 Worklist Smp#: 19

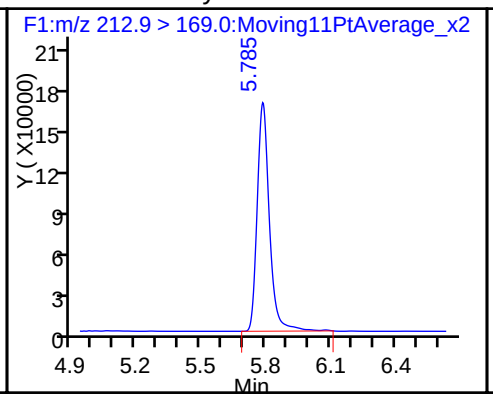
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

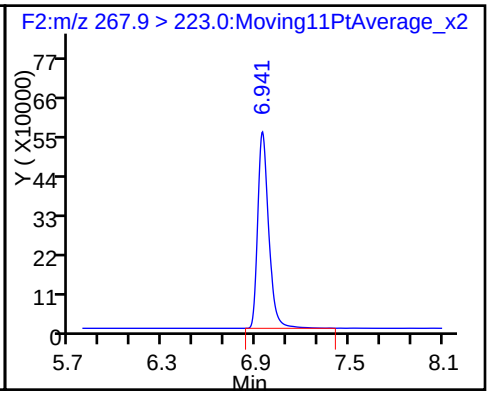
D 1 13C4 PFBA



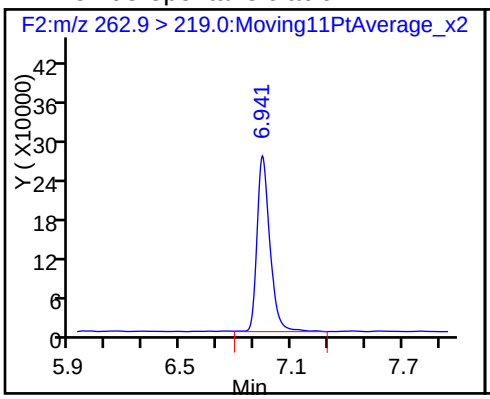
2 Perfluorobutyric acid



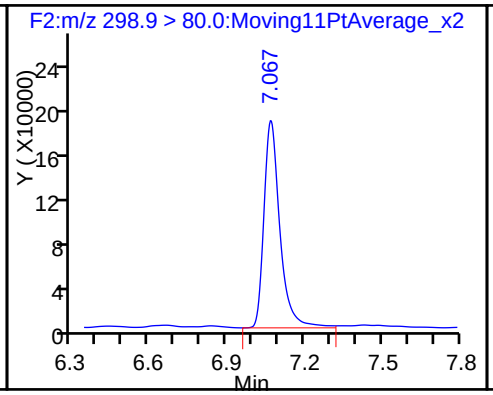
D 3 13C5-PFPeA



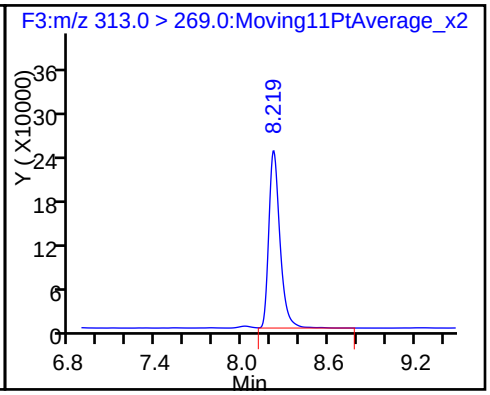
4 Perfluoropentanoic acid



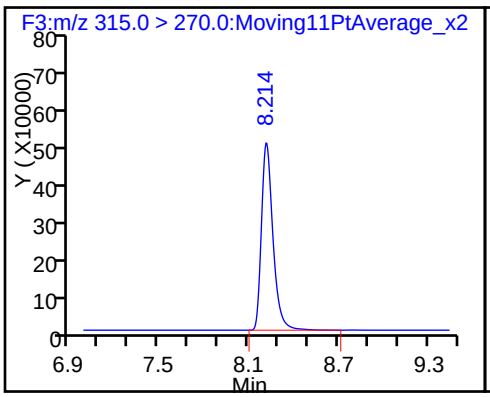
40 Perfluorobutanesulfonic acid



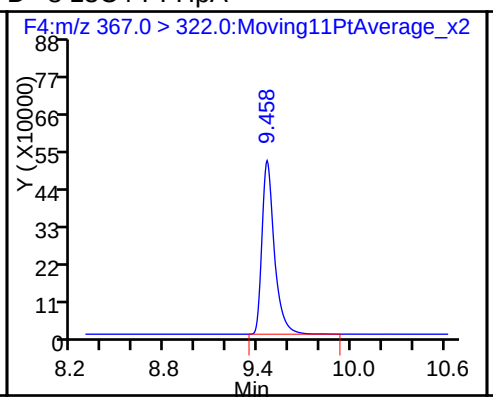
7 Perfluorohexanoic acid



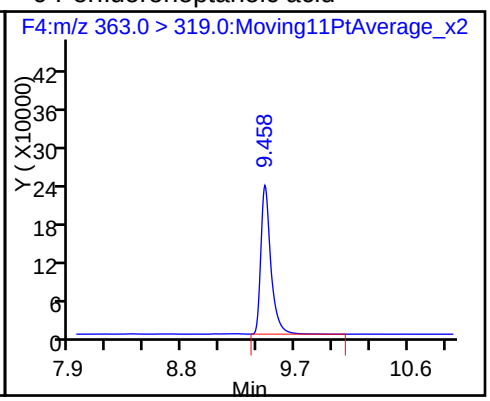
D 6 13C2 PFHxA



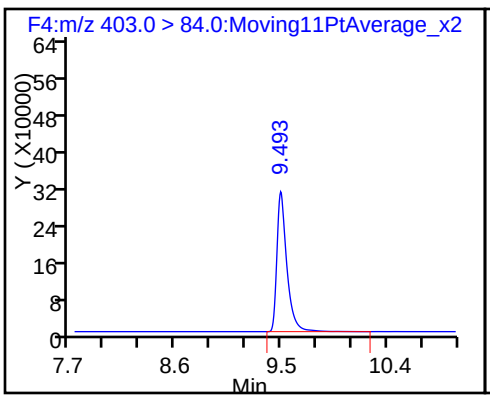
D 8 13C4-PFHpA



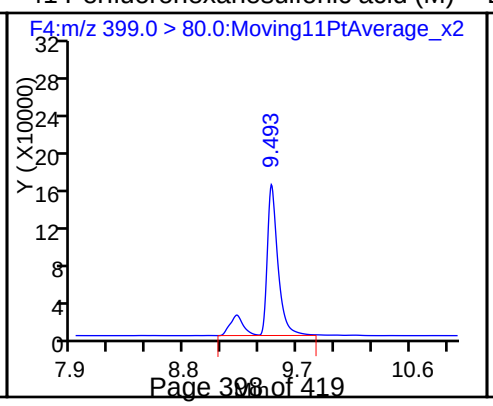
9 Perfluoroheptanoic acid



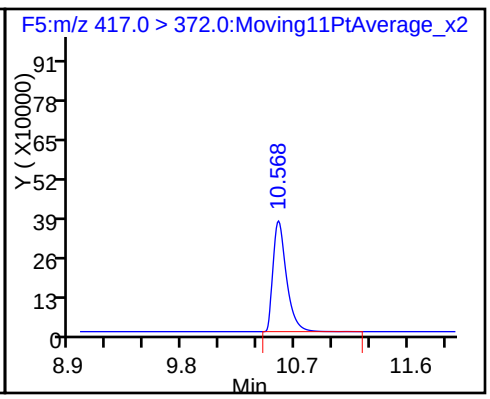
D 11 18O2 PFHxS



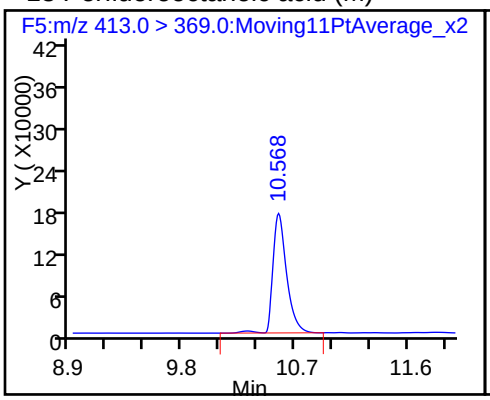
41 Perfluorohexanesulfonic acid (M)



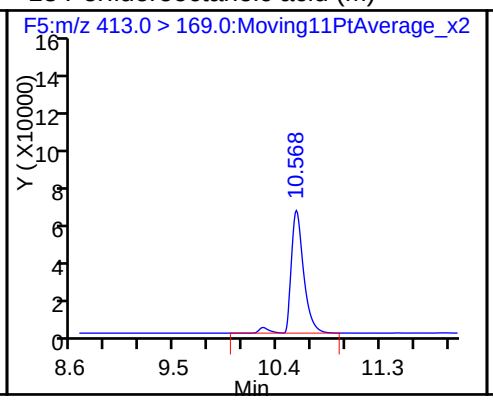
D 12 13C4 PFOA



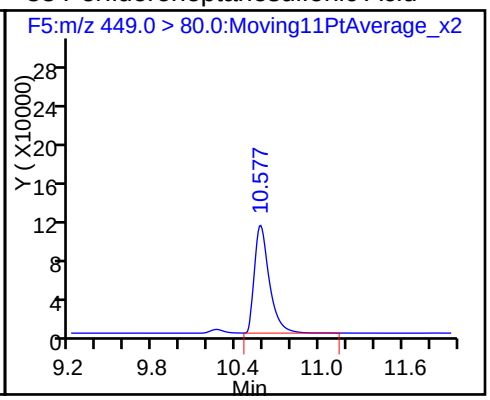
13 Perfluorooctanoic acid (M)



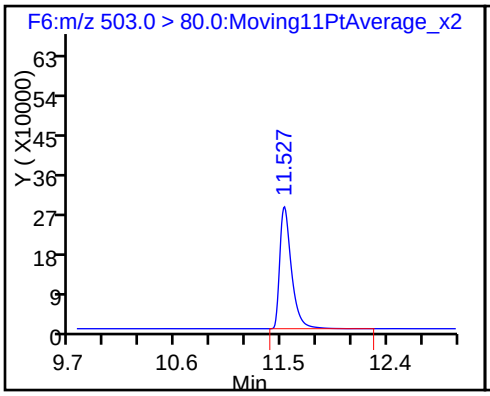
13 Perfluorooctanoic acid (M)



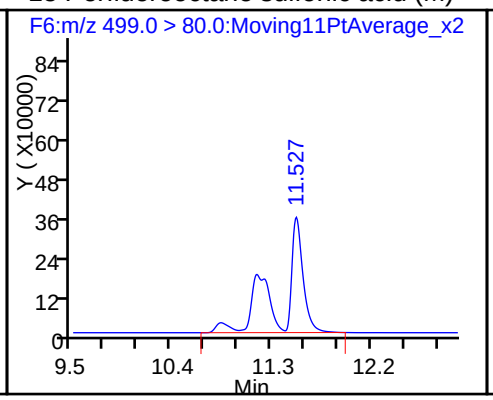
38 Perfluoroheptanesulfonic Acid



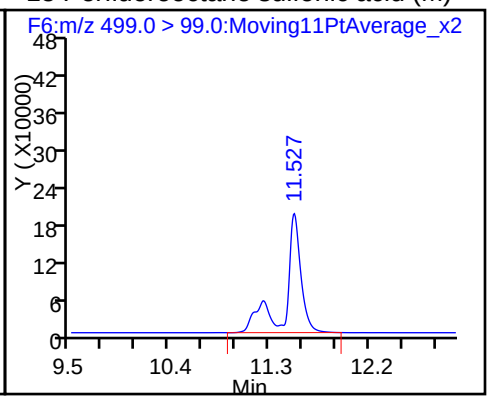
D 16 13C4 PFOS



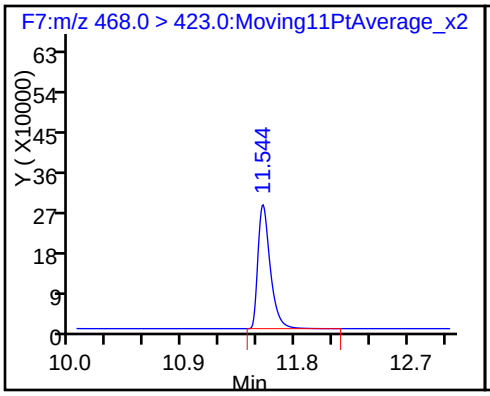
15 Perfluorooctane sulfonic acid (M)



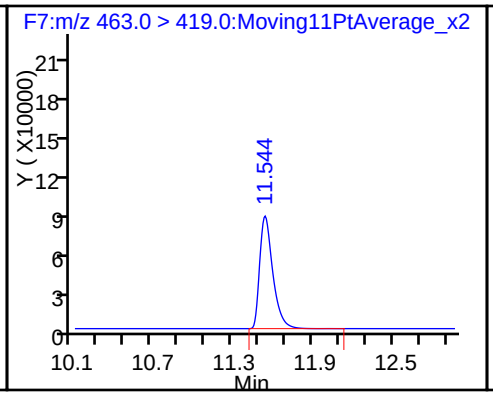
15 Perfluorooctane sulfonic acid (M)



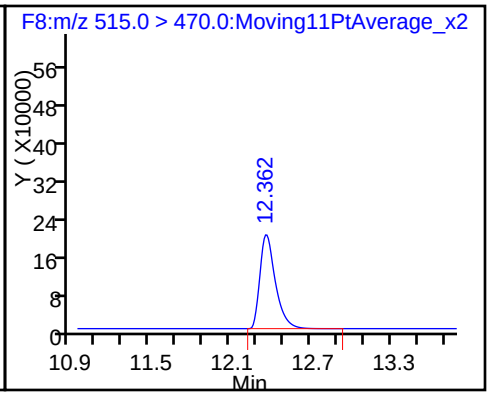
D 17 13C5 PFNA



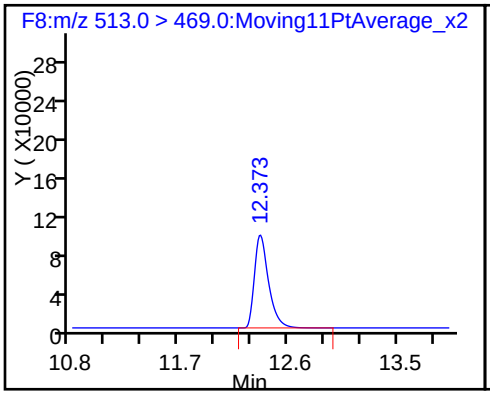
18 Perfluorononanoic acid



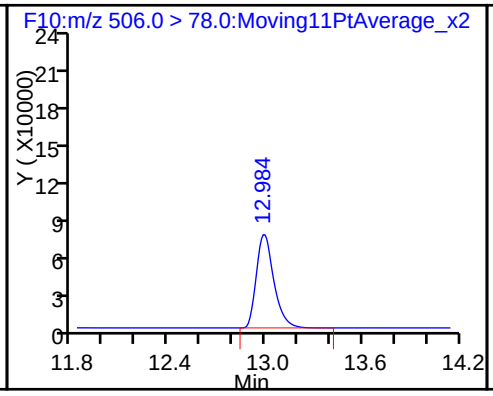
D 19 13C2 PFDA



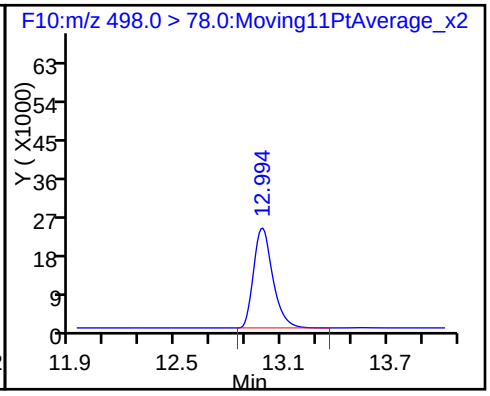
20 Perfluorodecanoic acid



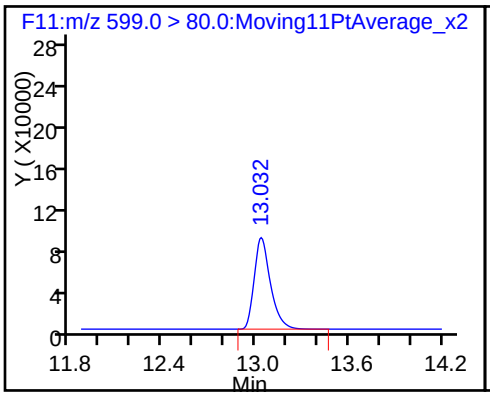
D 23 13C8 FOSA



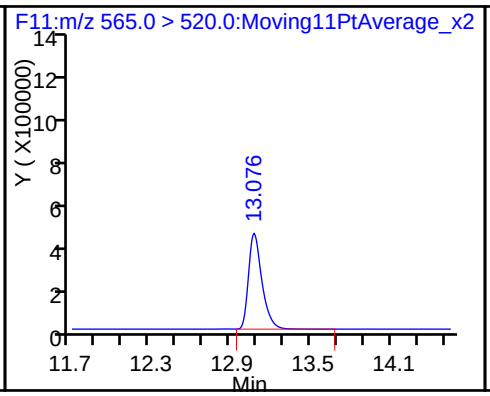
24 Perfluorooctane Sulfonamide



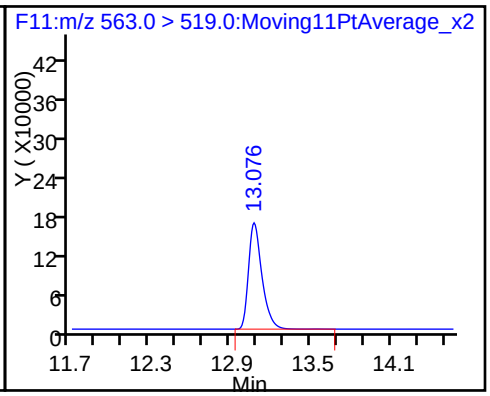
39 Perfluorodecane Sulfonic acid



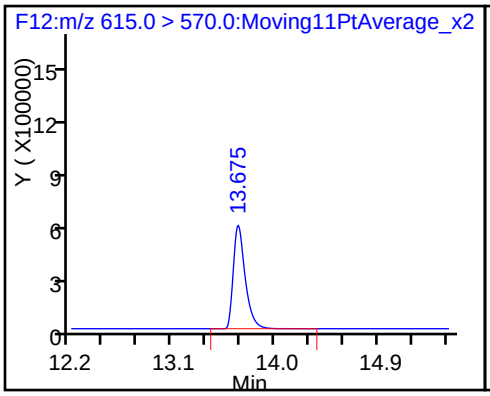
D 26 13C2 PFUnA



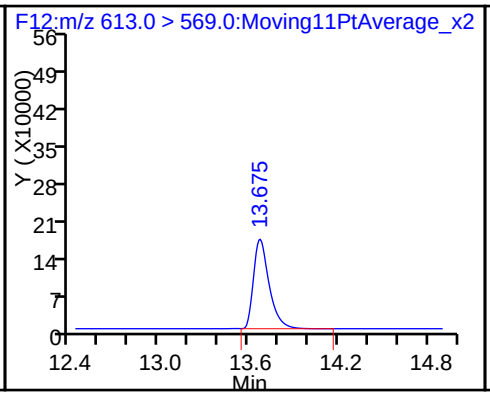
27 Perfluoroundecanoic acid



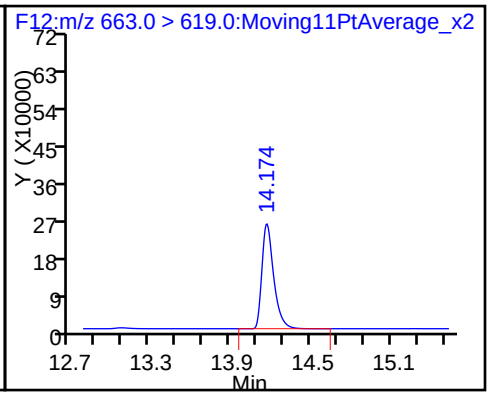
D 28 13C2 PFDoA



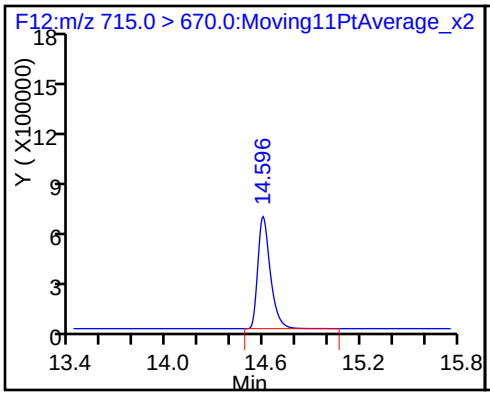
29 Perfluorododecanoic acid



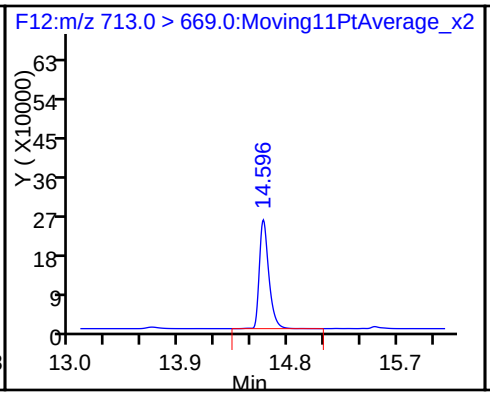
30 Perfluorotridecanoic acid



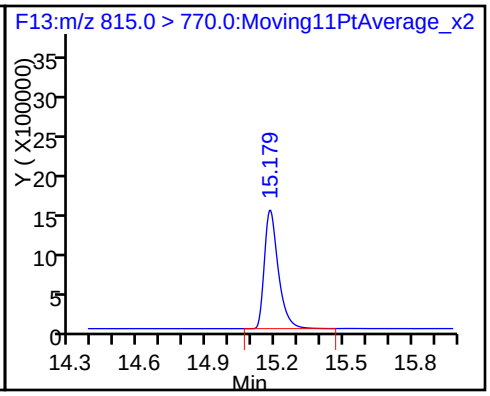
D 33 13C2-PFTeDA



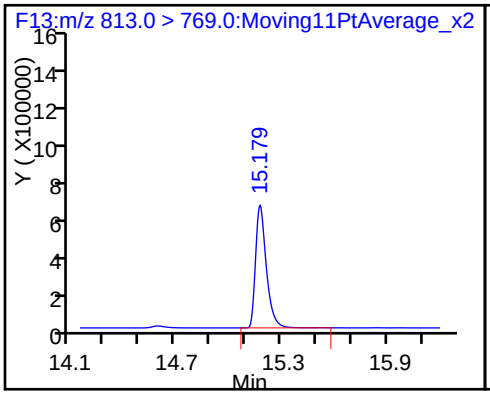
32 Perfluorotetradecanoic acid



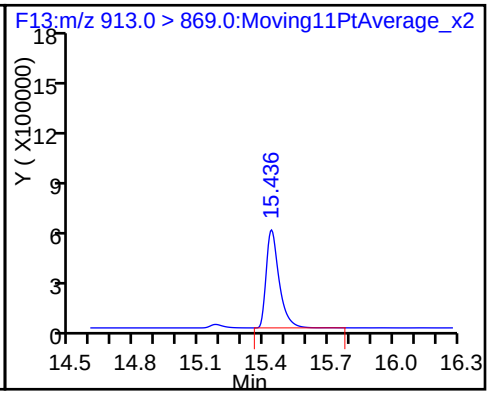
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

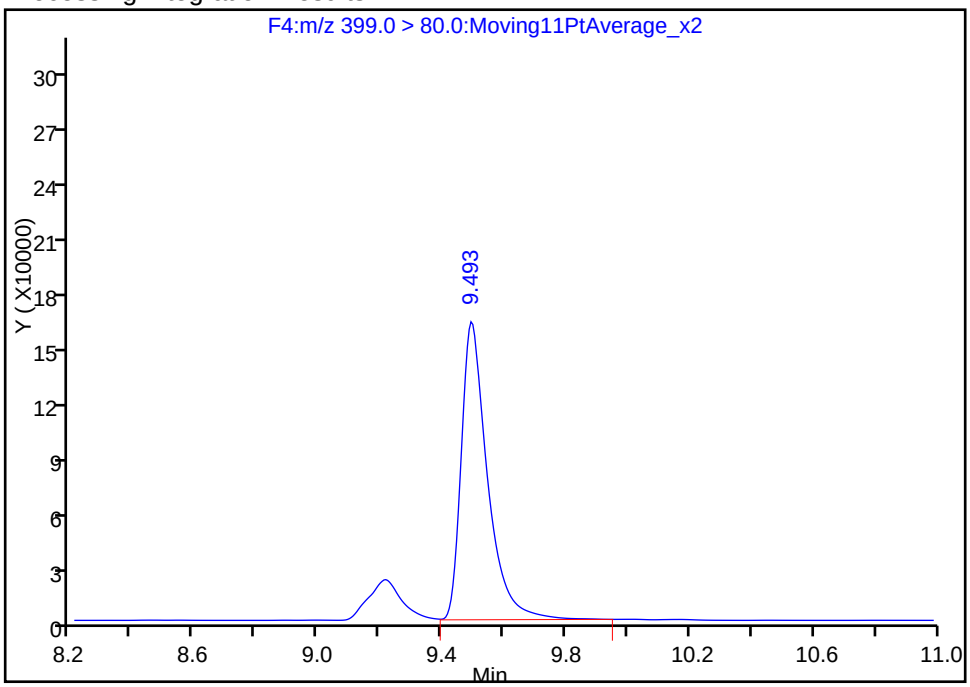
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_019.d				
Injection Date:	03-Jun-2016 22:51:58	Instrument ID:	A6		
Lims ID:	320-19198-A-1-B MSD				
Client ID:	DW-57				
Operator ID:	JRB	ALS Bottle#:	18	Worklist Smp#:	19
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F4:MRM		

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

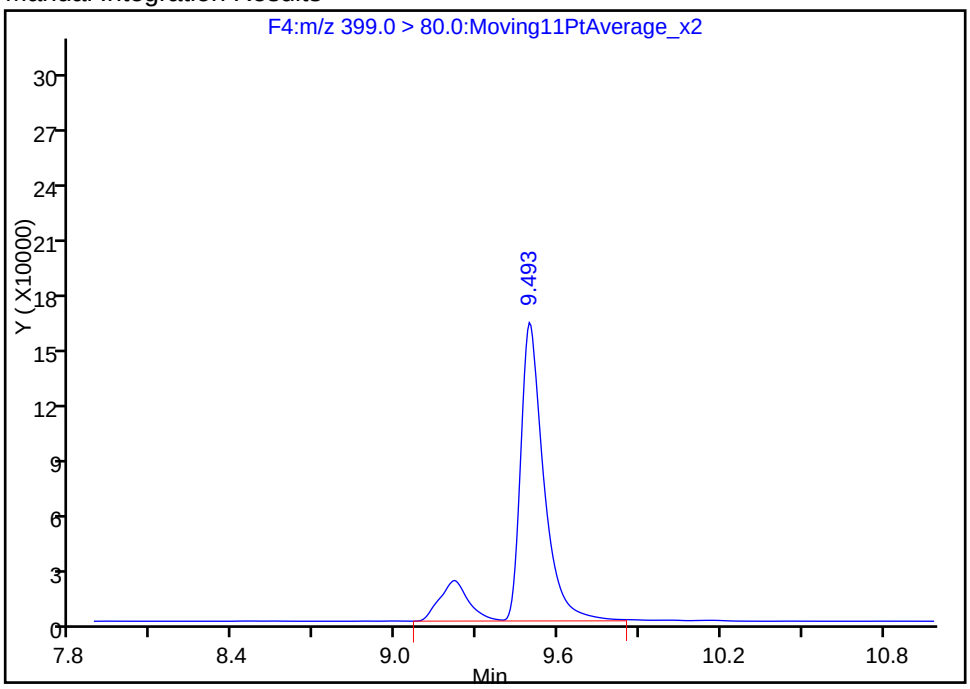
Processing Integration Results

RT: 9.49
Area: 961016
Amount: 33.024495
Amount Units: ng/ml



Manual Integration Results

RT: 9.49
Area: 1129755
Amount: 38.823067
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:21:33

Audit Action: Assigned Compound ID Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

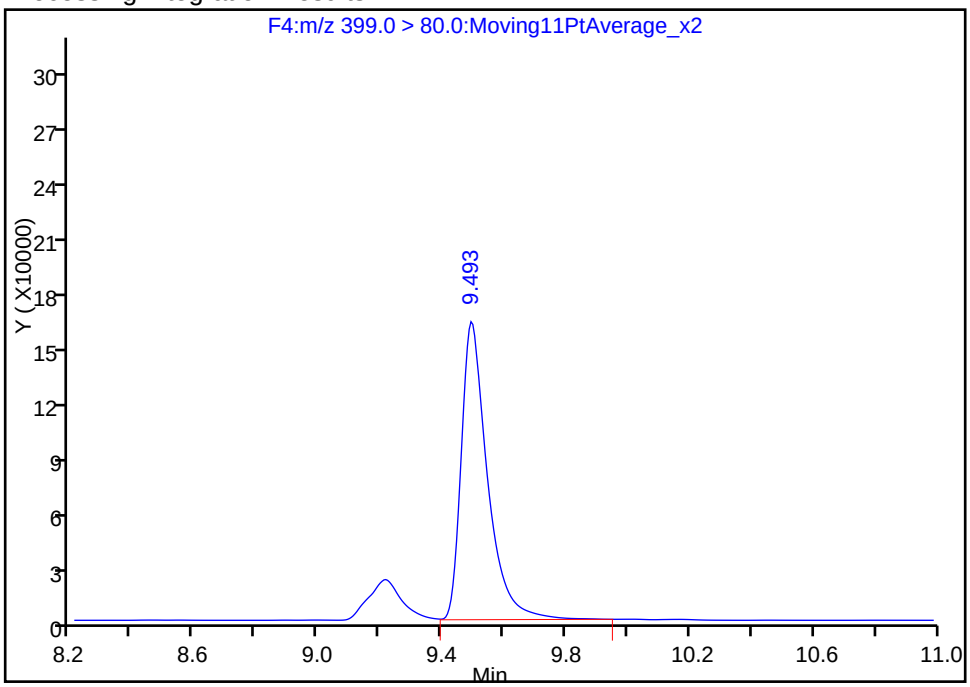
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_019.d				
Injection Date:	03-Jun-2016 22:51:58	Instrument ID:	A6		
Lims ID:	320-19198-A-1-B MSD				
Client ID:	DW-57				
Operator ID:	JRB	ALS Bottle#:	18	Worklist Smp#:	19
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F4:MRM		

41 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

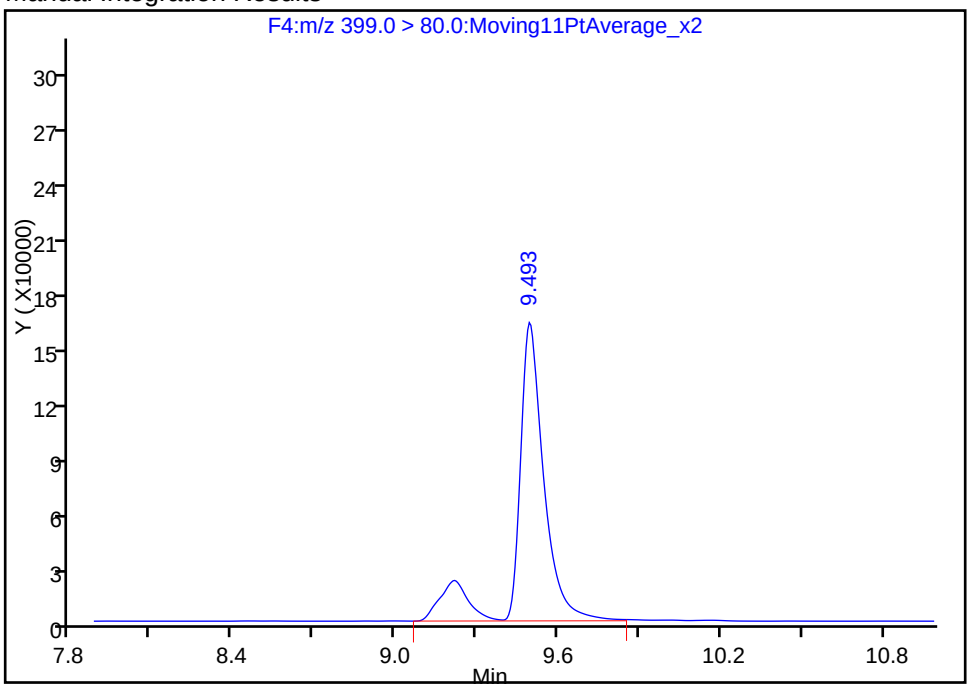
Processing Integration Results

RT: 9.49
Area: 961016
Amount: 33.024495
Amount Units: ng/ml



Manual Integration Results

RT: 9.49
Area: 1129755
Amount: 38.823067
Amount Units: ng/ml



Reviewer: barnettj, 06-Jun-2016 11:30:51

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

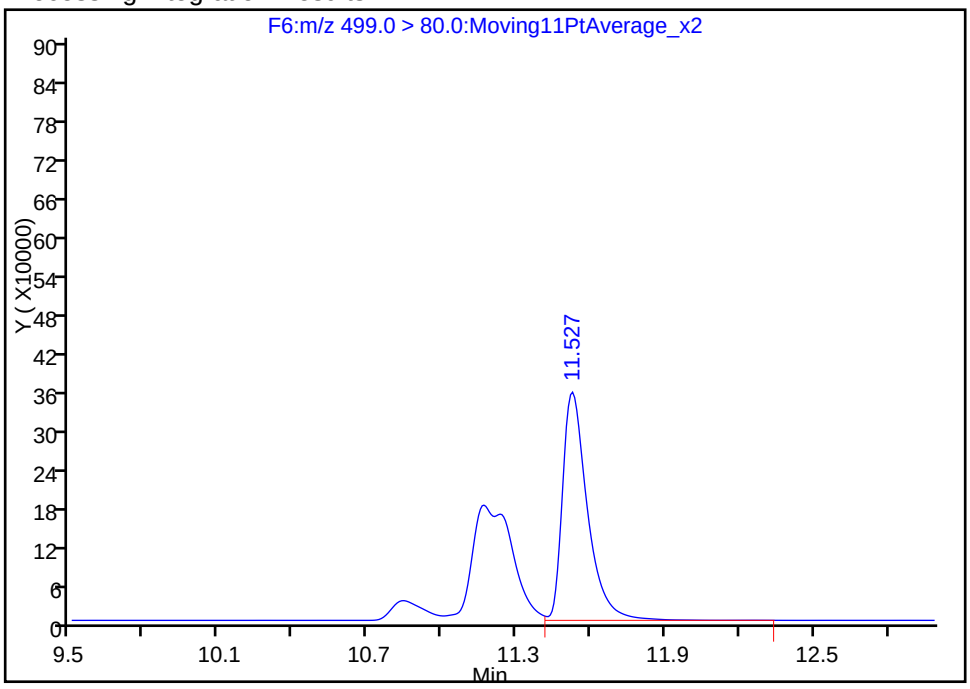
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_019.d				
Injection Date:	03-Jun-2016 22:51:58	Instrument ID:	A6		
Lims ID:	320-19198-A-1-B MSD				
Client ID:	DW-57				
Operator ID:	JRB	ALS Bottle#:	18	Worklist Smp#:	19
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F6:MRM		

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

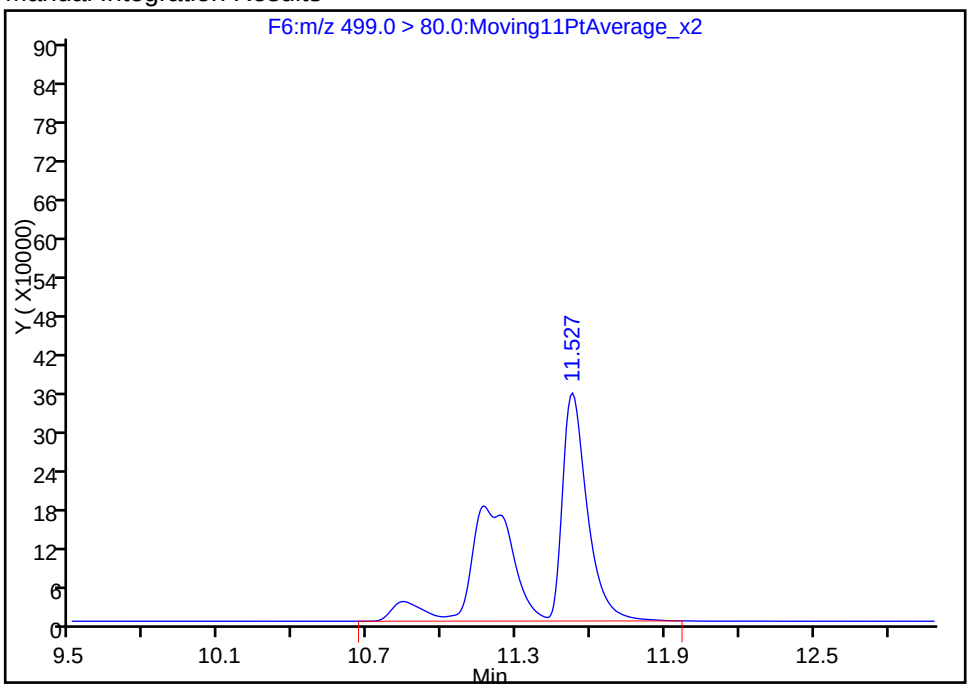
Processing Integration Results

RT: 11.53
Area: 2493654
Amount: 54.478351
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 4755407
Amount: 103.8904
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:21:33

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

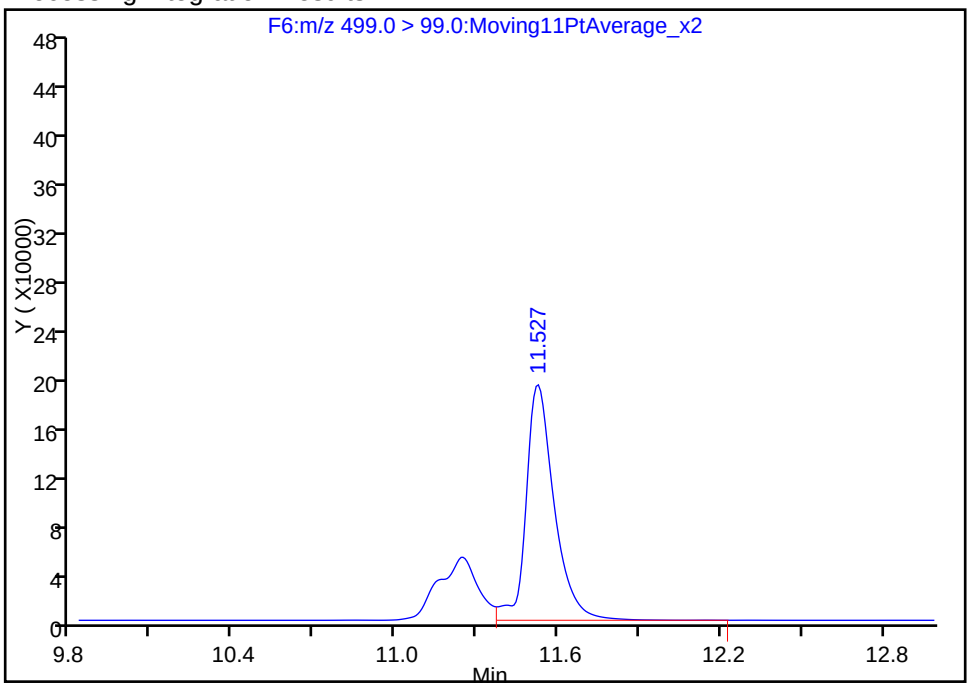
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_019.d				
Injection Date:	03-Jun-2016 22:51:58	Instrument ID:	A6		
Lims ID:	320-19198-A-1-B MSD				
Client ID:	DW-57				
Operator ID:	JRB	ALS Bottle#:	18	Worklist Smp#:	19
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F6:MRM		

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

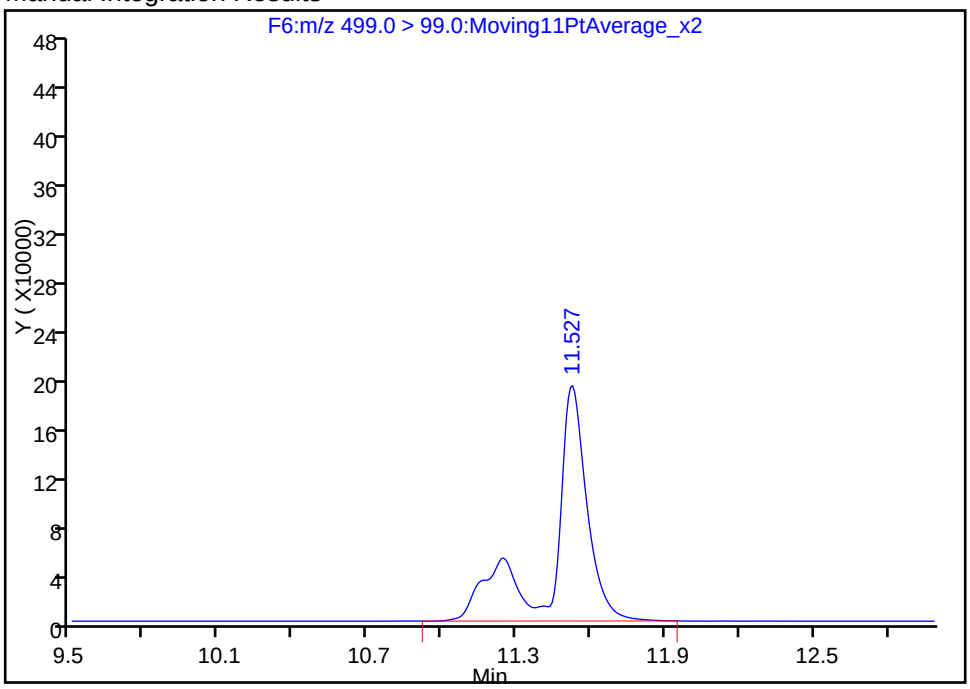
Processing Integration Results

RT: 11.53
Area: 1400180
Amount: 54.478351
Amount Units: ng/ml



Manual Integration Results

RT: 11.53
Area: 1915939
Amount: 103.8904
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:21:33

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

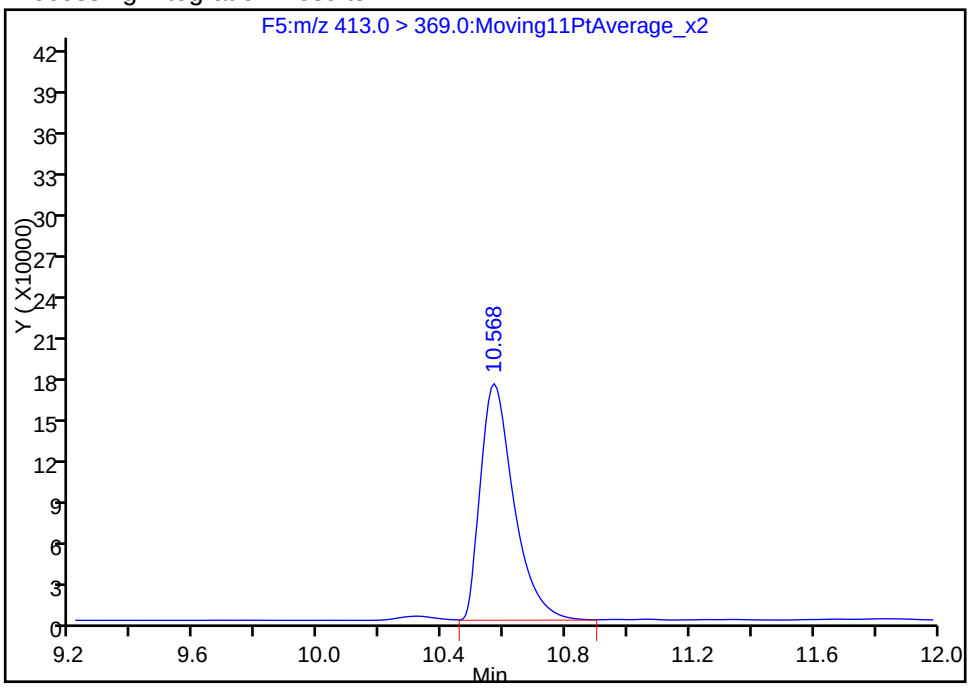
Data File:	\\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_019.d				
Injection Date:	03-Jun-2016 22:51:58	Instrument ID:	A6		
Lims ID:	320-19198-A-1-B MSD				
Client ID:	DW-57				
Operator ID:	JRB	ALS Bottle#:	18	Worklist Smp#:	19
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A6	Limit Group:	LC PFC_DOD ICAL		
Column:	Acquity BEH C18 (2.10 mm)	Detector	F5:MRM		

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

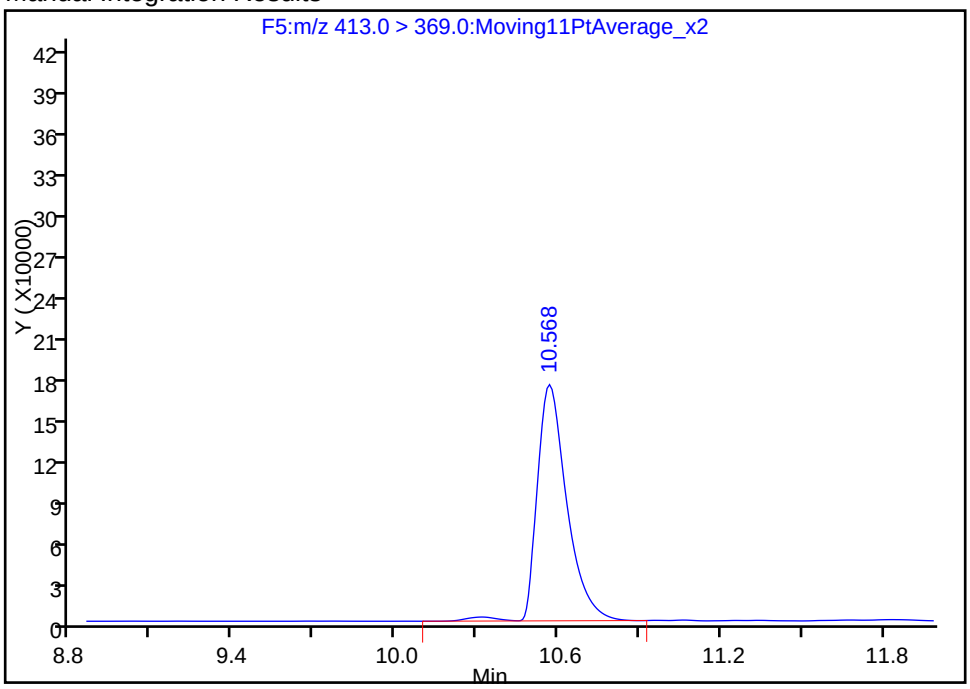
Processing Integration Results

RT: 10.57
Area: 1305144
Amount: 29.330900
Amount Units: ng/ml



Manual Integration Results

RT: 10.57
Area: 1321953
Amount: 28.796741
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:21:33

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

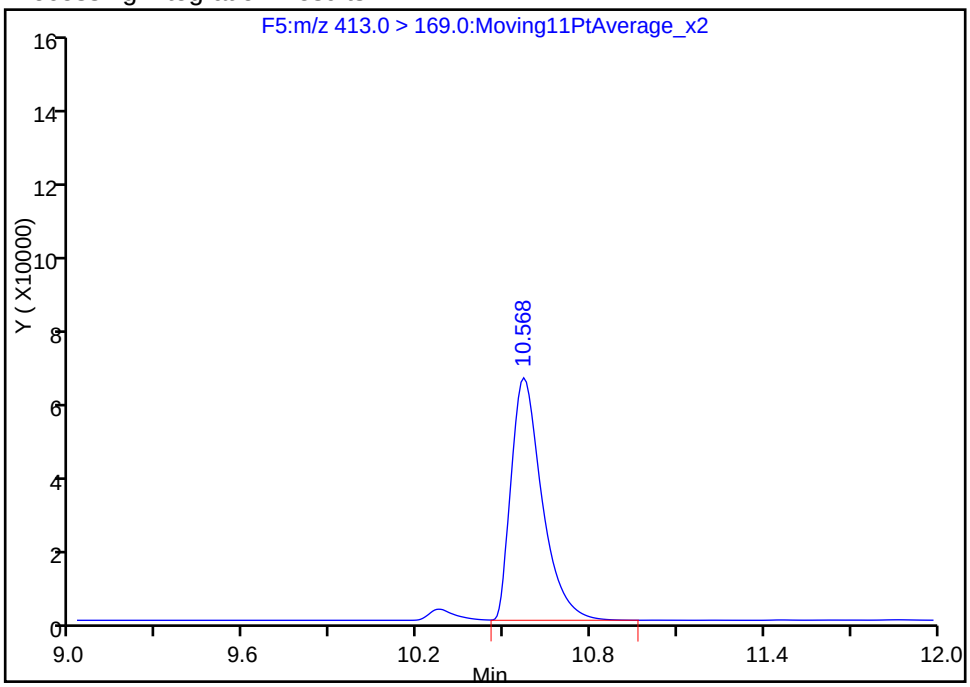
Data File: \\ChromNA\Sacramento\ChromData\A6\20160604-31336.b\03JUN2016A6A_019.d
Injection Date: 03-Jun-2016 22:51:58 Instrument ID: A6
Lims ID: 320-19198-A-1-B MSD
Client ID: DW-57
Operator ID: JRB ALS Bottle#: 18 Worklist Smp#: 19
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL
Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

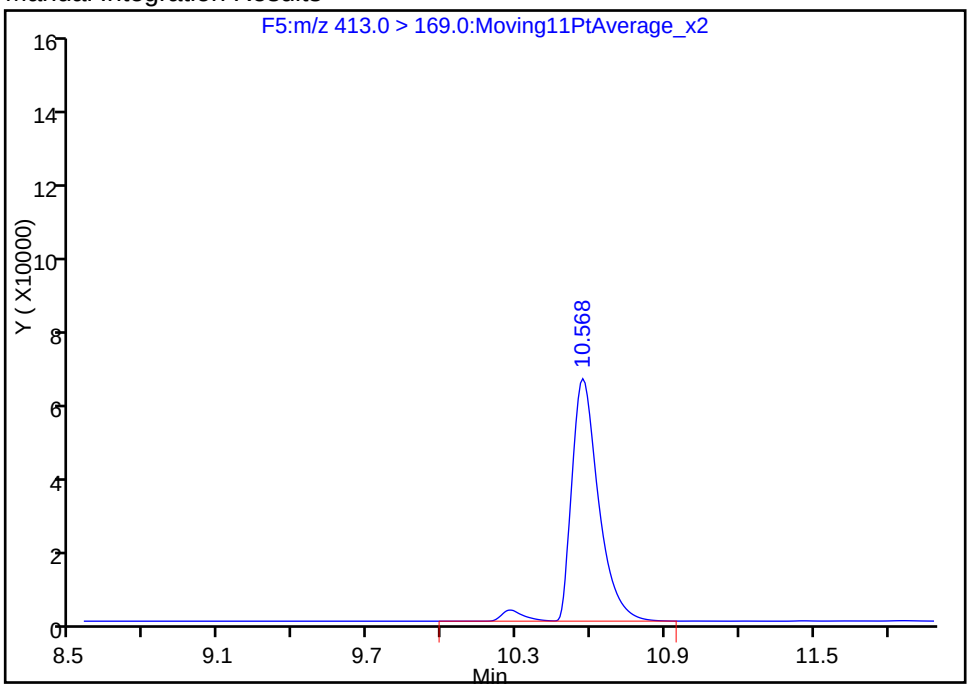
Processing Integration Results

RT: 10.57
Area: 468814
Amount: 29.330900
Amount Units: ng/ml



Manual Integration Results

RT: 10.57
Area: 486447
Amount: 28.796741
Amount Units: ng/ml



Reviewer: westendorfc, 04-Jun-2016 11:21:33
Audit Action: Manually Integrated Audit Reason: Isomers

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Instrument ID: A6 Start Date: 06/03/2016 17:32

Analysis Batch Number: 112504 End Date: 06/04/2016 00:59

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD 320-112504/4 IC		06/03/2016 17:32	1	03JUN2016A6A_004.d	Acquity 2.1(mm)
STD 320-112504/5 IC		06/03/2016 17:54	1	03JUN2016A6A_005.d	Acquity 2.1(mm)
STD 320-112504/6 IC		06/03/2016 18:15	1	03JUN2016A6A_006.d	Acquity 2.1(mm)
STD 320-112504/7 IC		06/03/2016 18:36	1	03JUN2016A6A_007.d	Acquity 2.1(mm)
STD 320-112504/8 IC		06/03/2016 18:57	1	03JUN2016A6A_008.d	Acquity 2.1(mm)
STD 320-112504/9 IC		06/03/2016 19:19	1	03JUN2016A6A_009.d	Acquity 2.1(mm)
STD 320-112504/10 IC		06/03/2016 19:40	1	03JUN2016A6A_010.d	Acquity 2.1(mm)
ZZZZZ		06/03/2016 20:01	1		Acquity 2.1(mm)
ICV 320-112504/12		06/03/2016 20:23	1	03JUN2016A6A_012.d	Acquity 2.1(mm)
ZZZZZ		06/03/2016 20:44	1		Acquity 2.1(mm)
MB 320-112069/1-A		06/03/2016 21:26	1	03JUN2016A6A_015.d	Acquity 2.1(mm)
LCS 320-112069/2-A		06/03/2016 21:48	1	03JUN2016A6A_016.d	Acquity 2.1(mm)
320-19198-1		06/03/2016 22:09	1	03JUN2016A6A_017.d	Acquity 2.1(mm)
320-19198-1 MS		06/03/2016 22:30	1	03JUN2016A6A_018.d	Acquity 2.1(mm)
320-19198-1 MSD		06/03/2016 22:51	1	03JUN2016A6A_019.d	Acquity 2.1(mm)
320-19198-2		06/03/2016 23:13	1	03JUN2016A6A_020.d	Acquity 2.1(mm)
320-19198-3		06/03/2016 23:34	1	03JUN2016A6A_021.d	Acquity 2.1(mm)
320-19198-4		06/03/2016 23:55	1	03JUN2016A6A_022.d	Acquity 2.1(mm)
320-19198-5		06/04/2016 00:17	1	03JUN2016A6A_023.d	Acquity 2.1(mm)
ZZZZZ		06/04/2016 00:38	1		Acquity 2.1(mm)
CCV 320-112504/25		06/04/2016 00:59	1	03JUN2016A6A_025.d	Acquity 2.1(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Batch Number: 112069 Batch Start Date: 06/01/16 10:55 Batch Analyst: Edwards, Stephanie N

Batch Method: 3535 Batch End Date: 06/03/16 12:40

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00042	LCPFCSP 00049
MB 320-112069/1		3535, WS-LC-0025				500 mL	1.00 mL	50 uL	
LCS 320-112069/2		3535, WS-LC-0025				500 mL	1.00 mL	50 uL	20 uL
320-19198-B-1	DW-57	3535, WS-LC-0025	T	567.02 g	44.07 g	523 mL	1.00 mL	50 uL	
320-19198-A-1 MS	DW-57	3535, WS-LC-0025	T	576.93 g	44.63 g	532.3 mL	1.00 mL	50 uL	20 uL
320-19198-A-1 MSD	DW-57	3535, WS-LC-0025	T	570.24 g	44.47 g	525.8 mL	1.00 mL	50 uL	20 uL
320-19198-B-2	FB-DW-57	3535, WS-LC-0025	T	574.74 g	44.53 g	530.2 mL	1.00 mL	50 uL	
320-19198-A-3	DW-95	3535, WS-LC-0025	T	582.94 g	45.84 g	537.1 mL	1.00 mL	50 uL	
320-19198-A-4	FB-DW-95	3535, WS-LC-0025	T	579.88 g	44.23 g	535.7 mL	1.00 mL	50 uL	
320-19198-A-5	DUP-052616	3535, WS-LC-0025	T	566.98 g	45.90 g	521.1 mL	1.00 mL	50 uL	

Batch Notes	
Balance ID	QA-070
Batch Comment	0.1N NaOH/H20 624176
H2O ID	5/24/16
Hexane ID	000135581
Manifold ID	6
Methanol ID	625013
Pipette ID	EC15219; EC15131
Analyst ID - Reagent Drop	SNE
Analyst ID - SU Reagent Drop	SNE
Analyst ID - SU Reagent Drop Witness	VPM
Solvent Lot #	636630
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	002736075A

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-19198-1

SDG No.:

Batch Number: 112069 Batch Start Date: 06/01/16 10:55 Batch Analyst: Edwards, Stephanie N

Batch Method: 3535 Batch End Date: 06/03/16 12:40

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

West Sacramento

HPLC/LCMS Data Review Checklist

Job Number(s): 19198 Work List ID(s): 31336

Extraction Batch: 112069 Analysis Batch(es): 112504

Delivery Rank 4 Due Date: 6-6-16

A. Calibration/Instrument Run QC	1st Level	2nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch#	✓	✓	
2. ICAL, CCV Frequency & Criteria met.	✓	✓	
• $RF_{average}$ criteria appropriate for the method.	✓	✓	
• Linear Regression criteria appropriate if required ($r \geq 0.995$).	✓	✓	
• Quadratic fit criteria appropriate if required ($r^2 \geq 0.990$).			✓
• For Linear Regression and Quadratic fit – Does the y-intercept support ½ the reporting limit as described in CA-Q-S-005?	✓	✓	
• All curve points show calculated concentrations.	✓	✓	
3. Peaks correctly ID'd by data system.	✓	✓	
5. Tune check frequency & criteria met and Tune check report attached.	✓	✓	
B. QA/QC			
1. Are all QC samples properly linked in TALS?	✓	✓	
2. Method blank, LCS/LCSD and MS/SD frequencies met.	✓	✓	
3. LCS/LCSD and MB data are within control limits. If not, NCM is present.	✓	✓	
4. Are MS/MSD recoveries and RPD within control limits?	✓	✓	
5. Holding Times were met for prep and analytical.	✓	✓	
6. IS/Surrogate recoveries meet criteria or properly noted.	✓	✓	
C. Sample Analysis			
1. Was correct analysis performed and were project instructions followed?	✓	✓	
2. If required, are compounds within RT windows?			✓
3. If required, are positive hits confirmed and >40% RPD flagged?			✓
4. Manual Integrations reviewed and appropriate.	✓	✓	
5. All analytes correctly reported. (Primary, secondary, acceptable status)	✓	✓	
6. Correct reporting limits used. (based on client request, prep factors, and dilutions)	✓	✓	
D. Documentation			
1. Are all non-conformances documented/attached? NCM# 53840	✓	✓	
2. Do results make sense (e.g. dilutions, etc.)?	✓	✓	
3. Have all flags been reviewed for appropriateness?	✓	✓	
4. For level 3 and 4 reports, have forms and raw data been reviewed?	✓	✓	
5. Was QC Checker run for this job?	✓	✓	

**Upon completion of this checklist, the reviewer must scan and attach the checklist to the TALS job.*

1st Level (Analyst): JRB Date: 6/6/16

2nd Level Reviewer: Mcway Date: 6/6/2016

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-112069
Method Code: 320-3535_IVWT-320

Analyst: Edwards, Stephanie N

Batch Open: 6/1/2016 10:55:34AM
Batch End: 6-3-16 12:40

Solid-Phase Extraction (SPE)

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-112069/1 N/A	N/A		500 mL				N/A	N/A	N/A		MB 320-112069/1-A
				1.00 mL								
2	LCS~320-112069/2 N/A	N/A		500 mL				N/A	N/A	N/A		LCS 320-112069/2-A
				1.00 mL								
3	320-19198-B-1 (PFC_IDA_DOD5)	N/A (320-19198-1)	567.02 g	523 mL				6/6/16	5_Day_RUSH	4		320-19198-B-1-A
			44.07 g	1.00 mL								
	320-19198-A-1~MS (PFC_IDA_DOD5)	N/A (320-19198-1)	576.93 g	532.3 mL				6/6/16	5_Day_RUSH	4		320-19198-A-1-A MS
			44.63 g	1.00 mL								
5	320-19198-A-1~MSD (PFC_IDA_DOD5)	N/A (320-19198-1)	570.24 g	525.8 mL				6/6/16	5_Day_RUSH	4		320-19198-A-1-B MSD
			44.47 g	1.00 mL								
6	320-19198-B-2 (PFC_IDA_DOD5)	N/A (320-19198-1)	574.74 g	530.2 mL				6/6/16	5_Day_RUSH	4		320-19198-B-2-A
			44.53 g	1.00 mL								
7	320-19198-A-3 (PFC_IDA_DOD5)	N/A (320-19198-1)	582.94 g	537.1 mL				6/6/16	5_Day_RUSH	4		320-19198-A-3-A
			45.84 g	1.00 mL								
8	320-19198-A-4 (PFC_IDA_DOD5)	N/A (320-19198-1)	579.88 g	535.7 mL				6/6/16	5_Day_RUSH	4		320-19198-A-4-A
			44.23 g	1.00 mL								
9	320-19198-A-5 (PFC_IDA_DOD5)	N/A (320-19198-1)	566.98 g	521.1 mL				6/6/16	5_Day_RUSH	4		320-19198-A-5-A
			45.90 g	1.00 mL								

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-112069 Analyst: Edwards, Stephanie N Batch Open: 6/1/2016 10:55:34AM

Method Code: 320-3535_IVWT-320 Batch End:

Batch Notes

Manifold ID	~~5~~ SNE 6/1/16 6
Methanol ID	625013
Hexane ID	000135581
Sodium Hypochlorite ID	NA
First Start time	NA
First End time	NA
Balance ID	QA-070
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	002736075A
H2O ID	5/24/16
Pipette ID	EC15219; EC15131
Solvent Name	0.3% NH4OH/MeOH
Solvent Lot #	636630
Analyst ID - Reagent Drop	SNE
Analyst ID - SU Reagent Drop	SNE
Analyst ID - SU Reagent Drop Witness	VPM
Acid Name	NA
Acid ID	NA
Reagent ID	NA
Reagent Lot Number	NA
NaCl ID	NA

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-112069
Analyst: Edwards, Stephanie N
Batch Open: 6/1/2016 10:55:34AM

Method Code: 320-3535_IVWT-320
Batch End:

SOP Number WS-LC-0025

Batch Comment 0.1N NaOH/H20 624176

Comments

320-19198-B-1	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-19198-A-1~MS	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-19198-A-1~MSD	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-19198-B-2	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-19198-A-3	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-19198-A-4	Method Comments:	Q5Rev111213_StdVarApp_30day disposal
320-19198-A-5	Method Comments:	Q5Rev111213_StdVarApp_30day disposal

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-112069

Analyst: Edwards, Stephanie N

Batch Open: 6/1/2016 10:55:34AM

Method Code: 320-3535_IVWT-320

Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-112069/1	LCMPFCSU_00042	50 uL	1.00 mL	SNE 6/1/16	VPM 6/1/16
LCS 320-112069/2	LCMPFCSU_00042	50 uL	1.00 mL		
LCS 320-112069/2	LCPFCSP_00049	20 uL	1.00 mL		
320-19198-B-1	LCMPFCSU_00042	50 uL	1.00 mL		
320-19198-A-1 MS	LCMPFCSU_00042	50 uL	1.00 mL		
320-19198-A-1 MS	LCPFCSP_00049	20 uL	1.00 mL		
320-19198-A-1 MSD	LCMPFCSU_00042	50 uL	1.00 mL		
320-19198-A-1 MSD	LCPFCSP_00049	20 uL	1.00 mL		
320-19198-B-2	LCMPFCSU_00042	50 uL	1.00 mL		
320-19198-A-3	LCMPFCSU_00042	50 uL	1.00 mL		
320-19198-A-4	LCMPFCSU_00042	50 uL	1.00 mL		
320-19198-A-5	LCMPFCSU_00042	50 uL	1.00 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-112069
Method Code: 320-3535_IVWT-320

Analyst: Edwards, Stephanie N

Batch Open: 6/1/2016 10:55:34AM
Batch End:

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 112069 Test: PFC_IDA_DOD5

Earliest Holding Time: 6/2/16

Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	NA	NA
Method/sample/login/QAS checked and correct	✓	✓
Worksheet Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All samples properly preserved	NA	NA
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and Cl Check)	✓	✓
The pH is transcribed correctly in TALS	NA	NA
All additional information transcribed into TALS is correct and raw data is attached	✓	✓
Comments are transcribed correctly in TALS	✓	✓
Reagents Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and entered into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Batch Information	**1st Level Reviewer**	**2nd Level Reviewer**
Date and time accurate and entered into TALS correctly	✓	✓
All necessary 'batch information' complete and entered into TALS correctly	✓	✓

1st Level Reviewer: SNE Date: 6/3/16

2nd Level Reviewer: HSA Date: 6-3-16

Comments:

Shipping and Receiving Documents

TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605-1500
Phone (916) 373-5600 Fax (303) 467-7248

Chain of Custody Record

TestAmerica

Client Information	Sampler: Sam Pagat	Lab PM: Johnston, Michelle A	Carrier Tracking No(s):	COC No: 280-48902-18075.1
Client Contact: Mike Dryden	Phone:	E-Mail: michelle.johnston@testamericainc.com		Page: Page 1 of 2
Company: Earth Toxics, Inc				Job #:
Address: PO BOX 3382	Due Date Requested:			
City: Logan	TAT Requested (days): Standard			
State, Zip: UT, 84321				
Phone:	PO #: Purchase Order Requested			
Email: mdryden@earthtoxics.com	WO #:			
Project Name: Ensafe-NWS - Earle, NJ PFCs Potable Water	Project #: 28014493			
Site:	SSOW#:			

Analysis Requested

320-19198 Chain of Custody

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Perform MS/MSD (Yes or No)	PFOS, PFOA, PFNA, PFHxS, PFHpA & PFBS	Special Instructions/Note:
DW-57	5/26/16	1101	G	AQ	X	X	
FB-DW-57	5/26/16	1105	G	AQ		X	
DW-95	5/26/16	1126	G	AQ		X	
FB-DW-95	5/26/16	1128	G	AQ		X	
DUP-052616	5/26/16	1126	G	AQ		X	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1		5/26/16 1330	TA		5/26/16 1330	TA
2		5/27/16 1800	TA		5/29/16 0900	TA
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
		1.6

* received @ 1128 05-28-16

Login Sample Receipt Checklist

Client: Earth Toxics, Inc

Job Number: 320-19198-1

Login Number: 19198
List Number: 1
Creator: Hytrek, Cheryl

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Sample	Sample Name	Specific Method	CAS Number	Analyte	Result	Units	Qualifier	Limit	Reports To	Dilution	Result Basis	Batch	Sampled	Prepared	Analyzed	Analysis
320-19198-1	DW-57	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	**2.9**	ng/L		0.88	MDL	1.0	Total	112504	5/26/2016 11:01 AM	6/1/2016 11:06 AM	6/3/2016 10:09 PM	Perfluorinated Hydrocarbons
320-19198-1	DW-57	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	**4.5**	ng/L		0.77	MDL	1.0	Total	112504	5/26/2016 11:01 AM	6/1/2016 11:06 AM	6/3/2016 10:09 PM	Perfluorinated Hydrocarbons
320-19198-1	DW-57	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	**35**	ng/L	M	0.83	MDL	1.0	Total	112504	5/26/2016 11:01 AM	6/1/2016 11:06 AM	6/3/2016 10:09 PM	Perfluorinated Hydrocarbons
320-19198-1	DW-57	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	**2.0**	ng/L	J	0.63	MDL	1.0	Total	112504	5/26/2016 11:01 AM	6/1/2016 11:06 AM	6/3/2016 10:09 PM	Perfluorinated Hydrocarbons
320-19198-1	DW-57	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	**150**	ng/L	M J	1.2	MDL	1.0	Total	112504	5/26/2016 11:01 AM	6/1/2016 11:06 AM	6/3/2016 10:09 PM	Perfluorinated Hydrocarbons
320-19198-1	DW-57	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	**17**	ng/L	M	0.72	MDL	1.0	Total	112504	5/26/2016 11:01 AM	6/1/2016 11:06 AM	6/3/2016 10:09 PM	Perfluorinated Hydrocarbons
320-19198-2	FB-DW-57	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	**1.5**	ng/L	J	0.87	MDL	1.0	Total	112504	5/26/2016 11:05 AM	6/1/2016 11:06 AM	6/3/2016 11:13 PM	Perfluorinated Hydrocarbons
320-19198-2	FB-DW-57	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	ng/L	U	0.76	MDL	1.0	Total	112504	5/26/2016 11:05 AM	6/1/2016 11:06 AM	6/3/2016 11:13 PM	Perfluorinated Hydrocarbons
320-19198-2	FB-DW-57	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	**0.83**	ng/L	J M	0.82	MDL	1.0	Total	112504	5/26/2016 11:05 AM	6/1/2016 11:06 AM	6/3/2016 11:13 PM	Perfluorinated Hydrocarbons
320-19198-2	FB-DW-57	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	1.9	ng/L	U	0.62	MDL	1.0	Total	112504	5/26/2016 11:05 AM	6/1/2016 11:06 AM	6/3/2016 11:13 PM	Perfluorinated Hydrocarbons
320-19198-2	FB-DW-57	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	**7.5**	ng/L	M	1.2	MDL	1.0	Total	112504	5/26/2016 11:05 AM	6/1/2016 11:06 AM	6/3/2016 11:13 PM	Perfluorinated Hydrocarbons
320-19198-2	FB-DW-57	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	**0.71**	ng/L	J	0.71	MDL	1.0	Total	112504	5/26/2016 11:05 AM	6/1/2016 11:06 AM	6/3/2016 11:13 PM	Perfluorinated Hydrocarbons
320-19198-3	DW-95	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	**3.3**	ng/L		0.85	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/3/2016 11:34 PM	Perfluorinated Hydrocarbons
320-19198-3	DW-95	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	**13**	ng/L		0.75	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/3/2016 11:34 PM	Perfluorinated Hydrocarbons
320-19198-3	DW-95	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	**6.6**	ng/L	M	0.81	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/3/2016 11:34 PM	Perfluorinated Hydrocarbons
320-19198-3	DW-95	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	**1.4**	ng/L	J	0.61	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/3/2016 11:34 PM	Perfluorinated Hydrocarbons
320-19198-3	DW-95	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	**37**	ng/L	M	1.2	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/3/2016 11:34 PM	Perfluorinated Hydrocarbons
320-19198-3	DW-95	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	**55**	ng/L	M	0.70	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/3/2016 11:34 PM	Perfluorinated Hydrocarbons
320-19198-4	FB-DW-95	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	**1.2**	ng/L	J	0.86	MDL	1.0	Total	112504	5/26/2016 11:28 AM	6/1/2016 11:06 AM	6/3/2016 11:55 PM	Perfluorinated Hydrocarbons
320-19198-4	FB-DW-95	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	1.9	ng/L	U	0.75	MDL	1.0	Total	112504	5/26/2016 11:28 AM	6/1/2016 11:06 AM	6/3/2016 11:55 PM	Perfluorinated Hydrocarbons
320-19198-4	FB-DW-95	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.9	ng/L	U	0.81	MDL	1.0	Total	112504	5/26/2016 11:28 AM	6/1/2016 11:06 AM	6/3/2016 11:55 PM	Perfluorinated Hydrocarbons
320-19198-4	FB-DW-95	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	**0.64**	ng/L	J	0.61	MDL	1.0	Total	112504	5/26/2016 11:28 AM	6/1/2016 11:06 AM	6/3/2016 11:55 PM	Perfluorinated Hydrocarbons
320-19198-4	FB-DW-95	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	**13**	ng/L	M	1.2	MDL	1.0	Total	112504	5/26/2016 11:28 AM	6/1/2016 11:06 AM	6/3/2016 11:55 PM	Perfluorinated Hydrocarbons
320-19198-4	FB-DW-95	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	**0.75**	ng/L	J	0.70	MDL	1.0	Total	112504	5/26/2016 11:28 AM	6/1/2016 11:06 AM	6/3/2016 11:55 PM	Perfluorinated Hydrocarbons
320-19198-5	DUP-052616	PFC_IDA_DOD5	375-73-5	Perfluorobutanesulfonic acid (PFBS)	**3.1**	ng/L		0.88	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/4/2016 12:17 AM	Perfluorinated Hydrocarbons
320-19198-5	DUP-052616	PFC_IDA_DOD5	375-85-9	Perfluoroheptanoic acid (PFHpA)	**13**	ng/L		0.77	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/4/2016 12:17 AM	Perfluorinated Hydrocarbons
320-19198-5	DUP-052616	PFC_IDA_DOD5	355-46-4	Perfluorohexanesulfonic acid (PFHxS)	**6.9**	ng/L	M	0.83	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/4/2016 12:17 AM	Perfluorinated Hydrocarbons
320-19198-5	DUP-052616	PFC_IDA_DOD5	375-95-1	Perfluorononanoic acid (PFNA)	**1.8**	ng/L	J	0.63	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/4/2016 12:17 AM	Perfluorinated Hydrocarbons
320-19198-5	DUP-052616	PFC_IDA_DOD5	1763-23-1	Perfluorooctanesulfonic acid (PFOS)	**46**	ng/L	M	1.2	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/4/2016 12:17 AM	Perfluorinated Hydrocarbons
320-19198-5	DUP-052616	PFC_IDA_DOD5	335-67-1	Perfluorooctanoic acid (PFOA)	**58**	ng/L	M	0.72	MDL	1.0	Total	112504	5/26/2016 11:26 AM	6/1/2016 11:06 AM	6/4/2016 12:17 AM	Perfluorinated Hydrocarbons

Naval Installation Restoration Information Solution (NIRIS)
Environmental Restoration Program (ERP) Records
Transmittal Form

Purpose

Complete one copy of this form to accompany the paper and electronic versions of Environmental Restoration Program (ERP) records submitted for inclusion to NIRIS.

Submitted By:

Name: Jennifer O'Keefe

Organization: Resolution Consultants

Email: jokeefe@ensafe.com **Phone:** 609-610-2721

Record Information:

Installation: NWS Earle

Program: (●) ERN ( ) BRAC **Supporting:** [ ] MRP [ ] LUC [ ] RAD [ ] POL

Document Title: Data Validation Report

AOC, SITE, SWMU, UST, UXO: Site 46 Military Sealift Command Fire School

Sample Delivery Groups (SDGs): 320-19181-1

Document Date: June 2016 **Number of Pages:** 6

Contract Number: N62470-11-D-8013 **CTO/DO Number:** WE09

Author/Affiliation: Jennifer O'Keefe/Resolution Consultants

Distribution/Availability Statement: [■] A [ ] B [ ] C [ ] D [ ] E [ ] F

Sensitive Content ( ) Yes (●) No **Cite Pages:**

Recommended File Type: ( ) Administrative Record ( ) Post Decision (●) Site File

Notes:

DATA VALIDATION REPORT

Site Name:	Naval Weapons Station Earle, Colts Neck, New Jersey, Site 46 — Military Sealift Command Firefighting School
Laboratory:	TestAmerica, Sacramento, California.
Sample Delivery Groups:	320-19181-1
Matrix:	Potable Water
Data Quality Level:	Stage 4, Electronic and Manual
Analysis:	Select perfluorinated compounds (PFCs) via Method 537 Modified

This report summarizes data review findings for potable water samples collected in May 2016 using the following reference documents:

- *Internal Draft Perfluorinated Compound Groundwater Investigation Sampling and Analysis Plan, Site 46 Military Sealift Command, Naval Weapons Station Earle Newport, Colts Neck, New Jersey*, Resolution Consultants (December 2015).

- Laboratory standard operating procedure (SOP) *Perfluorinated Compounds (PFCs) in Water, Soils, Sediments, and Tissue [Method 37 Modified],* TestAmerica, Sacramento, California, WS-LC-0025, Revision 1.5, (November 2015).

- *Contract Laboratory Program National Functional Guidelines for Chlorinated Dioxin/Furan Data review,* United States Environmental Protection Agency*,* (September 2011).

- *Department of Defense Quality Systems Manual for Environmental Laboratories*, Version 5.0. (July 2013).

Validation was performed on potable water and quality control (QC) samples, summarized in Attachment A, Table A-1. Samples discussed in this validation report were analyzed and reported as definitive data. A full deliverable data packages, QC summaries and raw data, were submitted for data review.

The data were evaluated based on the following review elements:

* Data completeness
* Sample receipt and preservation
* Initial calibration
* Initial calibration verification
* Continuing calibration verification
* Laboratory control sample/laboratory control sample duplicate results
* Holding times
* Isotope dilution recoveries
* Laboratory method blanks
  Field Blanks
* Field duplicate precision
  Matrix spike/matrix spike duplicates (MS/MSDs)
* Sample result transcriptions/recalculations

Acceptable data parameters for which all criteria were met or not qualified, as indicated above with an asterisk (*), are not discussed further.

Blanks

Blanks help determine how much, if any, contamination was introduced in the laboratory or the field. All results associated with a particular laboratory blank were evaluated to determine whether there was an inherent variability in the data, or if a problem was an isolated occurrence that did not affect the data.

For this project field blanks were collected assess potential ambient conditions cross-contamination that could potentially affect the quality of the associated samples. The field blanks consisted of laboratory blank water bottles that were opened in the field and transferred into another container at each sampling location. The primary purpose of this type of blank was to provide an additional check on possible sources of contamination beyond that which was intended for trip blanks.

Field Blanks

FB-DW-95 contained perfluorononanoic acid (PFNA) at a concentration of 0.64 nanograms per liter (ng/L). PFNA was detected below the limit of quantitation and was qualified as undetected "U" in DW-95 and its duplicate DUP-052616 due to potential cross-contamination.

Matrix Spikes/Matrix Spike Duplicates

MS/MSDs are generated to provide information about the effect of each sample matrix on the sample preparation and the measurement methodology. MS/MSD %Rs assess the effect of the sample matrix on the accuracy of the analytical results. %Rs above the laboratory control limit could indicate a potential high result bias while %Rs below QC limits could indicate a potential low result bias. The relative percent difference (RPD) between the MS and MSD results is evaluated to assess sample precision.

DW-57-0516 was spiked by the laboratory to assess accuracy and precision. Perfluorooctane sulfonic acid (PFOS) had a %R outside the control limits; however, since the native sample result was greater than four times the added spike amount, no qualification was performed.

Overall Assessment

The data from SDG 320-19181-1 was reviewed independently from the laboratory to assess data quality. PFNA in DW-95 and its duplicate were qualified as undetected due to suspected cross-contamination. The remaining results were acceptable without qualification; therefore, the data are usable for their intended purpose, according to U.S. Environmental Protection Agency and Department of Defense guidelines. Attachment B provides final results after data review.

Attachment A
Sample and Analysis Summary

Table A-1
Sample Summary

Sample Delivery Group	Lab ID	Sample ID	Location	Sample Date	Matrix
320191981	320-19198-1	DW-57-0516	DW-57	5/26/2016	Potable Water
320191981	320-19198-2	FB-DW-57-0516		5/26/2016	Field Blank
320191981	320-19198-3	DW-95-0516	DW-95	5/26/2016	Potable Water
320191981	320-19198-4	FB-DW-95-0516		5/26/2016	Field Blank
320191981	320-19198-5	DUP-052616	DW-95	5/26/2016	Duplicate of DW-95

Notes:
All samples were analyzed via laboratory standard operating procedure *Perfluorinated Compounds (PFCs) in Water, Soils, Sediments, and Tissue [Method 37 Modified],* TestAmerica, Sacramento, California, WS-LC-0025, Revision 1.5, (November 2015) for the following select list of analytes: Perfluorobutanesulfonic Acid (PFBS), Perfluoroheptanoic Acid (PFHPA), Perfluorohexanesulfonic Acid (PFHXS), Perfluorononanoic Acid (PFNA), Perfluorooctane Sulfonic Acid (PFOS), and Perfluorooctanoic Acid (PFOA).

Attachment B

Final Validated Results after Data Review

Table B-1
Perfluorinated Compound Results – May 2016

		Sample Delivery Group		320191981			320191981			320191981		
		Lab Identification		320-19198-1			320-19198-2			320-19198-3		
		Sample Identification		DW-57-0516			FB-DW-57-0516			DW-95-0516		
		Sample Date		5/26/2016			5/26/2016			5/26/2016		
		Sample Type		Potable Water			Field Blank			Potable Water		
Method	**Analyte**	**CAS No**	**Units**	Result	Qual	RC	Result	Qual	RC	Result	Qual	RC
TA_WS-LC-0025	PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	NG_L	2.9			1.5	J		3.3		
TA_WS-LC-0025	PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	NG_L	4.5			1.9	U		13		
TA_WS-LC-0025	PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	NG_L	35			0.83	J		6.6		
TA_WS-LC-0025	PERFLUORONONANOIC ACID (PFNA)	375-95-1	NG_L	2	J		1.9	U		1.9	U	bf
TA_WS-LC-0025	PERFLUOROOCTANE SULFONIC ACID (PFOS)	1763-23-1	NG_L	150	J		7.5			37		
TA_WS-LC-0025	PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	NG_L	17			0.71	J		55		

		Sample Delivery Group		320191981			320191981		
		Lab Identification		320-19198-4			320-19198-5		
		Sample Identification		FB-DW-95-0516			DUP-052616		
		Sample Date		5/26/2016			5/26/2016		
		Sample Type		Field Blank			Duplicate		
Method	**Analyte**	**CAS No**	**Units**	Result	Qual	RC	Result	Qual	RC
TA_WS-LC-0025	PERFLUOROBUTANESULFONIC ACID (PFBS)	375-73-5	NG_L	1.2	J		3.1		
TA_WS-LC-0025	PERFLUOROHEPTANOIC ACID (PFHPA)	375-85-9	NG_L	1.9	U		13		
TA_WS-LC-0025	PERFLUOROHEXANESULFONIC ACID (PFHXS)	355-46-4	NG_L	1.9	U		6.9		
TA_WS-LC-0025	PERFLUORONONANOIC ACID (PFNA)	375-95-1	NG_L	0.64	J		1.9	U	bf
TA_WS-LC-0025	PERFLUOROOCTANE SULFONIC ACID (PFOS)	1763-23-1	NG_L	13			46		
TA_WS-LC-0025	PERFLUOROOCTANOIC ACID (PFOA)	335-67-1	NG_L	0.75	J		58		

Notes:
ng/L = Nanograms per liter
Qual = Final qualifier
RC = Data qualification reason code
U = ***Undetected*** — The parameter was analyzed but undetected or was qualified as undetected during data review due to blank artifacts.
J = ***Estimated Value*** — One or more quality control parameters were outside control limits or the analyte concentration was less than the limit of quantitation.

Qualification Reason Codes
bf = Result qualified as undetected due to field-derived blank results

DODCMD_ID	INSTALLATION_ID	SDG	SITE_NAME	NORM_SITE_NAME	LOCATION_NAME	LOCATION_TYPE	LOCATION_TYPE_DESC	COORD_X	COORD_Y	CONTRACT_ID	DO_CTO_NUMBER	CONTR_NAME	SAMPLE_NAME	SAMPLE_MATRIX_DESC	SAMPLE_TYPE_DESC	COLLECT_DATE	ANALYTICAL_METHOD_GRP_DESC
MID_ATLANTIC	EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492	N62470-11-D-8013	WE09	RESOLUTION CONS	DW-95-0516	WP	Drinking water	26-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492	N62470-11-D-8013	WE09	RESOLUTION CONS	DW-95-0516	WP	Drinking water	26-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492	N62470-11-D-8013	WE09	RESOLUTION CONS	DUP-052616	WP	Drinking water	26-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320191981								N62470-11-D-8013	WE09	RESOLUTION CONS	FB-DW-57-0516	WQ	Water for QC samples	26-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492	N62470-11-D-8013	WE09	RESOLUTION CONS	DW-95-0516	WP	Drinking water	26-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320191981								N62470-11-D-8013	WE09	RESOLUTION CONS	FB-DW-57-0516	WQ	Water for QC samples	26-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492	N62470-11-D-8013	WE09	RESOLUTION CONS	DUP-052616	WP	Drinking water	26-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320191981								N62470-11-D-8013	WE09	RESOLUTION CONS	FB-DW-57-0516	WQ	Water for QC samples	26-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-57	DW	Domestic well	577074.2328	507231.8371	N62470-11-D-8013	WE09	RESOLUTION CONS	DW-57-0516	WP	Drinking water	26-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-57	DW	Domestic well	577074.2328	507231.8371	N62470-11-D-8013	WE09	RESOLUTION CONS	DW-57-0516	WP	Drinking water	26-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-57	DW	Domestic well	577074.2328	507231.8371	N62470-11-D-8013	WE09	RESOLUTION CONS	DW-57-0516	WP	Drinking water	26-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492	N62470-11-D-8013	WE09	RESOLUTION CONS	DUP-052616	WP	Drinking water	26-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492	N62470-11-D-8013	WE09	RESOLUTION CONS	DW-95-0516	WP	Drinking water	26-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492	N62470-11-D-8013	WE09	RESOLUTION CONS	DUP-052616	WP	Drinking water	26-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492	N62470-11-D-8013	WE09	RESOLUTION CONS	DUP-052616	WP	Drinking water	26-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320191981								N62470-11-D-8013	WE09	RESOLUTION CONS	FB-DW-95-0516	WQ	Water for QC samples	26-May-16	Perfluoroalkyl Compounds
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MID_ATLANTIC	EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-57	DW	Domestic well	577074.2328	507231.8371	N62470-11-D-8013	WE09	RESOLUTION CONS	DW-57-0516	WP	Drinking water	26-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320191981								N62470-11-D-8013	WE09	RESOLUTION CONS	FB-DW-57-0516	WQ	Water for QC samples	26-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-95	DW	Domestic well	577135.9624	507399.492	N62470-11-D-8013	WE09	RESOLUTION CONS	DW-95-0516	WP	Drinking water	26-May-16	Perfluoroalkyl Compounds
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MID_ATLANTIC	EARLE_NWS	320191981	SITE 00046	SITE 00046	DW-57	DW	Domestic well	577074.2328	507231.8371	N62470-11-D-8013	WE09	RESOLUTION CONS	DW-57-0516	WP	Drinking water	26-May-16	Perfluoroalkyl Compounds
MID_ATLANTIC	EARLE_NWS	320191981								N62470-11-D-8013	WE09	RESOLUTION CONS	FB-DW-95-0516	WQ	Water for QC samples	26-May-16	Perfluoroalkyl Compounds
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